How to Use Catalog

- How to Use the Catalog (P.83)
- Guide of Marks (P.85)
- MISUMI's Environmental Awareness and RoHS Compliancy (P.86)
- General Ordering Information (P.87)
- Delivery Times, Express Orders (P.88)
- Item Number Configuration (P.89)
- Alterations (P.90)

Washers / Collars / Shims



Page	81~98	Product Name	Metal Washers -Standard / Precision-	-With Flange-
		Page	101~109	110



Slotted Hole Washers	Thin-Walled Metal Collars	Pipe Collars	Spacers	Simultaneous Grinding Spacers	Stepped Spacers
115	116	116	116	117	118



Resin Washers –Counterbore–	Resin Collars –Tapped–	Resin Collars –Standard–	Resin Collars –Flanged–	Resin Collars -With Guide-
132	132	133	135	137



Square Resin Washers	Shim Rings / Shim Rings (Pack)	Precision Shim Rings / Wave Washers	Shims -Split-
142	143-144	145	146

Screws / Washers / Nuts



Product Name	Bolts (Box)	Nuts (Box)	Washers (Box)	Retaining Rings (Box)	Inserts (Box)	Hexagon Socket Head Cap Screws
Page	157~168	169	170	171	172	173~176



Socket Head Cap Screws - with Threadlocker Adhesive	Hexagon Socket Cap Screws with Hole	Tapped Socket Head Screws	Hexagon Socket Head Cap Screws -Fine Thread / Left-Hand Thread-	Cover Caps	Hexagon Socket Button Head Cap Screws	Hexagon Socket Flat Head Cap Screws / Pack
181	181	181	182	182	183~185	185



Small Head Cap Screws	Screws with Through Hole -Extra Low Head / Low Head / Hexagon Socket-	Screws with Through Hole –Hexagon / Full Thread Type–	Long Knurled Screws	Cover Screws -Hexagon Socket Head / Knurled / Button Head Cap Screw–
192	193	193	194	195~196

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



-Counterbored Type- 111



Metal Washers -Tapped- 113



–Countersunk– 114

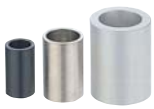


–With Screw Holes– 114



Metal Washers -Shape Selectable- 115

Addition



Metal Collars -Standard / Precision- 119~126



-Flanged / Standard- 127

Addition



Price Reduction Up to 15%

Resin Washers / Resin Collars 130





Resin Washers -Flanged Solid / Flanged- 131



Thermal Insulation / Fluororesin / PPS 138



Ceramic Washers / Sheets / Collars 139



Thermal Insulation Washers / Collars 140

NEW



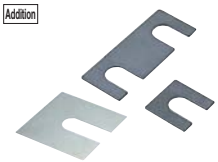
Extra Thin Resin Washers -Abrasion Resistance- 141



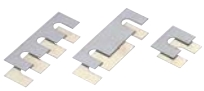
Price Reduction 30%

Extra Thin Resin Washers / Sheets 141

Addition



Square Shims –Adjustment– 147-148



Square Shims -Slotted- 149-150

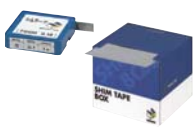


Square Shims -With Round Hole- 149-150

Addition



Shim Plates –Standard / Configurable– 151-152



Price Reduction 9%

Shim Tape 152

Addition



Price Reduction 35%

Hexagon Socket Head Cap Screws -Full Thread- 177



-High Strength Stainless Steel- 177



–Configurable Length– 177

Addition



Washer Assembled Hexagon Socket Head Cap Screws 178

Addition



1.4401 Hexagon Socket Head Cap Screws / Hexagon Screws / Nuts / Washers 179

Addition





Hexagon Socket Head Cap Screws -Titanium / Aluminum- 180

Addition

Price Reduction 15% on average



Hexagon Bolts 187



Extra Low Head Hexagon Screws 188



Hexagon Screws with Hole 188

Addition



Hexagon Socket Low Head Cap Screws 189

Addition



Hexagon Socket Extra Low Head Cap Screws 190

NEW



Price Reduction Up to 80%

Ultra Low Head Cap Screws -Hexalobular / Hexagon Socket- 191



Special Wrenches 191



Cover Screws-Extra Low Head / Low Head / Recessed / Long knurled 197-198



Hexagon Socket Cap Screws with Retaining Ring Groove 198



Stepped Screws –Extra Low Head / Low Head / Button Head Cap Screw / Cross Recessed– 199



Full Thread 200

2 2



Stud Bolts 200



Addition

Configurable Length Screws with Hexagon Sockets 201



Addition

Configurable Length Screws 202



Full Thread Screws with Scale 203



Flanged Brackets –Bracket– 203



Configurable Length Screws with Hexagon Sockets –Tip Shape Selectable– 204



Large Head Shoulder Screws 210



Low Head Shoulder Screws 211



Reamer Bolts 212



Plastic Hexagon Socket Cap Screws / Set Screws 213



NEW

Plastic Hexagon Socket Head Cap Screws -No Knurling- 214



Low Head Plastic Hexagon Socket Cap Screws / Extra Low Head Plastic Screws (Pack) 214



Washer Assembled Cross Recessed Hexagon Head Screws 224



Precision Machine Screws (Package) 225



Ornamental Screws / Washers 225



NEW

Self Tapping Screws 226



Addition

Price Reduction 22% on average

Nuts 227



Addition

Compact Nuts 228



Price Reduction 22% on average

Ring Nuts 228



Hard Lock Nuts 231



Price Reduction Average 27%

Changed

Washers 232



Quick-Tight Nuts 233



Tab Washers (Package) 233



Serrated Conical Disc Spring Washers 233



Conical Spring Washers 233



Square Washers / Nuts 234



NEW

Tapered Machine Keys with Gib Head 242



Dowel Pins / General Purpose Pins 243–248



Dowel Removal Jigs 248



Dual–Fit Dowel Pins 249



–Hollow, Tapped– 249



Stepped Dowel Pins 250



Insulating Dowel Pins 250



Split Pins 254



Addition

Price Reduction Up to 40%

Thread Inserts 255



Tools for Thread Inserts 255



Tangless Inserts 256



Hand Taps for Tangless Inserts·Tools 256



Self-Tapping Inserts 256



Bubble Levels –Surface Mounting Type– 260

-Embedded Type- 260

Grease Fittings 260

Hardened Precision Balls 260

Loss-Proof Stainless Steel Chains 261

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Hexagon Socket Set Screws	Hexagon Socket Cap Screws -with Soft Tips-	Set Pieces	Hexagon Socket Screws -Dog Point	Lifting Eye Bolts	Plastic Hexagonal Spacers	Shoulder Bolts
205-206	206	206	207	208	208	209-210



Plastic Cross Recessed Pan Head Screws (Pack)	Wing Screws / Wing Nuts	Tamper Proof Button Head Cap Screws / Hex Wrenches	Thumb Screws (Resin Head)	Cross-recessed Head Machine Screws	Phillips Low Head Screws / Binding Screws	Washer Assembled Cross Recessed Pan Head Screws
215	216	216	216	217~220	221-222	223



Tall Nuts	Knurled Nuts	Flanged Nuts	Cylindrical Nuts	Quick-Tight Nuts	T-Nuts	Taper Washers / Taper Nuts	U-Nuts®
228	228	229	229	230	230	230	231

Small Parts / Magnets



Product Name	Parallel Keys -Configurable-	-With Counterbores / With Tapped Counterbores-	-With Counterbore and Tapped Hole Type-	–With Pull-Out Tapped Hole–	- Blank Type -
Page	237-238	239	240	240	241



Plastic Dowel Pins	Spring Pins	Screw Plugs	Retaining Rings –C Type (External)–	(E-shaped) Retaining Rings	Retaining Rings –C Type (Internal)–	Hair Pin Cotters
250	251	252	253	253	254	254



Hand Tools for Self-Tapping Inserts	Scale Plates and Pointer Plates	Angle Scales –Plate Type–	-Double-sided Adhesive Tape-	Scale Tapes
256	257	259	259	259



Loss-Proof Chains	Loss-Proof Wires	Metal Joints	Mounting Brackets	Connecting Parts –Double Ring–	Temperature Sensing Labels
261	262	262	262	262	263







Price Reduction Up to 41%
Addition


Arrow Sign Stickers	Arrow Sign Plates	Open / Closed Sign Plates	Stickers	Magnets–Round–	–Ring–
264	264	264	265-266	268	269


NEW

Price Reduction Up to 7%
NEW

Addition

Price Reduction Up to 27%


–Oval Holder–	Urethane Coated Magnets	Threaded Magnets with Holders	Magnets with Holders	Magnets with Holders -Tolerance h7 Type-
272	273	273	274	275-276

Round Bars / Rods / Pipes / Resin Rods

NEW






Product Name	[Material Shop 24 Round Bars and Pipes Website]	Rods -1.1191 / 1.0038 / 1.7220-	Rods -Stainless Steel / Aluminum / Brass / Pure Titanium Class 2-	Precision Rods (Tolerance h7/g6) -1.1191 / 1.4305 / 1.4301-
Page	282	283	285	287


Price Reduction 4% on average

Price Reduction 4% on average

NEW



Thick-Walled Stainless Steel Pipes -Straight / Threaded / Tapped-	Thin-Walled Stainless Steel Pipes -Precision Inner / Outer Ø Type-	Stainless Steel Pipes with Bending Alteration	Resin Rod Exterior Surface Unfinished	Resin Rods -Outer Dia. Finished-
294-295	296	297	298	299

Springs / Shock Absorbers / Gas Springs

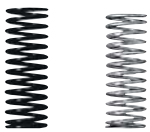






Product Name	Tension Springs	Tension Springs -Hook Free-	Tension Springs -Long Medium Load-	hook	Tension Springs -Hook Insertion-
Page	309~312	313	314	314	314



Addition

Addition



Constant Force Springs / Brackets for Constant Force Springs	Round Wire Springs -Outer/Inner Diameter Standard / L Configurable-	Round Wire Springs -Stainless Steel-	Washers for Compression Springs -Standard-
322	323~331	332~339	340

Addition

NEW

NEW
Addition


Stopper Nuts	Shock Absorbers -Coolant Resistant / Economy Type-	Gas Springs
345	347-348	350~354

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.








–Square–	Rubber Magnets -Super Strong Type-	Rubber Magnets -Strong Type-	Rubber Magnets -Standard Type-	–With Countersink–	Magnets -Countersink with Holder-
269	270	270	270	271	272








Hex Head Bolts with Magnets (Regular)	Magnet Blocks with Three-Side Attraction	Screw Stoppers with Magnet	Electromagnetic Holders -Standard / Tapped Through Hole / Rectangular / Cord Vertical-	Rectifiers for Electromagnetic Holders
277	278	278	279	280





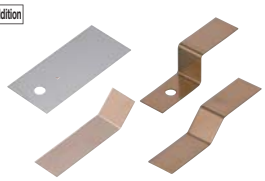

Mini Rods -Tip Shape, Outer Ø Tolerance Selectable, Outer Ø Configurable-	Hexagon Material	Inner Ø Selectable Steel Pipes / Wall Thickness Selectable Stainless Steel Pipes	Pipes -Welded, Thin Walled / Drawn Pipes
288~290	291	292	293






Precision Resin Rods	Ceramics Rods	Transparent Resin Rods / Pipes	Resin Pipes -Inner/Outer Ø Unfinished/Finished-
301	302	302-303	303-304






Posts for Tension Springs	Disk Springs	Flat Springs	Torsion Springs
315~317	318	319	320







Washers for Compression Springs -Tapped-	Washers for Coil Springs	Shock Absorbers	Eccentric Angle Adapters
340	340	343~344	345

Urethane / Rubbers / Sponge / Felt








Product Name	[Material Shop 24 Urethane, Rubber, Sponge Website] Urethane / Antistatic Urethane Washers	Abrasion Resistant / Heat Resistant Urethane Washers	Rubber Washer	Sponge Washers	Urethane Bumpers
Page	357	361	362	363	364	365~368



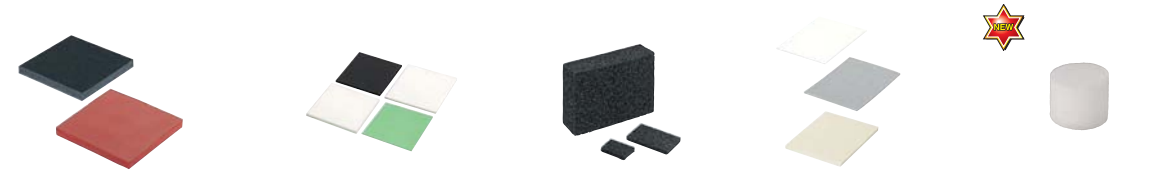
Threaded Urethane / Rubber Bumpers	Bumpers with Metal Washer	Urethane Bumpers -Counterbore L Standard / L Configurable-	Urethane Bumpers -Counterbore Hole Configurable- / Flanged Collars for Urethane Bumpers	Rubber Bumpers / Counterbored Rubber Bumpers
369	370	371	372-373	374



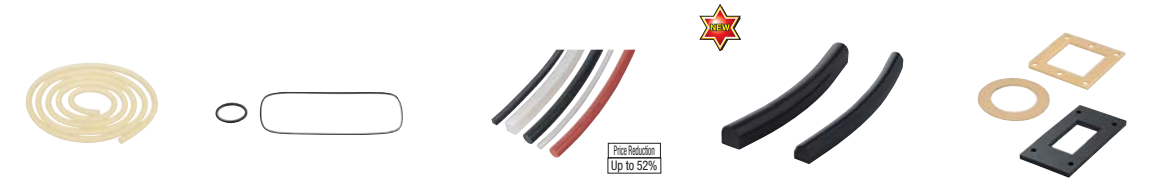
Shock Absorbing Bumpers -Tapped / Threaded-	Shock Absorbing Bumpers -Plate Type /Holder Type-	Urethane Sheets	Highly Abrasion Resistant / Heat Resistant Urethane Sheets	Urethane Sheets with Oil-Resistant Adhesives
379	380	381~384	385	387



Silicon / High Strength Silicon Rubber Sheets	Low Elasticity (Hanenaito®) Rubber Sheets	TPE Sheets / TPE Washers & Bumpers	Metal-Plated Urethane Sheets	Urethane / Rubber Blocks
397	399	401	403	404



Urethane / Rubber Sponge Sheets	Low Elasticity / Antistatic Low Rebound / Low Strain Sponge Sheets	EPT SEALER® Sponge	Felt Sheets	Felt Bumpers
409	411	412	413	414



Round Cord - Sealing Elastomer	Urethane - Rubber Round Strings -Ring Type-	Rubber / Rubber Sponge Strings -Round / Square-	Round Dome / Trapezoidal Dome Rubber	Urethane / Rubber / Sponge Gaskets
420	420	421	422	423~426



Antivibration Gel-Threaded/Plate Stopper Type-	Antivibration Gel Bushings	Antivibration Gel Sheets	-Antivibration Gel Rubber Coat Type-	Wire Rope Isolators	Antivibration Pads (Non-Staining Rubber / Natural Rubber)
436	436	437	437	438	439



Rubber Feet / Attachments	Sponge Tapes	Rubber Bumpers	Shock Absorbing Form
449-450	451	452	452

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

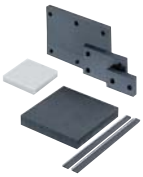
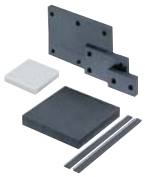
Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.

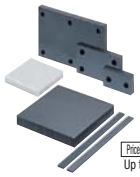


Price Reduction Up to 26%




Urethane / Rubbers -Spherical Tip-	Urethane / Rubbers -Tapered Tip-	Urethane / Rubbers -Pilot Type-	Urethane / Rubbers -Cap Type-	Extra Low Hardness Urethane Bumpers / Sheets
375	375	376	377	378

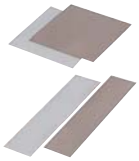





Price Reduction Up to 40%

Antistatic Urethane Sheets / Low Rebound Urethane Sheets	Nitrile Rubber Sheets	Chloroprene / Non-Staining Chloroprene Rubber Sheets	Ethylene Rubber Sheets / Butyl Rubber Sheets / Amber Color Rubber Sheets	Fluorine Rubber Sheets
388	389	391	393	395

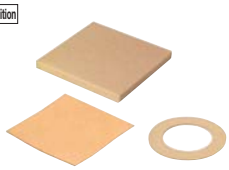







Anti-Skid Rubber Sheets	Nonskid Rubber Sheets	Silicon Gel Sheets	Low Friction Rubber Sheets -Nitrile / Silicon-	Resin Sheets	Fluororesin Tapes
405	406	406	407	408	408

Addition








Heat Insulation Sponge (Polyimide) Sheets / Washers	Heat Insulation Sheets	Heat Insulation Tapes	Heat Sinks	Heat Radiation Gel Sheets	Sponge Tapes
415-416	417	417	418	418	419

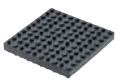
Antivibration / Soundproof / Antistatic Measures / Brushes

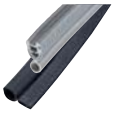



Price Reduction Max. 23%


Product Name	Antivibration Rubber -Stainless Steel Core Rod (Conductive Rubber / Chloroprene Rubber)-	Antivibration Rubber Mounts	Antivibration Gel -Both Ends Threaded-
Page	431-432	433-434	435

Addition



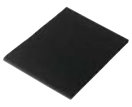


NEW



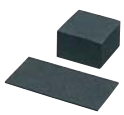
Antivibration Pads - RUBLOC® (Low Frequency Compatible)	Sound Proofing Materials	Trims	Trim Seals	Trim Compacts	Adhesives
440	441~444	445	446	447	448





Safety Protection Materials	Antistatic Rubber Sheets	Highly Conductive Rubber Sheets	Grounding Plates	Antistatic Sponge Sheets
453-454	455	456	456	457



Antistatic Sponge Sheets
458



Ionizers - Fan Type
459-460



Blow Type
461



Nozzle Attachments for Ionizers - Blow Type / Bar Type
462

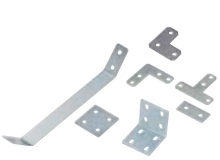


Neutralization Brushes
463

Aluminum Extrusions Extrusions & Brackets











Product Name	Aluminum Extrusions 20, 25, 40mm Square -HFS5 Series-	Brackets	Sheet Metal Plates / Brackets	Pre-assembly Fitting Nuts	Post-Assembly Insertion Nuts
Page	477~482	483~496	497	500~502	503~505



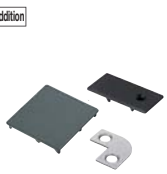
Pre-assembly Fitting Nuts
543~545



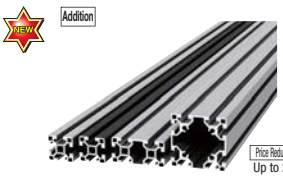
Post-Assembly Insertion Nuts
546~548



Nuts
549~550



Extrusion End Caps
551-552



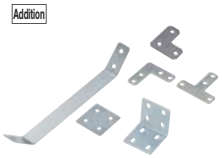
Aluminum Extrusions 40, 80mm Square -HFS8 Series-
553~562



Brackets
563~578



Brackets
601~612



Sheet Metal Plates / Brackets
613



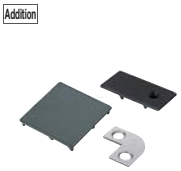
Pre-assembly Fitting Nuts
615~617



Post-Assembly Insertion Nuts
618~620



Nuts
621-622



Extrusion End Caps
623-624



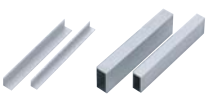
Aluminum Bracket Extrusions
660



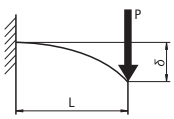
Flat Aluminum Extrusions
661~664



Fence Extrusions
665



Aluminum Extrusions
667-668



Technical Data for Aluminum Extrusions
669~680



Latch Magnets with Adhesive Tape
690



One-Sided Rollers for Aluminum Extrusions / Rollers for Aluminum Extrusions
691



Conveyor Roller Shaft Holders / Plastic Covers
692



Sliders for Aluminum Extrusions
693



Cable Covers / Cable Clamps
701



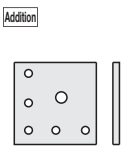
Hooks
702



Casters & Leveling Mounts Assembly
703-704



Plates with Casters / Leveling Mounts
705



Plates
706



Foot Bases
707

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Copper Foil Tape 463



Neutralization Tapes 463



Channel Brushes 465



Attachments for Brush 465



Roll Brushes 466



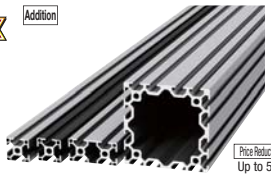
Nuts 506-507



Nuts (Package) 508



Extrusion End Caps 509



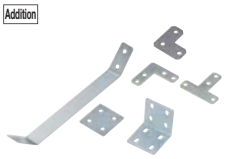
Aluminum Extrusions 30, 60mm Square -HFS6 Series- 511~522

Price Reduction Up to 5%

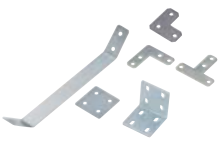


Brackets 523~540

Price Reduction Up to 10%



Sheet Metal Plates / Brackets 541



Sheet Metal Plates / Brackets 579



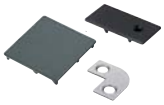
Pre-assembly Fitting Nuts 581~583



Post-Assembly Insertion Nuts 584~586



Nuts 587~588



Extrusion End Caps 589~590

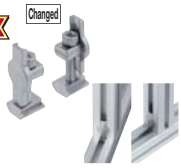


Price Reduction Up to 2%

Aluminum Extrusions 45, 50, 60, 90, 100mm Square -HFS8-45 Series- 591~600



Aluminum Extrusions with Built-in Joints 625

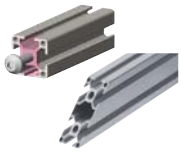


Blind Joint Components 627~640



Price Reduction 4% on average

Screws for Aluminum Extrusions 641~644



Alterations for Aluminum Extrusions 645~658



Aluminum Extrusions 15mm Square/Brackets/Square Nuts 659

Accessories for Aluminum Extrusions / HEPA Filters



Cover Attachment Brackets 683



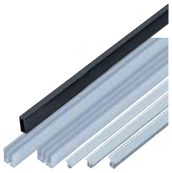
Panel Clamps / Post-Assembly Panel Holders 685-686



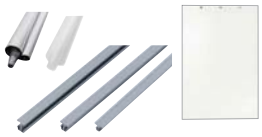
Slot Covers 687-688



Non-Slip Covers / Seal Covers / Protection Covers 689



Slide Rails / Spacers -Resin Type- 694



Sheets / Sheet Holders / Curtains 695~697



Fluorescent Light Units 698



Holders for Aluminum Extrusions / Clamps 699-700



Pads for Aluminum Extrusions / Foot Bases for 40 and 45 Squares 708



Casters for Aluminum Extrusions 709



Casters for Aluminum Extrusions - Threaded 710



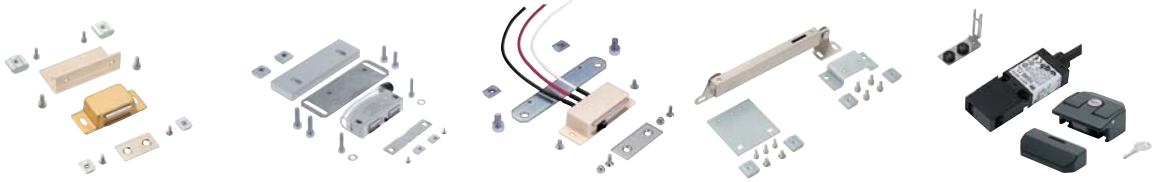
Foot Mount Brackets 710



Mounting Plates for Casters and Leveling Mounts 710



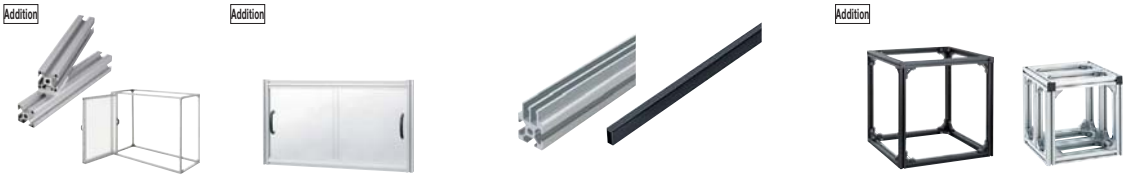
–With Mounting Plate–	Casters for Aluminum Extrusions -with Adjuster-	Floor Stoppers / Leveling Mounts for Aluminum Extrusions	Caster Kits for Doors	Anchors / Stands for Aluminum Extrusions
711	712	713-714	715	716~718



Latch Magnets for Aluminum Extrusions	Latch Magnets with Sensors for Aluminum Extrusions	Latch Magnets for Panels	Latches / Slide Bolt Sets for Aluminum Extrusions	Safety Door Switches / Locks for Aluminum Extrusions
729-730	731	732	734	735



Tensioners for Aluminum Extrusions / Stainless Steel Wires	Assembly Jigs / Drilling Jigs	Repair Pen	HEPA and ULPA Filter Units / Brackets	Clean Exhaust Units
747	748	748	751-752	754

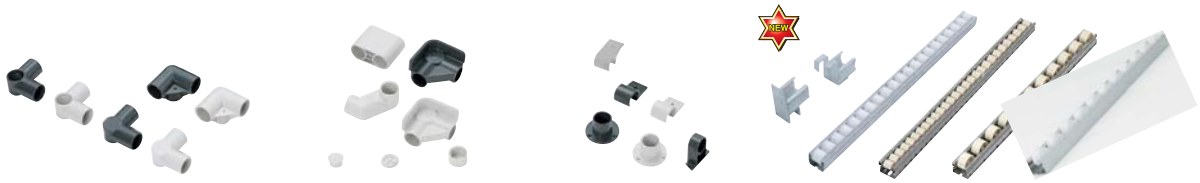


Folding Door Units / Sliders	Sliding Door Units	Aluminum Extrusions for Sliding Doors / Slide Spacers	Aluminum Extrusions Standard Units - Temporary Assembling Service
763-764	765	766	767~776

Factory Frames / Pipe Frames



Product Name	Factory Frames / Joints / Accessory Parts	Door Parts for Factory Frames	Pipe Frames
Page	788~792	793~796	799



Plastic Joints	Plastic Joints	Plastic Joints	Wheel Conveyor Assembly / Connecting Parts
804	805	806	807



Casters for Pipe Frames	Caster Attachment Parts	Stainless Steel Pipe Frames / Joints / Accessory Parts
811	812	813

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Hinges -Aluminum / Resin- 719~722



Hinges / Hinge Nuts 723~726



Aluminum Long Hinges 727



Torque Hinges 728



Slide Locks 737



Hooks 737



Aluminum Handles / Reinforcing Covers 738

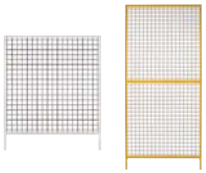


Handles 739~744

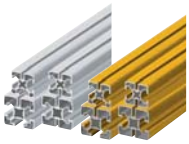


Components for Sliding Doors 745-746

Aluminum Extrusions Units - Assembly & Sipping Service



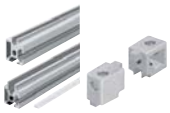
Safety Mesh Fence Units 757-758



Extrusions for Safety Fence 759

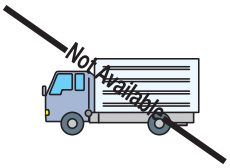


Door Units 761



Extrusion Components for Doors 762

Product Name	Safety Mesh Fence Units	Extrusions for Safety Fence	Door Units	Extrusion Components for Doors
Page	757-758	759	761	762



Assembling and Delivery Services 777



Aluminum Extrusions - Design Support Software 783



Curved Pipe Frames 799



Aluminum Pipe Frames 800



Metal Joints 802



Adhesive 803



Skid Pipes / Connecting Parts 808



Lifting Table Units 808



Accessory Parts 809



Adjusting Bolts 810



Pipe Frame Standard Units 816~818



Cutters 819



Spare Cutter Blades 819



Deburring Tools 819



Spare Cutter Blades 819

2 2

Cover Panels / Boards

Addition





Product Name	Aluminum Panels / Diamond Tread Plates	Stainless Steel Panels / Steel Panels
Page	823	825







Addition





-Ventilation Hole-	Baked Finish Steel Panels-Left Door / Right Door / Double Doors-	-Selectable Shapes-
833	834	835





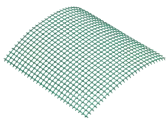


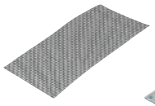


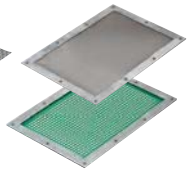


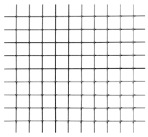
Perforated Metals-Framed-	-Standard Circular-	-Framed Circular-	-L-Shaped Retained-	-U-Shaped-
840	841	841	842	842

Addition

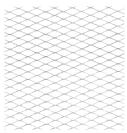








Addition



Addition



Net Plates	Fence Nets	Folding Nets	Framed
850	851-852	853	854





Price Reduction
Up to 12%





Acrylic Plates Economy	Polycarbonate Plates	Resin Sheets	Resin Cover Plates -L-Shaped / U-Shaped-
875	877	881	883

Addition







Price Reduction
13% on average



Price Reduction
20% Max.



Price Reduction
Up to 10%

Glass Plates -Square / Round-	Flange Base for Observation Port / Flange Set	Epoxy Glass Plates	Bakelite Plates - Paper Based / Fabric Based	MC Nylon® Plates
889-890	891-892	893	895	901









ABS Plates	PBT Plates	Unilate® (Free-Cutting Resin) Plates	Precision Resin Plates
917	919	919	921

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

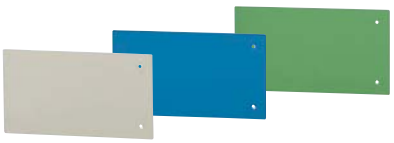
About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.

Addition



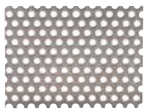
Cover Panels -(Compound Plates)- 829



Baked Finish Steel Panels 831

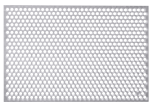


Baked Finish Steel Panels -Keyhole- 831

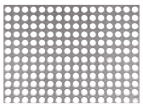


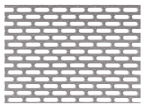
Perforated Metals-Standard- 837

NEW



Perforated Metals with Flames 838





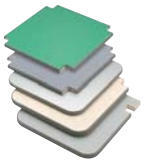
-Round Hole Parallel / Slot Hole- 839



Double-Sided Melamine Glued Laminated Plywoods / Particle Boards 843



Single-Sided Rubber Glued Laminated Plywoods-Standard / Antistatic- 845



Soft Edge Laminated Plywoods / End Tape Glued Laminated Plywoods 847

NEW



Stainless Steel Panels with Protective Sheet 849

Transparent Resin / Glass / Mirror / Resin Plates

NEW



Product Name [Material Shop 24 Resin Plates Website] Page 857

Addition



Price Reduction 20% Max.

PET Plates 865

Addition



Antistatic PVC Plates 869

Addition

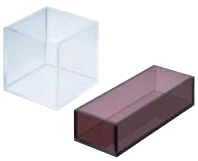


Price Reduction Up to 15%

Acrylic (Resin) Plates 871



Resin Circular Plates 885



Acrylic Cases 886



Mirror Plates (Glass Type / Acrylic Type) 887

Fused Silica Plates Square / Round 888



Price Reduction Up to 15%

Polyacetal Plates 905



Ultra High-molecular-weight Polyethylene Plates 909



Price Reduction Up to 15%

Fluororesin Plates 911



Price Reduction Up to 10%

PEEK Plates 913



PPS Plates 917



Resin Blocks 922



Resin Circular Plates -Standard / Precision- 923-924

Ceramics Plates 925



Ceramics Circular Plates 926

LED Lamp for Cabinetry



Product Name	Standard Type	Economy Type	Thin Type	Wide Type
Page	929	930	931	932

Casters / Adjustment Pads



Product Name	Economy Casters	Casters	-Electrically Conductive-	Casters -Stainless Steel-	-Light / Medium Load Type-	-Medium Load Type-
Page	943	945	946	946	947	948



-Super Heavy Load Type-	-Super Heavy Load Low Profile-	Screwed-on Casters	Ball Casters
954	954	955~959	959



-Heavy Load, Stainless Steel Type-	Casters with Adjustment Pads -Light Load Type-	-Lightweight Type-	-Antivibration Type-	-Space Saving Type-	Casters with Adjustment Pads -Light Load Type-	-Medium Load Type-
964	965	965	965	966	966	967



Cast Frame Casters-Standard Type-	-Trailer Use Type-	-Heavy Load-	Replacement Wheels for Casters	Wheel Shafts	Floor Stoppers	Floor Locks
973	973	974	975	976	977	978



-Heavy Load / Steering Wheel Type-	-Antivibration Type-	Attachments for Antivibration	Fixing Plates for Adjustment Pads -Thick Type-	Protection Caps	Adjustment Pads -Space Saving Type-	-Rotary Short Type-
982	983	983	984	984	985	986



-Separate / Knurled Type-	Lifting Units -Standard Type-	Foot Jack Bolts	Anchor Brackets -Standard Type-	-Ribbed Type-	Seating Plates -Standard Type-
991	992	993	995	995	996

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Embedding Type
933



Water Resistant Hard Glass Tube Type
934



Large Spot Type
935



Compact Spot Type
936



-Swivel Lockable Type-
949



-Double Locking-
949



Casters –Low Floor / Stainless Steel Type–
951



-Ultra Low Profile-
952



-Medium to Heavy Load Type-
953



Casters –Heavy Load Type–
953



Nylon Casters
960



Foot Mount Brackets
960



Design Casters
961



Dual Wheel Casters
961~963



-Dual Wheel, Medium Load-
964



-Heavy Load Type-
964



-Heavy Load Integrated Type-
967



-Large Diameter Wheel-
968



Casters & Leveling Mounts Assembly
969



With Integrated Plate and Adjustment Pads-Wheel Material Selectable-
970



Vibration Insulating Casters
971



Casters for Clean Environment
972



Adjustment Pads-Standard Type-
979

Addition



Adjustment Pads -Nonslip Type-
980

Price Reduction
30% Max.



–Fixed–
981

Price Reduction
30% Max.



- 2-Hole Type -
981



Adjustment Pads -Space Saving Type-
981



Economy Adjustment Pads
981



-Heavy Load-
982



-Tapped Socket Type-
986



Adjuster Feet –Rotary Type–
987



Adjustment Feet -Resin Rubber Type-
987



Rubber Base Adjustment Pads
988



Antivibration Pads
989



Anti-Vibration Mounts
990



Table-Top Bases
991

Levers / Handwheels / Knobs

Addition



Price Reduction
10% on average







Product Name	Clamp Levers -Baking Finish-	-Stainless Steel / Chrome Plating / Nickel Plating-	Miniature Clamp Levers	Flat Clamp Levers	Y-shaped Clamp Levers
Page	999	1000	1001	1001	1002



Wing-Shaped Clamp Levers	Clamp Levers with Captured Washers	Push Button Clamp Levers	Clamp Levers with Pad / with SR Tip	Resin Clamp Levers	Resin Clamp Levers	Miniature Resin Clamp Levers
1002	1002	1003	1003	1004	1004	1004



Tension / Safety Tension Levers	Stationary Handles	-Offset Levers-	Ball Knobs	Stationary Handles	Stationary / Revolving Stainless Steel Handles
1008	1008	1009	1009	1010	1010



Square Hole Handles - Folding Grip	Square / Round Bore Handwheels	Crank Handles	Plastic Offset Handwheels	Solid Disk Handwheels	Adjusting Collars
1013	1013	1013	1014	1015	1015



Thick Knurled Knobs	Knurled Knobs with Captured Washers	Large Diameter Knurled Knobs	Small Diameter Knurled Knobs	Stepped Knobs - Not Knurled	Hexagon Socket Knurled Knobs	Checker Knurled Knobs
1020	1021	1021	1021	1021	1022	1022



Checker Knurled Clamp Knobs	Stainless Steel Knobs	Knurled Knob Screws with Captured Washers	Knurled Knob Screws with Tip Pads	Plastic Clamp Knobs	Knurled Knobs	Plastic Knurled Handwheels
1025	1025	1026	1026	1026	1027	1027



Star Knobs	Cross Knobs	Five Lobed Knobs	Six Lobed Knobs	Seven Lobed Knobs	Super Knobs
1030	1030	1030	1030	1031	1031

Handles / Hinges / Door Parts



Product Name	Round Handles / Round Handles with Washer	Handles with Rubber	Washers for Handle	Oval Handles	Square Handles / Square Handles L Dimension Configurable Type
Page	1037	1038	1038	1040	1040

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.


Push Type Resin Clamp Levers 1005


Secured Resin Clamp Levers 1005


Ratcheting Clamping Levers 1006


Quick Levers 1006


Flat Tension Levers 1007


-Hexagon Socket Head- 1007


Price Reduction 20% Max.
Revolving Handles 1010

Addition

Folding Revolving Handles 1011


Flat-top Revolving Handles 1012


Miniature Revolving Handles 1012


Stainless Miniature Revolving Handles 1012


Revolving Ball Knobs 1012


Folding Handwheels 1016

NEW

Flat Handwheels 1016

Addition

Five Spoked Handwheels 1017


Two Spoked Handwheels 1018

Addition

Knurled Aluminum / Stainless Handwheels 1019


Knurled Knobs 1020


Drop-proof Knurled Knobs 1022


Knurled Knobs - with H.S.C.S 1023


Knurled Knobs with Tip Pads 1023


Price Reduction Up to 21%
Knurled Knobs -Slit- 1023


Knurled Knob Screws / SR Tip 1024


Knurled Clamp Knobs 1025


Knurled Knobs -Diamond Cut Type- 1028


Large Diameter Knurled Knobs 1028


Mushroom Shaped Knobs 1029


Wing Shaped Knobs 1029


Wing Knobs 1029


Three Lobed Knobs 1029


Adjustment Screws with Knobs 1031


Hex Socket Head Cap Knobs 1031

NEW

Hooks 1032


Drop-prevention Chains for Knobs 1032

NEW

Designer Handles -Tapped- 1041


-Phenol Handles- 1041


Handles - Nylon, Tapped 1042


Handles for Plates / Guides for Sliding Doors 1042


–Rubber Handles– 1042


T-Shaped Handles 1042

Handles - Welded Round Bar 1043



Handles for Aluminum Extrusions - Plate Mounted	-Oval Grip Handles-	Aluminum Handles	Handles - Sheet Metal	Handles (External Fixing) -U-Shaped-	Designer Handles -External Fixing-	Cast Handles
1043	1043	1044	1044	1044	1045	1045



Handles - Offset	-Casting Offset-	Aluminum Pipe Handles	Small Diameter Aluminum Pipe Handles	Small Resin External Handles	Handles - Nylon 6	Mounting Plates for Handle
1048	1048	1048	1048	1049	1049	1049



Handles for Welding	Spring Loaded Handles	Stainless Steel Rotary Handles	Embedded Handles	Stainless Steel Embedded Handles	Folding Embedded Handles	TPE Embedded Handles
1052	1052	1052	1053	1053	1054	1054



Aluminum Hinges with Tabs	Aluminum Flag Hinges / Aluminum Flag Hinges for Different Shape Frames	Stop Hinges	Stainless Steel Hinges for Heavy Load	Hinges with Slotted Holes	Aluminum Hinges with Slotted Holes	Plastic Hinges
1058	1059	1059	1060	1060	1060	1061



Damper Hinges	Hinge Dampers	Stainless Steel Detachable Hinges	Aluminum Detachable Hinges	Aluminum Detachable Hinges	Detachable Hinges for Heavy Loads	Stepped Detachable Hinges
1064	1064	1065	1066	1066	1066	1067



Magnetic Catches - High Strength	Latch Magnets	Latch Magnets	Thin Magnet Catches	Ultrathin Magnetic Catches
1070	1070	1070	1071	1071



Magnetic Catches with 3 Wires	Magnet Catches with Sensors - Lead Wire Connected	Magnetic Catches with Switch	Ball Catches	Snap Locks	Covered Snap Locks
1073	1074	1074	1074	1075	1076

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.

Addition



-Folding Handles- 1046



Handles with Caps 1046



Aluminum Pipe Handles 1046

Addition



Small Diameter Aluminum Pipe Handles 1046



Handles - Welded Round Bar 1047



Handles - with Pedestal - Offset 1047



Aluminum Handles - with Plate - Offset 1047



Phenol Handles - Counterbored 1050



Cantilever Handles 1050



Resin Handles with Cap 1050



Folding Handles 1051



Price Reduction Up to 47%

-Threaded Type- 1051



Handles - Side Mount 1051



T-Shaped Handles 1051



Embedded Handles 1054



Hinges -Stainless Steel / Steel 1055

Price Reduction Up to 24%



Stainless Steel Hinges 1056

Price Reduction Up to 26%



Stainless Steel Hinges 1056



Hinge Nuts 1056



Aluminum Hinges / Aluminum Hinges for Different Size Frames 1057



Aluminum Hinges - for Extra Low Head Cap Screws 1057



Compact Plastic Hinges 1061



Low Particulate Hinges 1061



Hinges - Offset Mounting Holes 1062



Stepped Hinges 1062



Stepped Hinges - Stainless Steel 1062

Addition



Spring Loaded Hinges 1062

NEW



Torque Hinges 1063



Vertical Detachable Hinges 1067

NEW



Detachable Welded Hinges 1067

Addition

Price Reduction Up to 53%



Welded Hinges - Stainless Steel 1068



Welded Steel Hinges 1068

Addition

Price Reduction Up to 37%



Welded Hinges for Heavy Loads 1068



Long Stainless Steel Hinges 1068

Addition

Price Reduction Up to 45%



Latch Magnets 1069



Adjustable Magnet Catches 1071

Addition

Price Reduction 30% Max.



Dust-Proof Latch Magnets 1072



Low Particulate Generation Thin Magnetic Catches 1072

NEW



Resin Catches 1072

NEW



Door Limit Switches 1073

–Terminal Attached– 1073

Snap Locks for Medium Loads 1076

Adjustable Snap Locks 1077

Corner Snap Locks 1077

Key Locks 1077

NEW

Large Cabinet Locks 1078

Hinges - With Slide Bolts 1078

Square Latches 1078

2 2



Airtight Latches	Latches	Canopy Latches	Small Canopy Latches	Latches with Catch Mechanisms	Rotary Latches	Spring Loaded Latches
1078	1079	1079	1079	1080	1080	1080



Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic	Manifold Blocks - Hydraulic / Pneumatic, Two Circuit
1089~1099	1090~1100	1101



Terminal Blocks - Hydraulic	Terminal Blocks - Pneumatic	Manifold Blocks - Pneumatic	Manifolds with Magnets
1109	1110	1111	1111



Pipe Manifolds	Pipe Manifolds -Socket Selectable-	-1 Direction Type (90° & 180°)-
1115	1116	1117~1119

Pipes / Joints / Hoses / Valves



Product Name	Steel Pipes	–Wrench Flat Type–	L-Shaped Angles for Steel Pipes	Pipe Supports
Page	1125	1127	1128	1129~1131



High Pressure Steel Pipe Fittings	Screw Fittings -Brass / Unequal Dia.-	-Unequal DIA. Pipe Threads-	Extension Joints
1137-1138	1139	1140-1141	1142



PVC Joints -TS Joints-	PVC Joints -HI Joints-	Compound Joints
1147~1158	1149-1150	1151

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.

Manifolds





Product Name	Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic	Manifold Blocks -Hydraulic / Pneumatic
Page	1084-1085	1084-1085-1087-1088	1086






Manifold Blocks -Hydraulic / Pneumatic, Two-Series-	-Lateral Through Hole-	Terminal Blocks - Hydraulic	Terminal Blocks - Pneumatic
1102	1103-1104	1105~1107	1105~1107






Manifold Blocks–Hydraulic / Pneumatic–Selectable Thread Size–	Manifold Blocks - Pneumatic	Aluminum Frame Manifolds	Rotary Manifolds
1112	1113	1113	1114






Sockets for Pipe Manifolds	Plates with Fittings	Simplified Manifolds	Brackets with Fittings
1117-1119	1121	1121	1122



Price Reduction Up to 82%

Price Reduction Up to 70%

Low Pressure Screw Fittings -Seal Coating Type-	-Equal Dia.-	-Unequal Dia.-
1132	1133~1135	1136

Addition





Steel Pipe Fittings - Threaded Couplings	Screw Conversion Joints -L-Shaped / T-Shaped-	Heat, Cold Retention Pipe Covers	PVC Pipes
1143	1144	1145	1146





Price Reduction 20% Max.

Welded Joints -Butt Welding Type-	Accessories for Plumbing Clamps	Plumbing Terminals	Screw Plugs
1152	1153-1154	1155	1156



Copper Pipes / Copper Pipe Fittings
1157-1158



Copper Pipe Fittings
1159



Annealed Copper Pipes / Fittings for Annealed Copper Pipes
1160



Flexible Hoses -High / Medium / Low Pressure Type-
1172-1173



Fluoro Resin Flexible Hoses
1174



Oil Hydraulic / Water Hydraulic Couplings
1175~1178



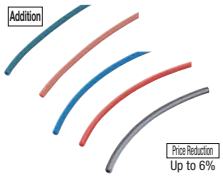
Hoses for Food
1181



Couplings for Hoses
1187~1189



Coil Hoses
1190



Air Hoses
1190



Hose Bands
1191



Plumbing Parts for Aluminum Duct Hoses
1199~1201



Duct Boxes
1202



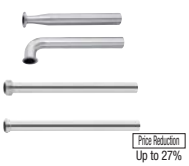
Ball Valves
1203-1204



Compact Ball Valves
1208-1209



Needle Valves
1209-1210



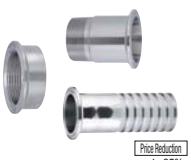
-One Side Welded-



-Both Sides Welded-
1217



-Branching Tees Type / One Side Welded / Both Sides Welded-
1219



Sanitary Adapter Fittings
1224



One-touch Clamp / Gasket for Mounting Accessories
1225-1226



Arm Lock Couplings
1226



Butterfly Valves
1227



Flange Ball Valves
1227

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Stainless Steel Pipes / Stainless Steel Pipe Fittings 1161~1164



Steel Pipes for Hydraulics / Bite Type Fittings 1165-1166



Hydraulic Rubber Hoses -Quick Calking- 1169-1170



Hydraulic Resin Hoses 1171



Silicone Hoses 1182



Non-PVC Hoses 1183



Fluoro Resin Flexible Hoses 1184



Resin Hoses for Ordinary Purposes 1185



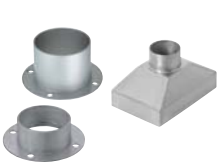
Hose Fixing Connectors 1186



High Pressure Blowers 1192



Duct Hoses 1194~1196



Parts for Duct Hoses 1197



Duct Hoses -Aluminum / Heat Resistant- 1198-1199



Globe Valves 1205



Check Valves 1205



Strainers 1205



Oil Hydraulic Valves 1205



Compact Ball Valves 1206-1207

Sanitary Pipes / Vacuum Plumbing Parts / Tanks



Sanitary Pipes -Standard Type / Welded with Low-neck Type- 1214



Welded Sanitary Pipes-Standard Type- 1215



-Branching Type- 1216



Sanitary Pipe Fittings -Ferrule x Welded Fittings- 1221



-Double Ferrules- 1222



-Welded /Welded Thread Type- 1223



Sanitary Adapter Fittings 1224



Sanitary Ball Valves 1228



Sanitary Sight Glasses 1229



Sanitary Tube Strainers 1230



Sanitary Pressure Gauges 1231



Shower-Balls
1231



Pressure Tanks -Simplified Type-
1233



Pressure Tanks - Standard Type
1234



Pressure Tanks -Wide Mouth-
1235



Pressure Tanks -Narrow Mouth-
1236



Regulators for Pressure Tank
1240



Low Level Float Switches
1240



Relief Valves
1240



Standard Type Open-Top Tanks
1242



Covers for Open-Top Tank -Standard / Seal-able Type-
1246



Gaskets for Sealing Cover
1246



Stands for Open-Top Tanks
1246



Open Tanks -Hopper Type-
1247

2
2

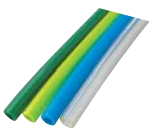
Tubes / Fittings Suction Parts / Nozzles



Product Name	Tubes -Polyurethane-
Page	1258



-Nylon-
1258



-Flat-
1259



-Water Resistant Spiral-
1259



-Multi-Spiral-
1259



-Silicon-
1261



-Spiral-
1261



-Soft Tube Inserts-
1261



Flexible Tubes
1262



Tube Cutters
1262



Tube Clips
1262



Free Angle Fittings
1269



Miniature One-Touch Coupling Connectors
1270



All Stainless Steel, 1-Touch Couplings
1271



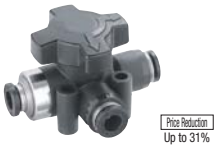
One Touch Couplings - Heat Resistant / High Heat Resistant
1272



Ball Valves - One Touch Coupling Type
1276



Hand Valves
1277



Change Valves
1278

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Pressure Tanks with Safety Function
1237-1238





Lids for Pressure Tank
1239



O-Rings
1239



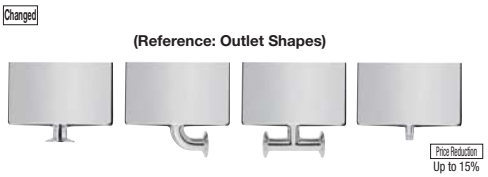
Tank Clamps
1239



Seal-able Open-Top Tanks
1244



Seal-able Open-Top Tanks - Outlet Shape Selectable
1243-1245



Outlet Shape Selectable
1243-1245



Vacuum Plumbing Parts -Flexible Tubes-
1249



Both Sides Welded Vacuum Pipes
1250



Vacuum Plumbing Parts
1251



Vacuum Pumps
1254



-Slit Spiral-
1259

-Sputter Resistant-
1259



-Vacuum / Antistatic / Polyolefin-
1259-1260



-Fluororesin-
1260



-Fluoro Rubber-
1261



Compact Air Fittings
1263



One-Touch Couplings
1264~1269



One-Touch Couplings For Clean Applications
1273-1274



Rotary Joints
1275



High Rotary Joints
1275



Check Valves
1278



Flow Rate Controllers
1279-1280



Valves with Adjusting Dial
1280



-Stainless Steel Type-
1281

2
2


Price Reduction Up to 19%

-Heat-resistant-
1281


Price Reduction Up to 12%

-Clean Type-
1281


Price Reduction Up to 26%

Throttle Valves
1282



Miniature Couplings
1283


Price Reduction Max. 23%

Quick Exhaust Valves
1289


Price Reduction Up to 16%

Pressure Gauges
1289


Price Reduction Up to 12%

Regulators
1290-1291



Digital Pressure Sensors
1292

Addition


Price Reduction Up to 15%

Air Filters
1296


Price Reduction Up to 15%

Air Regulators
1296



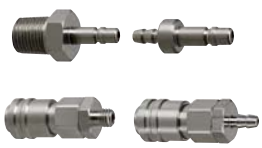
One-Touch Articulated Connectors
1297


Price Reduction Up to 50%

Resin Connectors
1297


Price Reduction Up to 24%

Quick Couplings
1305-1306



Air Couplers -High Chemical Resistant Type-
1307



High Chemical Resistant Products / High Heat Resistant Seals
1308



O-Ring
1309~1313



Price Reduction Up to 6%

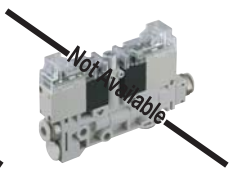
Vacuum Pressure Sensors
1319


Price Reduction Up to 29%

Vacuum Filters / Elements for Replacement
1320



Price Reduction Up to 64%



Vacuum Ejectors
1321-1322



Vacuum Fittings / Suction Cups
1326


Price Reduction Up to 56%

Suction Cups -Standard Type / Deep Type / Small Type-
1327-1328




Price Reduction Up to 57%

-Sponge Type / Bellows Type-
1329-1330

NEW



Air Nozzles -90 Degree Type-
1336



Air Nozzles -Economy Type-
1337



-Round Type-
1337



Nozzle Joint
1338

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.






Joints with Tube Insert	Couplings for Tubes	Fluororesin Couplings / Valves
1284	1285-1286	1287-1288









Pressure Switches	Moisture Traps	Service Units	Air Regulators with Filter	Lubricators
1293	1293	1294	1295	1295







Air Couplers	-Branching Type-	-Lightweight Type-	-Miniature Type-
1298~1301	1302	1303	1304







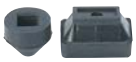


Large Diameter O-Rings	Oil Seals / Oil Free Seals	Seal Plugs	Seal Washers	Vacuum Generators
1314	1315-1316	1317	1317-1318	1319









Vacuum Generators with Vacuum Break Function	Special Vacuum Filters	Fall Prevention	Holders for Mini Suction Cup	Mini Suction Cups
1323	1323	1324	1325	1325









-Soft Type / Soft Bellows Type-	-Oval / Thin Object Type-	Air Nozzles -Flat Type-
1331-1332	1333-1334	1335






Point Nozzles	Steel Pipes for Air Nozzles	Steel Pipe Nozzles Slit Type	Steel Pipe Nozzles
1338	1339	1339	1340

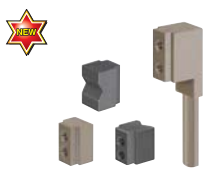




Nozzles for Pipe Cleaning	Terminals for Nozzles	Air Blow Nozzles
1341	1341-1342	1343-1344




Adjusting Hoses / Installation Tools	Connectors, Valves, Hoses
1349	1350


Nailed Arms -Direct Mounting Type-	Nail Ends -Flat, V Shape, Internal Dia. Grip Type-	Attachments for Air Grippers -Flat, V Shape, Internal Dia. Grip Type-
1362	1363-1364	1365~1367






Brackets for Compact Cylinders -Foot, Clevis Mount-	Cylinders Trunnion Plates	Small Cylinders	–Sensor Slot Type–
1373	1374	1375	1376



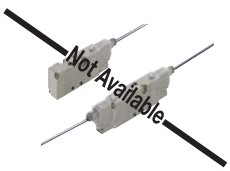
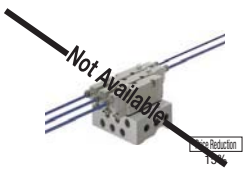
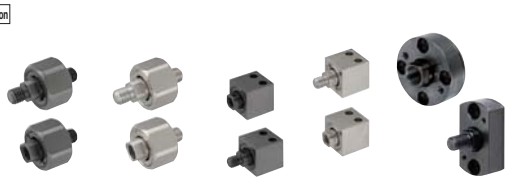



Brackets for Rotary Clamp Cylinders	Clamp Cylinders	Tie Rod Kits / Mounting Bracket Kits	Arms for Clamp Cylinders
1386	1388	1388	1389-1390






Step Switch Valves	Manual Switching Valve -Panel Mount Type-	-Grip-	-Miniature Type-
1394	1395-1396	1397	1397

Electromagnetic Valves -5 Port Direct Plumbing-	–5 Port Base Plumbing–	Floating Connectors-Threaded, Block Mount Type, Flange-
1401	1402	1403~1405

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Air Blow Nozzles 1345



Two-Fluid Nozzles 1346

Addition



Spray Nozzles 1347-1348

Grippers / Cylinders / Connecting Components



Mechanical Grippers -4, 6mm for Stroke- 1355



Mechanical Grippers -3, 4mm for Stroke- 1357



Attachments for Air-grippers 1358



Nails for Air Grippers Direct Mounting Type -Flat, V Shape, Internal Ø Grip Type- 1359~1361-1365~1367



Mounting Brackets for Work Grip 1367



Brackets 1368



Price Reduction Up to 10%

Compact Cylinders 1371



Price Reduction Up to 34%

Cylinder Sensors / Auto Switches 1356-1372-1380-1382



Cylinders with Guide 1379



Guides for Rotary Clamp Cylinders 1383



Arms for Rotary Clamp Cylinders 1384



Guides for Rotary Clamp Cylinders 1385



Brackets -Plate Type- 1391



Hinge Plates 1392



Air Cylinders -Pen-Shaped- 1393



Price Reduction Up to 32%

–Panel Mount Single-Acting– 1393



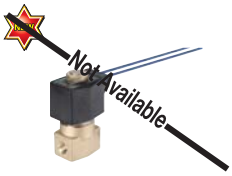
-Lever Type- 1398

Addition

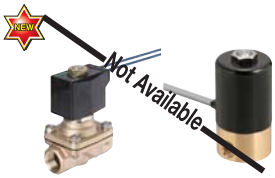


Price Reduction Up to 41%

Silencers 1398



Multilex Valves 1399



Price Reduction 25%

2 Port Solenoid Valves 1399



-Mount Flange / Cylinder Connector Sets- 1406-1407-1411-1412



Backing Plates 1408-1413-1414



-Mount Flanges- 1409



–Cylinder Connectors– 1410-1413



-Mount Flange -Flat Connector Sets / Flat Connector- 1411








- Both Sides Fixable Flange - Two Width Across Flats Cylinder Connector Set-	-Mount Flanges-	–Cylinder Connectors–	-Low Hardness / Low Hardness Thin-	-Slide Type-	Floating Connectors
1412	1412	1413	1414	1415	1419-1420

Changed Changed Changed Changed








-Bolt Mount Type-	–Separate Threaded Type–	Compact Floating Joints	-Extension Rod, Tapped / Threaded-	-Circular Tapped Type / Circular Threaded Type-	Holders -Compact-
1423	1424	1425	1426	1427	1428







Addition

-B Dimension Selectable-	-Tapped and Configurable Type-	-Threaded and Configurable Type-	Pushers for Cylinder with Guide	Pushers -MC Nylon / Polyacetal / Fluorine / Low Hardness / Urethane / Silicon-
1433	1434	1435	1437	1437~1441






Price Reduction Up to 34%

Price Reduction 7%

Spherical Bearing Holder Sets	Rod End Bearings	-Link Ball Type with Thread-	Rod End Coupling Rods -Both Ends Threaded / Both Ends Tapped / One End Threaded, One End Tapped-
1446	1447	1448	1449









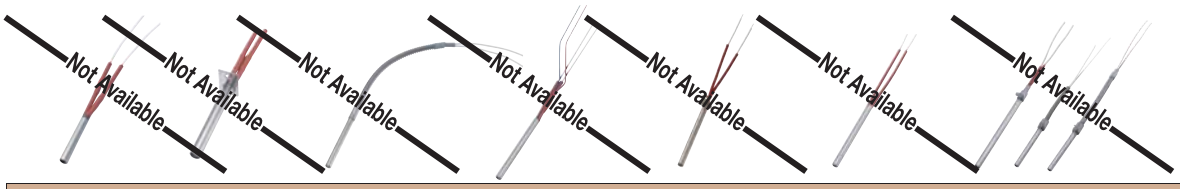
-General Purpose Type-	Clamp Links	-2 Clamps Type-	-Split Type-	Joint Plate	Hinge Bases	Hinge Bases -A Dimension Compact Type-
1459	1460	1460	1461	1461	1462	1463







–Center Fulcrum Type–	Thick Hinge Bases -With Oil Free Bushings-	-Convex Type-	-Concave Type-	Hinge Bolt
1471	1472	1473~1475	1476~1479	1480



-Configurable L, W and F-	-Flanged-	-Flexible Hose-	-With Sensor-	Cartridge Heaters -Lead Wire, Flange Selectable-	-Break Resistant, Internal Connection-	-Lead Wire Protection Type with Knurled Flange-
1493	1494	1495	1496	1497	1498	1499

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



-T Groove Type-	-Tapped Ends-	-Threaded Type-	Floating Joints -Standard-	-Compact Threaded Type-	-Sheet Metal Holder Set-	-Split Type-
1416	1417	1418	1421	1422	1422	1423



-L-Shaped Retained-	-Side Mount Flange / Bar-	-Top / Bottom Mount, Flange/Bar-	Knuckle Joints –Extra Short–	-Tool-less-	–Fixed–
1428	1429	1430	1431	1431	1432



Resin Pushers -Fixed / Configurable-	Metal Pushers	Urethane Caps for Liner Shafts	Pushers for Air Leak Inspection	Conversion Adaptor for Screws	Spherical Bearings
1442	1443	1443	1444	1445	1446

Price Reduction 2%

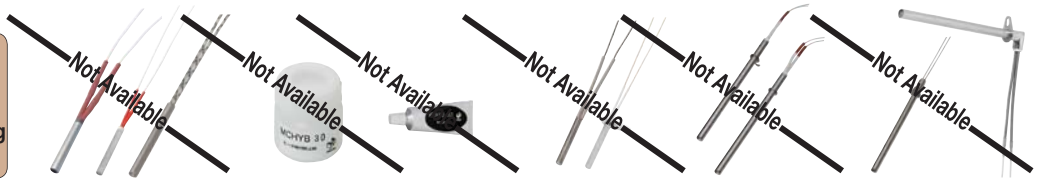


Link	–Bearing Embedded–	-Oil Free Bushings Press-Fit-	-Notched Type-	-Slot Type-	Link Bars
1451~1454	1455	1456	1457	1457	1458

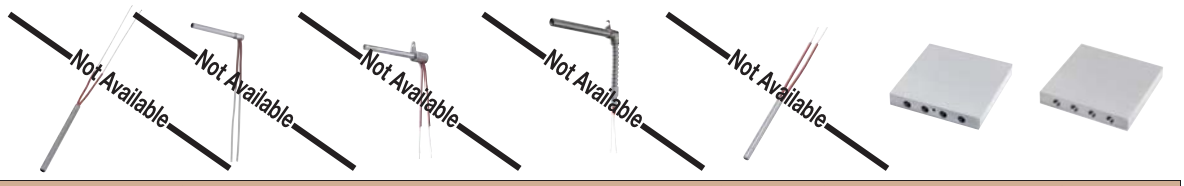


Hinge Bases Mounting Hole in the Center Type	Narrow Type	Thick Wall Hinge Bases	-L-Shaped Retained-	–Center Fulcrum Type–	Hinge Bases -L-Shaped-
1464	1465	1466-1467	1468	1469	1470

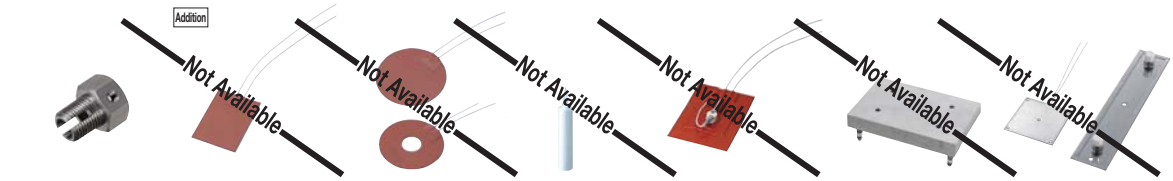
Heaters / Temperature Controllers / Heat Insulating Plates



Product Name	Cartridge Heaters -Standard / Configurable L & W-	Anti-seize Agent	Thermal Conductive Grease	Cartridge Heater -High Temperature-	-High Temperature / Configurable L & W-	-Lead Wire Protection / Internal Connection-
Page	1487	1488	1488	1489	1491	1492



-Uniform Heating-	-L-Shaped Retained-	-L-shaped Knurled Flanged-	-L-shaped Reinforcement-	-Heat Generating Part, Length Configurable-	Hot Plate	Cooling Plates
1500	1501	1502	1503	1504	1505	1505



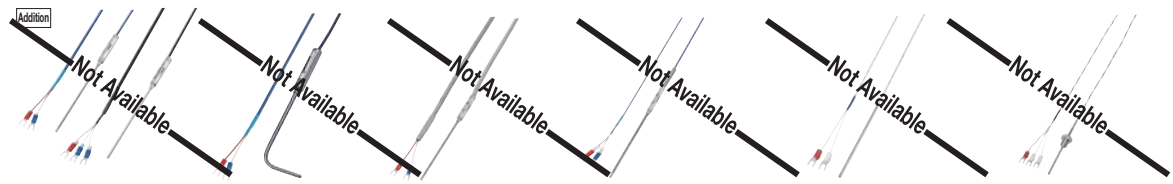
Mounting Bolts for Cartridge Heaters	Rubber Heaters-Square-	-Round-	Adhesives for Rubber Heater	Rubber Heaters -Square (With Thermostat)-	Cast-in Heaters	Plate Heaters
1506	1508	1509	1509	1510	1510	1511



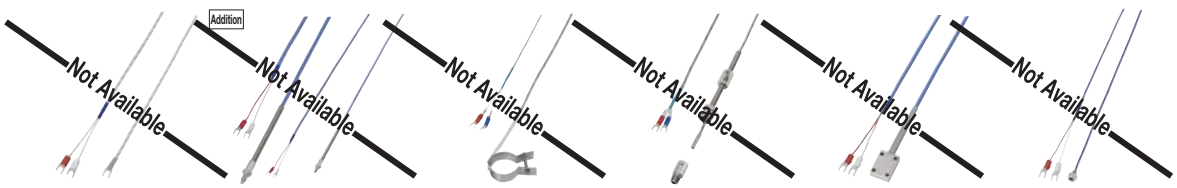
Heat Resistant Duct Hoses for Hot Air Generating Units	Piping Parts for Duct Hoses	Hot Air Generating Unit	-Hot Air Circulation Unit-	Sheathed Heaters for Liquid Heating -With Plug-	-With Overheating Prevention-
1518	1518	1519	1520	1523	1523



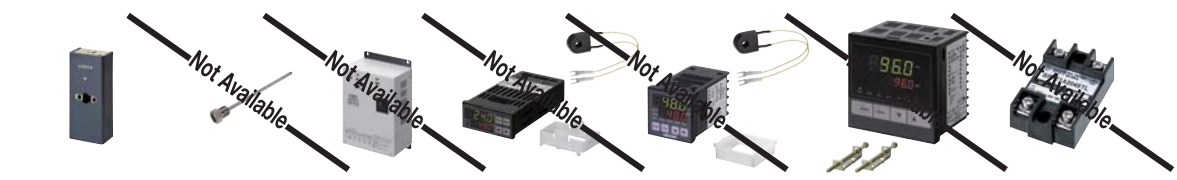
Cord Heater	Heat Resistant Tapes	Micro Heaters	Silicon Belt Heater	Silicon Rubber Heaters for Pipes	Band Heaters
1529	1529	1530	1530	1530	1531



Temperature Sensors -Standard-	-L-Shaped Retained-	-Lead Wire Protection-	-Heat-resistant-	-Compact Type-	-Taper Screw Type-
1538	1540	1540	1540	1541	1541



-Y-shape Terminal Tip Type-	-Threaded-	-Band Temperature Sensors-	Temperature Sensors with Spring	Surface Temperature Measuring Type	Surface Temperature Measuring Magnetic Type
1544	1545	1545	1546	1546	1546



Boxes for Thermostats	Protection Tube	Electromagnetic Circuit Contactor	Temperature Controllers -Size: 24x48-	-Size: 48x48-	-Size: 96x96-	SSR (Solid State Relays)
1549	1549	1550	1553	1554	1554	1555

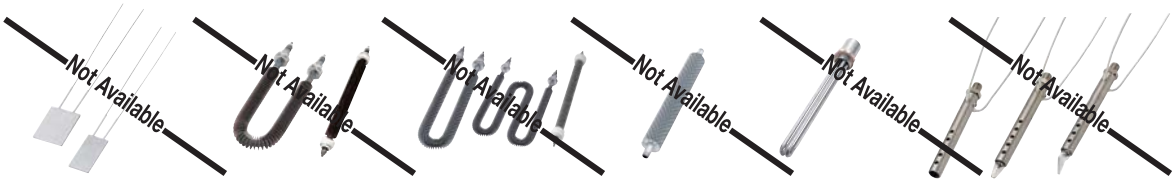


Heat Insulating Plates -Standard Grade-	-Heat Resistant Grade-	-High Strength Grade-	-High Temperature Resistant Grade-	-High Temperature Insulating Grade-	-High Temperature Super Insulating Grade-	- Very High Temperature Insulating Grade -
1561	1561	1561	1563	1565	1565	1567

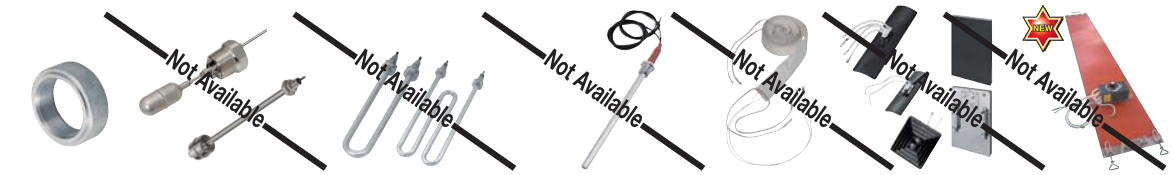
NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

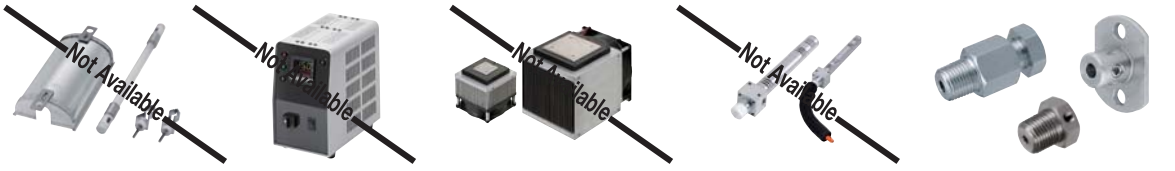
Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



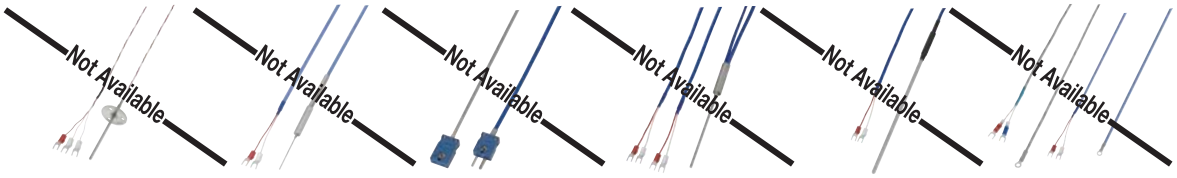
Small-Size Ceramic Plate Heaters	Air Sheathed Heaters -Configurable Type-	–Fixed–	Finned Pipes	Air Sheathed Plug Heaters	Small Hot Air Generator
1512	1515	1516	1516	1517	1517



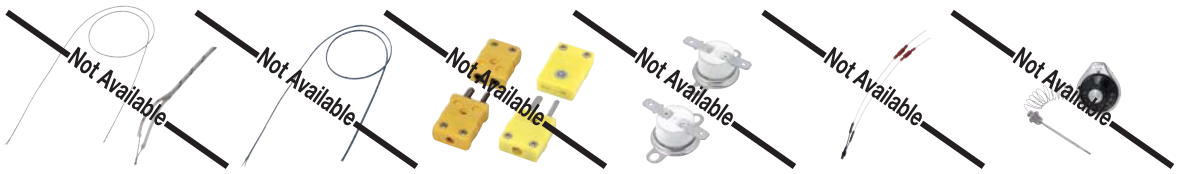
Connecting Parts for Heater	Float Switch	Sheathed Heaters for Liquid Heating -Standard U, M-	-Straight One Terminal-	Ribbon Heater	Far Infrared Ceramic Plate Heaters / Far Infrared Plate Heaters	Drum Heater -Economical Type-
1524	1524	1525	1525	1526	1527	1528



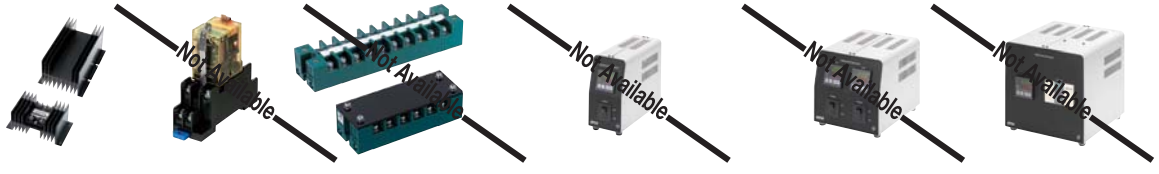
Quartz Far Infrared Heaters	Peltier Cooling Unit Controller	Peltier Cooling Unit	Jet Air Coolers	Plugs, Holes, Bolts for Mounting Temperature Sensor
1531	1532	1533	1535	1537



-Flanged-	-Configurable Sheath Ø Type-	-Connector Type-	-Double Element Type-	-Chemical Resistant Type-	-Round Thermal Tip Sensors-
1542	1542	1543	1543	1543	1544



Sheathed Thermocouples	Compensation Lead Wires	K Thermocouple Connectors	Bimetal Thermostat	-Lead Wire-	Thermostat
1547	1547	1548	1548	1548	1549



Heat Sink	Universal Relays	Terminal Blocks	Temperature Controllers -Universal / Compact-	-Universal / Two Channel Type-	-Universal / High Current Type-
1555	1556	1556	1558	1558	1558



-Free Cutting Grade-	Thermal Plates	Insulating Papers	High Temperature Insulation Sheets	Heat Insulating Plates -Circular Type-	Machined Resin Plates
1569	1569	1570	1571	1572	1573

Metal Plates





Addition 1.0038/S235JR 1583~1588
Addition 1.1206/C50E 1589~1594
EN AW-5052/AlMg2,5 1595
EN AW-5052 High Precision 1596
EN AW-2017/AlCu4MgSi 1597

Product Name	Material Shop 24 Metal Plate Website	Dimension Fixed Plates
Page	1581	1583~1597





Structural / Carbon Steel

1.0038/S235JR 1621 Price Reduction Up to 6%
1018 Carbon Steel 1631 Price Reduction 3% in Average
Annealed Material 1635 Price Reduction Up to 6%
1.1206/C50E 1643
1.1203/C55E

Specialty Steel

JIS SKS93 (For Oil-Quenching) 1645
Addition 1.2510, 1.2379, DC53® (Daido Steel) 1647 Price Reduction Up to 15%
New Product 1.7220/34CrMo4 1651
New Product 1.3343/S6-5-2 1653
Pre-Hardened Steel (1.2085, 1.2316, NAK55® (Daido Steel)) 1655 Price Reduction 3% in Average

Material Shop 24 Premium Plates	Configurable Plates
1617	1621~1697



High Precision Blocks (1.0038, 1.1206, 1.2316, NAK55® (Daido Steel)) 1698
Standard Type (1.0038, 1.1206, 1.1206 Thermal Refined, 1.4305, 1.4301) 1699
Long Type (1.0038, 1.1206) 1701
Aluminum Blocks EN AW-5052, EN AW-2017, EN AW-A7075 1702

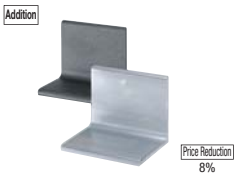


Addition Cold-rolled Flat Bars (1.0038, 1.1191, 1.4301-D, EN AW-6063) 1703
6F Equivalent Plates (1.0038, 1.1206) 1703
Square Steels (1.0038, 1.1191, 1.4301-D, EN AW-6063) 1705

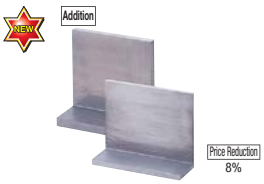
Blocks (Guaranteed Perpendicularity of All Angles)	Flat Bars / Cold-rolled Flat Bars
1698~1702	1703~1706

Angles / Section Steels



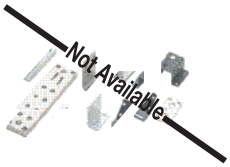






Product Name	"Material Shop 24 Angles / Section Steels site"	L-Shaped Angles -Machined-	L-Shaped Angles -Resin, Equal Sides-	L-Shaped Angles -Mill Finished-
Page	1718	1719~1720	1720	1721~1728

Mounting Plates / Brackets -For Motors / Cylinders / Sensors-











Product Name	Online Configuration and Ordering Service	Machined Sheet Metals –Plate Type–	–Disk Type–	–Bent Type–	–Angle Type–
Page	1737	1741	1743	1745	1747

Technical Data

International System of Units (SI) 1765
Quantifiers / Unit Symbols / Chemical Symbols 1767
Volume and Weight Calculations 1767
Physical Properties of Materials 1768
Surface Roughness Ranges of Various Processes 1769
Geometrical Tolerance Indication Methods 1770
Spring Calculations 1771
How to use coil springs 1773
General Tolerances of Machining Dimensions 1774
Technical Data: Basic of Fit Selections -Machine Keys and Keyways- 1775~1794

1763~1804

Index

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Product Name Index P.1871

1811~

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Addition 1.0038/S235JR **1598~1600** Price Reduction 10% on average
Addition 1.1206/C50E **1601~1604** Price Reduction 10% on average
1.4305/X10CrNiS18-9 **1605**
1.4301/X5CrNi18-10 **1606**
EN AW-5052/AlMg2,5 **1607**
EN AW-5052 High Precision **1608**
EN AW-2017/AlCu4MgSi **1609**
Tough Pitch Copper **1610**
Oxygen Free Copper **1610**
EN AW-5052 Aluminum Cut Plates **1611**
EN AW-5052 High Precision Aluminum Cut Plates **1613**
EN AW-2017 Precision Cut Plates **1615**

A Dimension Configurable Plates
1598~1616

Stainless Steel

1.4305/X10CrNiS18-9 **1657** Price Reduction Up to 6%
1.4301/X5CrNi18-10 **1661** Price Reduction Up to 6%
1.4305, 1.4301 Annealed **1665** Price Reduction 3% in Average
New Product 1.4401, 1.4404 **1667** Price Reduction Up to 3%
1.4016/X6(8)Cr17 **1669** Price Reduction 3% in Average
1.4125/X105CrMo17 **1671** Price Reduction 3% in Average

Aluminum Alloy

EN AW-5052/AlMg2,5 **1673** Price Reduction Up to 6%
EN AW-5052 High Precision **1679**
New Product EN AW-6061/EN AW-AlMg1SiCu **1681**
EN AW-2017/AlCu4MgSi **1683** Price Reduction Up to 6%
ANP79 **1689**
EN AW-7075/AlZn5,5MgCu **1691** Price Reduction Up to 6%

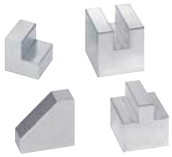
Brass / Pure Titanium Class 2

New Product Titanium Class 2 (3.7035/Ti99.5 (Ti2)-H) **1694**
Copper / Brass (Tough Pitch Copper / Oxygen Free Copper / Chrome Copper / Brass) **1695**

Addition



Material Shop 24 Shape Machining Website **1707**



Shape-Machined Blocks **1709~1713**

L-Shaped Blocks **1709**
U-Shaped Blocks **1711**
T-Shaped Blocks **1712**
Inclined Blocks **1713**

Price Reduction 8% in average



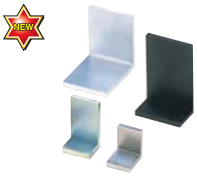
Price Reduction 4% on average

Circular Plates **1714**



Price Reduction 4% on average

Machined Circular Plates **1715**



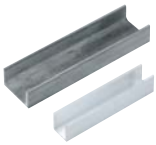
L-shaped Surface Treated Angles **1729**



L-Shaped Machined Angles **1731**



L-Shaped Welded Angles **1733**



Lightweight Channel Steels **1734**



Metal Boxes **1734**



Machined Metal Plates **1749**



–Flat Bar Type– **1751**



Machined L-Shaped Brackets –Standard Type– **1753**



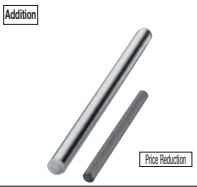
–Shape of Material Type– **1753**

Metal Table EN - JIS **1969**
Metal Table JIS - EN **1974**
Plastic Table **1979**
Surface Treatments **1983**

How to Use Catalog

- How to Use the Catalog (P.83)
- Guide of Marks (P.85)
- MISUMI's Environmental Awareness and RoHS Compliancy (P.86)
- General Ordering Information (P.87)
- Delivery Times, Express Orders (P.88)
- Item Number Configuration (P.89)
- Alterations (P.90)

Shafts





Page	81~98	Product Name	Shafts -Straight Type-	-One End Tapped / Both Ends Tapped-
		Page	107	109~116



-Both Ends Threaded- 133~142



-One End Threaded / One End Tapped- 143~150



-Stepped and Tapped- 151~162-167



-One End Two Tapped Holes Type- 175



-Retaining Ring Grooved- 177



-Keyway Type- 179



-Tapered- 181



-Shaft Ends Configurable Type- 193



Hollow Shafts -Shaft Ends Configurable Type- 195



Washers for Linear Shafts 196



-Flanged Mount- Slit 205-206



-Flanged Mount- Compact 207



T-Shaped Precision Casting 210~212



-T-Shaped (Machined)- 213



-T-Shaped Split (Machined)- 216



-Compact (Machined) - Set Screw / Side Slit / Split 217

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Full Length Hardness Guaranteed Shafts -Full Length Hardness Guaranteed Type- 117



Shafts -Set Screw Grooved- 119



-Tapped Pilot- 121

Addition
Standard / Precision



Price Reduction

-One End Threaded- 123~132

Addition
Standard / Precision



Price Reduction

-Stepped and Threaded- 163~166

Precision type



Precision Shafts -Stepped and Tapped / Threaded- 169



Shafts -Surface Treatment Fully Plated- 171



-Hexagon Socket Type- 173



Price Reduction

Hollow Shaft 183



-Tapped / Threaded - 183~188



-Stepped- 189~191



Shafts -Continuous Support - Predrilled and Tapped- 192

Shaft Supports



Price Reduction



Product Name	-Flanged Mount- Standard	-Flanged Mount- Thick Sleeve
Page	201-202	203-204





-Flanged Mount- End Mount / With a Keyway / Split 207-208

Standard / Wide



Price Reduction

Flanged (Precision Cast) 209



-T-Shaped (Machined)- 213

Standard / Wide



-T-Shaped Slit (Machined)- 214

Standard / Wide



-T-Shaped Side Slit (Machined)- 215



T-Shaped (Machined) - With Clamp Lever 219







Hinged Type (Machined) 220



L-Shaped Type (Precision Cast)	L-Shaped Type (Machined)
221-222	223-224



Side Mount Type (Machined)
229-230



Set Screw -Holes / Tapped-	Slit -Holes / Tapped-	Wedge -Holes / Tapped-	Split -Holes / Tapped-
243	244~246	247	248

Standard / Compact



For Bearing Fixing	With Thread Inserts (Lightweight)	Threaded Bore
251~254	255	256



Compact Wedge Type with Clamp Lever -D Cut-	Compact Wedge Type with Clamp Lever -Side Mount-	Two-Flats
261	261	262

Linear Bushings / Ball Splines



Product Name	Linear Bushings -Various Grease Application Services-	Linear Bushings with Lubrication Unit MX -Straight-
Page	272	274



Linear Bushings with Lubrication Unit MX -Flanged with Pilot-	Linear Bushing Housing Units with Lubrication Unit MX -Tall Block Type	Linear Bushing Housing Units with Lubrication Unit MX -Wide Block Type
276	277	277

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.






Bottom Mount Type (Machined)
225-226

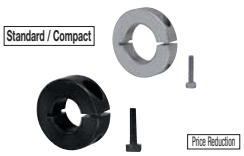





Bottom Mount Type (Machined)
227-228

Shaft Collars







Product Name	Set Screw -Standard-	Clamp -Standard Type-	Split -Standard Type-
Page	237-238	239-240	241-242




Keyless Bushing Type
249





With Urethane
250




Hinged Type	-One Touch Standard / Mount Hole Type-
257	257



With Key Escapement Groove
258



With Clamp Lever
259-260





Side Mount Hole Type
263-264

D Cut Type
265-266



Flanged Linear Bushings with Lubrication Unit MX
274



Center Flanged Linear Bushings with Lubrication Unit MX
275



Straight Type
278-279-281

Addition



Linear Bushings Straight Compact
280



Price Reduction
Addition


Flanged Linear Bushings Medium Type	Flanged Linear Bushings Single	Flanged Linear Bushings Compact Single
281-282	283	284




Price Reduction
Addition



Spacers	Fixing Plates	Flanged Linear Bushings Single with Pilot	Flanged Linear Bushings Compact Single with Pilot	Flanged Linear Bushings Single with Tapped Hole
288	288	289	290	290

Addition




Addition

Price Reduction

Flanged Linear Bushings Compact	Flanged Linear Bushings with Tapped Mounting Holes	Flanged Linear Bushings Long with Pilot	Linear Bushings with Tall Blocks
294	294	295-296	297~299

Addition

Price Reduction




Linear Bushings with Wide Blocks	Linear Bushings with Tall Blocks with Clamp Lever	Linear Bushings with Wide Blocks with Clamp Lever	Flanged Linear Bushings with Clamp Lever
303-304	305	306	307

Addition
Changed

NEW

NEW

NEW

Addition
Changed


-One End Stepped-	-Both Ends Stepped and Threaded-	-Both Ends Stepped and Tapped-	-One End Stepped and Threaded-	-One End Stepped and Threaded / One End Tapped-
314	315	315	316	316

Oil Free Bushings


Price Reduction 5%

Price Reduction 5%


Product Name	Oil Free Bushings -Copper Alloy Straight Type-	-Copper Alloy with Shoulder-	-Copper Alloy Thrust Type-
Page	331-332	333	334






Oil Free Bushings -Bronze Straight Type-	-Bronze Shoulder Type-	-Bronze Standard Flanged Type-	Oil Free Bushings with Threaded Housing
337	337	338	338

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.


Price Reduction


Addition







Flanged Linear Bushings Double	Flanged Linear Bushings Compact Double	Flanged Linear Bushings with Grease Fitting	Mini-Flanged Linear Bushings	Height-Adjusting Spacers for Flanged Linear Bushings
285	286	287	287	288


Price Reduction


Addition




Price Reduction

Flanged Linear Bushings Double with Pilot	Flanged Linear Bushings Compact Double with Pilot	Flanged Linear Bushings Double with Pilot and Tapped Holes	Center Flanged Type
291	292	292	293




NEW





Linear Bushings with Compact Tall Blocks	Shaft-sliding Linear Bushings with Pillow Blocks	Linear Bushings with Tall Blocks with Dowel Holes	Linear Bushings with Wide Blocks with Dowel Holes
297-298	300	301	302


Addition
Changed




Addition
Changed


NEW


NEW

Linear Ball Bushings	Ball Splines-Standard-	-Both Ends Tapped-	-One End Tapped-	-Both Ends Stepped-
308	312	313	313	314











Miniature Ball Bearing Guide Sets	Shafts for Miniature Ball Bearing Guides	Miniature Ball Guide Bushings	Ball Sliders	Needle Roller Guide Set
317~319	319-320	321-322	322	324








Price Reduction
5%

Flange Integrated Oil Free Bushings -Copper Alloy Standard Flanged-	-Pilot Flanged-	-Center Flanged-	Oil Free Copper Alloy Washers
335	336	336	336


Price Reduction
20%




NEW


Price Reduction
5%

Standard Flanged Oil Free Bushings -Compact-	-Standard-	-With Dust Seals-	Flanged Oil Free Bushings Pilot Type -Compact-
339	340	340	341




Reference: Cut-away View Photo


Flanged Oil Free Bushings Pilot Type -Standard-	Center Flanged Oil Free Bushings	Small Flanged Oil Free Bushings	Oil Free Bushing Housing Units -Flanged Type-
342	343	343	344







Oil Free Bushings -Casting Straight / Shoulder Type-	Oil Free Bushing Housing Units -Casting Type-	Flange Integrated Oil Free Bushings -Casting Type-	Oil Free Bushings -Multi-Layer LF Type-	Thrust Washers
347	347	347	348	348







Oil Free Bushings -Polyacetal Resin Type-	-PTFE Resin Type-	Oil Free Resin Washers	Flanged Oil Free Bushings -Built-in Resin Bushing Type-	Oil Free Bushing Housing Units -Built-in Resin Bushing Type-
351	351	352	352	352





Single Axis Robots RSDG1 / 2 / 3	Single Axis Robots Clean Room Specification RS1C / 2C / 3C	Single Axis Robots Clean Room Specification RSH1C / 2C / 3C
375~380	381~386	387~392


Price Reduction 15% / 25%

Price Reduction 15% / 25%

Single Axis Actuators LX20 / 26 / 30 / 45 Standard Type without Bracket	Single Axis Actuators LX20 / 26 / 30 / 45 Cover Type without Bracket
409, 415, 421, 427	411, 417, 423, 429

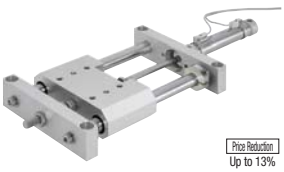






Linear Encoders (Linear Scales)	Motor Driven Single Axis Actuator LX Standard Type	Motor Driven Single Axis Actuator LX Cover Type
438	441, 445, 449, 453	443, 447, 451, 455



Price Reduction Up to 13%

Price Reduction Up to 13%

Single Axis Units -Rolled / Precision Ball Screw Type with Cover-	Pneumatic Module Units (Vertical)	Pneumatic Module Units (Horizontal)
469~472	475	477

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Oil Free Bushing Housing Units -Tall Block Type- 344



-Tall Block Compact / Wide Block Compact- 345



-Tall Block / Wide Block- 346



Oil Free Bushings -High Precision Type- 349



Flanged Oil Free Bushings -Built-in Multi-Layer MD Bushing Type- 349



Oil Free Bushing Housing Units -Built-in Multi-Layer MD Bushing Type- 350

Single Axis Robots / Actuators

Addition



Addition



NEW



Product Name	Single Axis Robots RS1 / 2 / 3	Single Axis Robots RSH1 / 2 / 3	Single Axis Robots RSD1 / 2 / 3
Page	363~368	369~374	375~380

Addition



Single Axis Robot Controllers 393

Addition



Single Axis Robot Options 395

Addition



Single Axis Robot Maintenance Items 396

NEW



Single Axis Actuator LX Motor Folded Type 433~436



Jigs for Motor Mount for LX 413, 419, 425, 431



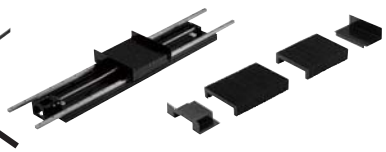
Two Axes Mounting Brackets for LX 437



Options for LX with Motor 457



Cables for LX with Motor 460

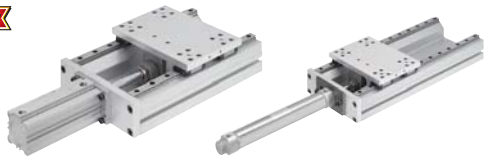


Single Axis Units - Rolled Ball Screw Type - w/Bellows- 467



Single Axis Units -Rolled / Precision Ball Screw Type- 463~466

NEW



Pneumatic Module Units (Linear Guides) 479

Addition



Manually Operated Units -Standard / High Load Capacity Type- 481



Price Reduction 20%

Manually Operated Units - Symmetrical Action Dual Carriage 483



Manually Operated Units -with Position Indicator-
485



Manually Operated Units -Handwheel Direction Configurable Type-
485



Manually Operated Units -Elevator Type-
487~489

Linear Guides







Product Name	Low Temperature Black Chrome Plating	Miniature Linear Guides -Short Blocks-	Short Blocks with Dowel Holes
Page	508	509	511









Miniature Linear Guides -Long Blocks-	Long Blocks with Dowel Holes	Wide Long Blocks	Extra Long Blocks for Miniature Linear Guides
521~524	525	527	529







Miniature Linear Guides -Wide Rail Long Blocks-	Wide Rail with Dowel Holes, Long Blocks	Wide Rail, Wide Long Blocks
539~542	543	545







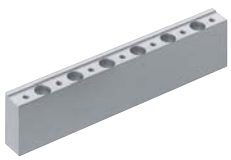
Price Reduction
Up to 3%

For Medium / Heavy Load with Lubrication Unit	Medium and Heavy Load, Dust Prevention	Medium and Heavy Load
553~566	553~556	557~562





Addition



Stopper Clamps for Miniature Linear Guides	Stopper Clamps for Medium / Heavy Load Linear Guides	Height Adjusting Blocks for Linear Guides
581	582	583~585











Rail Push Plates	Linear Locks	Linear Lock Plates	Linear Guide Lock Units	Linear Guide Lock Plates
586	587	588	588	588

1
2

NEW : New products added

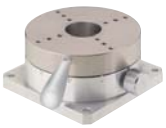
Change : Products whose part numbers have been changed.

Addition : Products with additional specifications.

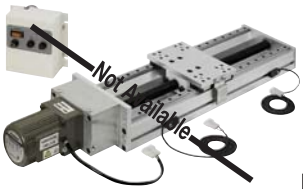
About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.

NEW

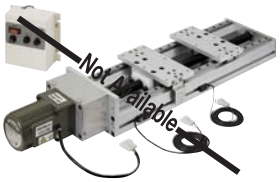


Manually Operated -Rotary Tables-
490



Price Reduction 16%

Motor Driven Units
491



Price Reduction 19%

Motor driven Units – Symmetrical Action Dual Carriage
493



Miniature Linear Guides -Standard Blocks-
513~516



Standard Blocks with Dowel Holes
517



Wide Standard Blocks
519



Miniature Linear Guides -Wide Rail Standard Blocks-
531~534



Wide Rail with Dowel Holes, Standard Blocks
535



Wide Rail, Wide Standard Blocks
537



Miniature Linear Guides -Heat Resistant-
547



With Lubrication Unit
549



Miniature Dust Prevention
551



Medium and Heavy Load with Dowel Holes
563~566



Medium and Heavy Load with Plastic Retainers
567~570, 573~576



Extra Heavy Load, Extra Super Heavy Load, With Plastic Retainers
571, 577~580



Stopper Bolts
586



Linear Guide Block Stopper Plates
586

NEW



Linear Guide Mounting Hole Caps (Package)
586

Changed



Cross Roller Tables
591-592

Changed



Cross Roller Guides
593



Ball Slide Guides
594



Pneumatically Driven Linear Guides
597~600

1
2

Slide Rails / Cable Carriers






Product Name	Telescopic Slide Rails -Aluminum / Steel / Stainless Steel-
Page	605~612




Price Reduction Up to 3%


Price Reduction Up to 4%


Roller Slide Rails	V Guides System -90°Type-
620	623-624


Price Reduction Up to 4%


Addition

Price Reduction Up to 2%


Oil Free Slide Plates -Dimension Selectable / Configurable-	-Multi-Layer Resin, Configurable-	Gibs	Cable Carriers -Slit Type-	-Compact Type-
632~634	635	636	639	641

Ball Screws / Support Units



Price Reduction Up to 26%


Price Reduction Up to 26%

Product Name	Rolled Ball Screws -Shaft Diameter 8, Lead 2, 4-	-Shaft Diameter 10, Lead 2, 4, 10-
Page	655	657



Price Reduction Up to 28%


Price Reduction Up to 28%

-Shaft Diameter 20, Lead 5, 10, 20-	-Shaft Diameter 25 Lead 5, 10, 25-
663	665






Precision Ball Screws -Shaft Ø 6, Lead 1-	-Shaft Diameter 8, Lead 1, 2-	-Shaft Diameter 10, Lead 2, 4, 10-	Precision Ball Screws -Shaft Ø 12, Lead 2, 4, 5, 10-
673	673	675	677


Price Reduction Up to 4%

Price Reduction Up to 5%

Price Reduction Up to 2%


-Fixed Side Economy Type-	-Fixed Side Standard with Dowel Hole-	-Fixed Side Radial Bearing Type-	-Support Side-
687	688	688	689

NEW : New products added

Change : Products whose part numbers have been changed.

Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Linear Rails -Preloaded Type- 614



Price Reduction Up to 4%

Linear Rails Stainless Steel, With Ball Bearings 616



Price Reduction Up to 4%

Aluminum, With Ball Bearings 615-617



Steel, With Ball Rollers 618



Price Reduction Up to 2%

Oil Free 619







Price Reduction Up to 8%

V Guides System -70°Type- 626



Price Reduction Up to 8%

Gibs -Dimension Selectable / Configurable- 628-629



Price Reduction Up to 6%

Gibs 630



Gibs -Block- 631



-Flap Open / Close- 642



-Flap Open/Close Full Cover Type- 643



Low Particulate / Low Noise 644



Low Friction / Low Noise 645



Cable Carrier Support Channels 646





Price Reduction Up to 26%

-Shaft Diameter 12, 14 Lead 4, 10- 659





Price Reduction Up to 25%

-Shaft Diameter 15 Lead 5, 10, 20- 661



Price Reduction Up to 28%

-Shaft Diameter 28, 32 Lead 10, 32- 667



Price Reduction Up to 22%

-Block Nut, Lead 5- 669



Price Reduction Up to 22%

-Block Nut, Lead 10- 669



Rolled Ball Screws -Shaft Ends Configurable Type- 671



-Shaft Diameter 15, Lead 5, 10, 20, 40- 679



-Shaft Diameter 20, Lead 5, 10, 20, 40- 681



-Shaft Diameter 25, Lead 5, 10, 20- 683



Price Reduction Up to 5%

Support Units - Fixed Side Standard 687



Stoppers for Ball Screws 689



Support Units - Fixed Side with Damper 690



-Support Side with Damper- 690



Precision Collars for Support Units 690



Support Units -Square, Fixed Side Compact-	691

Addition



-Fixed Side Low Profile-	691



-Fixed Side Mounting Hole Narrow Pitch-	691



-Support Side Compact-	692



Price Reduction
Up to 3%

-Fixed Side Economy Type-	694



Price Reduction
Up to 4%

-Fixed Side Radial Bearing Type-	694

Addition



Brackets for Ball Screw Nuts -Block Type-	695



Joint Units	696



Price Reduction
Up to 2%

-One End Stepped / One End Double Stepped-	711



-Both Ends Double Stepped-	713



-Straight Type-	715



Nuts for Lead Screws -Flanged-	717



-Compact Type-	717



Price Reduction
30% Max.

-High Strength Flanged Resin Type-	720



-Resin Type-	720



Price Reduction
Up to 3%

-Tall Block-	721



Price Reduction
Up to 4%

-Wide Block-	721



Brackets for Lead Screws	722



Clamp Plates for Large Position Indicator	728



Stop Plates for Lead Screws-Flanged with Bearing-	729



-Round Flanged-	729

NEW



-Square - 2 Screws-	730

Rotary Shafts

Addition



Product Name	Rotary Shafts-Straight-
Page	735



-Straight with Keyway-	737

Addition



-Retaining Ring Grooves on Both Ends-	739



-Both Ends Tapped with Keyways-	749



-One End Stepped-	751



-One End Stepped, One End Tapped-	753



-One End Stepped, One End Threaded-	755

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.

Addition



-Support Side Low Profile- 692



-Support Side Mounting Hole Narrow Pitch- 692



Price Reduction Up to 4%

Support Units -Round, Fixed Side Standard Type- 693



Price Reduction Up to 8%

-Support Side- 693

Lead Screws / Slide Screws

NEW



Lead Screws -For Lead Screw Support Units- 703

NEW



Lead Screw Support Units 705-706



Price Reduction Up to 2%

Lead Screws -Both Ends Stepped- 707



Price Reduction Up to 2%

-One End Stepped - One End Double Stepped- 709



-Piloted / Tapped Holes / Slotted Holes- 717



RoHS Compliant Nuts -with Round Flange- 718



-No Backlash Type- 718



-Oil-free Flanged- 719



-Straight Type- 719

NEW



Spacers for Wide Block 722



Digital Position Indicators Compact 725



Digital Position Indicators Large 726



Clamp Plates for Compact Position Indicator 727



-Square- 730



Price Reduction Up to 27%

-Miniature Slide Screws - One End Stepped / Both Ends Stepped- 731



Price Reduction Up to 27%

-Straight Type- 732



Nut Bracket 732



-Retaining Ring Grooves on Both Ends with Keyway- 741



-One End Tapped- 743



-One End Tapped with Keyway- 745

Addition



-Both Ends Tapped- 747



-One End Stepped, One End Threaded, One End Tapped- 757



-One End Stepped and Tapped- 759



-One End Stepped, Both Ends Tapped- 761



-Both Ends Stepped Type- 763

1 2



-Both Ends Stepped and Threaded-
765



-Both Ends Stepped and Tapped-
767



-One End Stepped with Retaining Ring Grooves-
769



-Both Ends Stepped with Retaining Ring Grooves-
769

Addition



Rotary Shafts-D-Cut-
775



Shaft for Tension-Pull - Retaining Ring Groove-
776

NEW



-Push Type / Pull Type-
777



Rotary Shaft-End Shape Selectable-
779



-One End Stepped, One End Double Stepped-
787



-With Flange-
789



-One End Stepped with Flange-
791



-Pilot - Threaded with Tapped End-
803



-Pilot - Threaded with Threaded Ends-
805



-Screw Mount with Retaining Ring Groove-
807



-Screw Mount, with Tapped End-
809



Pivot Pins -Split Pins-
819



-Straight Retaining Ring-
820



-Split Pins with Flange-
821



-Retaining Ring with Flange-
822



-Tapped - Hexagon Socket Head with Flange-
826



-Both Ends Tapped-
827



-Both Ends Threaded-
827



-Keyway Type-
828



-End Shape Selectable-
831



Diameter Tolerance Selectable
833



Fulcrum Pins -Standard / Configurable-
835-836

1
2

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



-Both Ends Stepped, One End Threaded- 771



-Both Ends Stepped, One End Threaded, One End Tapped- 771



-Both Ends Double Stepped- 773



Hollow Rotary Shafts-Straight- 774



Driving Shaft-Straight- 781



-One End Stepped- 783



-Both Ends Stepped- 785

Cantilever Shafts / Pivot Pins / Fulcrum Pins









Product Name	Cantilever Shafts -Threaded with Retaining Ring Groove-	-Threaded with Tapped End-	-Threaded with Threaded Ends-	-Pilot - Threaded with Retaining Ring Groove-
Page	795	797	799	801



-Screw Mount with Threaded End- 811



-Heavy Load- 813



-Flanged- 815



-For Tension- 817



-Lock Nut with Flange- 823



-Lock Nut with Hexagon Socket Head- 824



-Lock Nut with Extra Low Hexagon Socket Head- 825



-Tapped with Flange- 826



Keys for Precision Pivot Pins 828



Pivot Pins -Set Screw Flat- 829



-Flanged with Set Screw Flat- 829



-D Cut- 830



Fulcrum Pins -Low Head Stepped with Lock Nut- 837



Precision Pivot Pins -Retaining Rings- 838



-Tapped Ends- 838

Bearings with Housings / Bearings






Product Name	Bearings with Housings-Small Flanged-	-With Retaining Ring-	-Standard with Pilot - Retained-	-Direct Mount Non-retained-
Page	842	843	845	847








-Double Bearings with Pilot - Non-retained, L Selectable / Configurable-	-Long Double Bearings-	Low Particulate Grease Bearings with Housings	Bearings with Housings - L-Shaped-
863~866	867	869-870	871







Low Particulate Grease Bearings with Housings-T-Shaped-	-T-Shaped Double Bearings with Datums-	Bearings with Housings-Block-	-Block - Double Bearings-	-Bottom Mount-
879	880	881	882	883





Price Reduction
Up to 46%


Angular Contact Bearings with Housing-Flanged-	-Angular Contact + Deep Groove / Flanged-	-Angular Contact + Deep Groove / With Pilot-	Deep Groove Ball Bearings -Double Shielded-	-Economy Type-
892	893	895	897-898	899


Price Reduction
34%


Price Reduction
Up to 41%




Small Deep Groove Ball Bearings -Rubber Sealed-	Small Deep Groove Ball Bearings -Open-	-Double Shielded with Flanged-	Low Particulate Grease Bearings	1.4301 Ball Bearings for Special Environments
909	910	911-912	913-914	915


Price Reduction
38%

Price Reduction
Up to 10%


Price Reduction
Up to 21%


Price Reduction
20%

Thrust Ball Bearing	Thrust Bearings -With Inner Ring-	One-way Clutch	Angular Contact Bearings	Grease Seal Rings	Self-aligning Ball Bearings
920	921	922	923-924	924	925



Price Reduction
25%



Price Reduction
21%

Price Reduction
21%

-Cast Iron Housings with Pilot / Take-ups-	-Economy Type-	End Caps for Shafts	Steel Plate Ball Bearing Units -Flanged / Cast Pillow Blocks-
930	931-932	933	933-934

NEW : New products added

Change : Products whose part numbers have been changed.

Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



-Thrust Bearings- 849

-Short Double Bearing Retained- 850



-Double Bearing Retained - Standard / Configurable- 851~854



-Double Bearing Non-retained - Standard / Configurable- 855~858



-Double Bearings with Pilot - Retained - Standard / Configurable- 859~862



-T-Shaped Short, Double, Bearings- 872



-T-Shaped, Base Mount- 873



-T-Shaped Double Bearings with Datums- 875



-T-Shaped with Datums- 877



-T-Shaped Double Bearings with Datums- 878



-Bottom Mount Double Bearings- 884



-Front Mount Type- 885-886



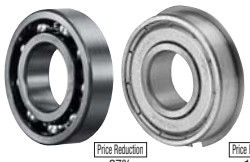
-Outer Ring Captured- 888



-Outer Ring Fixed with Pilot- 889



-Outer Ring Fixed, T-Shaped- 890



Price Reduction 27%

Price Reduction 19%

Deep Groove Ball Bearings -Open / With Retainer Ring- 900~902



-Single Shielded / Double Shielded with C3 Clearance- 903-904



Price Reduction 33%

Deep Groove Ball Bearings -Rubber Sealed- 905



Price Reduction 21%

Small Deep Groove Ball Bearings 907-908



-Economy Type- 909



Non-grease, Non-oil Ball Bearings for Special Environments 915



Plastic Bearings 916



Heat-Resistant Grease Filled Ball Bearings 917-918



Bearings with Set Screw Shaft Sleeve 918



Price Reduction 31%

Thrust Needle Roller Bearings 919



Stainless Steel Deep Groove Bearings 926



Ball Bearing Units -Cast Pillow Blocks / Diamond Shape Flanged- 927



-Cast Pillow Blocks / Bottom Mount- 928



-Cast Iron Housings Flanged- 929



Bearing Covers -Compact / Sealed- 935



-Standard Type- 936



Price Reduction Up to 68%

Lock Nuts and Toothed Lock Washers for Bearings 937



Price Reduction Up to 11%

Hard Locking Bearing Nuts 938



Price Reduction Up to 45%

Fine U Nuts® 938

1
2


Price Reduction 25%

Precision Lock Nut	Hook Spanners for Bearing Lock Nuts	Bearing Lock Nuts	Bearing Spacer	Bearing Shaft Screws
939	939	940	941	943


Price Reduction






Price Reduction



-Hexagon Socket Type-	-Hexagon Socket on Screw-	Guide Followers	Solid Eccentric Cam Followers	Miniature Cam Followers
949	950	951	951	952











Brackets for Cam Followers	Roller Followers-Separate / Solid-	Roller Followers Urethane Type	Roller Follower Pins
956	957	958	958


For Servo Motors


For Servo Motors


For Servo Motors


For Servo Motors

-Disk Clamping-	-HiB12gh Rigidity Disc Both Side Keyless Clamping-	-Both Sides Keywayed-	-High Rigidity Disc Clamping-
965	966-968-970	966-967-969	967-969









Spacers (for MCO__MCOC__)	-High Rigidity Oldham, Clamping-	Oldham, Large Shaft Diameter -Set Screw / Clamping-	Spacers (for MFJ__, MFJC__)
975	978	979	979


Price Reduction Max.14%


Price Reduction Max.14%


Price Reduction Max. 23%





-Oldham, Green, Short, Clamping-	Spacers (for CPO, CPOC, CPOCG)	N Couplings	Chain Couplings
982	981	983	983




For Servo Motors


Price Reduction Up to 5%


Price Reduction Up to 11%

-Jaw & Spider Type - Set Screw	-Extra Super Duralumin Set Screw, Clamping-	-Slit Set Screw-	-Slit Clamping-
987	988	989	990

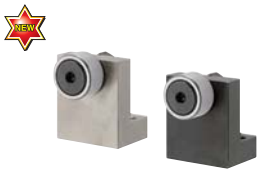
NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Bearing Shaft Screws w/Retaining Rings 944



Cam Followers with Bracket -L-Shaped- 945



-Blocks Retained- 946



Cam Followers-Standard- 947



-With Tapped Hole for Grease Fitting- 948



Resin Cam Followers 953



-With Retaining Rings- 953



Cam Followers Urethane Type 955



Bracket for Cam Followers -L-Shaped- 956



-Blocks- 956

Couplings / Motors



For Servo Motors



For Servo Motors



For Servo Motors



For Servo Motors

Product Name	High Positioning Accuracy Disc -Clamping / Both Sides Keywayed-	-High Rigidity Disc Clamping-	-High Torque Disk Clamping-
Page	963	963	964



Standard Torque Disc -Set Screw / Clamping- 971-972



High Torque Disc -Set Screw / Clamping- 973-974



-Oldham, Set Screw- 975



-High Rigidity Oldham, Set Screw- 976



-High Rigidity Oldham, Large Shaft Ø Set Screw- 980



-High Rigidity Oldham, Large Shaft Ø Clamping- 980



-Super Short, Oldham, Clamping- 981



-Oldham, Green, Set Screw- 982



For Servo Motors

-Jaw Set Screw Type / Clamping Type- 984



-Jaw Set Screw- 985



-Jaw Clamping- 986



-Sleeved, Set Screw- 987



-Rigid Set Screw- 991



-Rigid Clamping- 991



-Rigid Split- 992



- Bellows Type- 993

1 2







-Resin / Short Resin-	Universal Joints	- Induction Motors / Reversible Motors / Gear Heads
994	995-996	999

Roller Conveyance Components







Product Name	TM Magnetic Transmission Drive (Parts for Non-contact Magnetic Force Transmission)	-Economy Type-	Rollers -Straight / Crowned-	Rollers Tapped -Straight / Crowned-	Vertical Guide Rollers
Page	1012	1012	1013	1015	1016









Rollers -Set Screw Hole-	-Press-Fit Straight-	-Press-Fit Bearing-	Aluminum Rollers	Pipe Rollers -Straight-	-Bearing-
1022	1023	1024	1024	1025	1026







Knurled Urethane Rollers with Set Screw Holes at One End	Urethane Rollers Bearing Type	Urethane Rollers with Collars -Set Screw Holes at One End-	Knurled Urethane Rollers	Urethane Rollers with Shafts
1031	1032	1032	1032	1033









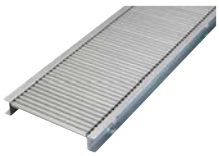
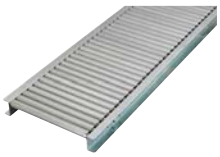

Urethane Mold Bearings – Inner Wheel Protruded Type–	Threaded Bearings	Shafts for Urethane Mold Bearings	Eccentric Bushings	Engineered Plastic Bearings -Flat-	-Arc Type-
1039	1040	1040	1040	1041	1041








Motor Rollers	Conveyor Rollers	Conveyor Roller Shafts as sets	Plastic Conveyor Rollers	Conveyer Roller Shafts
1046	1047	1048	1048	1049




Roller Conveyors -Roller Dia. 19mm-	-Roller Dia. 28mm-	-Roller Dia. 38mm-	Ball Rollers -Hexagon Bolt-	-Press Fit-
1056	1057	1058	1059	1059

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



- Variable Speed Motor Units / Gear Heads 1001



- Motors w/Electromagnetic Brakes / Gear Heads 1005



Compact Geared Motor Brackets (Alteration) 1007



Medium Geared Motors 1008



Rollers with Oil Free Bushings 1016



Rollers -Bearing- 1017



-Urethane Thickness Selectable- 1019



Groove Rollers 1020



-Bearing Type- 1020



Price Reduction UP to 36%

Plastic Rollers 1021



Price Reduction 8%

-Set Screw- 1027



Long Pipe Rollers -Bearing- 1028



Rollers with Keyway 1029



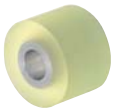
-With Keyway / Tapped Type- 1029



Price Reduction 16%

Pipe Rollers with Shafts 1030

Addition



Urethane Rollers with Collars 1031



-Both Ends Threaded- 1033



-Urethane Thickness Configurable- 1034



Silicon Rubber / Urethane Mold Bearings 1035



-Arc Type- 1036



-Threaded Flat- 1037



-Threaded Crown- 1038



-With Bracket- 1042



-U Grooved- 1042



-V Grooved- 1042



-One Side Flanged- 1042









Guide Rollers -V Groove 60°/ V Groove 90°/ For Wire / Flat / Double Flanged- 1043~1044



Mini-Rollers for Conveyors 1049



Price Reduction 4%

Conveyor Wheels 1050



Price Reduction 4%

Plastic Conveyors Wheels 1050



Roller Carriers -Roller Width 7~50mm- 1051~1054



-Insertion / Adhesive- 1059



Plunger Type Ball Rollers -Press-Fit- 1059



-Threaded- 1059



Ball Rollers -Lock Nut / Flange Mounting- 1060

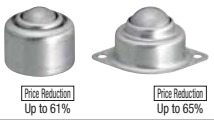


-Set Screw- 1060



-Rigid Clamping- 1060

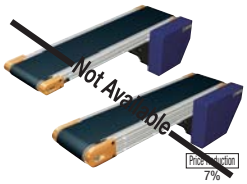


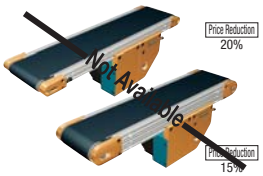





-Rigid Clamping-	Ball Rollers -Machining-	Pressed-in Bearing Type
1061	1062	1062

Conveyors



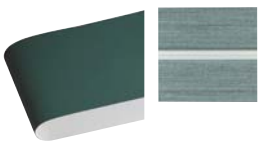






Product Name	Miniature Conveyors -Flat Belt Single Track Single Lane Head Drive-	-Single Track Center Drive-	-Built-in Single Track Motor-	Chain Conveyors -Dual Track Head Drive-
Page	1073~1074	1075~1076	1077	1078

Flat Belts / Round Belts / Pulleys / Idlers


Product Name	Flat Belts	-With Meandering Prevention Crosspiece-	Pulleys for Flat Belts -Width T=6~32-
Page	1087	1088	1089







Pulleys for Flat Belts Economy Type -Width L=110~500	Idlers for Flat Belts Economy Type -Width L=110~500-	Pulleys for Flat Belts -Width L=110~500-	Idlers for Flat Belts -Width L=110~500-
1093	1094	1095	1096










Idlers for Flat Belts-Width L=100~300-	Polyurethane Round Belts	Pulleys for Round Belts -Set Screw / Trapezoid Grooves-	-Set Screw / U Groove-	-Clamping / Trapezoidal Groove-
1100	1101~1102	1103	1103	1104

Timing Pulleys / Belts / Mecha Locks







Product Name	High Torque Timing Pulleys -2GT / 3GT / 5GT / 8YU-	Timing Pulleys -MXL / XL / L / H-	High Torque Timing Pulleys -S2M / S3M / S5M / S8M-	-S14M-
Page	1113~1120	1121~1128	1129~1136	1137







Keyless Timing Pulleys -XL / L / H Type-	-L / H Type (Mechanical Lock Standard Type incorporated)-	Keyless High Torque Timing Pulleys -S3M / S5M / S8M-	-S3M / S5M / S8M Type (Mechanical Lock Standard Type incorporated)-	-P5M / P8M-
1154, 1155, 1157	1156, 1158	1159, 1161, 1163	1160, 1162, 1164	1165, 1166

NEW : New products added

Change : Products whose part numbers have been changed.

Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Price Reduction 3%

Abrasion Resisting Polymer Guide Rails 1063



Abrasion Resisting Polymer Guide Rails 1065



Slide Tapes / Strong Double-Sided Tapes 1066



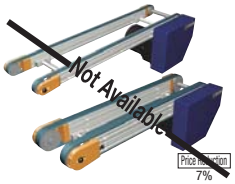
Guide Rails 1066



Stainless Steel Sliding Plates 1067

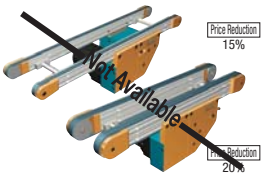


Product Chute Thin Plates 1069



Price Reduction 7%

Miniature Conveyor -Timing Belt Dual Track Head Drive 1079-1080



Price Reduction 15%

Price Reduction 20%

-Dual Track Center Drive- 1081-1082



Conveyor Guide Rails 1083



Price Reduction 20%

Guide Rail Brackets 1083



Conveyor Support Stands 1083



Idlers for Flat Belts -Width T=6~32- 1090



Pulleys for Flat Belts -Width L=25~100- 1091



Idlers for Flat Belts -Width L=25~100- 1092



Pulleys for Flat Belts with Urethane -Width L=25~100- 1097



Pulleys for Flat Belts Economy Type with Urethane -Width L=110~500- 1098



Shaft Pulleys for Flat Belts -Width L=25~100- 1099



Idlers for Flat Belts -Width L=38~90- 1100



-Clamping / U Groove- 1104



Idlers for Round Belts -Narrow- 1105



-Wide- 1106



Pulleys for Round Belts -Double Grooves- 1107



Idlers for Round Belts -Double Grooves- 1108



Non-Backlash Timing Pulleys -S8M- 1139



Price Reduction Up to 15%

High Torque Timing Pulleys -P2M / P3M / P5M / P8M- 1141~1146

Addition



Timing Pulleys -T5 / T10- 1147~1150



-AT5 / AT10- 1151



Keyless Timing Pulleys -T5 / T10- 1167, 1169



-T5 / T10 Type (Mechanical Lock Standard Type incorporated)- 1168, 1170



Clamping High Torque Timing Pulleys -S3M / S5M / S8M- 1171



Timing Pulleys -Width Configurable- 1173



Bar-Shaped Timing Pulleys 1174

1 2





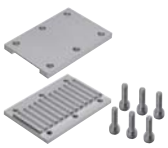

Flanged Idlers with Teeth -MXL / XL / L / H-	-S2M / S3M / S5M / S8M / S14M-	-P2M / P3M / P5M / P8M / 2GT / 3GT / 5GT / 8YU-	-T5 / T10 / AT5 / AT10-
1175~1178	1179~1182	1183	1185

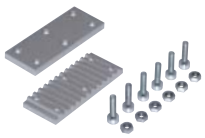





Price Reduction
Up to 50%

High Torque Timing Belts -S2M / S3M / S5M / S8M / S14M-	-P2M / P3M / P5M / P8M-	Super High Torque Timing Belts-MTS8M / UP5M / UP8M-	Timing Belts -T5 / T10-
1195	1197	1199	1200




Timing Belts Guides	Metal Fittings for Timing Belts -Overpressure Prevention Type-	-Overpressure Prevention Metal Fittings Hole Position Configurable Type-	-Nut Fitting Type-	-Bottom Metal Short Type-
1207	1209	1210	1211	1212

Gears





Product Name	Induction Hardened & Ground Spur Gears -Module 1.0/1.5/2.0/2.5/3.0-	Spur Gears -Module 0.5 / 0.8 / 1.0 / 1.5 / 2.0 / 2.5 / 3.0-	Bonded Plastic Spur Gears -Module 1.0 / 1.5 / 2.0 / 2.5 / 3.0-
Page	1223	1225~1236	1237






Spur Gears Bearing Built-in Type–Module 1.0/1.5/2.0–	Round Rack Gears	Worm	Worm Wheel
1245	1246	1246	1246

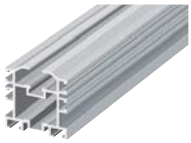
Sprockets / Chains





Price Reduction
Up to 21%

Product Name	Sprockets / Chains / Oil-free Chains	Keyless Sprockets	Sprockets 2-Row Type
Page	1253~1259	1260	1260







Frames for Double Speed Chain	Return Guides	Engineered Plastic Block Chains 1-Row Type	Engineered Plastic Block Chains 2-Row Type	Sprockets for Engineered Plastic Block Chains 2-Row Type
1264	1264	1265	1265	1265

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.


Price Reduction 20% Max.

Idlers -Backside Tension- 1187


Plastic 1188


Idler Shafts 1188

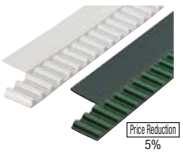

Timing Belts -2GT / 3GT / EV5GT / EV8YU- 1189~1192


Price Reduction Up to 15%

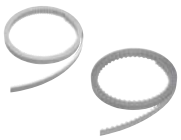
-MXL / XL / L / H- 1193


Timing Belts with Attachments 1201


Long Timing Belts-Iron Rubber®- 1203


Price Reduction 5%

-Polyurethane- 1204


Open End Belts-Iron Rubber®- 1205

Addition


-Polyurethane / Chloroprene Rubber- 1206


Mecha Locks -Thin Type- 1214


-Compact Type- 1215


-Standard Type- 1217


-Straight Type- 1219


-Easy Mounting (Nut) Type- 1220


-Straight Type for High Torque- 1220


Resin Spur Gears-Module 0.5 / 0.8 / 1.0 / 1.5 / 2.0 / 2.5 / 3.0- 1239

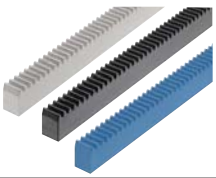

Spur Gears -Teeth Width, Hub Dimensions Configurable-Module 0.5 / 0.8 / 1.0 / 1.5 / 2.0 / 2.5 / 3.0- 1241


Keyless Hub Spur Gears -Module 1.0 / 1.5 / 2.0 / 2.5 / 3.0- 1243

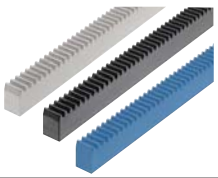

Bevel Gears-Module 1.0/1.5/2.0- 1247


Helical Gears-Module 1.0 / 1.5 / 2.0 / 2.5 / 3.0- 1248

Addition


Rack Gears - L Dimension Fixed 1249

Addition

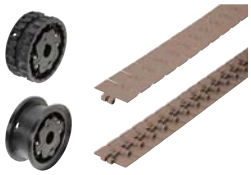

Rack Gears -L Dimension Configurable (One End Machined) 1250


Chains / Sprockets for Small Conveyors - Double Pitch Type - 1261


Chains for Small Conveyors -With Attachments- 1262


Double Speed Chains 1263


Sprockets for Double Speed Chain 1263


Top Chains 1266


Idler Sprockets 1267


Idler Pins 1268


Idler Sprockets with Hub 1269-1270

1
2





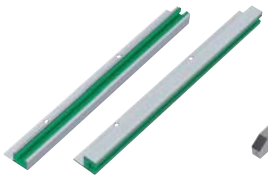
•Idler is optional.



•Idler is optional.



Small Idlers	Tensioner Units	Tensioners-Link Bars Type-	Slide Plates for Tensioning
1270	1271	1272	1272









-Mount Flange-	Steel Chain Guides	Turnbuckles	Turnbuckle Components
1276	1276	1277	1278

Addition



Addition



Addition







-Bolt Fixings Standard / Compact-	Small Head -Standard, Tapped-	-Configurable Taper Angle / D and P Tolerance Selectable-	-Large Head / Small Head, Set Screw-	Large Head Round Tapered
1292	1293~1296	1297	1298	1299~1302

Addition













-Spherical Large / Small Head - Set Screw-	Large Head Flat -Standard, Tapped-	-Threaded-	-Side Locating-	Small Head Flat -Standard, Tapped-	Pilot Shape Selectable -Standard-
1320	1321~1324	1325~1327	1328	1329~1334	1335

Addition



Addition





Addition





-Taper Angle / D and P Tolerance Selectable-	Shoulder Thickness Configurable / Shoulder Ø, Shoulder Thickness Configurable-	-Set Screw-	With Shoulder -Pilot Shape Selectable-	Straight Tapered Type
1342	1343-1344	1345	1346	1347





NEW



Addition



Addition



Addition



-With Base-	-Shouldered-	Locating Pins -Nonmagnetic-	-With Plastic Head-	Locating Pins -Large Head Plastic-	-Small Head Plastic-
1354	1355-1356	1357	1358	1359	1360











-Screw Mounted-	-With Pilot-	-Large Diameter - Screw Mounted-	-Eccentric-	Flanged -Flat-
1365	1365	1365	1366	1366

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



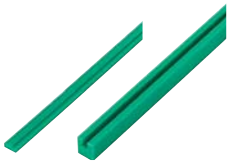
Chain Tensioners-idler Set Type- 1273



Chain Guide Tensioners 1274



Chain Guides -C-Channel Raised Track / Channel- 1275



-Raised Track / Channel- 1275

Locating Pins / Bushings for Jigs

Addition



Locating Pins Large Head -Standard, Tapped- 1283~1286



-Threaded- 1287

Addition



-Configurable Taper Angle / D and P Tolerance Selectable- 1289



-Threaded / With Hexagon Socket- 1291



Small Head Round Tapered 1303~1304



Large Head Bullet Nose Shaped 1305

Addition



Spherical Large Head -Standard, Tapped- 1307~1310



-Threaded- 1311~1314

Addition



Spherical Small Head -Standard, Tapped- 1315~1319



-Standard Tapped / Straight Tapped- 1336



-Threaded- 1337



-Tip Length Configurable - Threaded- 1338

Addition



With Shoulder -Standard, Tapped- 1339-1340



-Threaded- 1341

NEW



Straight Sphere Type 1348

NEW



Full Thread Type 1349

NEW



Marker Pins 1350

NEW



Locating Pins for Height Adjusting 1351

Addition



Small Diameter Locating Pins -Standard- 1352

Addition



-Small Head- 1353



-Small Head Plastic- 1361



-Screw Mounted Plastic- 1361



Work Pusher Pins -Straight- 1362



-Small Head- 1362



Locating Pins -With Air Vent- 1363



Locating Pilot Pins 1363



Locating Pins -Double Stepped- 1364

NEW



Flanged -Mount- 1367



Height Adjusting Blocks 1367



Locating Pins for Grippers 1368



Plate Centering Pins 1368



Feed Pins -Straight- 1369



Feed Pins -With Shoulder- 1370



-Height Adjusting Pins, Threaded -Hexagon- 1371



-With Shoulder, Round, Width Across Flats- 1371-1372



-Press-Fit Type- 1373

Addition



-Counterbored- 1373



Tapped -Hexagon- 1374



-Configurable Stepped- 1378



-Flat / Tip Set Screw- 1379



-Tip Shape Selectable- 1380



Hexagonal Support Pins -Stepped- 1381



-Flat Type- 1382



-Configurable with Shoulder, Set Screw- 1387



-Configurable No Shoulder, Threaded- 1388



-Configurable No Shoulder, Set Screw- 1388



-Standard with Shoulder, Threaded- 1389-1390



-Standard with Shoulder, Set Screw- 1389-1390



-Long, No Shoulder- 1395



-Screw Mounted, No Shoulder- 1396



-Screw Mounted, With Shoulder- 1396



Locating Pins for Jigs -Shading Arc, With Shoulder- 1397



-Shading Arc, No Shoulder- 1397



-Cannonball Shape, With Shoulder- 1398



Detecting Pins (Sensor Embedded) 1402



-Work Detection Unit- 1402



Pedestal Pins 1403



Height Adjusting Pins for Jigs 1403



Height Adjusting Washer 1404



Locating Pin Holders for Jigs 1404

NEW



-Oval- 1410

NEW



-Copper Alloy Straight / Shoulder- 1411



-Straight / Shoulder- 1412

NEW



-Flanged- 1413-1414

NEW



Brackets for Stopper Screws 1421



Threaded Stopper Blocks -Standard, Counterbored- 1422



Price Reduction
Up to 8%

-L-Shaped / T-Shaped / Side Counterbored / Two Hole- 1423-1424



Stop Pins -Press-Fit / Screw / Spherical / Press-Fit Urethane / Screw with Urethane / Wrench Hole- 1425-1426

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



-Round, Width Across Flats- 1374



-Small Head- 1375



Height Adjusting Pin 1375



Height Adjusting Caps 1375



Holders for Locating Pins 1376



Support Pins -Stepped- 1377



-Precision with Shoulder, Threaded- 1383-1384



-Precision with Shoulder, Set Screw- 1383-1384



-Precision No Shoulder, Threaded- 1385-1386



-Precision No Shoulder, Set Screw- 1385-1386



-Configurable with Shoulder, Threaded- 1387



-Standard No Shoulder, Threaded- 1391-1392



-Standard No Shoulder, Set Screw- 1391-1392



-Standard Short Set Screw, With Shoulder- 1393-1394



-Standard Short Set Screw, No Shoulder- 1393-1394



-Long, With Shoulder- 1395



-Cannonball Shape, No Shoulder- 1398



-Diamond Shape, With Shoulder- 1399



-Diamond Shape, No Shoulder- 1399



-Oval, With Shoulder- 1400



-Oval, No Shoulder- 1400



-Alumina Coated Pins- 1401

Addition



Bushings for Locating Pins -Straight Standard- 1405-1406

Addition



-Standard Shoulder- 1407-1408



-Retaining- 1409



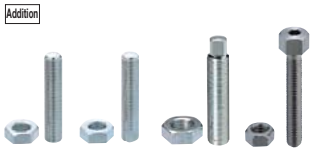
-Flanged, Retaining- 1409



-Notched- 1409

Locating and Guide Components

Addition



Addition



Price Reduction Up to 8%

Product Name	Adjusting Stopper Screws -Hexagon Sockets / Wrench Flats / Wrench Flats with Hexagon Sockets / Hexagon Bolts-	Adjusting Stopper Screws with Knurled Knobs	Locating Bolts	Stopper Bolts	Stopper Screws	Threaded Stopper Blocks
Page	1417-1418	1418	1419	1420	1420	1421

NEW



Stopper Bolts -With Urethane, Polyacetal, Silicon and MC Nylon- 1427-1428

Addition



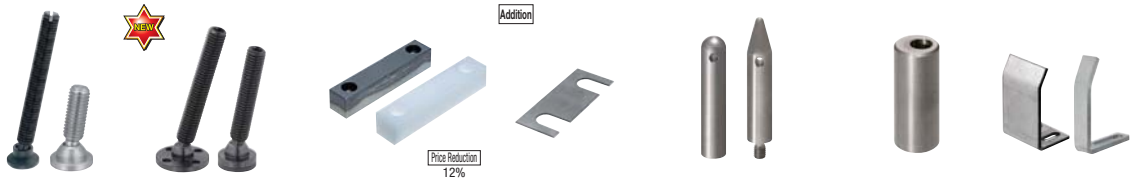
Shock Absorption Stoppers 1429



-Stoppers with Screw, Washer, and Plates- 1430


Price Reduction 12%

Stopper Blocks	Stopper Blocks with Urethane	Adjust Screws	Blocks for Adjusting Bolts	Adjusting Pins	Screw Jacks	Leveling Screws
1431	1432	1433-1434	1435-1436	1436	1437	1437


Price Reduction 12%

Grub Screw Sets	-Rubber Pads Type/Flanged Type-	Clamp Plates	Shims for Clamp Plates	Basic-Guide Pins -Tip Shape Selectable-	-Eccentric-	Basic Guides
1443	1444	1444	1444	1445	1445	1446



V Blocks -Standard / Precision-	-V-Shaped Locating Blocks-	U/T-shaped Locating Block Sets	Tapered Pin Locating Block Sets	Basic Guides for Welding Jigs -Round Pole-
1450	1451-1452	1453	1454	1455


Price Reduction 15%

Workpiece Detection System	Roller Pushers -Low Particulate Generation Type-	Point Pads	Lift Pins	Feed Fingers	-Economy Type-	Auto-latch
1460	1461	1461	1462	1463	1465	1466


Price Reduction 6%

-Long / L Dimension Selectable Long-	Wrenches for Ball Plunger	-Screw Tip Type-	-Flanged Type-	Ball Buttons	Press-Fit Plungers	-Roller Type-	Ball Buttons -Screw Head-
1472-1473	1473	1474	1474	1474	1475	1475	1475



Micro Spring Pins	Spring Plungers -Tapped Tip-	-With Hexagon Socket Tip-	-Hexagon Nose-	-Flat Tip-	-For Slope Surface-
1482	1482	1483	1483	1484	1484


Price Reduction 5%

-Long-	-With Precision Pilot-	-Press-Fit / Knob-	-Knob-less-	-Coarse / Fine Thread Lever Types-	-Switch Lever-
1488	1489	1489	1490	1491	1492

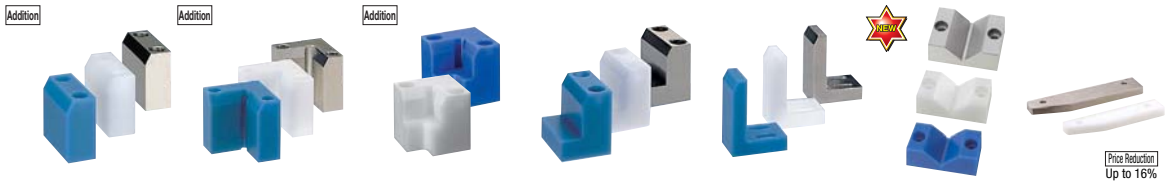
NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



-Large Holes for Adjustment / Wrench Flat Type-	Leveling Bolts	-Wrench Flats Thick-	Lock Nut	Clamping Screws	High-Lock Screws	Clamping Screws	Hexagon Head Clamping Screws
1437	1438	1438	1438	1439-1440	1440	1441-1442	1442



Guides -Straight / L-Shaped / Height Adjusting / Pedestal / Angle / V-Shaped / Plates-
1447~1449



-Plate Type-	-Ribbed Type-	Guide Plates	Round Stoppers	Flat Stoppers	Blocks for Shim Adjustment of Welding Jigs -Straight / L-Shaped-
1455	1456	1456	1457	1458	1459

Plungers



Product Name	Ball Plungers -Economy / Standard / Stainless Steel-	-Roller Type-	-Load Adjustable-	-Plastic / Fine Thread / Short-
Page	1469-1470	1470	1470	1471



Roller Plungers	Spring Plungers -Steel / Stainless Steel-	Wrenches for Plungers	Long Sleeve Plungers	Short Spring Plungers -Steel / Stainless Steel-	Micro Spring Plungers
1476	1477-1478	1478	1479	1480	1481



-Flanged Type-	Indexing Plungers -Standard-	-Flanged Type-	-Tip Tapped Type-	Short Thread Type	-Compact Type-
1484	1485	1486	1486	1487	1488



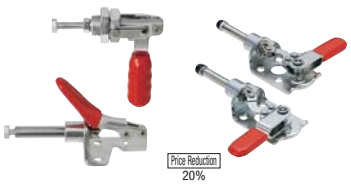
-Push Type-	-Plate Mount-	-Fine Thread, Coarse Thread-	Ball Lock Pins -Spring Type-	-Push Type-
1492	1492	1493	1494	1494

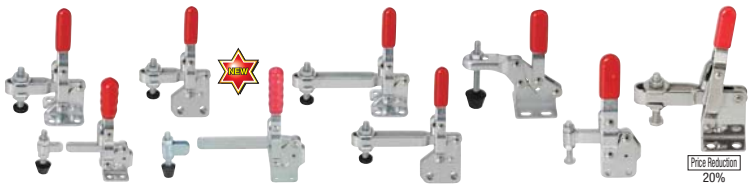
Clamp Units / Toggle Clamps





Product Name	Spring Clamps	Spring Side Clamps / Tip Attachments
Page	1497	1498





-Push-Pull Type, Horizontal Handle-	-Vertical Handle-
1507	1508~1513



-Push-Pull Type-
1516~1519

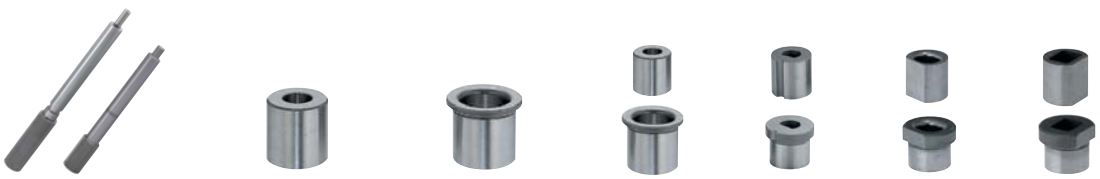
Inspection Jigs



Product Name	Slot Pins for Inspection Jigs -Straight-	-Stepped Straight-	-Stepped Diamond, Straight-	-Oval Straight-	-Stepped D-Shape-
Page	1527	1528	1529	1531	1533



-Tapered with No Step-	Tapped Pins for Inspection Jigs	-Diamond, Taper-	Marking Pins	Slot Pins for Inspection Jigs -Stepped Straight, Threaded-	-Threaded Pins-
1537	1538	1539	1541	1543	1544



Slot Pins for Inspection Jigs -With Groove-	Bushings for Inspection Jigs -Straight-	-Straight with Shoulder-	-Stepped Straight-	-D-Shape-	-Oval-	-Square-
1548	1549	1550	1551	1552	1553	1554



-Round-	Height Adjusting Pins -Standard-	-Threaded-	Hinge Units for Jigs Bases	Slide Units for Jigs Bases
1560	1560	1560	1561	1561

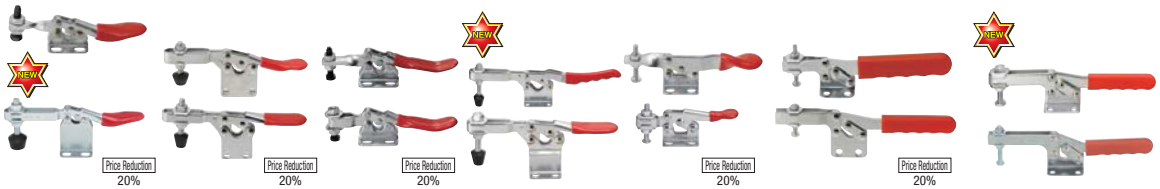
NEW : New products added

Change : Products whose part numbers have been changed.

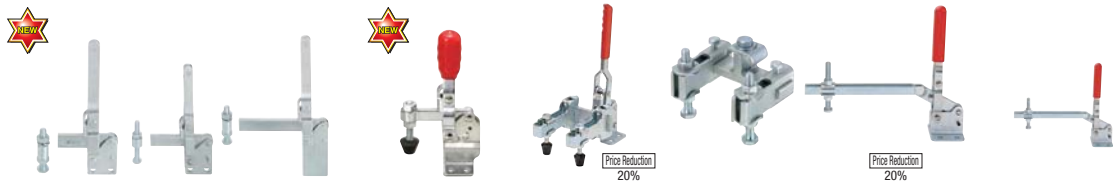
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.



Toggle Clamps -Hold Down, Horizontal Handle-
1501~1506



Vertical Handle, Welded Tip Type-	-High Arm Type-	-2-Pronged Type-	2-Pronged Metals	-Long Arm Type-	-Long Arm, Small Type-
1514	1514	1515	1515	1515	1515



-Smooth Stroke-	Welding Clamps	Metal Heads for Clamps	Components for Toggle Clamps-Two-pronged Clamp Arms-	-Clamp Arm Extension Kits-	-Clamp Brackets-
1519	1520	1521	1522	1522	1522



-Stepped Large Diameter-	-Small-	-Straight Long-	-Stepped Straight Long-	-Threaded Straight Long-	-Tapered-
1534	1534	1535	1535	1536	1537



-Threaded Taper, Round-	-Threaded Taper with No Step-	-Threaded Taper, Revolving Diamond-Shape-	-Straight Clamp-	-Taper Clamp-	GO / NO-GO Pins -Reversible-
1545	1545	1546	1547	1547	1548



-Stepped and Threaded / For Straight Pin / Taper Pin-	-Retaining Thread Bushings-	-Clip Detaching Blocks for Plastic Panels-	-Threaded Bushings-	-For Plastic Panels-	Shim Plates -Square-
1555-1556	1557	1558	1559	1559	1560



Hinge Units for Jigs -Vertical-	Angle Plate Sets for Jigs -For Horizontal / Vertical Rest Position-	Angle Plate Support Stands / Plates	Clamp Plates	-L Pins / T Pins-
1562	1563	1564	1565	1566







Jig Locating Kits	-Construction Balls, Covers, Pads-	-Pin Clips-	-Wires and Chains for Pins-	-Self-Retractable Wires for Slot Pin-
1567	1567	1568	1568	1568





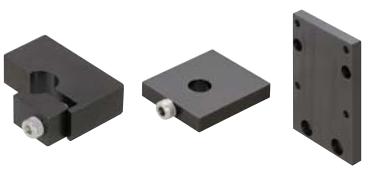
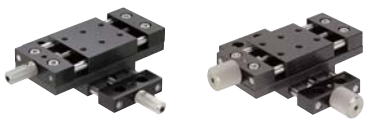



One Structure Contact Probes	Switch Probes	Terminals for Probes	Heat / Shrink Tubes	Circuit Board Guide Pins / Circuit Board Pusher Pins	Circuit Board Rough Guides
1583-1584	1585	1585	1585	1586	1586






[Simplified Adjustment] X Axis Push Screw Standard Type	[Simplified Adjustment] X Axis Feed Screw Compact Type	[Simplified Adjustment] X Axis Feed Screw Selectable Stroke Type	[Simplified Adjustment] X Axis Left / Right Screw Width Adjust Unit
1594	1595	1595	1596

[Simplified Adjustment] Z Axis Medium Load Capacity	[Simplified Adjustment] Dispenser Mounting Accessory	[Simplified Adjustment] XY Axes Feed Screw Type
1601	1602	1603

Standard / High Precision Positioning Stages

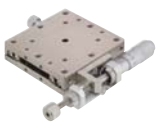






Product Name	[Standard] Dovetail Rack & Pinion	[Standard] Cross Roller	[High Precision] Dovetail Rack & Pinion	Knob Covers
Page	1614~1619	1620~1621	1622~1630	1638

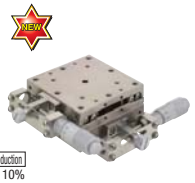






[High Precision] Cross-Roller Feed Screw High Rigidity	[High Precision] Linear Ball Slide	[High Precision] Cross Roller
1640	1641~1645	1647







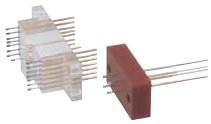
[High Precision] XY Axes Dovetail Groove Feed Screw	[High Precision] XY Axes Linear Balls	[High Precision] ZY Axes Cross Roller	[High Precision] Z Axis Dovetail Groove Rack & Pinion Type	[High Precision] Z Axis Feed Screw
1657	1658~1661	1662-1663	1664~1667	1668~1671

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

Items applicable to reduced prices vary depending on the type and size of products. Please refer to the corresponding pages.

Contact Probes



Addition


Product Name	Contact Probe Assembly Service	Double Tipped Probes	Probes / Receptacles -Min. Mounting Pitch 0.5mm~4.5mm Series-
Page	1571	1572	1573~1581

Simplified Adjustment Units

Addition



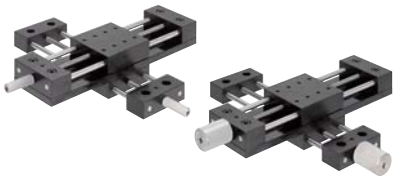
NEW


Product Name	[Simplified Adjustment] X Axis Feed Screw Standard/Configurable	[Simplified Adjustment] X Axis Feed Screw Large Lead Type
Page	1589~1592	1593


NEW




[Simplified Adjustment] X Axis Rack and Pinion Standard Type	[Simplified Adjustment] Z Axis Rack and Pinion Scaled Post Units	[Simplified Adjustment] Z Axis Feed Screw Standard Type	[Simplified Adjustment] Z Axis Push Screw Standard Type
1597	1598	1599	1600

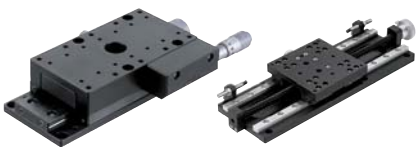

NEW



[Simplified Adjustment] XY Axes Rack and Pinion Standard Type	[Simplified Adjustment] XY Axes Feed Screw Large Lead Type	[Simplified Adjustment] XY Axes Push Screw Standard Type
1604	1605	1606

Addition

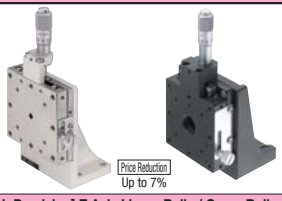



[High Precision] Dovetail Groove Feed Screw Lead 4.2mm	Post Locating Stages	[High Precision] Dovetail Slide Feed Screw
1631~1633	1635	1635~1639



Price Reduction
Up to 5%
NEW

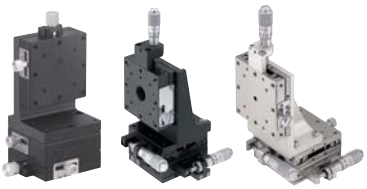

[High Precision] Long Stroke	[High Precision] XY Axes Dovetail Groove Rack & Pinion Type	[High Precision] XY Axes Dovetail Groove Feed Screw
1648	1651~1653	1654~1656


Price Reduction
Up to 7%


NEW




[High Precision] Z Axis Linear Balls / Cross Roller	[High Precision] Horizontal Z Axis
1672-1673	1674~1678


Price Reduction Up to 8%

Price Reduction Up to 8%

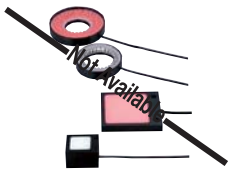

[High Precision] XZ Axes	[High Precision] XYZ Axes	[High Precision] Combined Stages
1681~1684	1685~1688	1689



Not Available

Not Available

Stage Maintenance Parts	X-Axis Motorized Stages	Peripherals for Motorized Stages
1697-1698	1701~1705	1706


Not Available

Not Available


LED Lamps for Image Processing	Power Controller for LED Lamps	Free Guides / Free Angles / Flexible Arms
1714-1715	1716	1718~1720

Sensor Switches


Not Available
Addition

Price Reduction Up to 25%

Price Reduction Up to 25%



Product Name	Photoelectric Sensors with built-in Amplifier	Brackets for Sensor with Stands	Clamps / Bases for Sensor Mounting	Proximity Sensors -Standard-	Proximity Sensors -Metal (IP68)-
Page	1727~1732	1733-1734	1735-1736	1737	1739


Not Available


Price Reduction


Photomicrosensors	Cams for Photo Sensor	Rails for Switch & Sensor -Aluminum-	Bar Nuts
1746~1748	1749	1750~1757	1757



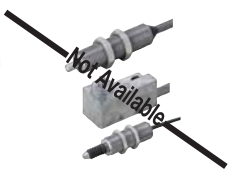




Limit Switch Flags	Compact Contact Switches	High Precision Touch Switches	Contact Switches -Cylinder, L-Shaped Cylinder-	-Bolt / L-Shaped-
1761	1771	1772	1773	1774







Not Available

-Bolt, Spherical Contacts, One-Signal, Water-Resistant, Hexagon Head-	Heat-Resistant Switches	Plunger Switches	Contact Switches -Non Contact Point Type-
1779-1780	1781	1782	1784

NEW : New products added
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Addition : Products with additional specifications.

About Reduced Prices

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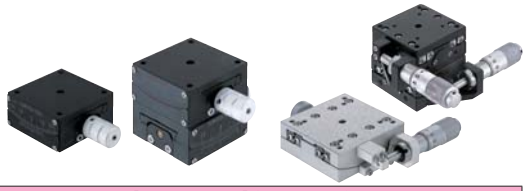
Price Reduction
Up to 8%



[High Precision] Revolving Stages	[High Precision] Goniometer Stages
1691~1694	1695~1696

Image Processing/ Connecting Parts for Measurement Instruments







Product Name	Macro Lenses	Objective Lenses / Auto Extension Rings	Mega-pixel CCTV Lenses / CCTV Lenses / Auto Extension Rings	Setscrews	Rear Convertor Lenses
Page	1709	1709	1711	1711	1711

Addition


Price Reduction
8% in average




Magnetic Bases	Shaft Mounts	Dial / Indicator Fittings	Dial Holders
1721	1721	1722	1722



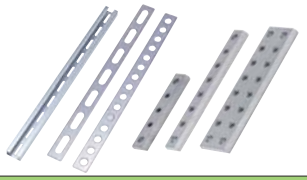


Price Reduction
16%



-Heat-Resistant (IP67)-	-Mini (IP67)-	-Square-	Proximity Sensor Attachments	Sensor Flags / Brackets	Proximity Sensor Flags
1739	1739	1741	1743	1743	1744




Price Reduction
Up to 75%


Rails for Photomicrosensors	Rails for Switch and Sensor -Steel-	-DIN Rails L Dimension Fixed Type-	C-Shaped Rails / Simple Stays / Grounding Blocks
1757	1758	1759	1760








-Long Stroke Type-	-Water-Proof (IP67)-	-With Plastic Tip (IP65)-	-Tip Shape Selectable / Wide Contact Angle Type-	Switches with Stoppers -Mini, Drip-Proof-	-Mini, Water-Proof-
1774	1775	1775	1776	1777	1778

Posts / Strut Clamps / Stands






Product Name	Hexagonal Posts / Attachment Blocks for Hexagonal Posts	Circular Posts	Square Posts	Spacer Blocks
Page	1788~1798	1799~1808	1809	1811







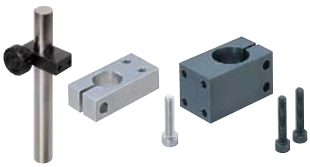

Posts for Stands	Caps for Pipe Posts	Posts for Stands -Calibrated Pipe-	-Calibrated, Length Configurable-	-Square Bars / Pipes-	-Calibrated Square Pipes, Length Configurable-
1814	1814	1815	1815	1816	1816







Brackets for Stands -Side Mount-	-Side Mounting with Dowel Holes-	-Side Mount Space Saving Type-	-Square Holes-	-Side Mount, Square Holes-
1829~1831	1829-1830	1831	1832	1832




-Vertical / Parallel Tapped with a Wing Knob / Clamp Lever-	-Tapped-	-Round / Square Holes, Perpendicular / Parallel, Tapped-
1845-1846	1847~1852	1851

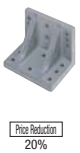
Gussets / Angle Plates / Welded Steel Stands






Product Name	Precision Casting Economy Gussets	Gussets - Through Hole & Counterbored Hole, Hole Position Fixed -	-Through Hole, Counterbore Hole, Hole Position Configurable-	Gussets -Tapped, Hole Position Fixed / Configurable-
Page	1864	1865	1866	1867





- Hole Position Configurable Type -	- Side A (Base Surface) Machining Configurable Type -	- Opposite Angle Dowel Type / Wide Type -	Welded Angle Plates -Compact, No Hole Type-	- No Hole Type and Hole Position Configurable Type -
1875	1877	1878	1879	1880

Technical Data

International System of Units (SI)	1887	Ball Screw Selection	1893
Quantifiers / Unit Symbols / Chemical Symbols / Element Symbols	1889	Linear System Life Calculations	1901
Volume and Weight Calculations	1889	Single Axis Actuator Selection	1905
Physical Properties of Materials	1889	Radial Bearing (Class 0) Tolerances and Allowances	1909
Area / Center of Gravity / Area Moment of Inertia Calculations	1890	IP Rating Codes of Position Sensor Switches	1909
Surface Roughness Ranges of Various Processes	1891	How to use coil springs and precautions	1910
Geometrical Tolerance Indication Methods	1892	Spring Calculations	1911

1885~1978

Index

Alphabetical Order	P.1987
Product Name Index	P.2045

1985~

NEW : New products added
Change : Products whose part numbers have been changed.
Addition : Products with additional specifications.

About Reduced Prices

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Device Stands
1817~1824



Stand Brackets
1825~1828



Strut Clamps -Perpendicular Configuration / With a Wing Knob / With Clamp-
1834



-Perpendicular-
1835~1841



-Parallel-
1842



Strut Clamps -Slotted Holes-
1853



–Arm–
1854

Bar Clamps
1854



Flexible Clamps
1855-1856



Pipe Stands
1858-1859



-Threaded Pipes Welded-
1859



Rotary Connectors
1861-1862



-Lightweight Type / Bridge Type-
1869-1870



Angle Plates -Cast Iron, Dimension Fixed Type-
1871



Aluminum / Stainless Steel / Dimension Fixed Type -
1872



- Mounting Holes Selectable / Holes Position Fixed Type -
1873



- Mounting Surface Tapped Holes and Mounting Holes Position Specified -
1874



Welded Steel Stands–Shaped Steel Type–
1881



Welded Steel Stands–Shape Steel Height Specified-
1882



- Shape Steel Lower Wide Type -
1883

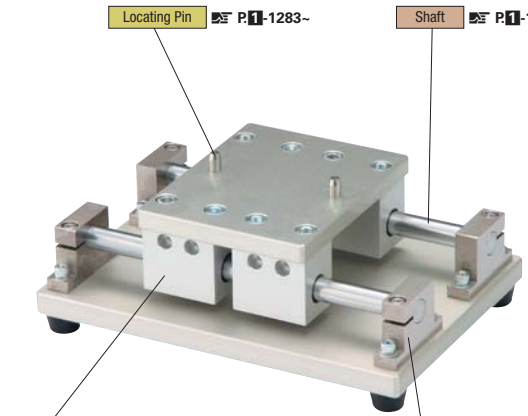


-Plate Type-
1884

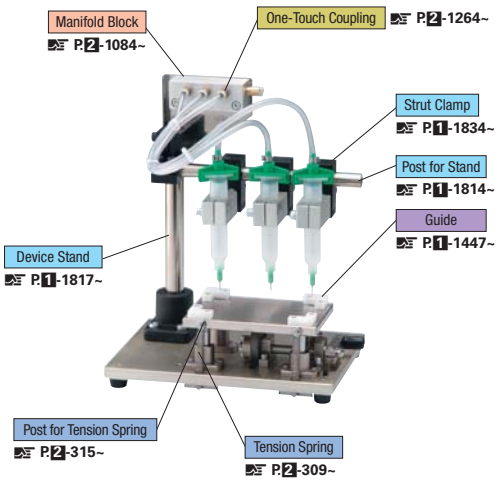
Chain Power Transmission Mechanism Design	1913~1920	Iron Rubber® Belt Selection	1943
Double Speed Chain / Top Chain Selections	1921	Technical Data -Synchronous Pulley- -Machine Keys and Keyway-	1947~1968
Flat Belt Selection	1922		
Power Transmission -Synchronous Belt Selection	1923~1939	Metal Table EN - JIS	1969
Conveyance Synchronous Belt Selection	1940	Metal Table JIS - EN	1974
Synchronous Belt Reference Information	1941	Plastic Table	1979
Synchronous Belt Replacement Signs	1942	Surface Treatments	1983

Example of Use 1: Standard Components

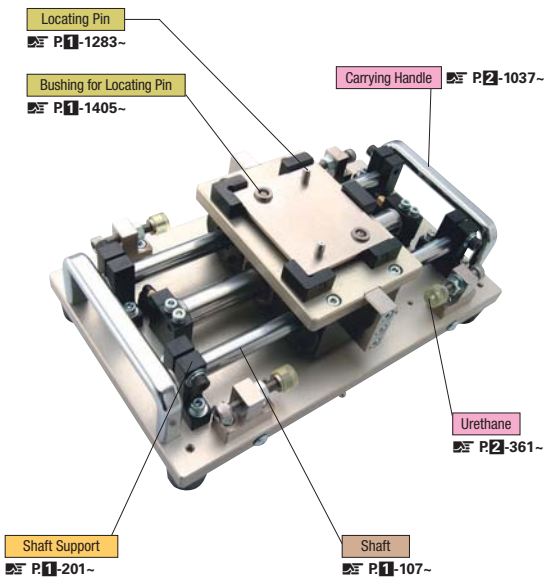
Oil Free Bushing Sliding Unit



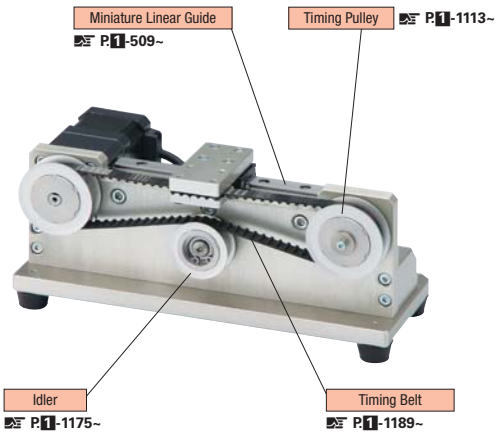
Dispense Unit



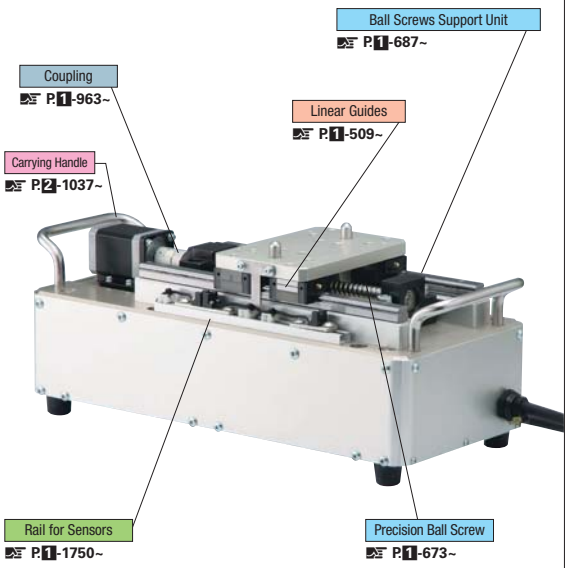
Cylinder-Driven Stage



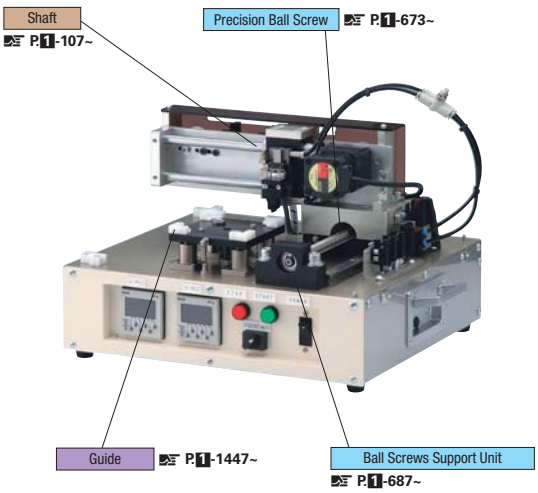
Belt-Driven Shuttle Unit



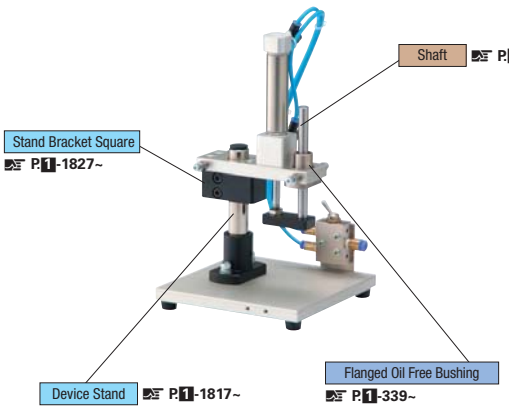
Ball Screw Linear Motion Unit



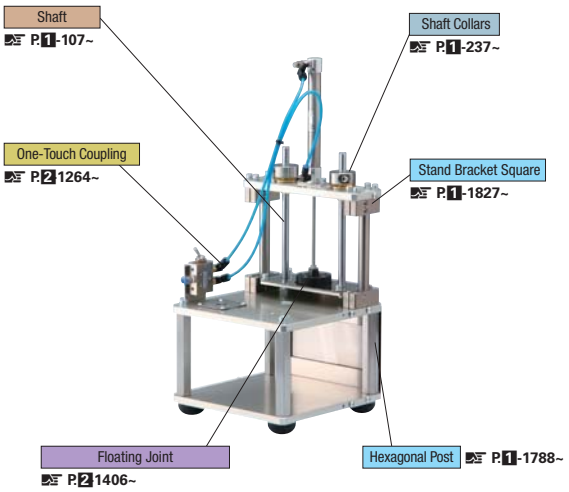
IC Chip Transfer Equipment



Vertical Movement Unit

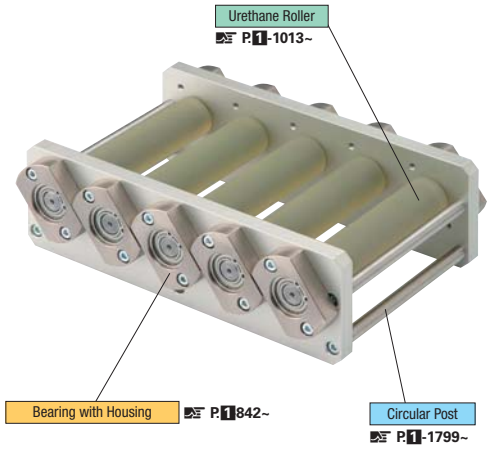


Shutter

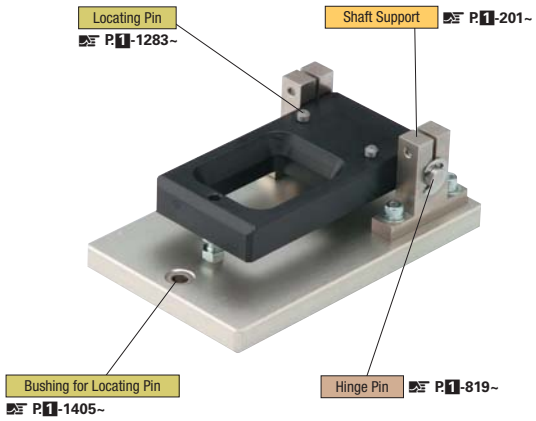


Example of Use 2: Standard Components

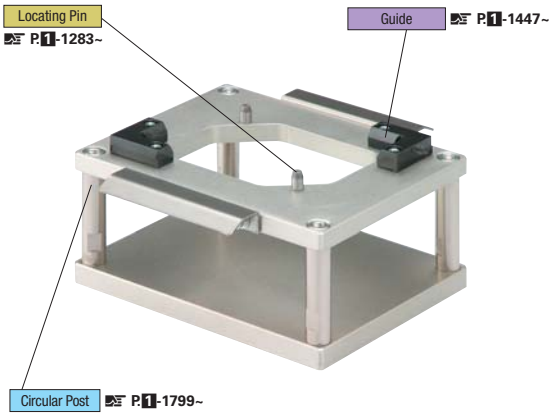
Urethane Roller Conveyor



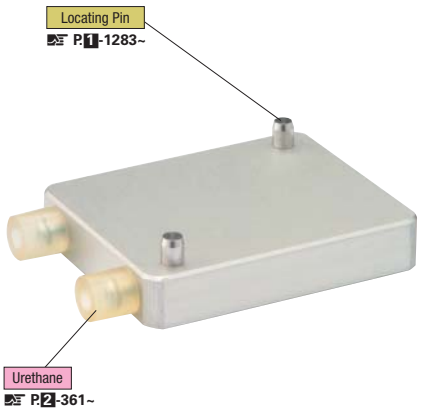
Assembly Jig



Positioning Jig



Pallet



Aluminum Extrusions







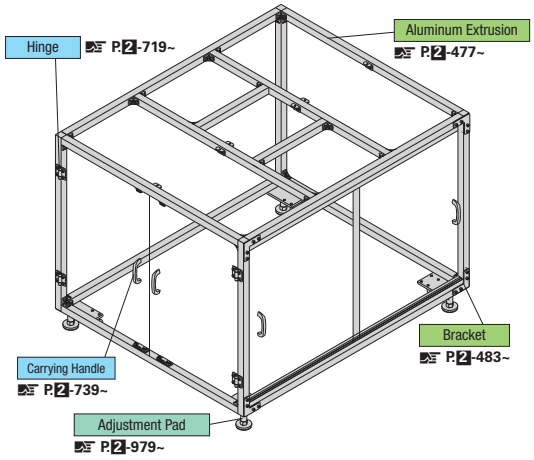
Pipe Frames

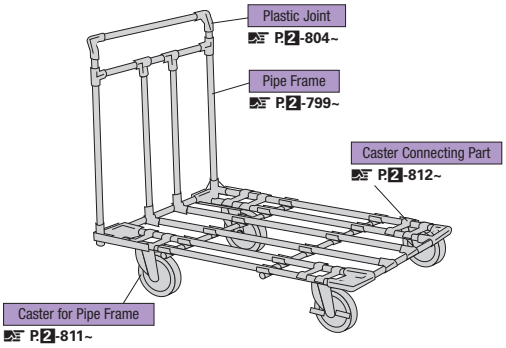


Factory Frames



Frame-relevant Components





■ **Aluminum Extrusions Standard Design Support Software** P.2-783~

Designing, load calculation, DXF data, component list and order form can be created easily on your PC. Available for free.

■ **3D Structure Conformational Analysis Software**

Warpage of the structure composed of aluminum extrusions can be analyzed. BMP · CSV and DXF Export compliant. (Paid software)

■ **Pipe Frames Standard Design Support Software**

DWG data and the order form can be created by simply selecting the shape, dimensions and components on your PC. Available for free.


ON
OFF







How to Use the Catalog

•How to Use the Catalog ····· 83
•Guide of Marks ····· 85
•MISUMI's Environmental Awareness and RoHS Compliancy ····· 86
•General Ordering Information ····· 87
•Delivery Times, Express Orders ····· 88
•Item Number Configuration ····· 89
•Alterations ····· 90
•WOS Explanation ····· 91

How to Use Catalog

Product Name

Part Number

Product Photograph

Material

- Our products are manufactured from materials according to the Japanese Industry Standard (JIS) For better understanding,the materials are given in the catalog according to EN or DIN. Comparison table.

Specifications

Drawing

Specification Table

- The Product Number is made up of variable sizes (blue or green letters on white background).
  It is composed in steps from the Catalog Number and its selected size, from left to right.
- All the dimensions are therefore contained in the catalog number.
  Sizes from blue highlighted tables are fixed sizes and are not used in the catalog numbers.

Price

- Prices are set and shown based on quantity 1.
- Volume discount rates are available for most products.

  <Calculation Example>
  The unit price for ordering 20 pieces of linear shafts
  SFJ12−300
  6,80×0.85=5,78 Euro per pc.
- Volume discount rate does not apply to alteration fees.

Page

1-107

How to Find the Product

To find the Product Shape, Part Number., Delivery Time, and the detail page,

- Use the Picture Index····· P.1
- Use the Part Number Index ····· P.1813
- Use the Product Name Index····· P.1871

Add. Spec.

Shafts
-Straight Type-

Shaft length can be specified in 1mm increments.

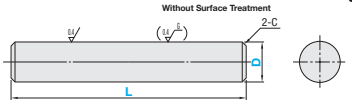


RoHS

Type			M Material	H Hardness	S Surface Treatment
D Tolerance g6	D Tolerance h5	D Tolerance f8			
SFJ	SFU	-	1.3505	Induction Hardening Effective Hardening Depth P.104	-
SSFJ	SSFU	-	1.4125		
PSFJ	PSFU	-	1.3505		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness 5μ or more
PSSFJ	PSSFU	-	1.4125	58HRC~	
RSFJ	-	-	1.3505	1.4125 equivalent 58HRC~	Raydent
-	-	PSFG	1.1191	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μm or more.
-	-	PSSFG	1.4301		

D Tolerance			
D	g6	h5	f8
3	-0.002 -0.008	0 -0.004	-
4			
5	-0.004 -0.012	0 -0.005	-0.010 -0.028
6			
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12			
13	-0.006 -0.017	0 -0.008	-0.016 -0.043
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

Without Surface Treatment



Features of Raydent P.118
For Circularity and Straightness P.103

Part Number Type	D	L 1mm Increments	C
(D Tolerance g6) SFJ SSFJ PSFJ PSSFJ RSFJ (D≤30, L≤500) / (D Tolerance h5) SFU SSFU PSFU PSSFU	3	10~ 400	0.2 or less
	4	10~ 400	
	5	10~ 400	
	6	20~ 600	0.5 or less
	8	20~ 800	
	10	20~ 800	
	12	20~1000	
	13	25~1000	
	15	25~1000	
	16	30~1200	
	18	30~1200	
	20	30~1200	1.0 or less
	25	35~1200	
	30	35~1500	
	35	35~1500	
	40	50~1500	
	50	65~1500	

Part Number Type	D	L 1mm Increments	C
(D Tolerance f8) PSFG PSSFG	6	20~ 600	0.5 or less
	8	20~ 800	
	10	20~ 800	
	12	20~1000	
	13	25~1000	
	15	25~1000	
	16	30~1200	
	18	30~1200	
	20	30~1200	1.0 or less
	25	35~1200	
	30	35~1500	
	35	35~1500	
	40	50~1500	
	50	65~1500	

Price

Volume Discount (Round down to one Cent) P87

Quantity	1~4	5~12	13~19	20~49
Discount Rates	€ Unit Price	5%	10%	15%

Minimum quoted quantity for precision grade shafts larger than 30mm O.D. with LTBC plating is 50.

Part Number Type	D	€ Unit Price Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
SFJ SFU	3・4・5	2,10	3,20	4,30	5,40	8,20	10,00	-	-	-	-	-	-
	6	1,60	2,30	3,20	3,90	6,00	7,30	9,00	10,70				
	8	1,60	2,40	3,20	4,00	6,20	7,40	9,40	11,10	14,80	-	-	-
	10	1,60	2,50	3,30	4,20	6,30	7,80	9,60	11,50	15,50			
	12	1,80	2,70	3,60	4,60	6,80	8,20	10,40	12,40	21,80	25,90		
	13	1,80	2,90	3,80	4,70	7,10	8,50	10,70	12,70	22,30	26,60		
	15・16	1,90	3,00	3,80	4,80	7,30	8,90	11,00	13,10	22,80	27,20	32,70	
	18・20	2,00	3,10	4,10	5,10	7,80	9,40	11,70	14,10	23,90	28,50	33,20	
	25	2,50	3,80	5,20	6,40	9,70	11,30	14,90	17,70	28,80	34,70	40,70	
	30	2,90	4,50	5,90	7,40	11,10	13,40	16,80	20,20	32,00	38,90	52,20	65,30
	35	3,50	5,50	7,20	9,10	13,70	16,50	20,60	24,80	38,10	46,30	54,60	68,20
	40	4,30	6,60	8,90	11,00	16,60	20,10	25,10	30,10	45,40	55,50	65,20	81,50
	50	-	8,90	11,80	14,80	22,10	26,60	33,20	40,00	58,30	71,90	84,70	105,90
SSFJ SSFU	3	3,20	4,70	6,30	7,80	11,80	14,20	-	-	-	-	-	-
	4・5	2,90	4,50	5,90	7,40	11,10	13,40						
	6	2,80	4,10	5,50	6,80	9,00	10,10	12,60	15,20				
	8	3,20	4,70	6,30	7,90	10,40	11,50	14,90	18,50	24,70	-	-	-
	10	3,20	4,70	6,30	7,90	10,40	11,50	14,90	18,50	24,70			
	12・13	4,00	5,90	7,90	9,80	12,90	14,30	18,80	23,20	32,90	41,70		
	15・16	4,90	7,40	9,80	12,40	16,90	19,30	22,40	25,30	36,20	45,70	54,90	
	18・20	5,60	8,10	11,00	13,70	18,60	21,00	24,40	27,80	42,20	50,20	63,10	
	25	6,10	9,30	12,40	15,40	21,50	24,90	28,80	32,80	46,20	58,70	74,10	
	30	6,90	10,60	14,10	17,50	24,50	28,20	32,70	37,00	52,60	66,80	84,60	105,70
	35	8,30	12,70	16,90	21,20	29,60	34,40	43,20	52,00	71,70	89,30	106,80	133,60
	40	11,90	18,30	24,30	30,40	38,90	42,70	53,60	64,40	88,70	110,50	132,20	165,20
	50	-	24,40	32,60	40,70	53,60	59,90	75,10	90,20	125,80	157,00	188,00	235,20

For D tolerance h5, 3,90 EUR is added to the prices above.

Part Number Type	D	€ Unit Price Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500	L501 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1500
PSFJ PSFU	3	2,20	3,30	4,40	5,50	8,30	9,90						
	4	2,10	3,00	4,10	5,00	7,60	9,10	-	-	-	-	-	-
	5	2,10	3,00	4,10	5,00	7,90	9,80						
	6	2,00	3,10	4,00	5,00	7,40	8,90	11,10	13,30				
	8	2,10	3,10	4,20	5,10	7,70	9,20	11,50	13,90	18,30	-	-	-
	10	2,20	3,20	4,30	5,30	8,00	9,60	11,90	14,10	19,00			
	12	2,30	3,50	4,70	5,80	8,60	10,30	12,70	15,30	26,80	31,90		
	13	2,40	3,50	4,70	5,90	8,90	10,60	13,20	15,70	27,60	32,80		
	15・16	2,50	3,60	4,80	6,10	9,10	10,90	13,50	16,20	28,20	33,70	40,50	
	18・20	2,70	3,90	5,10	6,40	9,60	11,50	14,50	17,40	29,70	35,30	41,10	
	25	3,20	4,90	6,50	8,10	12,30	14,70	18,30	21,90	35,70	42,90	50,40	
	30	3,60	5,60	7,40	9,30	14,00	16,60	20,80	25,00	39,60	48,10	64,60	80,80
	35	4,50	6,90	9,20	11,40	17,10	20,40	25,60	30,80	47,50	57,90	72,70	91,00
	40	5,40	8,40	11,10	13,90	20,80	25,00	31,20	37,40	56,40	69,30	81,30	101,60
	50	-	11,10	14,80	18,40	27,60	33,10	41,50	49,90	72,80	89,60	105,80	132,10
PSSFJ PSSFU	3	4,60	6,90	9,30	11,60	17,40	20,80						
	4	4,40	6,50	8,60	10,90	16,30	19,50	-	-	-	-	-	-
	5	4,40	6,50	8,60	10,90	14,80	16,70						
	6	4,20	6,40	8,60	10,60	14,10	15,80	16,60	17,40				
	8・10	4,90	7,30	9,70	12,20	16,00	17,90	23,40	28,80	38,40	-	-	-
	12・13	6,10	9,20	12,20	15,30	20,10	22,30	29,20	36,10	51,50	65,10		
	15・16	7,70	11,50	15,40	19,20	26,40	30,20	34,80	39,60	56,50	71,40	85,70	
	18・20	8,60	12,80	17,00	21,30	28,90	32,90	38,10	43,30	65,80	78,30	98,60	
	25	9,30	14,20	19,10	23,90	33,40	38,50	44,90	51,20	72,00	91,50	115,60	
	30	10,60	16,40	21,90	27,30	38,20	44,10	50,90	57,80	82,10	104,20	132,00	165,10
	35	11,60	17,90	23,90	29,90	42,00	48,80	61,20	73,60	101,70	126,50	151,30	190,20
	40	16,70	25,70	34,40	42,90	55,10	60,40	75,90	91,30	125,80	156,80	187,40	234,20
	50	-	34,80	46,10	57,60	76,00	85,00	106,40	127,80	178,30	222,50	266,50	333,20

Price Reduction
6%

CAD Data

Part Number Type	D	€ Unit Price Min. L 1 - 50	L51 - 100	L101 - 150	L151 - 200	L201 - 300	L301 - 400	L401 - 500
RSFJ	3 - 4 - 5	9,60	10,60	11,70	12,70	15,30	16,90	-
	6	9,20	9,90	10,70	11,50	13,50	15,90	17,50
	8	9,20	10,00	10,70	12,70	14,80	17,10	20,10
	10	9,30	10,10	12,00	12,90	17,20	19,60	22,50
	12	9,40	11,40	14,60	15,50	18,70	22,30	26,50
	13	9,40	11,60	13,60	15,60	20,10	23,70	27,90
	15	10,60	12,80	14,70	17,90	22,50	27,30	32,60
	16	10,60	12,80	15,80	17,90	24,70	29,50	34,80
	18	10,70	14,00	17,20	26,90	27,40	33,30	39,90
	20	13,20	17,00	22,60	25,50	30,60	37,70	40,30
	25	13,40	19,10	24,90	30,50	37,50	47,00	54,30
	30	15,90	23,00	30,90	34,30	48,20	53,40	62,70

Part Number Type	D	€ Unit Price Min. L 1 - 100	L101 - 200	L201 - 400	L401 - 600	L601 - 800	L801 - 1000	L1001 - 1200	L1201 - 1500
PSFG	6	2,00	3,30	6,60	9,90	-	-	-	-
	8	2,10	3,40	6,80	10,20	13,60			
	10	2,10	3,50	7,00	10,50	14,10			
	12	2,30	3,70	7,60	11,30	19,90	23,70		
	13	2,30	3,90	7,70	11,70	20,30	24,30		
	15 - 16	2,40	4,10	8,00	11,90	20,90	24,80	29,90	
	18 - 20	2,60	4,30	8,60	12,80	21,90	26,10	30,40	
	25	3,20	5,30	10,90	16,20	26,40	31,90	37,20	
	30	3,70	6,10	12,30	18,40	29,30	35,60	47,80	59,80
	35	4,50	7,60	15,00	22,60	34,80	42,50	50,00	62,50
	40	5,50	9,20	18,30	27,50	41,50	50,90	59,70	74,60
	50	7,30	12,20	24,30	36,50	53,50	65,80	77,60	97,00
PSSFG	6	4,70	7,70	12,30	19,90	-	-	-	-
	8	4,70	7,70	12,60	20,30	27,20			
	10	4,70	7,70	12,60	20,30	27,20			
	12	5,90	9,70	15,80	25,50	36,30	45,90		
	13	5,90	9,70	15,80	25,50	36,30	45,90		
	15 - 16	7,30	12,20	21,20	28,00	40,00	50,40	60,40	
	18 - 20	8,10	13,50	23,10	30,50	46,40	55,30	69,60	
	25	9,10	15,10	27,30	36,10	50,90	64,60	81,60	
	30	10,40	17,40	31,10	40,80	58,00	73,60	93,20	116,60
	35	11,80	19,70	35,60	53,90	74,30	92,50	110,70	138,50
	40	17,00	28,40	44,20	66,80	92,10	114,60	137,10	171,40
	50	22,90	38,00	62,10	93,50	130,40	162,80	194,90	243,80

Alterations — Part Number SFJ30 - L - 250 - (LKC / SC...etc.) LKC

10 Days (RSFJ is to be shipped on the 8th day after order)

DKC alterations was discontinued in June 2010. Please specify new part numbers; SFU, SSFU, PSFU and PSSFG on the left page to place orders.

Alteration Details P.105

Alterations	Code	Spec.	Price Adder
LKC	LKC	L Dimension Tolerance Changes (Precision) Order number LKC When using LKC, L dimensions can be specified in 0.1 increments. ℗ L<200 ···▸L±0.03; 200≤L<500 ···▸L±0.05; L≥500 ···▸L±0.1	4,00
SC	SC	Adds a set of wrench flats. Order number SC5 Application Notes Applicable to D = 6 and over SC=1mm Increment ℗ SC+ℓ₁≤L ℗ SC=0 or SC≥1 ⊗ can not be used with WSC	4,00
WSC	WSC	Add wrench flats at two locations Order number WSC12-X8 Application Notes Applicable to D = 6 and over Specify WSC/X in 1mm increments ℗ WSC+X+ℓ₁x2<L ℗ WSC (X)=0 or WSC (X)≥1 ⊗ Cannot be machined on the same plane. Can not be used with SC.	8,00
FC	FC	Add Set Screw Flat at one location Order number FC10-A8 Specify FC and A in 1mm increments. ℗ FC≤3xD ℗ When 1.5xD<FC, FC≤L/2 ℗ A=0 or A ≥ 2 ⊗ Can not be used with WFC	2,00
WFC	WFC	Add Set Screw Flats at two locations Order number WFC10-A8-E20 Specify WFC, A and E in 1mm increments ℗ WFC≤3xD ℗ When 1.5xD<FC, 2WFC≤L/2 ℗ A (E) = 0 or A (E) ≥ 2 ⊗ Cannot be machined on the same plane. Cannot be combined with FC.	4,00

Alterations	Code	Spec.	Price Adder
DKC	DKC	Change to h5 O.D. tolerance Ordering Code DKC Application Notes ⊗ Not applicable for RSFJ, PSFG and PSSFG are not applicable.	-
RC	RC	Add 90-deg. Set Screw Flat at one location Ordering Code RC10 Application Notes Applicable for D=10 ~ 30 ⊗ Can not be used with WRC	5,00
WRC	WRC	2 x 90-deg. Set Screw Flats Ordering Code WRC10-Y10 Application Notes Applicable for D=10 ~ 30 ⊗ Cannot be used in combination with RC. ⊗ Not available on the same plane.	10,00
VC	VC	Add V groove at one location Ordering Code VC6 Application Notes Applicable to D = 6 and over ⊗ Can not be used with WVC	2,00
WVC	WVC	Two V-grooves. Ordering Code WVC180-F8 Application Notes Applicable to D = 6 and over ⊗ Can not be used with VC	4,00
KC	KC	One keyway is added. Ordering Code KC10-G10 Application Notes Applicable only to D = 12, 16, 20, 25 or 30.	5,00

For details, please see Alterations Overview P.105

℗ Please see Alteration Guides for details if provided. P.105
℗ For more than one alteration, 2mm or more separation required between machined sections. P.106
℗ Alterations may lower hardness. P.104

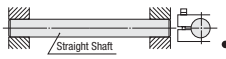
Order Example — Part Number SFJ20 - L - 75

Degreasing Service P.83

Days to Ship: 8 Days; - RSFJ 13 Days; 5 Days

Express A 8,00 EUR/unit
℗ A Express Charge of 21,60 EUR for 3 or more pieces of identical products.

Example



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Liability Exclusion

This catalog was put together with great care and all information checked for accuracy.
All information is based on the current level of knowledge at the time of publication and is not binding.
For any erroneous or incomplete information, or any damage possibly occurring from them, no liability is accepted.
Subject to change.
For most updated information related to our product range please refer to our homepage www.misumi-europe.com

All contents of this catalog are copyright protected.
Copying or distributing are, even as extracts (pictures, graphics, text, etc), only allowed with our previous approval in writing.
Otherwise our standard business conditions apply.

CAD Data Mark

•Shows that CAD Data are available.

Index

Order Example

•Example catalog number shows exactly which fields are required and how each field is written

Example

•Shows an application example of each component.

Delivery Time

•Number of working days needed for shipping (beginning with the first working day after your order date). P.87

2 Days	9 Days
5 Days	10 Days
6 Days	11 Days
7 Days	≀
8 Days	15 Days

How to Use Catalog
–Guide of Marks–

Symbol	Meaning	Description Example
	NEW PRODUCTS	New products added from previous catalog.
	ADDITIONAL SPECIFICATION	Additional specifications are shown in red characters.
	DELIVERY TIME, IMPROVED	Production Time has been shortened from previous catalog.
	Part Number AND SPECIFICATION CHANGED	Part Number and specification shown in purple characters have been changed.
	MATERIAL	M 1.3505/100Cr6
	HARDNESS	H 58~60HRC
	SURFACE TREATMENT	S Black Oxide
	ACCESSORIES	A NETW2
	TOLERANCE	T $^{+0.005}_{0}$
	NOTE: WARNING	WFC≤3D
	NOT AVAILABLE	Indicates that specific sizes or items are not available. ⊗ D3~8(Not available for D3~8)
	REFER TO CATALOG PAGE	P.234
	IF A, ···› B	L $^{+0.02}_{0}$ (L>200 ···› L $^{+0.05}_{0}$) The standard tolerance of length L $^{+0.02}_{0}$ changes to ($^{+0.05}_{0}$) when L is over 200.

Symbol	Meaning	Description Example
(1) (2) (3)	UNIT No.	Number applied to each part of a unit product
	EXAMPLE PART NUMBER	Order Example Part Number – L MS 6 – 50
	DELIVERY TIME	Days to Ship 6 Days
	DELIVERY TIME	2 Days: Delivery Time is 2 workdays 5 Days: Delivery Time is 5 workdays 6 Days: Delivery Time is 6 workdays 15 Days: Delivery Time is 15 workdays
	EXPRESS SERVICE	Express Delivery Services are available, to shorten required production time.
	PRICE (Euro)	Price
	UNIT PRICE	**Unit Price**
	EXAMPLE	Example
	ALTERATION	Alteration which can be ordered without drawings.

MISUMI's Environmental Awareness and RoHS Compliancy

■Green Procurement

MISUMI has formulated Green Procurement Guidelines to observe the legal restrictions, and other requirements concerning environmental chemicals, and to help build up a recycling society. By preparing Green Procurement Guidelines and continuously striving to improve our environmental preservation and environmental chemicals management activities, we seek to eliminate environmental chemicals from our products. We ask our customers and business partners for their cooperation with these efforts.

Please refer to our website for details regarding the MISUMI Green Procurement Guidelines.
http://www.misumi.co.jp/about_e/environment/green/index.html

■What is RoHS?

Official Name : Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
RoHS is the directive to speculate and restrict the use of certain hazardous substances in electrical and electronic equipments.
It aims to minimize the hazards on environment and health through the life cycles of products from production to disposal.

■RoHS Restricted Substances (Compliant with EU Directive came into force on 1 July 2006)

Substances			Subject Items and Application	Threshold value *	
1	Cadmium (Cd) and Its Compounds		Cadimum contained in alloys with zinc content (brass, zinc, diecast, lead-free solder, etc.), plating, plastic, rubber, oating, etc.	100 ppm or less	For packing materials, less than 100 ppm combined of cadmium, lead, mercury and hexavalent chromium
		Exemption	Cadmium and its compounds in electrical contacts and cadmium plating except for the uses prohibited under 91/338/EEC which is a revision of the EU directive 76/769/EEC	–	
2	Lead (Pb) and Its Compounds		Lead contained in all types of alloys, solder, all items other than the following exemptions	1,000 ppm or less	
		Exemption	Lead which is alloyed with steel	3,500 ppm or less	
			Lead which is alloyed with aluminum	4,000 ppm or less	
			Lead which is alloyed with copper	40,000 ppm or less	
			Lead used in solder which contains more than or equal to 85% of lead	–	
3	Mercury (Hg) and Its Compounds		Mercury contained in all items aside from small fluorescent light bulbs and straighttube fluorescent light bulbs	1,000 ppm or less	
4	Hexavalent chromium (Cr6+) and Its Compounds		All Hexavalent chromium in chromate treatment, plating, coating, etc.. Chromium metal and chrome in metal alloys are exempted.	1,000 ppm or less	
5	Polybrominated Biphenyls (PBBs)		Flame retardant	1,000 ppm or less	
6	Polybrominated Diphenylethers (PBDEs)		Flame retardant	1,000 ppm or less	

*Threshold value is, whether consciously or not, the maximum concentration value set for each homogeneous material which cannot be mechanically disjointed into different materials.

General ordering information

1 How to Order

For customers from Europe & Africa:
Customers can contact our Customer Service directly under +49 (0) 61 96 / 77 46 – 0
or by using our website www.misumi-europe.com under „Services“.
Existing Customers may send their order, including item name, item number and quantity directly by
fax to +49 (0) 61 96 / 77 46 – 3 60, by E-Mail to sales@misumi-europe.com or use our „online service“ at www.misumi-europe.com under “eCatalog/WOS”.

2 Quantity

No minimum order quantity! Misumi accepts 1-piece orders without surcharge.

3 Delivery Times

The respective delivery time in working days for each product can be seen by the delivery times symbol.
Please notice that items which are marked as stock items are available for quick delivery.
For deliveries outside of Germany the delivery time can be slightly extended due to the respective customs clearance.
Orders which are made Mon. to Thurs. before 4:00 pm and Fri. before 3:00 pm are processed the same day.

4 Express Deliveries

To shorten delivery time we offer an express delivery service.
For more information please contact our customer service.

5 Terms of Delivery

Deviating from our general terms of delivery (see T&C):
Other shipment modes can be used depending on size, weight and dimensions of the shipment .
For truck deliveries the customer is responsible for ensuring that a Fork Lift Truck or Pallet
Truck is available.

6 Changes or Cancellation of an Order

Orders may be changed or cancelled on the same day as initiated.
For changes or cancellation of an order on the next day, please contact our customer service.

7 Returning Items

Items which are on stock may be returned after contact with us.
We cannot accept returns of items which were not on stock, unless they were delivered with defects.
For individual cases please contact our customer service.

8 Claims

We make every attempt to guarantee the quality of our products irrespective of the quantity ordered by our customers.
If you believe that the delivered items do not fulfill the expected quality requirements, have the wrong dimensions or are of incorrect quantity, please contact our customer service.
We will find a solution for YOU.

Delivery times, Express Orders

3 Delivery Times

What is the „Delivery Time“?

Delivery Time 

means the number of workdays needed until delivery.

(from the first workday after your order is received).

Symbols for Delivery Time

Delivery Time is 2 workdays ···›  Delivery time **2 Days**

Delivery Time is 5 workdays ···›  Delivery time **5 Days**

Delivery Time is 6 workdays ···›  Delivery time **6 Days**

≀

Delivery Time is 15 workdays ···›  Delivery time **15 Days**

If „on inquiry“ is indicated in the quantity table, the offer also has a delivery date. In certain cases the delivery date can change with the quantity ordered, even if „on inquiry“ is not indicated.

Volume Discount P.87

No. pieces	1~3	4~7	8~10	11~29	50~
Discount	Price List	5%	10%	15%	on inquiry

4 Express Deliveries

Express Service

For your urgent orders we are offering an express service for many products.
Our express service is avaible for products, wich are marked by one of the following symbols.

2 Days

8 Days Express **A**

10 Days Express **B**

13 Days Express **C**

The avaibility of this service depends on the dimensions and the specification of the article and on the country of origin of the customer.
Different receipt date of orders, in some cases have a small effect on delivery schedule.
For detailed information please ask our customer service.

Delivery time reductions of 1-3 days are typical.

Expresscharge

8 Days

Express **A** 2,00 EUR/piece

A flat charge of 5,40 EUR for 3 or more identical pieces
The term flat charge designates the maximum amount, wich has to be paid independently of the number of items for a supply by express.

Example:
1 pieces = 2,00 euro surcharge
2 pieces = 4,00 euro surcharge
3 pieces = 5,40 euro surcharge
10 pieces = 5,40 euro surcharge

Remaining delivery terms (carriage free within Germany) remains unaffected.

Item number configuration

Shafts -Standard Type / Precision Type-
-Both Ends Stepped and Female Thread / Both Ends Stepped-

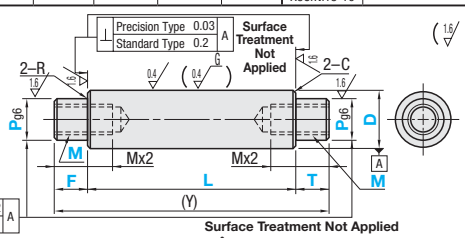
RoHS



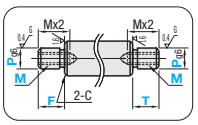
Type							Material	Hardness	Surface Treatment
Both Ends Female Thread				Both Ends Stepped					
Precision type	Standard			Standard					
D Tolerance g6	D Tolerance g6	D Tolerance h5	D Tolerance f8	D Tolerance g6	D Tolerance h5	D Tolerance f8			
VFAH	SFAH	SFUH	-	SFAJ	SFUJ	-	1.3505/100Cr6	Induction Hardening Effective Hardening Depth ☞P.104 1.3505/100Cr6 58HRC~ 1.4125/X105CrMo17 equivalent 56HRC~	-
VSFAH	SSFAH	SSFUH	-	SSFAJ	SSFUJ	-	1.4125/ equivalent		
VPFAH	PSFAH	PSFUH	-	PSFAJ	PSFUJ	-	1.3505/100Cr6		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness 5μ or more
VPSFAH	PSSFAH	PSSFUH	-	PSSFAJ	PSSFUJ	-	1.4125/ equivalent		
VRAH	RSFAH	-	-	RSFAJ	-	-	1.3505/100Cr6		Raydent
VSRAH	-	-	-	-	-	-	1.4125/ equivalent		
-	-	-	PSFGH	-	-	PSFGJ	1.1191/C45E	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μm or more.
-	-	-	PSSFGH	-	-	PSSFGJ	1.4301/ X5CrNi18-10		

D Tolerance			
D	g6	h5	f8
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

Both Ends Female Thread

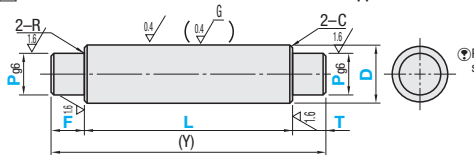


Features of Precision Type
Concentricity is ◎ Ø0.02,
Squareness is ⊥ 0.03



Precision shafts have grinding undercuts at stepped sections (max. width 1mm / max. depth 0.1mm).

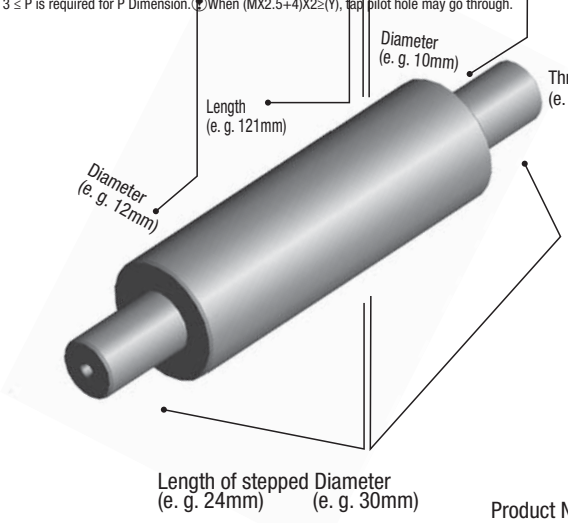
Both Ends Stepped



Annealing required for machining wrench flats and shaft end threading (effective thread length + approx. 10mm) may lower hardness. ☞ P.104
Changes in circularity, straightness, perpendicularity, coaxiality and hardness ☞ P.103
Features of Raydent ☞ P.118

Part Number Type				D	1mm Increments L	F / T	P	M (Coarse Threads) Selection	(Y) Max.	R	C
Standard Type				8	25~796		6	3	800	0.3 or less	0.5 or less
Both Ends Female Thread (D Tolerance g6)	(D Tolerance h5)	Both Ends Stepped (D Tolerance g6)	(D Tolerance h5)	10	25~796		6~8	3 4 5	800		
SFAH	SFUH	SFAJ	SFUJ	12	25~996		6~10	3 4 5 6	1000		
SSFAH	SSFUH	SSFAJ	SSFUJ	13	25~996		6~11	3 4 5 6 8	1000		
PSFAH	PSFUH	PSFAJ	PSFUJ	15	25~996		6~13	3 4 5 6 8 10	1000		
PSSFAH	PSSFUH	PSSFAJ	PSSFUJ	16	25~1196	2≤F≤Px4	6~14	3 4 5 6 8 10	1200		
RSFAH (D≤30, L≤500) (D Tolerance f8)		RSFAJ (D≤30, L≤500) (D Tolerance f8)		18	25~1196		8~16	4 5 6 8 10 12	1200		
PSFGH		PSFGJ		20	25~1196	2≤T≤Px4	8~17	4 5 6 8 10 12	1200		1.0 or less
PSSFGH		PSSFGJ		25	25~1196		8~22	4 5 6 8 10 12 16	1200		
				30	25~1496		9~27	5 6 8 10 12 16 20 24	1500		
				35	25~1496		9~32	5 6 8 10 12 16 20 24	1500	0.5 or less	
				40	25~1496		11~37	6 8 10 12 16 20 24 30	1500		
				50	25~1496		11~47	6 8 10 12 16 20 24 30	1500		

- Both Ends Female Thread ⓟ M + 3 ≤ P is required for P Dimension. ⓟ When (MX2.5+4)X2≥(Y), tap pilot hole may go through.



Specification of :
Tolerance
Material
Hardness
Surface

Product Number: SSFAH12-121-F24-P10-M6-T30

Alterations

Options and special models

Options can be ordered without drawings

With the aid of our Alterations service you can select additional product characteristics and tolerances.
To order an alteration simply add the desired alteration code to the catalog number as illustrated.
You do not need to create a drawing for us.

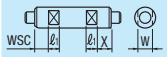
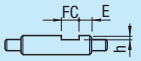
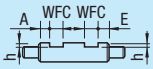
There is no discount applicable for alterations.

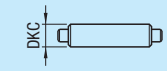
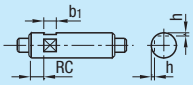
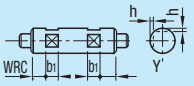
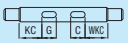
An example of the Option Service (Steel shafts for linear movements)

Alterations

Part Number	-	L	-	F	-	P	-	M	-	T	-	(LKC · WSC...etc.)
SFAH20	-	400	-	F25	-	P16	-	M10	-	T20	-	LKC

Please notice the changed delivery times for options

Alterations	Code	Spec.	Price Adder
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less for precision type ⊗Not applicable when D-P≤2 When using LKC, L dimensions can be specified in 0.1 increments. Ⓟ L<200 ···→L±0.03 200≤L<500···→L±0.05 L≥500 ···→L±0.1	4,00
	WSC	Add wrench flats at two locations Ordering Code WSC12-X8 Specify WSC/X in 1mm increments. Ⓟ WSC+X+ℓ1x2<L Ⓟ WSC (X)=0 or WSC (X)≥1 ⊗Not available on the same plane. D W ℓ1: 8 7 8; 10 8 8; 12 10 10; 13 11 10; 15 13 10; 16 14 10; 18 16 10; 20 17 10; 25 22 10; 30 27 15; 35 30 15; 40 36 20; 50 41 20	8,00
	FC	Add set screw flat at one location Ordering Code FC10-E8 Application Notes ⊗Not applicable to precision type Specify FC and E in 1mm increments. Ⓟ FC≤3xD Ⓟ When 1.5xD<FC, FC≤L/2 Ⓟ E=0 or E≥2⊗Can not be used with WFC D h: 8~18 1; 20~40 2; 50 3	2,00
	WFC	Add set screw flats at two locations Ordering Code WFC8-A8-E4 Application Notes ⊗Not applicable to precision type Specify WFC, A and E in 1mm increments Ⓟ WFC≤3xD Ⓟ When 1.5xD<FC, 2WFC≤L/2 Ⓟ A (E) = 0 or A (E) ≥ 2 ⊗Machining on the same plane is not applicable. Can not be used with FC. D h: 8~18 1; 20~40 2; 50 3	4,00

Alterations	Code	Spec.	Price Adder
	DKC	Change to h5 O.D. tolerance Ordering Code DKC Application Notes ⊗Precision type, D tolerance f8 shafts and Not applicable to LTBC Plated Shafts.	-
	RC	Add 90-deg. Set Screw Flat at one location Ordering Code RC10 Application Notes Applicable to D=10 ~ 30 ⊗Not applicable to precision type ⊗Can not be used with WRC	5,00
	WRC	2 x 90-deg. Set Screw Flats Ordering Code WRC10-Y10 Application Notes Applicable to D=10 ~ 30 ⊗Not applicable to precision type ⊗Cannot be used in combination with RC. ⊗Not available on the same plane.	10,00
-Keyway at one location :KC  -Keyways at two locations :WKC 	KC WKC	Keyway Ordering Code KC10-G10 WKC10-C8-KC10-G10 Application Notes Applicable only to D = 12, 16, 20, 25 or 30. ⊗Not applicable to precision type	KC 5,00 WKC 10,00

MISUMI 24/7 e-Commerce
-How does it work?-



Step 1:
Product search

You can search for MISUMI products by product name or part number under the product search tab. You can search the entire site by key phrase under the website tab.



Step 2:
Configure / check prices

You can automatically generate a part number by selecting parameters with our configurator. Check price & delivery date on the spot.



Step 3:
2D / 3D CAD data download

You can download FREE 2D/3D CAD data.
We have more than 30 different data formats.



Step 4:
Quote / Order

You can quote/order MISUMI products online and check the results immediately.



With MISUMI 24/7 e-Commerce quickly to target: How to solve your design problems

Register

The registration occurs online (**www.misumi-europe.com**) by using the respective form. After completing all required information, you will receive a PDF document which you need to print out, sign and send back to MISUMI Europa GmbH. Subsequently, we will activate your account. The registration might require up to two working days.

In order to register successfully, please agree to the MISUMI privacy policy as well as our terms and conditions . If you are already registered as standard-user you can get a free upgrade to premium-user without having to fill in the customer registration form again. This upgrade is possible at any time. Please contact our customer service team by phone at +49 (0) 6196 7746 0 or mail at:sales@misumi-europe.com“.

Two account options are available:

FUNCTIONALITY	STANDARD	PREMIUM	
Search for standard, purchased and custom-made components	•	•	
Configure standard, purchased and custom-made components	•	•	TECHNICAL
Prices online	•	•	
Delivery time online	•	•	
Download 2D/3D models	•	•	
Upload bill of material	•	•	
Create a quote	•	•	
Quote managing and quote history	•	•	
Order online	x	•	
Order managing and order history	x	•	E-SHOP
Registration for customers **within** the European Union (EU) or Switzerland	Registration	Registration	
Registration for customers **outside** the European Union (EU) or Switzerland	Registration	Registration	





MISUMI Tutorial videos

Why MISUMI?

- ···› Easily realisable solutions
- ···› Configurable components in 1mm increments
- ···› All in one catalogue
- ···› more components than you could ever imagine

Are you also struck by the 3.000 pages of the catalogue and do you have difficulties finding the required components quickly? MISUMI now provides you with a helpful tool.



Video tutorial "How to use the paper catalog'

Our **video tutorial** will show you how to use our paper catalog. The video is approx. 6 minutes long.

Adobe PDF

"Manual eCatalog/WOS" as PDF file or brochure

Here you can find a guide for the use of our eCatalog/ WOS system as **PDF file**. If you prefer the brochure as a **hardcopy**, you can write us an e-Mail via sales@ misumi-europe.com or order it by phone at +49 (0) 6196 7746 0.

Are you interested in using MISUMI 24/7 e-Commerce and are you looking for more details?

MISUMI provides a comprehensive tutorial video: **www.misumi-europe.com**



Tutorial videos are available
or download helpful PDF-documents.

MISUMI Catalogue One for All

Our main catalogue provides all technical and commercial component information at a glance!



- ···› Details on tolerances, materials and coatings
- ···› All information regarding dimensions and configuration including options
- ···› Component drawings and sample applications
- ···› Delivery times and prices with bulk discounts, surcharges for additional optional extras or express delivery
- ···› To request a catalogue (DE/EN/IT/FR/CZ), please go to **www.misumi-europe.com**

MISUMI Info DVD

This DVD contains comprehensive information about MISUMI. The DVD contains:



- ···› Catalogue “Mechanical Components for Assembly Automation” (DE/EN/IT/FR/CZ) (PDF)
- ···› Catalogue “Standard Components for Plastic Mold & Diecast” (EN) (PDF)
- ···› Catalogue “Standard Components for Press Dies” (EN) (PDF)
- ···› Company presentation (DE/EN/IT/FR/CZ) (Powerpoint)
- ···› Video tutorials (DE/EN/IT/FR/CZ)

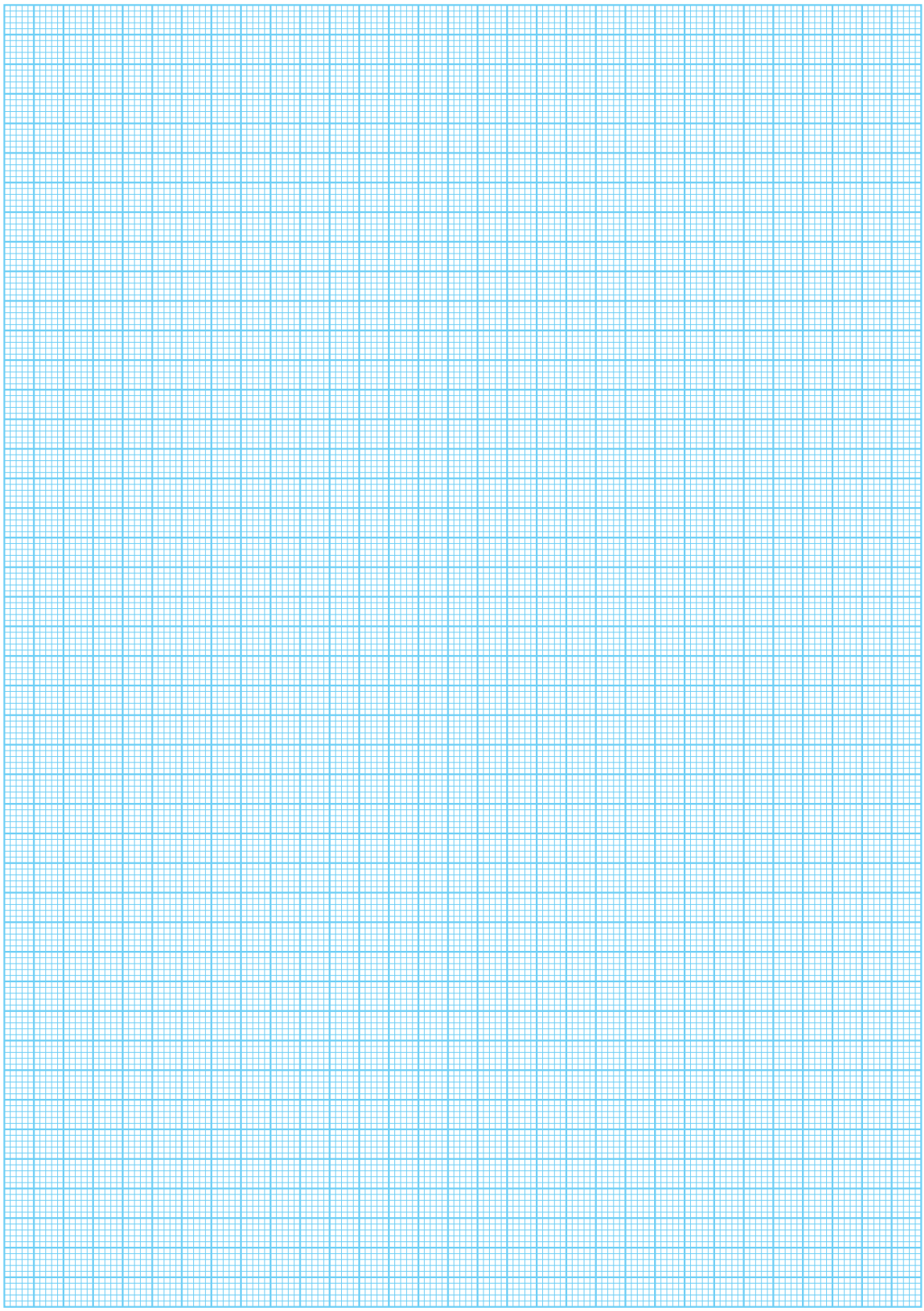
Product Brochures

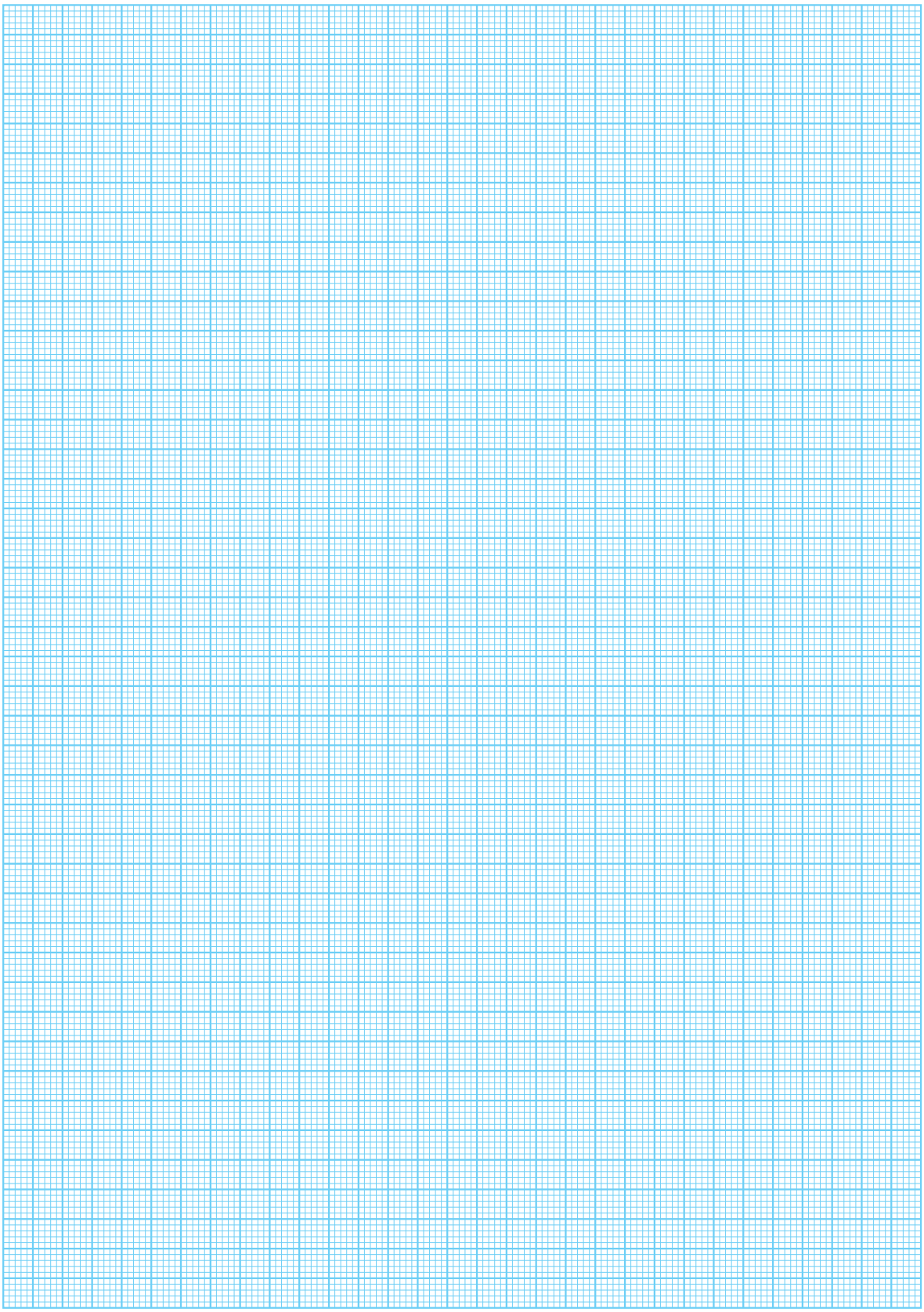


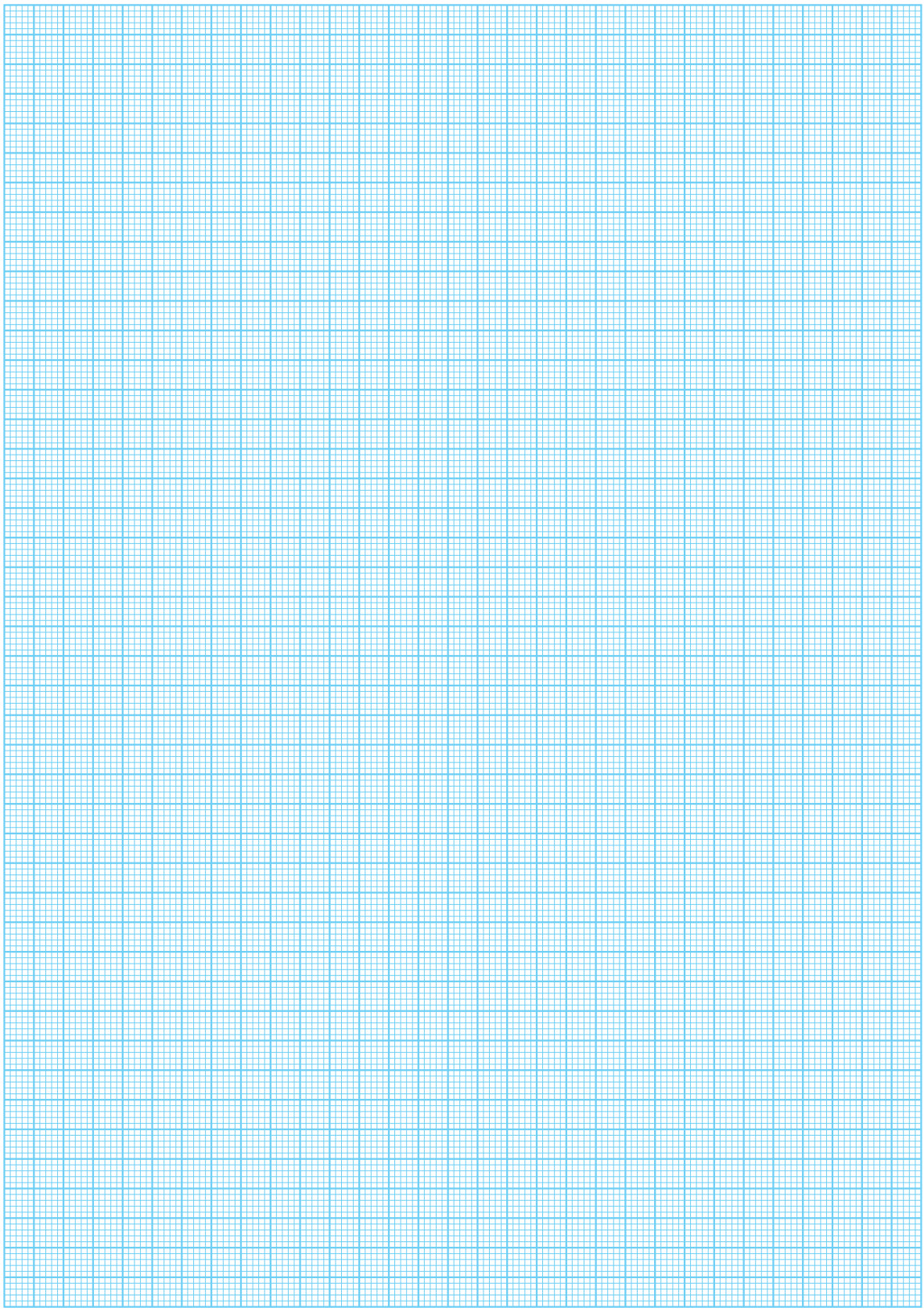
Product Brochures can be downloaded as PDF files. Some of the brochures are also available as printed versions. Send an informal e-mail to **insales@misumi-europe.com**

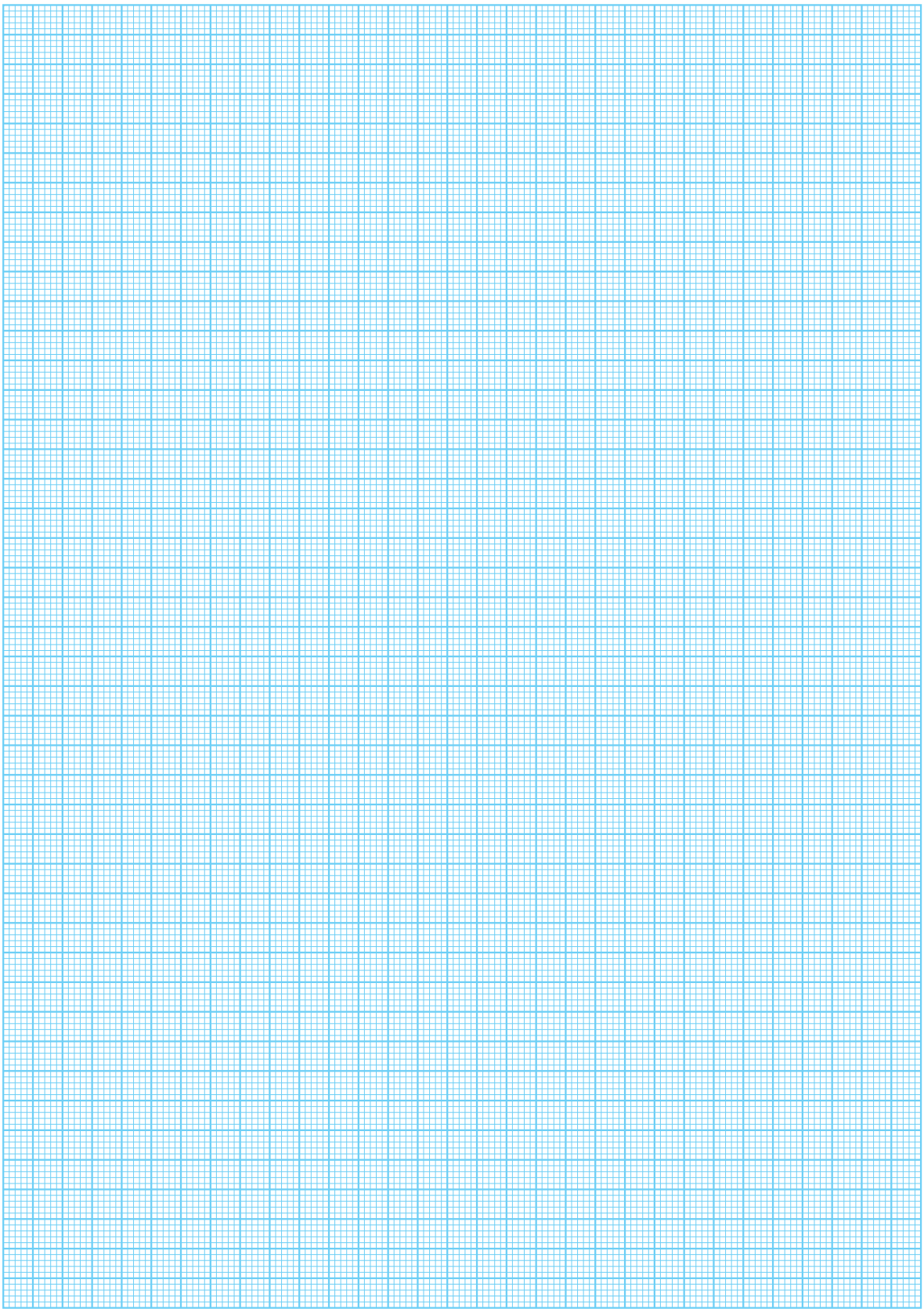


We have gathered information on some selected products of our extensive product portfolio. Here you can find brochures with detailed information on these selected parts which can be downloaded as PDF files. Some of the brochures are also available as printed versions. For example: Linear units LX/KUA, linear unit RS, Toggle clamps, XY stages, G-Manifold, Aluminum frame etc.









Washers / Collars / Shims

Washers / Collars / Shims

Addition






Product Name	Metal Washers -Standard Class T Dimension Selectable / T Dim. Configurable-	-Precision Class T Dimension Selectable / T Dim. Configurable-	-Standard Class Dimension Configurable-	-Precision Class Dimension Configurable-
Page	101	102	103	105







-Inner and Outer Ø Tol. Selectable / Dim. Configurable / Standard / Precision-	-Standard Precision / Ultra Precision Class T Dim. Tol. Selectable / Dim. Configurable-	Metal Washers -Flanged-	-Counterbore-	–Female Thread–
107	109	110	111	113







–Countersunk–	–With Screw Holes–	–Shape Selectable–	-Slotted Hole Washers-	Thin-Walled Metal Collars
114	114	115	115	116



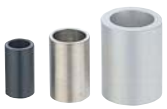
Addition







Addition



Hollow Collars	Spacers	Simultaneous Grinding Spacers	Stepped Spacers	Metal Collars –L Standard, L Configurable / Standard / Precision–
116	116	117	118	119






Addition



Price Reduction
Up to 15%

-Standard Class Dim. Configurable-	-Precision Class Dim. Configurable-	-Inner and Outer Ø Tol. Selectable / Dim. Configurable / Standard / Precision-	-Flanged / Standard-	Resin Washers -Standard / Configurable-
121	123	125	127	130






Addition



Resin Washers -Flanged Solid / Flanged-	Resin Washers –Counterbore–	Resin Collars –Female Thread–	Resin Collars –Standard–
131	132	132	133






Resin Collars –Flanged–	Resin Collars -With Guide-	-Thermal Insulation / Fluororesin / PPS-	Ceramic Washers / Sheets / Collars
135	137	138	139



Thermal Insulation Washers / Collars
140

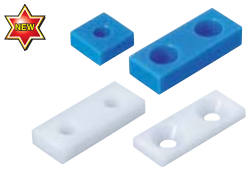


Extra Thin Resin Washers -Abrasion Resistance-
141



Price Reduction
30%

Extra Thin Resin Washers / Sheets
141



Square Resin Washers
142



Shim Rings
143



Shim Rings Package
144



Price Reduction
10%

Precision Class Shim Rings
145



Wave Washers
145

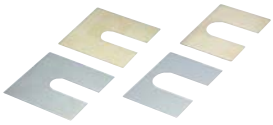


Price Reduction
20%

–Split Type–
146



Square Shims -For Motor Base / For Pillow Block-
147

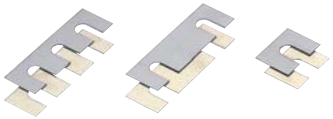


Square Shims Package
148

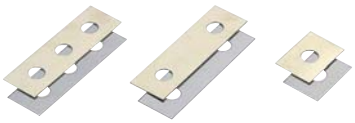
Addition



Square Shims –Adjustment–
148



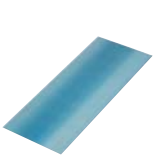
Square Shims -Slotted-
149



Square Shims -With Round Hole-
149



Shim Plates –Standard / Configurable–
151



Shim Plates -SK Hardening Steel-
152



Price Reduction
9%

Shim Tape
152



Boxes of Shim Tape
152

Metal Washers

-Standard Class - T Dimension Selectable · T Dimension Configurable-

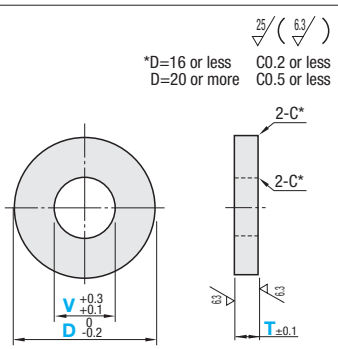
CAD Data



RoHS

Type		M Material	S Surface Treatment	H Hardness
T Selectable	T Dimension Configurable Type			
WSSB	TWSSB	1.1191/C45E	Black Oxide	-
WSSM	TWSSM		Electroless Nickel Plating	
WSSS	TWSSS	1.4301/X5CrNi18-10	-	
WSSBH	-	1.1191/C45E	Black Oxide	45~50HRC
WSSMH			Electroless Nickel Plating	
WSSSH	-	1.4031/X38Cr13	-	

(?)Depending on thickness and length, hardened 1.1191/C45E material may be less than 45HRC.
(?)Stainless Steel Hardening Type (WSSSH) may be discolored by hardening.



■ T Dimension Selectable Type (Standard Class)

Part Number Type	D	V Selection	T Selection	€ Unit Price WSSB	WSSM	WSSS	WSSBH	WSSMH	WSSSH
WSSB WSSM WSSS WSSBH WSSMH WSSSH	4	2	1 2						
	5	2 3	1 2						
	6	2 3 4	1 2						
		3 4	1.5 3 5 6				✕	✕	✕
	8	2 3 4 5 6	1 2 3 5						
		3 4 5 6	1.5 4 6 8				✕	✕	✕
	10	2 3 4 5 6 8	1 2 3 5						
		4 5 6 8	1.5 2.5 4 6 8				✕	✕	✕
	12	3 4 5 6 8 10	1 2 3 5						
		5 6 8 10	1.5 2.5				✕	✕	✕
		6 8	4 6 8				✕	✕	✕
	13	4 5 6 8 10	1 2 3 5						
		6 8	1.5 2.5				✕	✕	✕
	14	4 5 6 8 10	1 2 3 5						
		6 8 10	1.5				✕	✕	✕
	15	4 5 6 8 10 12	1 2 3 5						
		6 8 10 12	1.5				✕	✕	✕
	16	4 5 6 8 10 12	1 2 3 5						
		6 8 10 12	1.5				✕	✕	✕
		10 12	4				✕	✕	✕
	20	4 5 6 8 10 12 15 16	1				✕	✕	✕
			2 3 5						
		6 10 15	1.5 2.5 4 6 8				✕	✕	✕
	25	6 8 10 12 15 16 20	2 3 5						
	30	8 10 12 15 16 20 25	2 3 5						
	35	10 12 15 16 20 25	3 5 10						
	40	10 12 15 16 20 25 30	3 5 10						
	50	10 12 15 16 20 25 30	3 5 10						
	60	15 16 20 25 30	3 5 10						

Order Example: Part Number - V - T → WSSS14 - 10 - 5

Days to Ship: - T Dimension Selectable Type (Standard Class)
6 Days
2 Days

Express A 2,00 EUR/ piece P.88

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price: - T Dimension Selectable Type (Standard Class)

■Volume Discount ((?)Round down to one Cent.) P.88

Quantity	1~9	10~19	20~49	50~199
Discount rate	€ Unit Price	30%	35%	40%

(?)For orders larger than indicated quantity, please request a quotation.

■ T Dimension Configurable Type (Standard Grade)

Part Number Type	D	V Selection	T 0.5mm Increment
TWSSB TWSSM TWSSS	4	2	1.0~10.0
	5	2 3	
	6	2 3 4	
	8	2 3 4 5 6	
	10	2 3 4 5 6 8	
	12	3 4 5 6 8 10	
	13	4 5 6 8 10	
	14	4 5 6 8 10	
	15	4 5 6 8 10 12	
	16	4 5 6 8 10 12	
	20	4 5 6 8 10 12 15 16	
	25	6 8 10 12 15 16 20	
	30	8 10 12 15 16 20 25	

D	T	€ Unit Price TWSSB	TWSSM	TWSSS
4~10	1.0~ 2.0			
	2.5~ 5.0			
	5.5~10.0			
12~20	1.0~ 2.0			
	2.5~ 5.0			
	5.5~10.0			
25 / 30	1.0~ 2.0			
	2.5~ 5.0			
	5.5~10.0			

Order Example: Part Number - V - T → TWSSB30 - 8 - 5.5

Days to Ship: - T Dimension Configurable Type (Standard Grade)
8 Days

Express A 2,00 EUR/ piece P.88

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price: - T Dimension Configurable Type (Standard Grade)

■Volume Discount ((?)Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

(?)For orders larger than indicated quantity, please request a quotation.

Metal Washers

-Precision Class T Dimension Selectable · T Dimension Configurable-

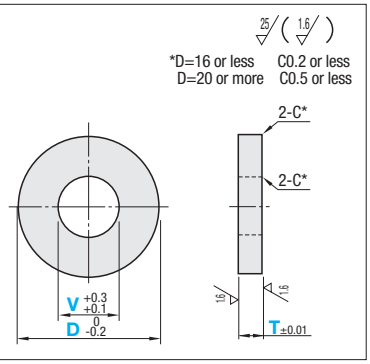
CAD Data



RoHS

Type		M Material	S Surface Treatment	H Hardness
T Selectable	T Dimension Configurable Type			
WASB	TWASB	1.1191/C45E	Black Oxide	-
WASM	TWASM		Electroless Nickel Plating	
WASS	TWASS	1.4301/X5CrNi18-10	-	
WASBH	-	1.1191/C45E	Black Oxide	45~50HRC
WASMH			Electroless Nickel Plating	
WASSH	-	1.4031/X38Cr13	-	

Depending on thickness and length, hardened 1.1191/C45E material may be less than 45HRC.
Stainless steel hardened type (WASSH) may be discolored by hardening.



■ T Dimension Selectable Type (Precision Class)

Part Number Type	D	V Selection	T Selection	€ Unit Price WASB	WASM	WASS	WASBH	WASMH	WASSH
WASB WASM WASS WASBH WASMH WASSH	4	2	1 2						
	5	2 3	1 2						
	6	2 3 4	1 2						
		3 4	1.5				✕	✕	✕
	8	2 3 4 5 6	1 2 3 5						
		3 4 5 6	1.5				✕	✕	✕
	10	2 3 4 5 6 8	1 2 3 5						
		4 5 6 8	1.5 2.5				✕	✕	✕
	12	3 4 5 6 8 10	1 2 3 5						
		5 6 8 10	1.5 2.5				✕	✕	✕
	13	4 5 6 8 10	1 2 3 5						
		6 8	1.5 2.5				✕	✕	✕
	14	4 5 6 8 10	1 2 3 5						
		6 8 10	1.5				✕	✕	✕
	15	4 5 6 8 10 12	1 2 3 5						
		6 8 10 12	1.5				✕	✕	✕
	16	4 5 6 8 10 12	1 2 3 5						
		6 8 10 12	1.5				✕	✕	✕
	20	4 5 6 8 10 12 15 16	2 3 5						
		6 10 15	1.5 2.5				✕	✕	✕
	25	6 8 10 12 15 16 20	2 3 5						
	30	8 10 12 15 16 20 25	2 3 5						
	35	10 12 15 16 20 25	3 5 10						
	40	10 12 15 16 20 25 30	3 5 10						
	50	10 12 15 16 20 25 30	3 5 10						
	60	15 16 20 25 30	3 5 10						

Order Example: Part Number - V - T → WASB14 - 10 - 5

Days to Ship: 8 Days

- T Dimension Selectable Type (Precision Class)

Express A: 2,00 EUR/ piece

P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- T Dimension Selectable Type (Precision Class)

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	15%	30%

For orders larger than indicated quantity, please request a quotation.

■ T Dimension Configurable Type (Precision Grade)

Part Number Type	D	V Selection	T 0.5mm Increment
TWASB TWASM TWASS	4	2	1.0~10.0
	5	2 3	
	6	2 3 4	
	8	2 3 4 5 6	
	10	2 3 4 5 6 8	
	12	3 4 5 6 8 10	
	13	4 5 6 8 10	
	14	4 5 6 8 10	
	15	4 5 6 8 10 12	
	16	4 5 6 8 10 12	
	20	4 5 6 8 10 12 15 16	
	25	6 8 10 12 15 16 20	
	30	8 10 12 15 16 20 25	

D	T	€ Unit Price TWASB	TWASM	TWASS
4~10	1.0~ 2.0			
	2.5~ 5.0			
	5.5~10.0			
12~20	1.0~ 2.0			
	2.5~ 5.0			
	5.5~10.0			
25 / 30	1.0~ 2.0			
	2.5~ 5.0			
	5.5~10.0			

Order Example: Part Number - V - T → TWASB30 - 8 - 5.5

Days to Ship: 8 Days

- T Dimension Configurable Type (Precision Grade)

Express A: 2,00 EUR/ piece

P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- T Dimension Configurable Type (Precision Grade)

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

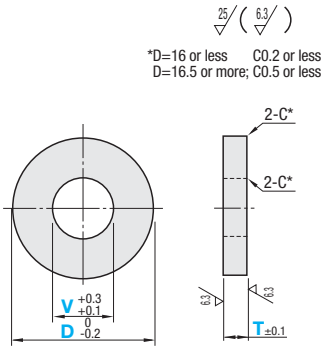
Metal Washers

-Standard Class Dimension Configurable-

RoHS



Part Number Standard T±0.1	Material No.	M Material	S Surface Treatment	H Hardness
FWS	(1)	1.0038/S235JR	-	-
FWSSC	(2)	1.1191/C45E	-	-
FWSSB	(3)		Black Oxide	
FWSSM	(4)		Electroless Nickel Plating	
FWSSR	(5)		LTBC Plating	
FWSSA	(6)	EN AW-2017/AlCu4MgSi	Clear Anodize	-
FWSSAB	(7)		Black Anodize	
FWSBB	(8)	CW614N/CuZn39Pb3	-	-
FWSSS	(9)	1.4301/X5CrNi18-10	-	-
FWSSSR	(10)		LTBC Plating	
FWSUS	(11)	1.4401/X5CrNiMo17-12-2	-	-
FWSSCH	(12)	1.1191/C45E	-	45~50HRC
FWSSBH	(13)		Black Oxide	
FWSSMH	(14)		Electroless Nickel Plating	
FWSSK	(15)	1.2510/100MnCrW4	-	55HRC~
FWSSKB	(16)		Black Oxide	
FWSSKM	(17)		Electroless Nickel Plating	
FWSSSH	(18)	1.4031/X38Cr13	-	45~50HRC
FWSSSHR	(19)		LTBC Plating	



Depending on thickness and length, hardened 1.1191/C45E material may be less than 45HRC.
Stainless Steel Hardening Type (FWSSSH) may be discolored by hardening.

■Standard Class

Part Number	D	V 0.5mm Increment (V 3 or more)	T 0.1mm Unit	€ Unit Price * Numbers ((1)~(11)) indicate material No.										
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
				FWS	FWSSC	FWSSB	FWSSM	FWSSR	FWSSA	FWSSAB	FWSBB	FWSSS	FWSSSR	FWSUS
FWS FWSSC FWSSB FWSSM FWSSR FWSSA FWSSAB FWSBB FWSSS FWSSSR FWSUS	4.0~10.0 0.5mm Increment	0 (No Hole) (Selection) 2.0 2.6 (0.5mm) Unit 3.0 ~ 90.0	1.0~ 2.0											
			2.1~ 5.0											
			5.1~ 10.0											
	10.5~20.0 0.5mm Increment		1.0~ 2.0											
			2.1~ 5.0											
			5.1~ 10.0											
	21~30 1mm Increment		1.0~ 2.0											
			2.1~ 5.0											
			5.1~ 10.0											
	31~40 1mm Increment		1.0~ 2.0											
			2.1~ 5.0											
			5.1~ 10.0											
	41~50 1mm Increment		1.0~ 2.0											
			2.1~ 5.0											
			5.1~ 10.0											
	51~60 1mm Increment		1.0~ 2.0											
			2.1~ 5.0											
			5.1~ 10.0											
	61~80 1mm Increment		5.0~ 10.0											
	81~100 1mm Increment		5.0~ 10.0											

Materials EN AW-2017/AlCu4MgSi · 1.4401/X5CrNiMo17-12-2 / Brass···› T≥2
No specification available for sizes without declaration of value.

D · V Machining Conditions
D≤60···› V≤D–2
D≥61···› V≤D–4

D · V Machining Conditions of Material EN AW-2017/AlCu4MgSi
4≤D≤ 10 ···› V≤D- 2
10.5≤D≤ 30 ···› V≤D- 4
31≤D≤ 60 ···› V≤D- 6
61≤D≤ 80 ···› V≤D- 8
81≤D≤100 ···› V≤D-10

Order Example: Part Number - D - V - T
FWSSC - D71 - V50.0 - T10.0

Days to Ship

- Standard Class Material: 1.0038/S235JR · 1.1191/C45E · 1.4301/X5CrNi18-10 · CW614N/CuZn39Pb3

8 Days | Express A | 2,00 EUR/piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Standard Class Material: EN AW-2017/AlCu4MgSi · 1.4401/X5CrNiMo17-12-2 LTBC

10 Days | Express B | 2,00 EUR/piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Service is not available for LTBC plating.

Price

- Standard Class

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Alterations P.104

Standard Class (Hardening)

Part Number	D	V 0.5mm Increment (V 3 or more)	T 0.1mm Unit	€ Unit Price (12) FWSSCH	(13) FWSSBH	(14) FWSSMH	(15) FWSSK	(16) FWSSKB	(17) FWSSKM	(18) FWSSSH	(19) FWSSSHR
FWSSCH FWSSBH FWSSMH FWSSK FWSSKB FWSSKM FWSSSH FWSSSHR	4.0~10.0 0.5mm Increment	0 (No Hole) (Selection) 2.0 2.6 (0.5mm) Unit 3.0 ~ 90.0	1.0~ 2.0								
			2.1~ 5.0								
			5.1~ 10.0								
	10.5~20.0 0.5mm Increment		1.0~ 2.0								
			2.1~ 5.0								
			5.1~ 10.0								
	21~30 1mm Increment		1.0~ 2.0								
			2.1~ 5.0								
			5.1~ 10.0								
	31~40 1mm Increment		1.0~ 2.0								
			2.1~ 5.0								
			5.1~ 10.0								
	41~50 1mm Increment		1.0~ 2.0								
			2.1~ 5.0								
			5.1~ 10.0								
	51~60 1mm Increment		1.0~ 2.0								
			2.1~ 5.0								
			5.1~ 10.0								
	61~80 1mm Increment		5.0~ 10.0								
	81~100 1mm Increment		5.0~ 10.0								

* Numbers ((12)~(19)) indicate material No.

D · V Machining Conditions
D≤60⋯› V≤D−2
D≥61⋯› V≤D−4

D · V Machining Conditions of Material 1.2510/100MnCrW4
4≤D≤ 10 ⋯› V≤D- 2
10.5≤D≤ 30 ⋯› V≤D- 4
31≤D≤ 60 ⋯› V≤D- 6
61≤D≤ 80 ⋯› V≤D- 8
81≤D≤ 100 ⋯› V≤D- 10

Order Example Part Number - D - V - T
FWSSK - D71 - V50.0 - T10.0

Price

- Standard Class (Hardening)

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders of 301 or more identical pieces, please request a quotation.

Days to Ship

- Standard Class (Hardening) Material: 1.1191/C45E · 12510/100MnCrW4 · 1.4021/X20Cr13

8 Days | Express A | 2,00 EUR/ piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Standard Class (Hardening) MaterialLTBC Plated Products

10 Days

Alterations

Order Example Part Number - D - V - T - (KC · SC · WSC · VKC · DKC · HKC)
FWSSB - D20 - V10 - T5 - VKC

Days to Ship

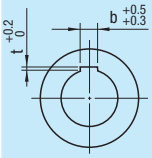
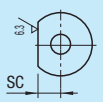
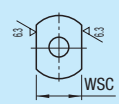
- Material: 1.0038/S235JR · 1.1191/C45E · CW614N/CuZn39Pb3 · 1.4031/X38Cr13rNi18-10 · 1.2510/100MnCrW4 (Except LTBC Plated Products.)

8 Days ⊗Express Serviceis not available.

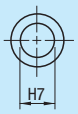
- Material EN AW-2017/AlCu4MgSi · 1.4401/X5CrNiMo17-12-2 LTBC

10 Days ⊗Express Serviceis not available.

When both Inner and Outer Diameter Tolerance Changes are specified, the concentricity is Ø0.02.

Alterations	Code	Spec.	Price Adder
Internal Notch 	KC	Adds an internal notch. Ordering Code KC Machining Conditions ▽V≥8 ⊗Not available for D61~100	3,00
One Flat 	SC	Adds a flat. Ordering Code SC10 = 1mm Increment SC≥V/2+2 ⊗Not available for D4~8	2,00
Two Flats 	WSC	Adds two flats. Ordering Code WSC10 WSC = 1mm Increment WSC≥V+4 ⊗Not available for D4~8	4,00

V	b	T	D-V
8 ~10.5	3	2.0	7 or More
11~12.5	4	2.5	8 or More
13~17.5	5	3.0	10 or More
18~22.5	6	3.5	12 or More
23~30.5	8	4.0	14 or More
31~38.5	10	4.0	14 or More
39~42.5	12	4.0	14 or More
43~44.0	14	4.5	16 or More

Alterations	Code	Spec.	Price Adder
Inner Diameter Tolerance 	VKC	Changes the inner diameter tolerance to H7. Ordering Code VKC Machining Conditions ▽D≥6 V≥3	Only Available for following Part Numbers
Outer Diameter Tolerance 	DKC (g6) HKC (h7)	Changes the outer diameter tolerance to g6 or h7. Ordering Code DKC / HKC Machining Conditions ▽When D≥43, T≥1.5. ▽D≥6	

D	D-V
6~10	D−V≥2
10.5~20	D−V≥3
21~30	D−V≥6
31~40	D−V≥8
41~50	D−V≥10
51~60	D−V≥12
61~70	D−V≥14
71~80	D−V≥16
81~90	D−V≥18
91~100	D−V≥20

Part Number	Days to Ship	VKC	DKC HKC
FWS FWSSC FWSSB FWSSM	8 days	3,00	4,00
FWSSR	10 days		
FWSSA	10 days		
FWSBB	8 days		
FWSSS			
FWSSSR	10 days		
FWSUS			

⊗Express Service is not available.
⊗Not available for part numbers not listed on the list.

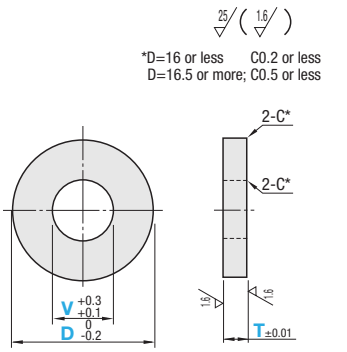
Metal Washers

-Precision Class Dimension Configurable-

RoHS



Part Number Precision Class T±0.01	Material No.	M Material	S Surface Treatment	H Hardness
FWAS	(1)	1.0038/S235JR	-	-
FWASC	(2)	1.1191/C45E	-	-
FWASB	(3)		Black Oxide	
FWASM	(4)		Electroless Nickel Plating	
FWASR	(5)		LTBC Plating	
FWASA	(6)	EN AW-2017/AlCu4MgSi	Clear Anodize	-
FWASS	(7)	1.4301/X5CrNi18-10	-	-
FWASSR	(8)		LTBC Plating	
FWASU	(9)	1.4401/X5CrNiMo17-12-2	-	-
FWASCH	(10)	1.1191/C45E	-	45~50HRC
FWASBH	(11)		Black Oxide	
FWASMH	(12)		Electroless Nickel Plating	
FWASK	(13)	1.2510/100MnCrW4	-	55HRC~
FWASKB	(14)		Black Oxide	
FWASKM	(15)		Electroless Nickel Plating	
FWASSH	(16)	1.4031/X38Cr13	-	45~50HRC



Depending on thickness and length, hardened 1.1191/C45E material may be less than 45HRC.
Stainless Steel Hardening Type (FWASSH) may be discolored by hardening.

■Precision Class

Part Number	D	V 0.5mm Increment (V 3 or more)	T 0.1mm Unit	€ Unit Price (1) FWAS	(2) FWASC	(3) FWASB	(4) FWASM	(5) FWASR	(6) FWASA	(7) FWASS	(8) FWASSR	(9) FWASU
FWAS FWASC FWASB FWASM FWASR FWASA FWASS FWASSR FWASU	4.0~10.0 0.5mm Increment	0 (No Hole) (Selection) 2.0 2.6 (0.5mm) Unit 3.0 ~ 90.0	1.0~ 2.0									
			2.1~ 5.0									
			5.1~ 10.0									
	10.5~20.0 0.5mm Increment		1.0~ 2.0									
			2.1~ 5.0									
			5.1~ 10.0									
	21~30 1mm Increment		1.0~ 2.0									
			2.1~ 5.0									
			5.1~ 10.0									
	31~40 1mm Increment		1.0~ 2.0									
			2.1~ 5.0									
			5.1~ 10.0									
	41~50 1mm Increment		1.0~ 2.0									
			2.1~ 5.0									
			5.1~ 10.0									
	51~60 1mm Increment		1.0~ 2.0									
			2.1~ 5.0									
			5.1~ 10.0									
	61~80 1mm Increment		5.0~ 10.0									
	81~100 1mm Increment		5.0~ 10.0									

* Numbers ((1)~(9)) indicate material No.

Material
EN AW-2017/AlCu4MgSi · 1.4401/X5CrNiMo17-12-2⋯› T≥2
No specification available for sizes without declaration of value.

D · V Machining Conditions
D≤60⋯› V≤D−2
D≥61⋯› V≤D−4

D · V Machining Conditions of Material EN AW-2017/AlCu4MgSi
4≤D≤ 10 ⋯› V≤D- 2
10.5≤D≤ 30 ⋯› V≤D- 4
31≤D≤ 60 ⋯› V≤D- 6
61≤D≤ 80 ⋯› V≤D- 8
81≤D≤100 ⋯› V≤D-10

Order Example: Part Number - D - V - T
FWASB - D15.5 - V5.5 - T2.6

Days to Ship

- Precision Class Material: 1.0038 · 1.1191 · 1.4301
8 Days | Express A | 2,00 EUR/piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Precision Class Material: EN AW-2017 · 1.4401 · LTBC
10 Days | Express B | 2,00 EUR/piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Service is not available for LTBC plating.

Price

- Precision Class

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Alterations P.106

■Precision Class (Hardening)

Part Number	D	V 0.5mm Increment (V 3 or more)	T 0.1mm Unit	€ Unit Price (10) FWASCH	(11) FWASBH	(12) FWASMH	(13) FWASK	(14) FWASKB	(15) FWASKM	(16) FWASSH
FWASCH FWASBH FWASMH FWASK FWASKB FWASKM FWASSH	4.0~10.0 0.5mm Increment	0 (No Hole) (Selection) 2.0 2.6 (0.5mm) Unit 3.0 ~ 90.0	1.0~ 2.0							
			2.1~ 5.0							
			5.1~ 10.0							
	10.5~20.0 0.5mm Increment		1.0~ 2.0							
			2.1~ 5.0							
			5.1~ 10.0							
	21~30 1mm Increment		1.0~ 2.0							
			2.1~ 5.0							
			5.1~ 10.0							
	31~40 1mm Increment		1.0~ 2.0							
			2.1~ 5.0							
			5.1~ 10.0							
	41~50 1mm Increment		1.0~ 2.0							
			2.1~ 5.0							
			5.1~ 10.0							
	51~60 1mm Increment		1.0~ 2.0							
			2.1~ 5.0							
			5.1~ 10.0							
	61~80 1mm Increment		5.0~ 10.0							
	81~100 1mm Increment		5.0~ 10.0							

(?)No specification available for sizes without declaration of value.

(?)D · V Machining Conditions
D≤60⋯› V≤D–2
D≥61⋯› V≤D–4

(?)D · V Machining Conditions of Material
1.2510/100MnCrW4
4≤D≤ 10 ⋯› V≤D- 2
10.5≤D≤ 30 ⋯› V≤D- 4
31≤D≤ 60 ⋯› V≤D- 6
61≤D≤ 80 ⋯› V≤D- 8
81≤D≤ 100 ⋯› V≤D- 10

Order Example

Part Number	-	D	-	V	-	T
FWASK	-	D15.5	-	V5.5	-	T2.6

Price

- Precision Class (Hardening)

■Volume Discount (?)Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

(?)For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Precision Class (Hardening)

8 Days | Express A | 2,00 EUR/ piece | P.88

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations

Order Example

Part Number	-	D	-	V	-	T	-	(KC / SC / WSC / VKC / DKC / HKC)
FWASS	-	D20	-	V10	-	T5	-	VKC

Days to Ship

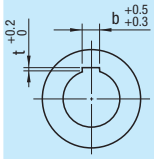
- Material: 1.0038 · 1.1191 · 1.4301 · 1.2510 · 1.4031 (Except LTBC Plated Products.)
8 Days ⊗Express Service is not available.

- Material EN AW-2017 · 1.4401 · LTBC
10 Days ⊗Express Service is not available.

(?)When both Inner and Outer Diameter Tolerance Changes are specified, the concentricity is Ø0.02.

Alterations

Internal Notch



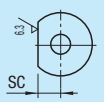
Code: KC

Adds an internal notch.
Ordering Code KC
Machining Conditions
(?)V≥8
⊗Not available for D61~100

V	b	T	D-V
8~10.5	3	2.0	7 or More
11~12.5	4	2.5	8 or More
13~17.5	5	3.0	10 or More
18~22.5	6	3.5	12 or More
23~30.5	8	4.0	14 or More
31~38.5	10	4.0	14 or More
39~42.5	12	4.0	14 or More
43~44.0	14	4.5	16 or More

Price Adder: 3,00

One Flat

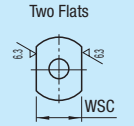


Code: SC

Adds a flat.
Ordering Code SC10
= 1mm Increment
SC≥V/2+2
⊗Not available for D4~8

Price Adder: 2,00

Two Flats



Code: WSC

Adds two flats.
Ordering Code WSC10
WSC = 1mm Increment
WSC≥V+4
⊗Not available for D4~8

Price Adder: 4,00

Inner Diameter Tolerance



Code: VKC

Changes the inner diameter tolerance to H7.
Ordering Code VKC
Machining Conditions (?)D≥6 V≥3

D	D-V
6~10	D–V≥2
10.5~20	D–V≥3
21~30	D–V≥6
31~40	D–V≥8
41~50	D–V≥10
51~60	D–V≥12
61~70	D–V≥14
71~80	D–V≥16
81~90	D–V≥18
91~100	D–V≥20

Price Adder: Only Available for following Part Numbers

Part Number	Days to Ship	VKC	DKC HKC
FWAS FWASC FWASB FWASM	3 days	3,00	4,00
FWASR	5 days		
FWASA	5 days		
FWASS	3 days		
FWASSR	5 days		
FWASU			

⊗Express Serviceis not available.
⊗Not available for part numbers not listed on the list.

Outer Diameter Tolerance



Code: DKC (g6) HKC (h7)

Changes the outer diameter tolerance to g6 or h7.
Ordering Code DKC / HKC
Machining Conditions
(?)When D≥43, T≥1.5. (?)D≥6

D	D-V
6~10	D–V≥2
10.5~20	D–V≥3
21~30	D–V≥6
31~40	D–V≥8
41~50	D–V≥10
51~60	D–V≥12
61~70	D–V≥14
71~80	D–V≥16
81~90	D–V≥18
91~100	D–V≥20

Metal Washers

-Inner and Outer Dia. Tolerance Selectable / Dimension Configurable / Standard / Precision-



Part Number		M Material	S Surface Treatment
Standard Class	Precision Class		
SWSC	SWMC	1.1191/C45E	-
SWSB	SWMB		Black Oxide
SWSM	SWMM		Electroless Nickel Plating
SWSS	SWMS	1.4301/X5CrNi18-10	-

D	T D Tolerance			
	G	H	N	X
	g6	h7	-	-
5.0~8.5	-	-	-0.1~0.3	0~0.2
9.0~10.0	-0.005 -0.014	0 -0.015		
10.5~18.0	-0.006 -0.017	0 -0.018		
18.5~30	-0.007 -0.020	0 -0.021		
31~50	-0.009 -0.025	0 -0.025		
51~60	-0.010 -0.029	0 -0.030		

V	T V Tolerance		
	H	N	X
	H7	-	-
3.0	+0.010 0	+0.3 +0.1	+0.2 0
3.5~6.0	+0.012 0		
6.5~10.0	+0.015 0		
10.5~18.0	+0.018 0		
18.5~30.0	+0.021 0		
30.5~50.0	+0.025 0		
50.5~58.0	+0.030 0		

■Inner and Outer Dia. Tolerance Price No. List

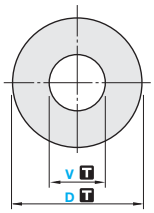
D (Outer Dia.)	V (Inner Dia.)	Price No.
G	H	(2)
	N	(1)
	X	(1)
H	H	(2)
	N	(1)
	X	(1)
N	H	(1)
	N	(3)
	X	(3)
X	H	(1)
	N	(3)
	X	(3)

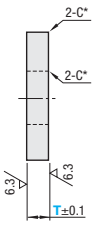
- Guide to Price List
<Ex.> When ordering: Material 1.1191/C45E, Outer Dia. g6, Inner Dia. H7 and Thickness Tolerance ±0.01
Part Number: SWMC–GH–D10.0–V4.0–T1.0

1. Check the Inner and Outer Dia. Tolerance Price No. List. (GH is Price No. (2))
2. Find the column of inner and outer tolerance price No. (2) shown in the price list of precision class.
3. From D and T dimensions, the price is 10,20 EUR

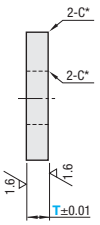
25 (6.3 1.6)

Standard Class





Precision Class



* D=16 or less C0.2 or less
D=16.5 or more; C0.5 or less

■Standard Class

Part Number	D Tolerance Selection	V Tolerance Selection	D	V 0.5mm Increment	T 0.1mm Increment	€ Unit Price											
						SWSC			SWSB			SWSM			SWSS		
						Tolerance (1)	Tolerance (2)	Tolerance (3)	Tolerance (1)	Tolerance (2)	Tolerance (3)	Tolerance (1)	Tolerance (2)	Tolerance (3)	Tolerance (1)	Tolerance (2)	Tolerance (3)
SWSC SWSB SWSM SWSS	G H N X	H N X	5.0~10.0 0.5mm Increment	3.0~58.0 (V≤D-2) ※ Refer to the following.	1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			10.5~20.0 0.5mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			21~30 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			31~40 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			41~50 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			51~60 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												

※T≥3 for SWSS
※No specification available for sizes without declaration of value.

※D ≥9 is applicable when G or H is selected as the tolerance values of D and V. The dimension ranges of V and T are shown in the table below.

D	V	T
9~30	D–V≥6	1~10
31~60	D–V≥12	2~10

Order Example

Part Number - Tolerance Selection - D - V - T → Price (euros)

D V

SWSC - G H - D10.0 - V4.0 - T1.0

- Standard Class

Days to Ship

8 Days | Express A | 2,00 EUR/ piece ☞P.88

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations

Part Number - Tolerance Selection - D - V - T - (TCB · TCC · TCD · TCE) ☞P.108

D V

SWSC - G H - D10.0 - V4.0 - T1.0 - TCB

- Standard Class

■Volume Discount Price (※Round down to one Cent.) P.88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

※For orders larger than indicated quantity, please request a quotation.

■Precision Class

Part Number	D Tolerance Selection	V Tolerance Selection	D	V 0.5mm Increment	T 0.1mm Increment	€ Unit Price											
						SWMC			SWMB			SWMM			SWMS		
						Tolerance (1)	Tolerance (2)	Tolerance (3)	Tolerance (1)	Tolerance (2)	Tolerance (3)	Tolerance (1)	Tolerance (2)	Tolerance (3)	Tolerance (1)	Tolerance (2)	Tolerance (3)
SWMC SWMB SWMM SWMS	G H N X	H N X	5.0~10.0 0.5mm Increment	3.0~58.0 (V≤D-2) ※ Refer to the following.	1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			10.5~20.0 0.5mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			21~30 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			31~40 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			41~50 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												
			51~60 1mm Increment		1.0~ 2.9												
					3.0~ 5.0												
					5.1~10.0												

※T≥3 for SWMS

※No specification available for sizes without declaration of value.

※D ≥9 is applicable when G or H is selected as the tolerance values of D and V. The dimension ranges of V and T are shown in the table below.

D	V	T
9~30	D–V≥6	1~10
31~60	D–V≥12	2~10

Order Example

Part Number	-	Tolerance Selection		-	D	-	V	-	T
		D	V						
SWMC	-	G	H	-	D10.0	-	V4.0	-	T1.0

Days to Ship

- Precision Class

8 Days | Express A | 2,00 EUR/ piece | P.88

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- Precision Class

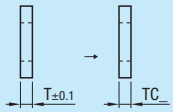
■**Volume Discount** (※Round down to one Cent.) P.88

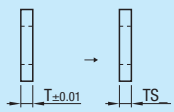
Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

※For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	Tolerance Selection		-	D	-	V	-	T	-	(TSB · TSC · TSD · TSE)
		D	V								
SWMC	-	G	H	-	D10.0	-	V4.0	-	T1.0	-	TSB

Alterations		Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Standard Class T Tolerance	Code	TCB	TCC	TCD	TCE
	 ※Available for Standard Class	Changes Thickness Tolerance (T) $T^{-0.1}_{-0.3}$ Ordering Code TCB	Changes Thickness Tolerance (T) $T^{+0.3}_{+0.1}$ Ordering Code TCC	Changes Thickness Tolerance (T) $T^{0}_{-0.2}$ Ordering Code TCD	Changes Thickness Tolerance (T) $T^{+0.2}_{0}$ Ordering Code TCE
	Price Adder	0,80	0,80	0,80	0,80

Alterations		Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Precision Class T Tolerance	Code	TSB	TSC	TSD	TSE
	 ※Available for Precision Class	Changes Thickness Tolerance (T) $T^{-0.01}_{-0.03}$ Ordering Code TSB	Changes Thickness Tolerance (T) $T^{+0.03}_{+0.01}$ Ordering Code TSC	Changes Thickness Tolerance (T) $T^{0}_{-0.02}$ Ordering Code TSD	Changes Thickness Tolerance (T) $T^{+0.02}_{0}$ Ordering Code TSE
	Price Adder	1,00	1,00	1,00	1,00

Metal Washers

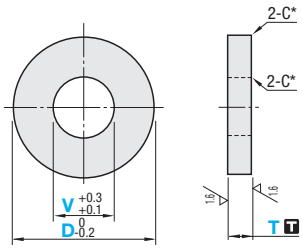
-T Tolerance Selectable / Dimension Configurable / Standard / Precision / Ultra Precision-

CAD Data



Part Number	Material	Surface Treatment	Hardness
AWSC	1.1191/C45E	-	-
AWSB		Black Oxide	
AWSM		Electroless Nickel Plating	
AWSS	1.4301/X5CrNi18-10	-	
AWSH	1.4031/X38Cr13	-	45~50HRC

Stainless Steel Hardening Type (AWSH) may be discolored by hardening.



T T Dimension Tolerance Selectable Table			
A	±0.005	-	-
B	-0.1 -0.3	SB	-0.01 -0.03
C	+0.3 +0.1	SC	+0.03 +0.01
D	0 -0.2	SD	0 -0.02
E	+0.2 0	SE	+0.02 0

25 (1.6)

* D=16 or less C0.2 or less
D=16.5 or more; C0.5 or less

■ T Dimension Tolerance Selectable · Configurable

Part Number	T Tolerance Selection	D	V 0.5mm Increment	T 0.1mm Increment	€ Unit Price														
					–Ultra Precision Class– Tolerance A				–Standard Class– Tolerance B~E					–Precision Class– Tolerance SB~SE					
					AWSC	AWSB	AWSM	AWSH	AWSC	AWSB	AWSM	AWSS	AWSH	AWSC	AWSB	AWSM	AWSS	AWSH
AWSC AWSB AWSM AWSS AWSH	–Ultra Precision– A	5.0~10.0 0.5mm Increment	3.0~58.0	1.0~ 2.9															
				3.0~ 5.0															
				5.1~10.0															
		10.5~20.0 0.5mm Increment		1.0~ 2.9															
				3.0~ 5.0															
				5.1~10.0															
	–Standard Class– B C D E	21~30 1mm Increment		1.0~ 2.9															
				3.0~ 5.0															
				5.1~10.0															
		31~40 1mm Increment		1.0~ 2.9															
				3.0~ 5.0															
				5.1~10.0															
	–Precision Class– SB SC SD SE	41~50 1mm Increment		1.0~ 2.9															
				3.0~ 5.0															
				5.1~10.0															
		51~60 1mm Increment		1.0~ 2.9															
				3.0~ 5.0															
				5.1~10.0															

D≤60···V≤D-2 D≥61···V≤D–4 Ultra Precision Class (Tolerance A) is not available for AWSS.

Order Example

Part Number	-	T Tolerance Selection	-	D	-	V	-	T
AWSB	-	B	-	D20.0	-	V8.0	-	T5.0
AWSS	-	SB	-	D20.0	-	V8.0	-	T5.0

Days to Ship

- T Tolerance A: 8 Days
- T Tolerance B~E, SB~SE: 8 Days — Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount Price (Round down to one Cent.) P.88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Metal Washers
-Flanged-

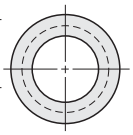
CAD Data

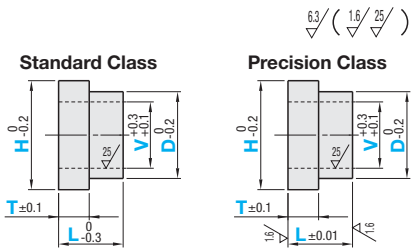
RoHS



Part Number		Material	Surface Treatment	Hardness
Standard Class	Precision Class			
FTCSS	-	1.0038/ S235JR	-	-
FTCC	FTCMC	1.1191/ C45E	-	-
FTCB	FTCMB		Black Oxide	
FTCM	FTCMM		Electroless Nickel Plating	
FTCSK	-	1.2510/ 100MnCrW4	-	55HRC~
FTCSKB			Black Oxide	
FTCSKM			Electroless Nickel Plating	
FTCS	FTCMS	1.4031/ X38Cr13	-	45~50HRC

Stainless Steel Hardening Type (FTCS · FTCMS) may be discolored by hardening.





Circumference C0.5 or less

Circumference C0.5 or less

■Standard Class · Precision Class

Part Number		D	H	V 0.5mm Increment (V 3 or more)	T 0.1mm Increment	L 0.1mm Increment	€ Unit Price											
							Standard Class								Precision Class			
–Standard Class–	–Precision Class–						FTCSS	FTCC	FTCB	FTCM	FTCSK	FTCSKB	FTCSKM	FTCS	FTCMC	FTCMB	FTCMM	FTCMS
FTCSS	FTCMC	5.0~9.0 (0.5mm Increment)	7.0~12.0 (0.5mm Increment)	(Selection) 2 2.6 (0.5mm Increment) 3.0~58.0	1.0~8.0	2.0~10.0												
FTCC	FTCMB	9.5~20.0 (0.5mm Increment)	11.5~25.0 (0.5mm Increment)															
FTCB	FTCMM	21~30 (1mm Increment)	23~40 (1mm Increment)															
FTCM	FTCMS	31~40 (1mm Increment)	33~50 (1mm Increment)															
FTCSK		41~50 (1mm Increment)	43~60 (1mm Increment)															
FTCSKB		51~60 (1mm Increment)	53~70 (1mm Increment)															
FTCSKM																		
FTCS																		

Machining Conditions T≤L–1

D	H	V
When 5 ~20	D+2≤H≤Dx1.5	V≤D–2
When 21 ~40	D+2≤H≤Dx1.4	V≤D–4
When 41 ~60	D+2≤H≤Dx1.2	V≤D–6

Machining Conditions of Material 1.2510/100MnCrW4 (FTCSK · FTCSKB · FTCSKM) 2≤T≤L-2

D	H	V
When 5 ~10	D+2≤H≤Dx1.4	V≤D–2
When 10.5~30		V≤D–4
When 31~60	D+2≤H≤Dx1.2	V≤D–6

Order Example Part Number - D - H - V - T - L

FTCMS - D25 - H30 - V8.0 - T2.0 - L5.0

Days to Ship 8 Days — Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price euros

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Alterations Part Number - D - H - V - T - L - (TCB · TCC · TCD · TCE · TSA · TSB · TSC · TSD · TSE · VKC · DKC · HKC)

FTCMM - D25 - H30 - V8.0 - T2.0 - L5.0 - TSC- VKC

- T Tolerance

8 Days — Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Inner and Outer Dia. Tolerance Material: 1.0038/S235JR · 1.1191/C45E

8 Days ⊗Express Serviceis not available.

When both Inner and Outer Diameter Tolerance Changes are specified, the concentricity is Ø0.02.

⊗Not available for the Hardening Products.

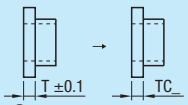
Alterations	Code	Spec.	Price Adder
Inner Diameter Tolerance 	VKC	Changes the inner diameter tolerance to H7. Ordering Code VKC Machining Conditions D≥6 V≥3	Material 1.0038/ S235JR 1.1191/ C45E 3,00

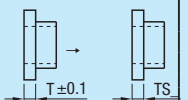
D	D-V
6~10	D–V≥2
10.5~20	D–V≥3
21~30	D–V≥6
31~40	D–V≥8
41~50	D–V≥10
51~60	D–V≥12

Alterations	Code	Spec.	Price Adder
Outer Diameter Tolerance 	DKC (g6) HKC (h7)	Changes the outer diameter tolerance to g6 or h7. Ordering Code DKC / HKC Machining Conditions When D≥43, T≥1.5. D≥6	Material 1.0038/ S235JR 1.1191/ C45E 4,00

D	D-V
6~10	D–V≥2
10.5~20	D–V≥3
21~30	D–V≥6
31~40	D–V≥8
41~50	D–V≥10
51~60	D–V≥12

⊗Not available for the Hardening Products (FTCSK · FTCSKB · FTCSKM · FTCS · FTCMS).

Alterations	Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Code	TCB	TCC	TCD	TCE
Standard Class T Tolerance  Available for Standard Class	Changes Shoulder Thickness Tolerance (T). T -0.1 -0.3 Ordering Code TCB	Changes Shoulder Thickness Tolerance (T). T +0.3 +0.1 Ordering Code TCC	Changes Shoulder Thickness Tolerance (T). T 0 -0.2 Ordering Code TCD	Changes Shoulder Thickness Tolerance (T). T +0.2 0 Ordering Code TCE
Price Adder	1,00	1,00	1,00	1,00

Alterations	Shoulder Thickness Tolerance	Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Code	TSA	TSB	TSC	TSD	TSE
Precision Class T Tolerance  Available for Precision Class	Changes Shoulder Thickness Tolerance (T). T ±0.025 Ordering Code TSA	Changes Shoulder Thickness Tolerance (T). T -0.01 -0.06 Ordering Code TSB	Changes Shoulder Thickness Tolerance (T). T +0.06 +0.01 Ordering Code TSC	Changes Shoulder Thickness Tolerance (T). T 0 -0.05 Ordering Code TSD	Changes Shoulder Thickness Tolerance (T). T +0.05 0 Ordering Code TSE
Price Adder	1,20	1,20	1,20	1,20	1,20

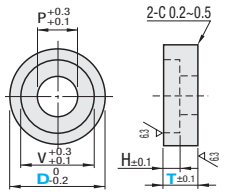
Metal Washers
-Counterbore-



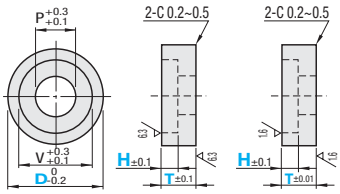
Standard Class T T Tolerance±0.1			Precision Class T T Tol. ±0.01		M Material	S Surface Treatment	H Hardness
T Selectable	T Dim. Configurable Type	Dim. Configurable Type	T Dim. Configurable Type	Dim. Configurable Type			
-	-	FWZASS	-	-	1.0038/S235JR	-	-
-	-	FWZAC	-	FWZSC	1.1191/C45E	-	-
WZAB	TWZAB	FWZAB	TWZSB	FWZSB		Black Oxide	
WZAM	TWZAM	FWZAM	TWZSM	FWZSM		Electroless Nickel Plating	
-	-	FWZAA	-	-	EN AW-2017/ AlCu4MgSi	Clear Anodize	-
		FWZAAB				Black Anodize	
WZAS	TWZAS	FWZAS	TWZSS	FWZSS	1.4301/X5CrNi18-10	-	-
-	-	FWZACH	-	-	1.1191/C45E	-	45~50HRC
WZABH		FWZABH				Black Oxide	
WZAMH		FWZAMH				Electroless Nickel Plating	
-	-	FWZASK	-	-	1.2510/100MnCrW4	-	55HRC~
		FWZASKB				Black Oxide	
		FWZASKM				Electroless Nickel Plating	
WZASH	-	FWZASH	-	-	1.4031/X38Cr13	-	45~50HRC

Depending on thickness and length, hardened 1.1191/C45E material may be less than 45HRC. Stainless Steel Hardening Type (WZASH, FWZASH) may be discolored by hardening.

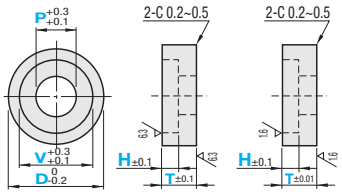
T Selectable



T Dimension Configurable Type



Dimension Configurable Type



T Dimension Selectable Type

Part Number Type	D	H	T Selection	V	P	€ Unit Price WZAB	WZAM	WZAS	WZABH	WZAMH	WZASH
WZAB WZAM WZAS WZABH WZAMH WZASH	10	4	6 8 10	6	3.5						
	12	5	8 10	8	4.5						
	14	6	8 10	10	5.5						
	15	8	10 12	11	6.5						
	20	8	10 12 15								
	30	10	12 15	14	9						
	40	12	15 20	18	11						
	50	12	15 20								
	60	12	15 20								

T Dimension Configurable Type

Part Number Type	D	H 0.5mm Increment	T 0.5mm Increment	V	P	€ Unit Price Standard Class TWZAB	TWZAM	TWZAS	Precision Class TWZSB	TWZSM	TWZSS
–Standard Class– TWZAB TWZAM TWZAS –Precision Class– TWZSB TWZSM TWZSS	10	1.0~18.0	3.0~10.0	6	3.5						
			10.5~20.0								
	12		3.0~10.0	8	4.5						
			10.5~20.0								
	14		3.0~10.0	10	5.5						
			10.5~20.0								
	15		3.0~10.0	11	6.5						
			10.5~20.0								
	20		3.0~10.0								
			10.5~20.0								
	30		3.0~10.0	14	9						
			10.5~20.0								

Machining Conditions: H+2≤TPx8

Order Example

- T Selectable

Part Number	-	T
WZAS15	-	10

- T Dimension Configurable Type

Part Number	-	H	-	T
TWZAB10	-	3.5	-	10.0

Price

- T Dimension Selectable · T Dimension Configurable

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- T Selectable

8 Days | Express A | 2,00 EUR/ piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- T Dimension Configurable Type

8 Days | Express A | 2,00 EUR/ piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Dimension Configurable Type

Part Number	D	0.5mm Increment V	P	H	T	€ Unit Price Standard Class FWZASS	FWZAC	FWZAB	FWZAM	FWZAA	FWZAAB FWZAS	FWZACH	FWZABH	FWZAMH	FWZASK	FWZASKB	FWZASKM	FWZASH	Precision Class FWZSC	FWZSB	FWZSM	FWZSS
–Standard Class– FWZASS FWZAC FWZAB FWZAM FWZAA FWZAAB FWZAS FWZACH FWZABH FWZAMH FWZASK FWZASKB FWZASKM FWZASH –Precision Class– FWZSC FWZSB FWZSM FWZSS	10.0~20.0 (0.5mm Increment)	5.0~90.0	3.0~88.0	1.0~48.0	3.0~10.0																	
					10.5~20.0																	
					20.5~30.0																	
					30.5~40.0																	
					40.5~50.0																	
	21~30 (1mm Increment)				3.0~10.0																	
					10.5~20.0																	
					20.5~30.0																	
					30.5~40.0																	
					40.5~50.0																	
	31~40 (1mm Increment)				3.0~10.0																	
					10.5~20.0																	
					20.5~30.0																	
					30.5~40.0																	
					40.5~50.0																	
	41~50 (1mm Increment)				3.0~10.0																	
					10.5~20.0																	
					20.5~30.0																	
					30.5~40.0																	
					40.5~50.0																	
	51~60 (1mm Increment)				3.0~10.0																	
					10.5~20.0																	
					20.5~30.0																	
					30.5~40.0																	
					40.5~50.0																	
	61~80 (1mm Increment)				5.0~10.0																	
					10.5~20.0																	
					20.5~30.0																	
					30.5~40.0																	
					40.5~50.0																	
	81~100 (1mm Increment)				5.0~10.0																	
					10.5~20.0																	
					20.5~30.0																	
					30.5~40.0																	
					40.5~50.0																	

Machining Conditions

D	V	P
When 10~ 60	V ≤ D – 2	P ≤ V – 2
When 61~100	V ≤ D – 4	P ≤ V – 4

2≤(T–H)≤Px8 The shaft diameter is 2mm or more and Px8 or less.

Machining Conditions of Material 1.2510/100MnCrW4 *

D	V	P
When 10	V≤D–2	P ≤ V – 2
When 10.5~30	V≤D–4	
When 31~60	V≤D–6	P ≤ V – 4
When 61~80	V≤D–8	
When 81~100	V≤D–10	

* (FWZASK · FWZASKB and FWZASKM)

No specification available for sizes without declaration of value.

Order Example

Part No.	D	V	P	H	T
FWZASS	D25	V12.0	P6.0	H5.5	T10.5
FWZSC	D20	V10.0	P5.0	H5.5	T15.5

Days to Ship

- Dimension Configurable Type Materials except EN AW2017

8 Days

Express A | 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Dimension Configurable Type Material: EN AW2017 (FWZAA · FWZAAB)

10 Days

Express B | 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- Dimension Configurable Type Standard Class

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

- Dimension Configurable Type Precision Class

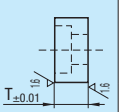
Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99
Discount rate	€ Unit Price	10%	15%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part No.	D	V	P	H	T	(TKC)
FWZASH	D15.0	V10.5	P6.5	H12.5	T18.5	TKC

Alteration	Code	Spec.	Price Adder	
	TKC	Changes T dimension tolerance. Ordering Code TKC T±0.1→±0.01 ⊗FWZAA, FWZAS and FWZASH are not available for D=61~100. Applicable only to Dimension Configurable Type, Standard Class (except FWZAAB).	Material EN AW-2017/AlCu4MgSi 1.1191/C45E 1.2510/100MnCrW4 1.0038/S235JR 1.4031/X38Cr13	3,00
			Material 1.4301/X5CrNi18-10	5,00

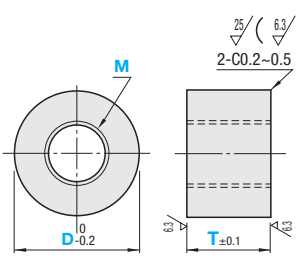
Metal Washers

-Female Thread Type-

CAD Data



T Selectable	T Dimension Configurable Type	Dimension Configurable Type	Material	Surface Treatment
Coarse Thread	Coarse Thread	Coarse Thread		
-	-	FWTAC	1.1191/C45E	-
WTAB	TWTAB	FWTAB		Black Oxide
WTAM	TWTAM	FWTAM		Electroless Nickel Plating
-	-	FWTAA	EN AW-2017/ AlCu4MgSi	Clear Anodize
		FWTAAB		Black Oxide
WTAS	TWTAS	FWTAS	1.4301/ X5CrNi18-10	-



M	Pitch
	Coarse Thread
2	0.4
2.6	0.45
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

■T Selectable

Part Number Type	D	M Selection	T Selection	€ Unit Price WTAB	WTAM	WTAS
WTAB WTAM WTAS	10	2 3 4 5	3 5 8 10			
	12	4 5 6	5 8 10 15			
	16	5 6 8	5 8 10 15			
	20	6 8 10	8 10 15 20			
	30	8 10 12	10 15 20			
	40	10 12 16	10 15 20			
	50	16 20	15 20			
	60	16 20	15 20			

■T Dimension Configurable Type

Part Number Type	D	M Selection	T 0.5mm Increment
TWTAB TWTAM TWTAS	6	2 3 4	3.0~20.0
	8	2 3 4	
	10	2 3 4 5	
	12	4 5 6	3.5~20.0
	16	5 6 8	
	20	6 8 10	
	30	8 10 12	

※T≤Mx8 ※M2 ···› T≤Mx5

Part Number Type	D	T 0.5mm Increment	€ Unit Price TWTAB	TWTAM	TWTAS
TWTAB TWTAM TWTAS	6~10	3.0~ 5.0			
		5.5~10.0			
		10.5~20.0			
	12 • 16	3.5~ 5.0			
		5.5~10.0			
		10.5~20.0			
	20 • 30	3.5~ 5.0			
		5.5~10.0			
		10.5~20.0			

■Dimension Configurable Type

Part Number	D	M Selection	T 0.5mm Increment Unit	€ Unit Price FWTAC	FWTAB	FWTAM	FWTAA	FWTAAB FWTAS
FWTAC FWTAB FWTAM FWTAA FWTAAB FWTAS	6~10 (0.5mm Increment)	2(3≤T≤10) 2.6(3≤T≤13) 3(3≤T≤24) 4(3≤T≤32) 5(3≤T≤40) 6(3≤T≤48) 8(4≤T≤50) 10(5≤T≤50) 12(6≤T≤50) 16(6≤T≤50) 20(8≤T≤50) 24(10≤T≤50) 30(12≤T≤50)	3.0~5.0					
			5.5~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					
	10.5~20.0 (0.5mm Increment)		3.0~5.0					
			5.5~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					
	21~30 (1mm Increment)		3.0~5.0					
			5.5~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					
	31~40 (1mm Increment)		3.0~5.0					
			5.5~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					
	41~50 (1mm Increment)		3.0~5.0					
			5.5~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					
	51~60 (1mm Increment)		3.0~5.0					
			5.5~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					
	61~80 (1mm Increment)		5.0~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					
	81~100 (1mm Increment)		5.0~10.0					
			10.5~20.0					
			20.5~30.0					
			30.5~540.0					
			40.5~50.0					

※ (D-M)/2≥2※T≤Mx8※ M2 / M2.6···› T≤Mx5

Order Example

Part Number	-	D	-	M	-	T
WTAB12			-	6	-	5
TWTAB12			-	6	-	5.5
FWTAM	-	D20	-	M5	-	T4.5

Days to Ship

- T Selectable

8 Days — Express A 2,00 EUR/ piece

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

- T Dimension Configurable · Dimension Configurable Type Materials 1.1191/C45E ·1.4301/X5CrNi18-10

8 Days — Express A 2,00 EUR/ piece P.88

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Dimension Configurable Type Material En AW2017

10 Days — Express B 2,00 EUR/ piece P.88

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (※Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

※For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	D	-	M	-	T	- (WSC)
FWTAS		- D15	-	M6	-	T15	- WSC10

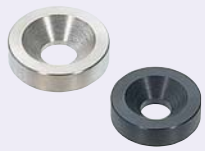
Alteration	Code	Spec.	Price Adder
	WSC	Adds two flats. Ordering Code WSC10 WSC = 1mm Increment WSC≥M+4 ⊗Not available for D6~D8 ⊗Not available for T Selectable Type · T Configurable Type	4,00

Metal Washers

-Countersunk / With Screw Holes-

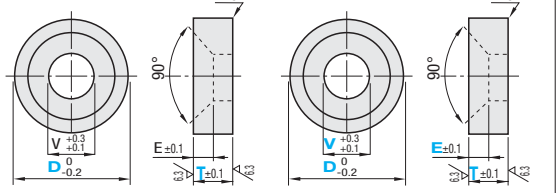
CAD Data

Countersunk RoHS



Standard Type	Dimension Configurable	Material	Surface Treatment
-	FWSRC	1.1191/C45E	-
WSRB	FWSRB		Black Oxide
WSRM	FWSRM		Electroless Nickel Plating
-	FWSRA	EN AW-2017/AlCu4MgSi	Clear Anodize
WSRS	FWSRS	1.4301/X5CrNi18-10	-

Standard Type / Dimension Configurable Type



Countersunk · Standard Type

Part Number Type	D	T Selection	E	V	€ Unit Price WSRB	WSRM	WSRS
WSRB WSRM WSRS	14	2.5	2.5	4.5			
		4					
		5					
	16	3	3	5.5			
		4					
		5					
	20	3.5	3.5	6.6			
		4					
		5					
	25	5	5	9			
		5.5					
		6					
	30	6	6	11			
		7					
		8					
	40	10	6	11			
	50	10	6	11			

Countersunk · Dimension Configurable Type

Part Number	D	V 0.5mm Increment (V 3 or more)	E 0.5mm Increment	T 0.5mm Increment	€ Unit Price FWSRC	FWSRB	FWSRM	FWSRA	FWSRS
FWSRC FWSRB FWSRM FWSRA FWSRS	10.0~20.0 (0.5mm Increment)	2.0	2.0~10.0 E≤T	2.0~ 5.0					
				5.5~10.0					
	21~30 (1mm Increment)			2.0~ 5.0					
				5.5~10.0					
	31~40 (1mm Increment)	2.6		2.0~ 5.0					
				5.5~10.0					
	41~50 (1mm Increment)	3~30		2.0~ 5.0					
				5.5~10.0					
	51~60 (1mm Increment)			2.0~ 5.0					
				5.5~10.0					

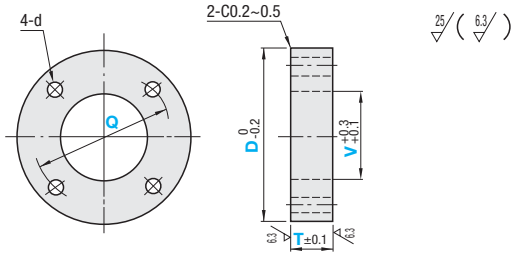
(D-V)/2-E≥2···2mm or more is required for the min. thickness.

Circularity cannot be guaranteed because the thickness V becomes 0 when E=T.

With Screw Holes RoHS



Type	Material	Surface Treatment
WBAC	1.1191/C45E	-
WBAB		Black Oxide
WBAM		Electroless Nickel Plating
WBAA	EN AW-2017/AlCu4MgSi	Clear Anodize
WBAS	1.4301/X5CrNi18-10	-



Part Number Type	D	V 0.5mm Increment	Q 0.5mm Increment	T 1mm Increment	D	Applicable Screw	€ Unit Price WBAC T1~2	WBAC T3~5	WBAC T6~10	WBAB T1~2	WBAB T3~5	WBAB T6~10	WBAM T1~2	WBAM T3~5	WBAM T6~10	WBAA T2	WBAA T3~5	WBAA T6~10	WBAS T1~2	WBAS T3~5	WBAS T6~10
WBAC WBAB WBAM WBAA WBAS	20	3.0~ 5.0	10.5~13.5	1~10	3.5	M3															
	25	3.0~ 9.5	10.5~17		3.5	M3															
	30	3.0~10.0	12 ~20		4.5	M4															
	35	3.0~16.0	12 ~25		4.5	M4															
	40	3.0~20.0	12 ~30		4.5	M4															
	50	3.0~22.0	14 ~35		5.5	M5															
	60	3.0~28.0	14 ~40		5.5	M5															

Q≥V+d+4 T≥2 for WBAA.

Order Example

Part Number	-	D	-	V	-	E	-	Q	-	T
WSRM14									-	2.5
FWSRS	-	D17.5	-	V6.5	-	E3			-	T7.5
WBAB30			-	V8			-	Q18	-	T3

Alterations

Part Number	-	D	-	V	-	E	-	Q	-	T	-	(TKC / FC)
FWSRB		- D15	-	V5	-	E3			-	T3.0	-	TKC
WBAS40			-	V10			-	Q25	-	T10	-	FC3

Alteration is available for Dimension Configurable Type only.

Days to Ship

- Countersunk · Standard Type

8 Days — Express A — 2,00 EUR/piece — 2 Days

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Countersunk Dimension Configurable Type · With Screw Holes Material: 1.1191/C45E / 1.4301/X5CrNi18-10

8 Days — Express A — 2,00 EUR/piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Countersunk Dimension Configurable Type · With Screw Holes Material: EN AW-2017/AlCu4MgSi

10 Days — Express B — 2,00 EUR/piece — P.88

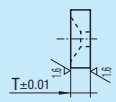
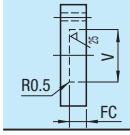
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

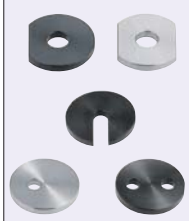
Alterations	Code	Spec.	Price Adder
T Dimension Tolerance 	TKC	Changes T dimension tolerance. Ordering Code TKC T±0.1→±0.01 Available for Countersunk Screw Type only	3,00
Blind Hole 	FC	Changes V hole to blind hole. Ordering Code FC3 FC=1 mm Increment Available for With Screw Holes only. T−FC≥2 V≥10 FC≥2	6,00

Metal Washers / Slotted Hole Washers

-Shape Selectable- -Flat / Pilot-

CAD Data

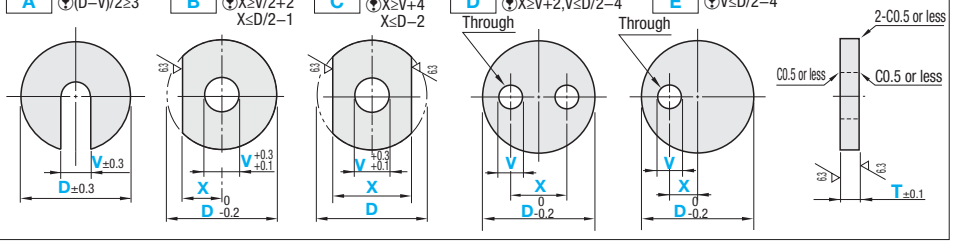
Metal Washers RoHS



Part Number	Material	Surface Treatment
KWSC	1.1191/C45E	-
KWSB		Black Oxide
KWSM		Electroless Nickel Plating
KWSS	1.4301/X5CrNi18-10	-

25/ (6.3/)

A (D−V)/2≥3 B X≥V/2+2 X≤D/2−1 C X≥V+4 X≤D−2 D X≥V+2,V≤D/2−4 Through E V≤D/2−4 Through



Part Number	Shapes Selection	D	V 1mm Increment	X 0.1mm Increment	T 0.1mm Increment	€ Unit Price KWSC A	KWSC B	KWSC C	KWSC D	KWSC E	KWSB A	KWSB B	KWSB C	KWSB D	KWSB E	KWSM A	KWSM B	KWSM C	KWSM D	KWSM E	KWSS A	KWSS B	KWSS C	KWSS D	KWSS E
KWSC KWSB KWSM KWSS	A B C D E	10.0~20.5 0.5mm Increment	3~30	4.0~48.0	3.0~5.0																				
					5.1~10.0																				
		21~30 1mm Increment			3.0~5.0																				
					5.1~10.0																				
		31~40 1mm Increment			3.0~5.0																				
					5.1~10.0																				
		41~50 1mm Increment			3.0~5.0																				
					5.1~10.0																				

Order Example

Part Number	Shapes	D	V	X	T
KWSB	B	D12.0	V5	X5.0	T3.0

Alterations

Part Number	Shapes	D	V	T	(HH)
KWSB	A	D20	V10	T3	HH

Days to Ship 8 Days

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Alteration	Code	Spec.	Price Adder
	HH	Hardens the washer in the shape of A. H 45~50HRC Ordering Code HH Available for KWSB · KWSC only. Deformation may occur in some cases due to heat treatment.	2,00

Slotted Hole Washers RoHS

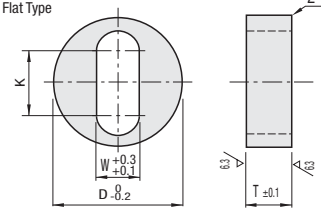


Type	Material	Surface Treatment
WLM	1.1191	Electroless Nickel Plating
WLS	1.4301	-

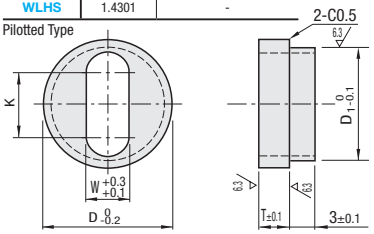
Type	Material	Surface Treatment
WLHM	1.1191	Electroless Nickel Plating
WLHS	1.4301	-

25/ (6.3/)

Flat Type



Pilotted Type



Flat Type

Part Number Type	No.	D	T	K	W	Applicable Screw	€ Unit Price WLM	€ Unit Price WLS
WLM WLS	3	18	3	5	3.5	M3		
	4	20		6	4.5	M4		
	5	22		7	5.5	M5		
	6	26		8	6.6	M6		
	8	30		10	9	M8		
	10	38	4	12	11	M10		
	12	46	5	16	14	M12		

Pilotted Type

Part Number Type	No.	D	D1	T	K	W	Applicable Screw	€ Unit Price WLHM	€ Unit Price WLHS
WLHM WLHS	4	20	14	3	6	4.5	M4		
	5	22	16		7	5.5	M5		
	6	26	18		8	6.6	M6		
	8	30	22		10	9	M8		
	10	38	28	4	12	11	M10		
	12	46	36	5	16	14	M12		

Order Example

Part Number
WLM5
WLHS4

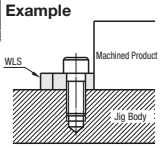
Days to Ship 6 Days / 2 Days P.88

Volume Discount (Round down to one Cent.) P.87

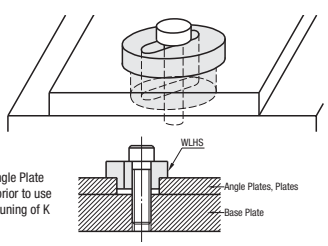
Quantity	1~49	50~69	70~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Example



For the Pilot Type (WLHM · WLHS), drill a hole on Angle Plate or Base Plate, etc. to insert the pilot part (with D1) prior to use (see the right figure). The slotted hole allows fine-tuning of K dimension.



Thin-Walled Metal Collars / Hollow Collars / Spacers

CAD Data

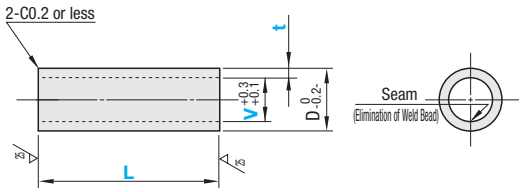
Thin-Walled Metal Collars



RoHS

Type	Material
TASC	1.4301/X5CrNi18-10

L Dimension	Tolerance
3.0~10.0	±0.05
10.5~20.0	±0.1



Part Number Type	V	t	L 0.5mm Increment	D t0.5	D t1	€ Unit Price L3.0~5.0	L5.5~10.0	L10.5~15.0	L15.5~20.0
TASC	1	0.5 1	3.0 ~ 20.0	2	3				
	1.5			2.5	3.5				
	2			3	4				
	2.5			3.5	4.5				
	3			4	5				
	3.5			4.5	5.5				
	4			5	6				
	5			6	7				

Order Example: Part Number - t - L → TASC1 - 0.5 - 3.0

Days to Ship: 8 Days — Express A 2,00 EUR/piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~39	40~49	50~99
Discount rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

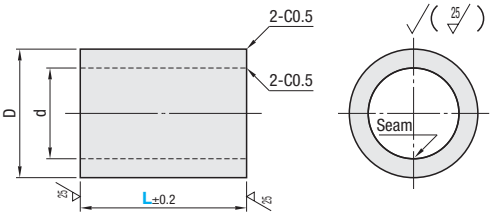
Hollow Collars



RoHS

Type	Material	Surface Treatment
SGP	1.0035/S185	-
SGPBB		Black Oxide
STPG	1.0254/S235 (Sch40)	-
STPGB		Black Oxide
STPGH	1.0254/S235 (Sch80)	-
STPGHB		Black Oxide

This tube has a welding seam on the inner diameter surface.
Only 1.0035/S185 and SGPBB have 0.5~1mm weld seam rise inside.



Part Number Type	No.	L 0.5mm Increment	D	d SGP SGPBB	d STPG STPGB	d STPGH STPGHB	€ Unit Price SGP L6~80	SGP L80.5~150	SGP L150.5~200	SGPBB L6~80	SGPBB L80.5~150	SGPBB L150.5~200	STPG L6~80	STPG L80.5~150	STPG L150.5~200	STPGB L6~80	STPGB L80.5~150	STPGB L150.5~200	STPGH L6~80	STPGH L80.5~150	STPGH L150.5~200	STPGHB L6~80	STPGHB L80.5~150	STPGHB L150.5~200
SGP SGPBB STPG STPGB STPGH STPGHB	6A	6.0~ 80.0	10.5	6.5	7.1	5.7																		
	8A		13.8	9.2	9.4	7.8																		
	10A	10.0~ 150.0	17.3	12.7	12.7	10.9																		
	15A		21.7	16.1	16.1	14.3																		
	20A		27.2	21.6	21.4	19.4																		
	25A	20.0~ 200.0	34.0	27.6	27.2	25.0																		
	32A		42.7	35.7	35.5	32.9																		
	40A		48.6	41.6	41.2	38.4																		

Order Example: Part Number - L → SGP6A - 45.0

Days to Ship: 8 Days — Express A 2,00 EUR/piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations: Part Number - L - (LKC) → STPG15A - 80 - LKC

Alteration	Code	Spec.	Price Adder
L Dimension Tolerance 	LKC	Changes L Dimension Tolerance from ±0.2 to ±0.05. Ordering Code LKC	2,00

Spacers

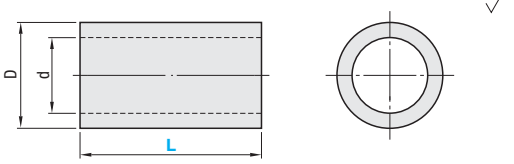


RoHS

Type	Material	Surface Treatment
SMKB	1.0330/DC01	Black Chromate

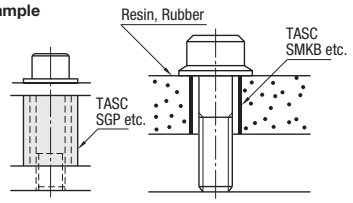
L Dimension	Tolerance
3, 4, 5, 8, 10	±0.05
12, 15, 20	±0.1
30	±0.15

The circle may be slightly deformed due to winding process.



Part Number Type	No.	L Selection	D	d	€ Unit Price L3~10	L12~20	L30
SMKB	2	3 4 5 8 10	3	2			
	2.6	3 4 5 8 10	3.65	2.65			
	3	3 4 5 8 10 12 15 20	4	3			
	4	3 4 5 8 10 12 15 20 30	5.3	4.1			
	5	3 4 5 8 10 12 15 20 30	6.3	5.1			
	6	3 4 5 8 10 12 15 20 30	7.8	6.2			
	8	4 5 8 10 12 15 20 30	10	8.2			
	10	5 8 10 12 15 20 30	12.2	10.2			

Example



Order Example: Part Number - L → SMKB2.6 - 10

Days to Ship: 6 Days — P.88

Price

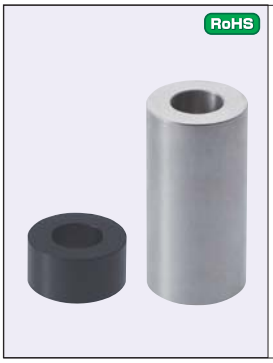
Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~69	70~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

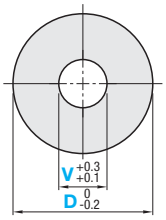
For orders larger than indicated quantity, please request a quotation.

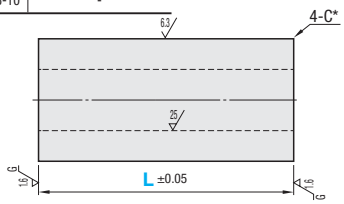
Simultaneous Grinding Spacers

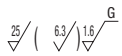
CAD Data



Type	Material	Surface Treatment
DWSSB	1.1191/C45E	Black Oxide
DWSSM	1.1191/C45E	Electroless Nickel Plating
DWSSS	1.4301/X5CrNi18-10	-







* D=16 or less, C0.1~0.2
D=20 or more C0.5 or less

Ganged machining allows L Dimension variations to be within ±5μ per order.

Part Number	D 0.5mm Increment	V 0.5mm Increment (V 3 or more)	L Machining Conditions	L 0.1mm Increment	Simultaneous Grinding Maximum Quantity	€ Unit Price DWSSB	€ Unit Price DWSSM	€ Unit Price DWSSS
DWSSB DWSSM DWSSS	4.0~10.0	0 2.0 2.6 3.0~8.0	L ≤40→D-V ≥2 40.1≤L≤50→D-V≥4	1.0~ 5.0 5.1~ 10.0 10.1~ 25.0 25.1~ 40.0 40.1~ 50.0	100 pcs.			
	10.5~15.5	0 2.0 2.6 3.0~13.5	L ≤40→D-V ≥2 40.1≤L≤80→D-V≥4 80.1≤L≤100→D-V≥6	1.0~ 5.0 5.1~ 10.0 10.1~ 25.0 25.1~ 40.0 40.1~ 55.0 55.1~ 70.0 70.1~ 85.0 85.1~ 100.0				
	16.0~20.0	0 2.0 2.6 3.0~18.0	L ≤40→D-V ≥2 40.1≤L≤80→D-V≥4 80.1≤L≤100→D-V≥6	1.0~ 20.0 20.1~ 30.0 30.1~ 40.0 40.1~ 50.0 50.1~ 60.0 60.1~ 70.0 70.1~ 80.0 80.1~ 90.0 90.1~ 100.0	50 pcs.			
	20.5~30.0	0 2.0 2.6 3.0~28.0	L ≤50→D-V ≥2 50.1≤L≤100→D-V≥6	1.0~ 20.0 20.1~ 30.0 30.1~ 40.0 40.1~ 50.0 50.1~ 60.0 60.1~ 70.0 70.1~ 80.0 80.1~ 90.0 90.1~ 100.0				
	30.5~39.5	0 2.0 2.6 3.0~37.5	L ≤50→D-V ≥2 50.1≤L≤100→D-V≥6	1.0~ 20.0 20.1~ 30.0 30.1~ 40.0 40.1~ 50.0 50.1~ 60.0 60.1~ 70.0 70.1~ 80.0 80.1~ 90.0 90.1~ 100.0	20 pcs.			
	40.0~50.0	0 2.0 2.6 3.0~48.0	L ≤50→D-V ≥2 50.1≤L≤100→D-V≥6	1.0~ 20.0 20.1~ 30.0 30.1~ 40.0 40.1~ 50.0 50.1~ 60.0 60.1~ 70.0 70.1~ 80.0 80.1~ 90.0 90.1~ 100.0				

Common Machining Conditions: (1) L≤Vx8; (2) DWSSS (1.4301/X5CrNi18-10) L≥2

Order Example

Part Number	-	D	-	V	-	L
DWSSS	-	D35.5	-	V12.5	-	L58.4

Days to Ship: 8 Days

Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- D4~15.5

Volume Discount (Round down to one Cent.) P.88

Quantity	2~9	10~39	40~69	70~100
Discount rate	€ Unit Price	5%	10%	15%

- D16~30

Volume Discount (Round down to one Cent.) P.88

Quantity	2~9	10~29	30~39	40~50
Discount rate	€ Unit Price	5%	10%	15%

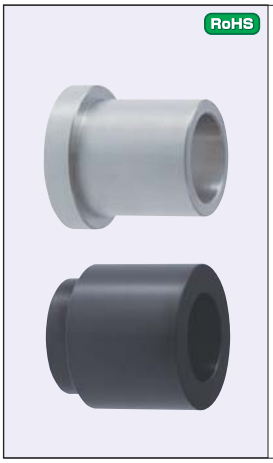
- D30.5~50

Volume Discount (Round down to one Cent.) P.88

Quantity	2~4	5~9	10~14	15~20
Discount rate	€ Unit Price	5%	10%	15%

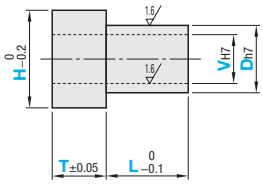
Stepped Spacers

CAD Data

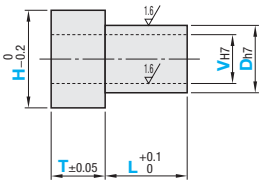


Type	L Tolerance	Material	Surface Treatment
DCLB	0 -0.1	1.1191/C45E	Black Oxide
DCLM		1.1191/C45E	Electroless Nickel Plating
DCLS		1.4301/X5CrNi18-10	-
MCLB	+0.1 0	1.1191/C45E	Black Oxide
MCLM		1.1191/C45E	Electroless Nickel Plating
MCLS		1.4301/X5CrNi18-10	-

■L Tolerance 0 -0.1



■L Tolerance +0.1 0



6.3 (1.6)

Circumference C0.5 or less

Part Number	Dh7 0.5mm Increment	VH7 0.5mm Increment	H 0.5mm Increment	T 0.1mm Increment	L 0.1mm Increment	€ Unit Price L Tolerance -0.1~0 DCLB	DCLM	DCLS	€ Unit Price L Tolerance 0~+0.1 MCLB	MCLM	MCLS
L Tolerance 0~-0.1 DCLB DCLM DCLS / L Tolerance +0.1~0 MCLB MCLM MCLS	5.0~10.0	2.0~8.0 (V≤D-2)	7.0~16.0 (D+2≤H≤D+6)	1.0~20.0	1.0~5.0						
					5.1~10.0						
					10.1~25.0						
					25.1~40.0						
					40.1~50.0						
	10.5~20.0	2.0~18.0 (V≤D-2)	12.5~26.0 (D+2≤H≤D+6)		1.0~5.0						
					5.1~10.0						
					10.1~25.0						
					25.1~40.0						
					40.1~50.0						
	20.5~30.0	2.0~28.0 (V≤D-2)	22.5~40.0 (D+2≤H≤D+10)		1.0~20.0						
					20.1~30.0						
					30.1~40.0						
					40.1~50.0						
	30.5~540.0	6.0~36.0 (V≤D-4)	32.5~50.0 (D+2≤H≤D+10)		1.0~20.0						
					20.1~30.0						
					30.1~40.0						
					40.1~50.0						
	40.5~50.0	10.0~44.0 (V≤D-6)	42.5~60.0 (D+2≤H≤D+10)		1.0~20.0						
					20.1~30.0						
					30.1~40.0						
					40.1~50.0						

For common machining conditions: (1) L+T≤Vx8; (2) V≥8 and L+T≥Vx4, intermediate clearance is added.

Order Example

Part Number	-	D	-	V	-	H	-	T	-	L
DCLS	-	D25.5	-	V12.5	-	H33.5	-	T10.7	-	L40.2

Days to Ship: 8 Days

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

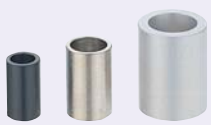
■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Add. Spec. Metal Collars

-L Dimension Standard · L Dimension Configurable · Standard Class · Precision Class-



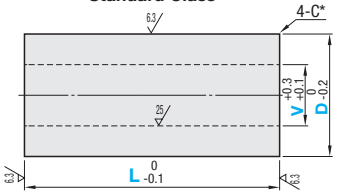
RoHS

Type			M Material	S Surface Treatment	H Hardness
L Dimension Standard Type	L Dimension Configurable Type				
Standard Class		Precision Class			
-	NCLC	ACSC	1.1191/C45E	-	-
KNCLB	NCLB	ABSC		Black Oxide	
KNCLM	NCLM	AMSC	1.1191/C45E	Electroless Nickel Plating	-
-	NCLA	AASC	EN AW-2017/AlCu4MgSi	Clear Anodize	-
KNCLSS	NCLSS	SASC	1.4301/X5CrNi18-10	-	-
-	NCLCH	ASH	1.1191/C45E	-	45~50HRC
	NCLBH	ASC		Black Oxide	
	NCLMH	PASC		Electroless Nickel Plating	
-	NCLSSH	SASCH	1.4031/X38Cr13	-	

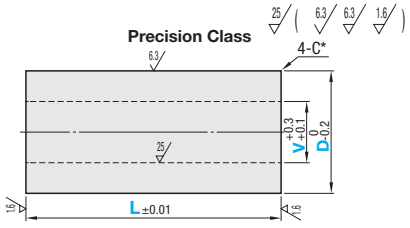
Depending on thickness and length, 1.1191/C45E hardened type may be less than 45HRC.
Stainless Steel Hardening Type may be discolored due to hardening.

* D=16 or less, C0.1~0.2
D=20 or more, C0.5 or less

Standard Class



Precision Class



■L Dimension Standard Type–Standard Class–

Part Number Type	V	D Selection												L Selection
KNCLB KNCLM KNCLSS	3	5	6	8	10	12								10 12 15 20 25 30 35
	4		6	8	10	12	13	14	15	16	20			
	5			8	10	12	13	14	15	16	20			
	6			8	10	12	13	14	15	16	20	25		
	8				10	12	13	14	15	16	20	25	30	
	10					12	13	14	15	16	20	25	30	
	12								15	16	20	25	30	
	15										20	25	30	
	16										20	25	30	
	20											25	30	
	25												30	

Order Example

Part Number	-	D	-	L
KNCLB3	-	5	-	10

Price

- L-Dimension Standard Type

■Volume Discount (R ound down to one Cent.) P.88

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- L-Dimension Standard Type

6 Days P.88

Part Number Type	D	€ Unit Price L10	L12	L15	L20	L25	L30	L35
KNCLB	5							
	6							
	8							
	10							
	12							
	13							
	14							
	15							
	16							
	20							
	25							
	30							

Part Number Type	D	€ Unit Price L10	L12	L15	L20	L25	L30	L35
KNCLM	5							
	6							
	8							
	10							
	12							
	13							
	14							
	15							
	16							
	20							
	25							
	30							

Part Number Type	D	€ Unit Price L10	L12	L15	L20	L25	L30	L35
KNCLSS	5							
	6							
	8							
	10							
	12							
	13							
	14							
	15							
	16							
	20							
	25							
	30							

The prices are based on the outer diameters (D).

■L Dimension Configurable Type –Standard Class · Precision Class–

Part Number Type	V	D Selection	L Standard Class: 0.5mm Increment Precision Class: 0.1mm Increment	€ Unit Price													
				Standard Class							Precision Class						
				NCLC	NCLM	NCLB NCLCH	NCLA NCLBH	NCLMH	NCLSS	NCLSSH	ACSC	AMSC	ABSC ASH	AASC ASC	PASC	SASC	SASCH
–Standard Class– NCLC NCLB NCLM NCLA NCLSS NCLCH NCLBH NCLMH NCLSSH	2	4 5 6 8 10	10.0~ 16.0														
	3	5 6 8 10 12	10.0~ 25.0														
			25.1~ 50.0														
	4 5 6	(6) 8 10 12 13 14 15 16 ※(6)···Applicable when V4.	10.0~ 25.0														
			25.1~ 50.0														
		20 25	10.0~ 25.0														
			25.1~ 50.0														
	8 10 12	(10) (12) (13) (14) 15 16 ※(10)···Applicable to V8.※(12 13 14)···Applicable to V8, 10	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
		20 25	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
		30 35	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
	10 12	40 50 60	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
–Precision Class– ACSC ABSC AMSC AASC SASC ASH ASC PASC SASCH	15 16 20	(20) 25 ※(20)···Applicable when V15, 16.	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
		30 35	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
		40 50 60	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
	25	30 35	10.0~ 25.0														
			25.1~ 50.0														
			50.1~ 75.0														
			75.1~ 100.0														
	25 30	40 50 60	10.0~ 25.0														
			25.1~ 50.0														
			50.1~75.0														
			75.1~ 100.0														

Order Example

Part Number	-	D	-	L
NCLB3	-	5	-	10.5

Price

- L Dimension Configurable Type

■Volume Discount (※Round down to one Cent.) P.88

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

※For orders larger than indicated quantity, please request a quotation.

Days to Ship

- L Dimension Configurable Type Materials: 1.1191/C45E · 1.4301/X5CrNi18-10

8 Days | Express A | 2,00 EUR/ piece | P.88

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

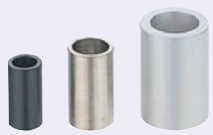
- L Dimension Configurable Type Materials: 1.4031/X38Cr13 · 1.4031/X38Cr13

10 Days | Express B | 2,00 EUR/ piece | P.88

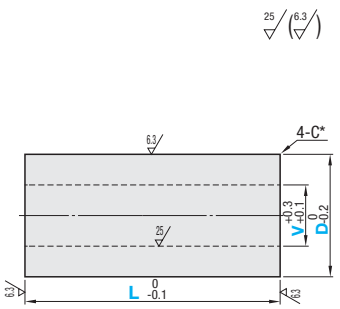
※A Express Charge of 5,40 EUR for 3 or more identical pieces.

Metal Collars
-Standard Class Dimension Configurable-

RoHS



Part Number / Standard Class	Material No.	M Material	S Surface Treatment	H Hardness
FNCL	(1)	1.0038/S235JR	-	-
FNCLC	(2)	1.1191/C45E	-	-
FNCLB	(3)		Black Oxide	
FNCLM	(4)		Electroless Nickel Plating	
FNCLR	(5)		LTBC Plating	
FNCLBB	(6)	CW614N/CuZn39Pb3 Brass (JIS)	-	-
FNCLA	(7)	EN AW-2017/ AlCu4MgSi	Clear Anodize	-
FNCLAB			Black Anodize	
FNCLSS	(8)	1.4301/X5CrNi18-10	-	-
FNCLSSR	(9)		LTBC Plating	
FNCLCH	(10)	1.1191/C45E	-	45~50HRC
FNCLBH	(11)		Black Oxide	
FNCLMH	(12)		Electroless Nickel Plating	
FNCSK	(13)	1.2510/ 100MnCrW4	-	55HRC~
FNCSKB	(14)		Black Oxide	
FNCSKM	(15)		Electroless Nickel Plating	
FNCLSH	(16)	1.4031/X38Cr13	-	45~50HRC
FNCLSHR	(17)		LTBC Plating	



* D=16 or less, C0.1~0.2
D=16.5 or more; C0.5 or less

Machining Conditions
* 1 Machining Limits of Collar Thickness and Overall Length
10.0≤L≤50.0⋯› (D−V)/2≥1
50.5≤L≤100.0⋯› (D−V)/2≥3
* 2 Machining Limits of Collar Thickness and Overall Length
4≤D≤10⋯› V≤D−2
10.5≤D≤30⋯› V≤D−4
31≤D≤60⋯› V≤D−6
61≤D≤80⋯› V≤D−8
81≤D≤100⋯› V≤D−10
* 3 Machining Limits of V and Overall Length
L≤Vx8

Stainless Steel Hardening Type may be discolored due to hardening.
LTBC may not be available for the inner diameter of a collar.

Standard Class

Part Number	V 0.5mm Increment (V 3 or more)	D	L 0.5mm Increment	€ Unit Price (1) FNCL	(2) FNCLC	(3) FNCLB	(4) FNCLM	(5) FNCLR	(6) FNCLBB	(7) FNCLA FNCLAB	(8) FNCLSS	(9) FNCLSSR
FNCL FNCLC FNCLB FNCLM FNCLR FNCLBB FNCLA FNCLAB FNCLSS FNCLSSR	(Selection) 2.0 2.6 (0.5mm Increment) 3.0~90.0	4.0~10.0 (0.5mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~ 100.0						⊗	⊗		
		10.5~20.0 (0.5mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
		21~30 (1mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~ 100.0									
		31~40 (1mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~ 100.0									
		41~50 (1mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
		51~60 (1mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~ 100.0									
		61~80 (1mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0							⊗		
		81~100 (1mm Increment)	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0							⊗		

* Numbers ((1)~(9)) indicate material No.

Machining Conditions *1, *2, *3

Order Example: Part Number FNCLB - V V10.5 - D D19.5 - L L50.5

Price - Standard Class

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Days to Ship - Standard Class Materials: 1.0038 · 1.1191 · 1.4301 · Brass
8 Days | Express A | 2,00 EUR/ piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Days to Ship - Standard Class Materials: EN AW-2017/AlCu4MgSi · LTBC
10 Days | Express B | 2,00 EUR/ piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Service is not available for LTBC plating.

Alterations P.122

■Standard Class (Hardening)

Part Number	V 0.5mm Increment (V 3 or more)	D	L 0.5mm Increment	€ Unit Price (10) FNCLCH	(11) FNCLBH	(12) FNCLMH	(13) FNCSK	(14) FNCSKB	(15) FNCSKM	(16) FNCLSH	(17) FNCLSHR
FNCLCH FNCLBH FNCLMH FNCSK FNCSKB FNCSKM FNCLSH FNCLSHR	(Selection) 2.0 2.6 (0.5mm Increment) 3.0~90.0	4.0~10.0 (0.5mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								
		10.5~20.0 (0.5mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								
		21~30 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								
		31~40 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								
		41~50 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								
		51~60 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								
		61~80 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								
		81~100 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~ 100.0								

* Numbers ((10)~(17)) indicate material No.

(?)Machining Conditions *1, *2, *3 (Refer to P.121)

Order Example

Part Number	-	V	-	D	-	L
FNCLCH	-	V10.5	-	D19.5	-	L50.5

Price

- Standard Class (Hardening)

■Volume Discount ((?)Round down to one Cent.) P.88

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

(?)For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Standard Class (Hardening) Material: 1.1191 · 1.2510

8 Days — Express A — 2,00 EUR/piece — P.88

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Standard Class (Hardening) Materials: 1.4031/X38Cr13 · LTBC

10 Days — Express B — 2,00 EUR/piece — P.88

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.
⊗Express Service is not available for LTBC plating.

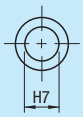
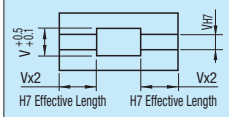
Alterations

Part Number	-	V	-	D	-	L	-	(VKC / DKC / HKC)
FNCLB	-	V10.5	-	D45	-	L70.5	-	VKC

· Materials: 1.0038 · 1.1191 · 1.4301 (Except hardened products)
8 Days ⊗Express Serviceis not available.

· Materials: EN AW-2017 · LTBC
10 Days ⊗Express Serviceis not available.

(?)When both Inner and Outer Diameter Tolerance Changes are specified, the concentricity is Ø0.02. ⊗Not available for the Hardening (H)Products with hardness indications) or Black Anodized Products.

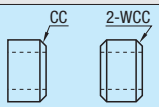
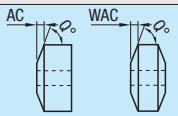
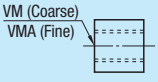
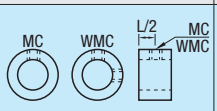
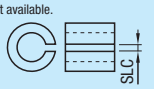
Alteration	Code	Spec.	Price Adder
Inner Ø Tolerance 	VKC	Changes the inner diameter tolerance to H7. Ordering Code VKC Machining Conditions (?)When V≥8 and L≥Vx5, adds a relief at the center as shown below.  (?)D≥6V≥3	4,00

D	D-V
6~10	D–V≥2
10.5~20	D–V≥3
21~30	D–V≥6
31~40	D–V≥8
41~50	D–V≥10
51~60	D–V≥12
61~70	D–V≥14
71~80	D–V≥16
81~90	D–V≥18
91~100	D–V≥20

Alteration	Code	Spec.	Price Adder
Outer Ø Tolerance 	DKC (g6) HKC (h7)	Changes the outer diameter tolerance to g6 or h7. Ordering Code DKC / HKC Machining Conditions (?)D≥6	5,00

D	D-V
6~10	D–V≥2
10.5~20	D–V≥3
21~30	D–V≥6
31~40	D–V≥8
41~50	D–V≥10
51~60	D–V≥12
61~70	D–V≥14
71~80	D–V≥16
81~90	D–V≥18
91~100	D–V≥20

(?)Not available for the Hardening (H)Products with hardness indications) or Black Anodized Products.

Alterations	C Chamfering (1-One Side Both Sides)	Taper (1-One Side Both Sides)	Tapping	Set Screw Hole Alteration (1-set 2-set)	Slitting
					(?)Combination with other alteration is not available. 
Code	CC / WCC	AC / WAC	VM (Coarse) VMA (Fine)	MC / WMC	SLC
Spec.	Chamfers C plane. Ordering Code CC1.5 WCC2.5 (?)CC / WCC=0.5mm Increment (?)CC / WCC<(D–V)/2	Adds a taper. Ordering Code AC3.5-Q60 WAC5.0-Q30 (?)AC, WAC=0.5mm Increment (?)Q=Selection from 15, 20, 30 and 60 (?)AC≤L–5	Adds a tapped hole (Through). Ordering Code VM4: Specify VM or VMA instead of V. Ex: FNCL-VMA4-D10-L18 (?)For the Machining Limits of tap dia. and full length (L), see the table below. Tap diameter ≤ D/2	Adds a tapped hole (coarse thread) at D part. Ordering Code MC3 WMC5 (?)Condition of thickness (D–V)/2: as table below. (?)L ≥ MC / WMCx3 (?)MC / WMC=Select from table below.	Adds a slit. Ordering Code SLC (?)Condition of thickness (D–V)/2: as table below. (?)Slit width is fixed. (?)D, V and L Dimension tolerances are the values before alteration. They may change after alteration depending on materials.

Female Thread Hole Ø	VM Pitch (Coarse)	VMA Pitch (Fine)	L max
4	0.7	0.5	20
5	0.8		30
6	1.0	0.75	35
8	1.25	1.0	40
10	1.5		50
12	1.75		55
16	2.0	1.5	90
18	-		100
20	2.5		

MC / WMC	(D–V)/2
3, 4	3 or More
5, 6, 8	5 or More
10, 12	8 or More

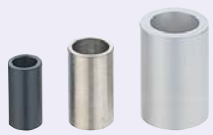
Outer Ø D	SLC	(D–V)/2
10.0~20.0	1	5 or Less
20.5~40	2	10 or Less
41~	3	20 or Less

Price Adder												
CC	1,00	AC	2,00	Female Thread Hole Ø	VM, VMA	Female Thread Hole Ø	MC	WMC	3,00
WCC	2,00	WAC	4,00	4 · 5 · 6 · 8	2,00	3 · 4 · 5 · 6	1,50	2,00	
				10 · 12 · 16 · 18 · 20	3,00	8 · 10 · 12	2,00	3,00	

Metal Collars

-Precision Class Dimension Configurable-

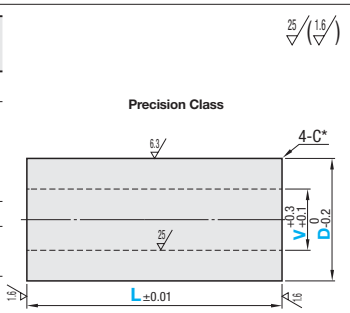
RoHS



* 1 Machining Limits of Collar Thickness and Overall Length
  10.0≤L≤50.0⋯› (D-V)/2≥1
  50.5≤L≤100.0⋯› (D–V)/2≥3
* 2 Machining Limits of Collar Thickness and Overall Length (Materials: EN AW-2017/AlCu4MgSi / 1.2510/100MnCrW4 / Brass)
  4≤D≤10⋯› V≤D–2
  10.5≤D≤30⋯› V≤D–4
  31≤D≤60⋯› V≤D–6
  61≤D≤80⋯› V≤D–8
  81≤D≤100⋯› V≤D–10
* 3 Machining Limits of V and Overall Length
  L≤Vx8

Part Number / Precision Class	Material No.	M Material	S Surface Treatment	H Hardness
FAC	(1)	1.0038/ S235JR	-	-
FACS	(2)	1.1191/C45E	-	-
FABSC	(3)		Black Oxide	
FAMSC	(4)		Electroless Nickel Plating	
FARSC	(5)		LTBC Plating	
FAASC	(6)	EN AW-2017	Clear Anodize	-
FSASC	(7)	1.4301/ X5CrNi18-10	-	-
FSASCR	(8)		LTBC Plating	
FAS	(9)	1.1191/C45E	-	45~50HRC
FASC	(10)		Black Oxide	
FPASC	(11)		Electroless Nickel Plating	
FASK	(12)	1.2510/ 100MnCrW4	-	55HRC~
FASKB	(13)		Black Oxide	
FASKM	(14)		Electroless Nickel Plating	
FSASCH	(15)	1.4031/ X38Cr13	-	45~50HRC
FSASCHR	(16)		LTBC Plating	

Stainless Steel Hardening Type may be discolored due to hardening.
LTBC may not be available for the inner diameter of a collar.



■Precision Class

Part Number	V 0.5mm Increment (V 3 or more)	D	L 0.1mm Increment	€ Unit Price * Numbers ((1)~(8)) indicate material No.							
				(1) FAC	(2) FACS	(3) FABSC	(4) FAMSC	(5) FARSC	(6) FAASC	(7) FSASC	(8) FSASCR
FAC FACS FABSC FAMSC FARSC FAASC FSASC FSASCR	(Selection) 2.0 2.6 (0.5mm Increment) 3.0~90.0	4.0~10.0 (0.5mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		10.5~20.0 (0.5mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		21~30 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		31~40 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		41~50 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		51~60 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		61~80 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		81~100 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								

Machining Conditions *1, *2, *3 No specification available for sizes without declaration of value.

Order Example

Part Number	-	V	-	D	-	L
FACS		- V10.5		- D19.5		- L50.5

Price

- Precision Class
- Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Precision Class Materials: 1.0038 · 1.1191 · 1.4301

8 Days | Express A | 2,00 EUR/ piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Precision Class Materials: EN AW-2017 · LTBC

10 Days | Express B | 2,00 EUR/ piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Service is not available for LTBC plating.

Alterations P.124

■Precision Class (Hardening)

Part Number	V 0.5mm Increment (V 3 or more)	D	L 0.1mm Increment	€ Unit Price (9) FAS	(10) FASC	(11) FPASC	(12) FASK	(13) FASKB	(14) FASKM	(15) FSASCH	(16) FSASCHR
FAS FASC FPASC FASK FASKB FASKM FSASCH FSASCHR	(Selection) 2.0 2.6 (0.5mm Increment) 3.0~90.0	4.0~10.0 (0.5mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
		10.5~20.0 (0.5mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		21~30 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		31~40 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		41~50 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		51~60 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		61~80 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~ 100.0								
		81~100 (1mm Increment)	10.0~ 25.0								
			25.1~ 50.0								
			50.1~ 75.0								
			75.1~100.0								

* Numbers ((9)~(16)) indicate material No.

(Machining Conditions *1, *2, *3 (Refer to P.123) (No specification available for sizes without declaration of value.

Order Example

Part Number	-	V	-	D	-	L
FASKM	-	V10.5	-	D19.5	-	L50.5

Price

- Precision Class (Hardening)

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

(For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Precision Class (Hardening) Materials: 1.1191/C45E · 1.2510/100MnCrW4

8 Days — Express A — 2,00 EUR/piece — P.88

(A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Precision Class (Hardening) Materials: 1.4031/X38Cr13 · LTBC

10 Days — Express B — 2,00 EUR/piece — P.88

(A Express Charge of 5,40 EUR for 3 or more identical pieces.
⊗Express Service is not available for LTBC plating.

Alterations

Part Number	-	V	-	D	-	L	- (VKC · DKC · HKC)
FSASC	-	V10.5	-	D45	-	L70.5	- VKC

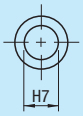
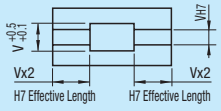
- Materials: 1.0038S235JR · 1.1191/C45E · 1.4301/X5CrNi18-10 (Except hardened products)

8 Days ⊗Express Service is not available.

- Materials: EN AW2017 · LTBC

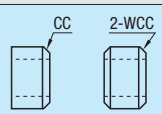
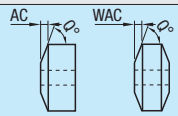
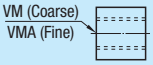
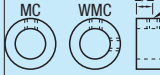
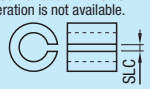
10 Days ⊗Express Service is not available.

(When both Inner and Outer Diameter Tolerance Changes are specified, the concentricity is Ø0.02. ⊗Not available for the Hardening Products. (H Products with hardness indications)

Alteration	Code	Spec.	Price Adder
Inner Diameter Tolerance 	VKC	Changes the inner diameter tolerance to H7. Ordering Code VKC Machining Conditions (When V≥8 and L≥Vx5, adds a relief at the center as shown below.  (D≥6 V≥3	D | D-V 6~10 | D−V≥2 10.5~20 | D−V≥3 21~30 | D−V≥6 31~40 | D−V≥8 41~50 | D−V≥10 51~60 | D−V≥12 61~70 | D−V≥14 71~80 | D−V≥16 81~90 | D−V≥18 91~100 | D−V≥20	4,00

Alteration	Code	Spec.	Price Adder
Outer Diameter Tolerance 	DKC (g6) HKC (h7)	Changes the outer diameter tolerance to g6 or h7. Ordering Code DKC · HKC Machining Conditions (D≥6	D | D-V 6~10 | D−V≥2 10.5~20 | D−V≥3 21~30 | D−V≥6 31~40 | D−V≥8 41~50 | D−V≥10 51~60 | D−V≥12 61~70 | D−V≥14 71~80 | D−V≥16 81~90 | D−V≥18 91~100 | D−V≥20	5,00

(Not available for the Hardening Products. (H Products with hardness indications)

Alterations	C Chamfering (1-One Side Both Sides)	Taper (1-One Side Both Sides)	Tapping	Set Screw Hole Alteration (1-set 2-set)	Slitting
					(Combination with other alteration is not available. 
Code	CC · WCC	AC · WAC	VM (Coarse) VMA (Fine)	MC · WMC	SLC
Spec.	Chamfers C plane. Ordering Code CC1.5 WCC2.5 (CC · WCC=0.5mm Increment (CC · WCC<(D−V)/2	Adds a taper. Ordering Code AC3.5-Q60 WAC5.0-Q30 (AC, WAC=0.5mm Increment (Q=Selection from 15, 20, 30 and 60 (AC≤L−5	Adds a tapped hole (Through). Ordering Code VM4: Specify VM or VMA instead of V. Ex: FNCL-VMA4-D10-L18 (For the Machining Limits of tap dia. and full length (L), see the table below. Tap diameter ≤ D/2 Female Thread Hole Diameter VM · VMA | VM Pitch (Coarse) | VMA Pitch (Fine) | L max 4 | 0.7 | 0.5 | 20 5 | 0.8 | 30 6 | 1.0 | 0.75 | 35 8 | 1.25 | 40 10 | 1.5 | 1.0 | 50 12 | 1.75 | 55 16 | 2.0 | 90 18 | - | 1.5 | 100 20 | 2.5	Adds a tapped hole (coarse thread) at D part. Ordering Code MC3 WMC5 (Condition of thickness (D−V)/2: as table below. (L ≥ MC / WMCx3 (MC · WMC=Select from table below. MC · WMC | (D-V)/2 3 · 4 | 3 or More 5 · 6 · 8 | 5 or More 10 · 12 | 8 or More	Adds a slit. Ordering Code SLC (Condition of thickness (D−V)/2: as table below. (Slit width is fixed. Outer Diameter D | SLC | (D-V)/2 10.0~20.0 | 1 | 5 or Less 20.5~40 | 2 | 10 or Less 41~ | 3 | 20 or Less (D, V and L dimension tolerances are the values before alteration. They may change after alteration depending on materials.
Price Adder	CC 1,00 WCC 2,00	AC 2,00 WAC 4,00	Female Thread Hole Diameter | VM · VMA 4 · 5 · 6 · 8 | 2,00 10 · 12 · 16 · 18 · 20 | 3,00	Female Thread Hole Diameter | MC | WMC 3 · 4 · 5 · 6 | 1,50 | 2,00 8 · 10 · 12 | 2,00 | 3,00	3,00

Metal Collars

-Inner and Outer Dia. Tolerance Selectable · Dimension Configurable · Standard / Precision-



Part Number		Material	Surface Treatment
Standard Class	Precision Class		
SNCC	SNMC	1.1191/C45E	-
SNCB	SNMB		Black Oxide
SNCM	SNMM		Electroless Nickel Plating
SNCS	SNMS	1.4301/X5CrNi18-10	-

D	D Tolerance			
	G	H	N	X
	g6	h7	-	-
5.0~8.5	-	-	-0.1 -0.3	0 -0.2
9.0~10.0	-0.005 -0.014	0 -0.015		
10.5~18.0	-0.006 -0.017	0 -0.018		
18.5~30	-0.007 -0.020	0 -0.021		
31~50	-0.009 -0.025	0 -0.025		
51~60	-0.010 -0.029	0 -0.030		

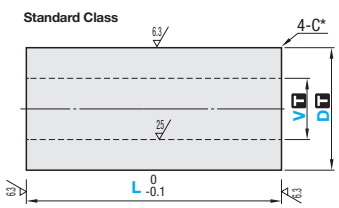
V	V Tolerance		
	H	N	X
	H7	-	-
3.0	+0.010 0	+0.3 +0.1	+0.2 0
3.5~6.0	+0.012 0		
6.5~10.0	+0.015 0		
10.5~18.0	+0.018 0		
18.5~30.0	+0.021 0		
30.5~50.0	+0.025 0		
50.5~58.0	+0.030 0		

■Inner and Outer Dia. Tolerance Price No. List

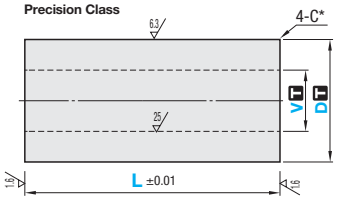
D (Outer Dia.)	V (Inner Dia.)	Price No.
G	H	(2)
	N	(1)
	X	(1)
H	H	(2)
	N	(1)
	X	(1)
N	H	(1)
	N	(3)
	X	(3)
X	H	(1)
	N	(3)
	X	(3)

- Guide to Price List
<Ex.> When ordering: Material 1.1191/C45E, Outer Dia. g6, Inner Dia. H7 and L Tolerance ± 0.01
Product Number: SNMC–GH–V4.0–D10.0–L10.0
1. Check the Inner and Outer Dia. Tolerance Price No. List.
(GH is Price No. (2))
2. Find the column of inner and outer tolerance price No. (2) shown in the price list of precision class.
3. From D / L dimension, the price is 12,90 EUR

Standard Class



Precision Class



* D=16 or less, C0.1~0.2
D=16.5 or more; C0.5 or less

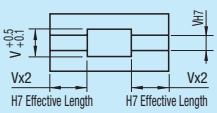
■Standard Class

Part Number	D Tolerance Selection	V Tolerance Selection	V 0.5mm Increment	D	L 0.5mm Increment	€ Unit Price SNCC Tolerance (1)	SNCC Tolerance (2)	SNCC Tolerance (3)	SNCB Tolerance (1)	SNCB Tolerance (2)	SNCB Tolerance (3)	SNCM Tolerance (1)	SNCM Tolerance (2)	SNCM Tolerance (3)	SNCS Tolerance (1)	SNCS Tolerance (2)	SNCS Tolerance (3)
SNCC SNCB SNCM SNCS	G H N X	H N X	3.0~58.0 (V≤D-2) ※ Refer to the following.	5.0~10.0 0.5mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 64.0												
				10.5~20.0 0.5mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				21~30 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				31~40 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				41~50 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				51~60 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												

※ D ≥9 is applicable when G or H is selected as the tolerance values of D and V. The dimension range of V is shown in the table below.

D	V
9~30	D–V≥6
31~60	D–V≥12

※ Machining Limits of V and Overall Length
※ When H is selected as the tolerance values of D and V, and L≥Vx4 when V≥8, a middle relief is added.
L≤Vx8



Order Example

Part Number - Tolerance Selection - V - D - L
D V
SNCS - G H - V10.0 - D25 - L50.5

Price

- Standard Class
■Volume Discount (※Round down to one Cent.) P.88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

※For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Standard Class
8 Days | Express A | 2,00 EUR/ piece | P.88
※A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations P.126

Precision Class

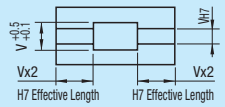
Part Number	D Tolerance Selection	V Tolerance Selection	V 0.5mm Increment	D	L 0.5mm Increment	€ Unit Price SNMC Tolerance (1)	SNMC Tolerance (2)	SNMC Tolerance (3)	SNMB Tolerance (1)	SNMB Tolerance (2)	SNMB Tolerance (3)	SNMM Tolerance (1)	SNMM Tolerance (2)	SNMM Tolerance (3)	SNMS Tolerance (1)	SNMS Tolerance (2)	SNMS Tolerance (3)
SNMC SNMB SNMM SNMS	G H N X	H N X	3.0~58.0 (V≤D-2) ⓘ Refer to the following.	5.0~10.0 0.5mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 64.0												
				10.5~20.0 0.5mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				21~30 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				31~40 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				41~50 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												
				51~60 1mm Increment	10.0~ 25.0												
					25.5~ 50.0												
					50.5~ 75.0												
					75.5~100.0												

ⓘ D ≥9 is applicable when G or H is selected as the tolerance values of D and V. The dimension range of V is shown in the table below.

D	V
9~30	D–V≥6
31~60	D–V≥12

ⓘ Machining Limits of V and Overall Length

ⓘ When H is selected as the tolerance values of D and V, and L≥Vx4 when V≥8, a middle relief is added. L≤Vx8



Order Example

Part Number - Tolerance Selection (D V) - V - D - L

SNMS - G H - V10.0 - D25 - L50.5

Price - Precision Class

Volume Discount (ⓘ Round down to one Cent.) P.88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

ⓘ For orders larger than indicated quantity, please request a quotation.

Days to Ship - Precision Class

8 Days | Express A | 2,00 EUR/ piece | P.88

ⓘ A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations Order Example

Part Number - Tolerance Selection (D V) - V - D - L - (LCB · LCC · LCD · LCE) - Standard Class (LSB · LSC · LSD · LSE) - Precision Class

SNCS - G H - V10.0 - D25 - L50.0 - LCB

Alterations	Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Code	LCB	LCC	LCD	LCE
Standard Class L Tolerance	Changes L Tolerance (T) L 0 -0.1 -0.2	Changes L Tolerance (T) L +0.3 +0.1	Changes L Tolerance (T) L 0 -0.2	Changes L Tolerance (T) L +0.2 0
ⓘ Available for Standard Class	Ordering Code LCB	Ordering Code LCC	Ordering Code LCD	Ordering Code LCE
Price Adder	0,80	0,80	0,80	0,80

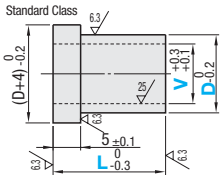
Alterations	Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Code	LSB	LSC	LSD	LSE
Precision Class L Tolerance	Changes L Tolerance (T) L -0.01 -0.03	Changes L Tolerance (T) L +0.03 +0.01	Changes L Tolerance (T) L 0 -0.02	Changes L Tolerance (T) L +0.02 0
ⓘ Available for Precision Class	Ordering Code LSB	Ordering Code LSC	Ordering Code LSD	Ordering Code LSE
Price Adder	1,00	1,00	1,00	1,00

Metal Collars
-Flanged / Standard / Precision Class-



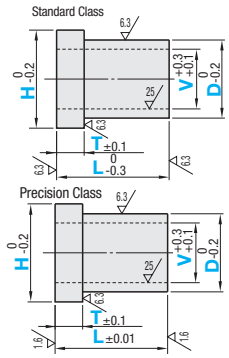
Type			M Material	S Surface Treatment	H Hardness
Standard	Configurable				
Standard Class		Precision Class			
-	FTCLS	-	1.0038/S235JR	-	-
-	FTCLC	FTCLMC	1.1191/C45E	-	-
TCLB	FTCLB	FTCLMB		Black Oxide	
TCLM	FTCLM	FTCLMM		Electroless Nickel Plating	
-	FTCLBB	-	CW614N/CuZn39Pb3 Brass (JIS)	-	-
TCLA	FTCLA	-	EN AW2017/AlCu4MgSi	Clear Anodize	-
-	FTCLAB			Black Anodize	
TCLSS	FTCLSS	-	1.4301/X5CrNi18-10	-	-
-	FTCLCH	-	1.1191/C45E	-	45~50HRC
	FTCLBH			Black Oxide	
	FTCLMH			Electroless Nickel Plating	
-	FTCLSK	-	1.2510/100MnCrW4	-	55HRC~
-	FTCLSH	FTCMSH	1.4031/X38Cr13	-	45~50HRC

Standard Type



Circumference C0.5 or less

Dimension Configurable Type



RoHS

Depending on thickness and length, 1.1191/C45E hardened type may be less than 45HRC.
Stainless Steel Hardening Type may be discolored due to hardening.

■Standard Type Standard Class

Part Number Type	V	D Selection	L 0.1mm Increment
TCLB TCLM TCLA TCLSS	2	5 6 8 10	10.0~16.0
	3	5 6 8 10 12	
	4	6 8 10 12 13 14 15 16 20	10.0~50.0
	5	8 10 12 13 14 15 16 20	
	6	8 10 12 13 14 15 16 20 25	
	8	10 12 13 14 15 16 20 25 30	
	10	12 13 14 15 16 20 25 30 35 40 50	
	12	15 16 20 25 30 35 40 50	
	15	20 25 30 35 40 50 60	10.0~100.0
	16	20 25 30 35 40 50 60	
	20	25 30 35 40 50 60	
	25	30 35 40 50 60	
	30	40 50 60	

Part Number Type	V	€ Unit Price L10.0~25.0	25.1~50.0	50.1~75.0	75.1~100.0
TCLB	2				
	3 4 5				
	6				
	8 10				
	12				
	15				
	16				
	20				
	25				
	30				
TCLM	2				
	3 4 5				
	6				
	8 10				
	12				
	15				
	16				
	20				
	25				
	30				

Part Number Type	V	€ Unit Price L10.0~25.0	25.1~50.0	50.1~75.0	75.1~100.0
TCLA	2				
	3 4 5				
	6				
	8				
	12				
	15				
	16				
	20				
	25				
	30				
TCLSS	2				
	3 4 5				
	6				
	8 10				
	12				
	15				
	16				
	20				
	25				
	30				

Order Example: Part Number - D - L
TCLB10 - 20 - 60.0

Days to Ship: - Standard Type Standard Class Materials: 1.1191/C45E · 1.4301/X5CrNi18-10 · Brass
8 Days | Express A | 2,00 EUR/ piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Days to Ship: - Standard Type Standard Class Material: EN AW-2017/AlCu4MgSi
10 Days | Express B | 2,00 EUR/ piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- Standard Type Standard Class
■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Dimension Configurable Type Standard Class

Part Number	V 0.5mm Increment (V=3 or more)	D	H	T 1 mm Increment	L 0.1mm Increment	€ Unit Price FTCLS	FTCLC	FTCLB	FTCLM FTCLBB	FTCLA	FTCLAB FTCLSS	FTCLCH	FTCLBH	FTCLMH	FTCLSK	FTCLSH
FTCLS FTCLC FTCLB FTCLM FTCLBB FTCLA FTCLAB FTCLSS FTCLCH FTCLBH FTCLMH FTCLSK FTCLSH	(Selection) 2.0 2.6 (0.5mm Increment) 3.0~55.0	4.0~10.0 (0.5mm Increment)	6.0~20.0 (0.5mm Increment)	1~20 (T≤L-1) FTCLBB (2≤T≤L-2)	10.0~ 25.0											
					25.1~ 50.0											
					50.1~ 75.0											
					75.1~ 100.0											
		10.5~20 (0.5mm Increment)	12.5~30 (0.5mm Increment)		10.0~ 25.0											
					25.1~ 50.0											
					50.1~ 75.0											
					75.1~ 100.0											
		21~30 (1mm Increment)	23~40 (1mm Increment)		10.0~ 25.0											
					25.1~ 50.0											
					50.1~ 75.0											
					75.1~ 100.0											
		31~40 (1mm Increment)	33~50 (1mm Increment)		10.0~ 25.0											
					25.1~ 50.0											
					50.1~ 75.0											
					75.1~ 100.0											
		41~50 (1mm Increment)	43~60 (1mm Increment)		10.0~ 25.0											
					25.1~ 50.0											
					50.1~ 75.0											
					75.1~ 100.0											
		51~60 (1mm Increment)	53~70 (1mm Increment)		10.0~ 25.0											
					25.1~ 50.0											
					50.1~ 75.0											
					75.1~ 100.0											

D–V Machining Conditions
10.0≤L≤50.0⋯› (D-V)/2≥1
50.1≤L≤100.0⋯› (D–V)/2≥3

D–V Machining Conditions
(FTCLSK / FTCLBB)
4≤D≤10⋯› V≤D–2
10.5≤D≤30⋯› V≤D–4
31≤D≤60⋯› V≤D–6

H–D≥2 D/10≤L≤Vx8

Order Example: Part Number - V - D - H - T - L
FTCLB - V10.5 - D20 - H30 - T4 - L23.8

Days to Ship: - Dimension Configurable Type Standard Class
Materials: 1.0038 · 1.1191 · 1.4301 · 1.2510 · Brass
8 Days | Express A | 2,00 EUR/ piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Days to Ship: - Dimension Configurable Type Standard Class Materials: En AW-2017/AlCu4MgSi · 1.4031/X38Cr13
10 Days | Express B | 2,00 EUR/ piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- Dimension Configurable Type Standard Class
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Dimension Configurable Type Precision Class

Part Number	V 0.5mm Increment (V=3 or more)	D	H	T 0.5mm Increment	L 0.1mm Increment	€ Unit Price FTCLMC	FTCLMB	FTCLMM	FTCMSH
FTCLMC FTCLMB FTCLMM FTCMSH	(Selection) 2.0 2.6 (0.5mm Increment) 3.0~55.0	4.0~10.0 (0.5mm Increment)	6.0~20.0 (0.5mm Increment)	1.0~20.0	10.0~ 25.0				
					25.1~ 50.0				
					50.1~ 75.0				
					75.1~100.0				
		10.5~20 (0.5mm Increment)	12.5~30 (0.5mm Increment)	2.0~20.0	10.0~ 25.0				
					25.1~ 50.0				
					50.1~ 75.0				
					75.1~100.0				
		21~30 (1mm Increment)	23~40 (1mm Increment)	3.0~20.0	10.0~ 25.0				
					25.1~ 50.0				
					50.1~ 75.0				
					75.1~100.0				
		31~40 (1mm Increment)	33~50 (1mm Increment)		10.0~ 25.0				
					25.1~ 50.0				
					50.1~ 75.0				
					75.1~100.0				
		41~50 (1mm Increment)	43~60 (1mm Increment)		10.0~ 25.0				
					25.1~ 50.0				
					50.1~ 75.0				
					75.1~100.0				
		51~60 (1mm Increment)	53~70 (1mm Increment)		10.0~ 25.0				
					25.1~ 50.0				
					50.1~ 75.0				
					75.1~100.0				

? D–V Machining Conditions
4≤D≤10··· V≤D–2
10.5≤D≤30··· V≤D–4
31≤D≤60··· V≤D–6

? H–D≥2

? T≤L–1

? D/10≤L≤Vx8

Order Example: Part Number - V - D - H - T - L
FTCLMB - V10.5 - D20 - H30 - T4 - L23.8

Price - Dimension Configurable Type Precision Class
Volume Discount (?Round down to one Cent.) P88

Quantity	1~9	10~19	20~29	30~49
Discount rate	€ Unit Price	5%	10%	15%

?For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Dimension Configurable Type Precision Class Material: 1.1191/C45E
8 Days — Express A — 2,00 EUR/ piece P.88
?A Express Charge of 5,40 EUR for 3 or more identical pieces.

- Dimension Configurable Type Precision Class Material: 1.4031/X38Cr13
10 Days — Express B — 2,00 EUR/ piece P.88
?A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations

- Standard Class
Part Number - V - D - H - T - L - (TCB · TCC · TCD · TCE · CC · VM · (VMA) · MC · (WMC) · SLC · VKC)
FTCLB - V10.5 - D20 - H30 - T4 - L23.8 - TCB

- Precision Class
Part Number - V - D - H - T - L - (TSA · TSB · TSC · TSD · TSE · CC · VM · (VMA) · MC · (WMC) · SLC · VKC)
FTCLMB - V10.5 - D20 - H30 - T4 - L23.8 - TSB

- Materials 1.0038/S235JR · 1.4301/X5CrNi18-10 · 1.1191/C45E (except hardened products) · Brass
8 Days ⊗Express Serviceis not available.

⊗Not available for Standard Type. ⊗Not available for Anodized Products. ⊗Not available for the Hardening Products. (H Products with hardness indications)

Standard Class T Tolerance

Alterations	Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Code	TCB	TCC	TCD	TCE
	Changes Shoulder Thickness Tolerance (T). T -0.1 -0.3 Ordering Code TCB	Changes Shoulder Thickness Tolerance (T). T +0.3 +0.1 Ordering Code TCC	Changes Shoulder Thickness Tolerance (T). T 0 -0.2 Ordering Code TCD	Changes Shoulder Thickness Tolerance (T). T +0.2 0 Ordering Code TCE
Price Adder	1,00	1,00	1,00	1,00

?Available for Standard Class

Precision Class T Tolerance

Alterations	Shoulder Thickness Tolerance	Negative Tolerance	Positive Tolerance	Zero · Negative tolerance	Zero · Positive tolerance
Code	TSA	TSB	TSC	TSD	TSE
	Changes Shoulder Thickness Tolerance (T). T ±0.025 Ordering Code TSA	Changes Shoulder Thickness Tolerance (T). T -0.01 -0.06 Ordering Code TSB	Changes Shoulder Thickness Tolerance (T). T +0.06 +0.01 Ordering Code TSC	Changes Shoulder Thickness Tolerance (T). T 0 -0.05 Ordering Code TSD	Changes Shoulder Thickness Tolerance (T). T +0.05 0 Ordering Code TSE
Price Adder	1,20	1,20	1,20	1,20	1,20

?Available for Precision Class

Alterations

C Chamfering (1-One Side Both Sides)

Code: CC

Chamfers C plane.
Ordering Code CC1.5 WCC2.5
?CC / WCC=0.5mm Increment
?CC / WCC<(D–V)/2

CC	1,00
WCC	2,00

Tapping

Code: VM (Coarse) VMA (Fine)

?Applicable only to Dimension Configurable Type.
Adds a tapped hole (Through).
Ordering Code Specify VM4 V instead of VM / VMA.
Ex.: FTCLS-VMA4-D10-H13-T18
?L≤Mx8

Female Thread Hole Diameter VM · VMA	VM Pitch (Coarse)	VMA Pitch (Fine)	L max.
4	0.7	0.5	20
5	0.8		30
6	1.0	0.75	35
8	1.25	1.0	40
10	1.5		50
12	1.75		55
16	2.0	1.5	90
18	-		100
20	2.5		

Female Thread Hole Diameter	VM · VMA
4 · 5 · 6 · 8	2,00
10 · 12 · 16 · 18 · 20	3,00

Set Screw Hole Alteration (1-set 2-set)

Code: MC · WMC

Adds a tapped hole (coarse thread) at D part.
Ordering Code MC3 WMC5
?Condition of thickness (D–V)/2: as table below.
?L ≥ MC / WMCx3
?MC / WMC=Select from table below.

MC · WMC	(D-V)/2
3 · 4	3 or More
5 · 6 · 8	5 or More
10 · 12	8 or More

Female Thread Hole Diameter	MC	WMC
3 · 4 · 5 · 6	1,50	2,00
8 · 10 · 12	2,00	3,00

Slitting

Code: SLC

?Combination with other alteration is not available.
Adds a slit.
Ordering Code SLC
?Condition of thickness (D–V)/2: as table below.
?Slit width is fixed.

Outer Diameter D	SLC	(D-V)/2
10.0~20.0	1	5 or Less
20.5~40	2	10 or Less
41~	3	20 or Less

?D, V and L Dimension tolerances are the values before alteration.
?They may change after alteration depending on materials.

3,00

Inner Diameter Tolerance

Code: VKC

Changes the inner diameter tolerance to H7.
Ordering Code VKC
Machining Conditions
?D≥6 V≥3 L≤Vx5

D	D-V
6~10	D–V≥2
10.5~20	D–V≥3
21~30	D–V≥6
31~40	D–V≥8
41~50	D–V≥10
51~60	D–V≥12
61~70	D–V≥14
71~80	D–V≥16
81~90	D–V≥18
91~100	D–V≥20

4,00

Resin Washers / Collars Characteristics and Features

■Resin Washers · Collars Characteristics and Features

	Item		Testing Method (ASTM)	Unit	Material: Polyacetal	MC Nylon: Standard	MC Nylon: Conductive Grade CDR2	MC Nylon: Conductive Grade CDR6	Bakelite: Paper Base	Bakelite: Cloth Base	Fluoro Resin Polytetra-fluoro-ethylene	PEEK Polyether Ether Ketone	Epoxy Glass	Polycar-bonate
Mechanical Properties	Tensile Strength		D638	Mpa	61	96	68	74	113	97	13.7~34.3	98	309	59
	Elongation		D638	%	40	30	10	7	2.6	2	200~400	20	4	60~120
	Bending Strength	Vertical	D790	Mpa	89	110	117	117	189	144	-	170	431	80.4
		Parallel	D790						182	148				
	Flexural Modulus		D790		2589	3530	4110	4020	9680	8650	550	4021	16300	2200
	Compression Strength	Vertical	D695		103	95	98	93	135	116	11.8	119	266	73.5
	[5% Deformation]	Parallel	D695						132	115				
	Izot Impact Strength (Notched)		D256	J/m	74	50	35	35	-	-	160	77	-	740~980
	Rockwell Hardness		D785	R / M Scale	R119 M78	R120	R119	R117	-	-	-	120	-	M60~70
Thermal Characteristics	Deflection Temperature Under Load	(0.45Mpa)	D648	℃	158	215	215	215	-	-	121	-	-	145
		(1.82Mpa)			110	200	200	200	206	230~	55	155	230~	-
	Linear Expansion Coefficient		D696	10 -5/℃	9.0	9.0	8.0	7.5	-	-	9.9	5.0	1.55	6.0~7.0
	Thermal Conductivity		D177	W/(mk)	0.233	0.233	0.512	0.709	0.21	0.38	0.25	0.25	0.47	0.19
Electrical Characteristics	Dielectric Constant (106 Hz)		D150	-	3.7	3.7	-	-	4.24	5.33	18.6	3.3	-	3.0
	Dissipation Factor (106 Hz)		D150	-	0.007	0.02	-	-	0.036	0.056	$2x10^{-4}$	$3x10^{-3}$	-	0.0012
	Specific Volume Resistivity		D257	Ω·cm	$>10^{14}$	$4.2x10^{15}$	10^2~10^4	10^4~10^6	-	-	$>10^{18}$	10^{16}	10^{11}~10^{12}	$>10^{17}$
	Dielectric Breakdown Strength		D149	kV/mm	20	20	-	-	29.5	18.6	19	19	23	15
	Arc Resistance		D495	sec	-	-	-	-	-	-	>300	23	180	-
Others	Specific Gravity		D792	-	1.41	1.16	1.2	1.23	1.4	1.4	2.14~2.2	1.32	1.8~1.85	1.2
	Water Absorption (At 23°C x 24h)		D570	%	0.22	0.8	-	-	0.5~1.3	1.6~1.8	<0.01	0.14	0.4	0.24
	Glass Fiber Content		-	-	-	-	-	-	-	-	-	-	Contain	-
	Ambient Operation Temperature		-	℃	-45~95	-40~120			-50~100	-50~100	-40~250	-50~250	-150~180	~110
	Food Sanitation Laws		-	-	Suitable	Suitable*	Suitable*		-	-	Suitable	Suitable	-	-
Properties	◎ : Excellent ○ : Good Δ : Questionable X : Poor		Sliding Properties		○	○	○	○	Δ	Δ	◎	○	Δ	Δ
			Heat Resistance		Δ	Δ	Δ	Δ	○	○	○	○	Δ~○	○
			Insulation		○	○	-	-	○	○	○	○	◎	◎
			Abrasion Resistance		Δ	○	Δ	Δ	X	X	○	○	X	X
			Dimension Stability		○	Δ	Δ	Δ	○	○	X	◎	○	○
			Machinability		◎	○	○	○	○	○	○	○	Δ	○

(?)* In compliance with Food Sanitation Laws (MC Nylon, Standard: After boiling for 1.5hrs; Conductive Grade: After boiling for 2hrs.) Listed values are for reference, not guaranteed.
(?)Do not store resin materials for prolonged duration to avoid dimensional deformation due to water absorption. (Material with a higher moisture absorption rate will be deformed more.)
(?)Property values of Polycarbonate are obtained by JIS test (for reference).
(?)Bakelite may be discolored over time, but the properties do not change.
(?)For properties of Polyslider ®, refer to **P.141**

■Washers / Collars Lineup

	Shape	Material	Poly-acetal	MC Nylon: Standard	MC Nylon: Conductive Grade CDR2	MC Nylon: Conductive Grade CDR6	Bakelite: Paper Base	Bakelite: Cloth Base	Fluoro Resin Polytetra-fluoro-ethylene	PEEK Polyether Ether Ketone	Epoxy Glass	Polycar-bonate	Poly-slider®
		Color	White	Blue	Black		Brown	Light Brown	White	Gray	Green	Transparent	Black
		Standard Size		Ivory									
Washers	-Standard Type-	**P.130** Outer Diameter D 4~60 Inner Diameter V 0~55 Thickness T 2~10	● T0.2~1.0 Available (White) **P.141**	●	●		●		● T0.1~1.0 Available **P.141**	●	●	T0.1~1.0 Only **P.141**	Only T0.13 ~1.0 **P.141**
	-Flanged Slitless Type-	**P.131** Outer Diameter D 6~60 Nose Diameter V 2~58 Thickness T 3~50	●	●	●	● D6~50	●	●	● D6~50	● D6~50	● D6~50	-	-
	–Flanged–	**P.131** Outer Diameter D 4~60 Flange Diameter H 6~70 Inner Diameter V 0~55 Overall Length L 2~10	●	●	●		●	●	●	●	●	-	-
	-Counterbore-	**P.132** Outer Diameter D10~60 Inner Diameter P 3~53 Thickness T 3~50	●	●	●	● D10~50	●	●	● D10~50	● D10~50	● D10~50	-	-
	-Square Resin Washer-	**P.142** Length A 6~25 Width B 6~100 Thickness T 2~10	● -	● -	-	-	-	-	-	-	-	-	-
Collar	-Standard Type-	**P.133** Outer Diameter D 4~100 Inner Diameter V 2~55 Overall Length L10~100	●	●	●	● D4~50	●	●	● D4~50	● D4~50	● D4~50	-	-
	–Flanged–	**P.135** Outer Diameter D 4~100 Flange Diameter H 6~110 Inner Diameter V 0~90 Overall Length L10~100	●	●	●	● D4~50	●	●	● D4~50	● D4~50	● D4~50	-	-
	-With Guide-	**P.137** Outer Diameter D 8~30 Inner Diameter V 3~20 Overall Length L 2~50	● -	● -	-	-	-	-	-	-	-	-	-

●Product Available - Product not available

Add. Spec.

Resin Washers

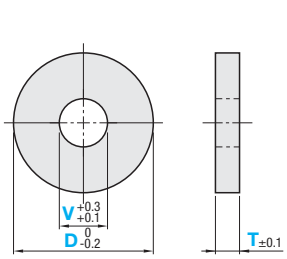
-Standard Type / Dimension Configurable Type-

Price Reduction
Up to 15%

CAD Data



Type		Material		Color
Dimension Selectable Type	Dimension Configurable Type			
WSJJ	FWSJJ	Polyacetal		White
WSJK	FWSJK			Black
WSJM	FWSJM	MC Nylon Standard Grade		Blue
WSJW	FWSJW			Ivory
WSJD	FWSJD	MC Nylon Conductive Grade	CDR2	Black
WSJT	FWSJT		CDR6	
WSJB	FWSJB	Bakelite	Paper Base	Brown
WSJN	FWSJN		Cloth Base	Light Brown
WSJF	FWSJF	Fluoro Resin		White
WSJP	FWSJP	PEEK		Gray
WSJE	FWSJE	Epoxy Glass		Green



Material Properties P.129

■Dimension Selectable Type

Items without listed price are not available.

Part Number Type	D	V Selection	T Selection	€ Unit Price WSJJ WSJK	WSJM WSJW	WSJD	WSJT	WSJB	WSJN	WSJF	WSJP	WSJE
	4	2	2									
	5	2 3	2									
	6	2 3 4	2									
WSJJ	8	2 3 4 5 6	2 3 5									
WSJK	10	2 3 4 5 6 8	2 3 5									
WSJM	12	3 4 5 6 8 10	2 3 5									
WSJW	13	4 5 6 8 10	2 3 5									
WSJD	14	4 5 6 8 10	2 3 5									
WSJT	15	4 5 6 8 10 12	2 3 5									
WSJB	16	4 5 6 8 10 12	2 3 5									
WSJN	20	4 5 6 8 10 12 15 16	2 3 5									
WSJF	25	6 8 10 12 15 16 20	2 3 5									
WSJP	30	8 10 12 15 16 20 25	2 3 5									
WSJE	35	10 12 15 16 20 25	3 5 10									
	40	10 12 15 16 20 25 30	3 5 10									
	50	10 12 15 16 20 25 30	3 5 10									
	60	15 16 20 25 30	3 5 10									

Order Example: Part Number WSJJ6 - V 4 - T 2

Days to Ship: - Dimension Selectable Type — 8 Days

Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

- WSJJ · WSJK · WSJM · WSJW

■Volume Discount

(Round down to one Cent.) P.87

Quantity	1~49	50~79	80~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

- WSJD · WSJT · WSJB · WSJN · WSJF · WSJP · WSJE

■Volume Discount

(Round down to one Cent.) P.87

Quantity	1~49	50~79	80~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Dimension Configurable Type

Items without listed price are not available.

Part Number	D	V 0.5mm Increment (V 3 or more)	T 0.5mm Increment	€ Unit Price FWSJJ FWSJK	FWSJM FWSJW	FWSJD	FWSJT	FWSJB	FWSJN	FWSJF	FWSJP	FWSJE
	4.0~10.0 (0.5mm Increment)	0 (No Hole Machining) 2.0 2.6 3.0~58.0 (V≤D-2) 58.5~90.0 (V≤D-6)	2.0~ 5.0									
			5.5~10									
FWSJJ	10.5~20 (0.5mm Increment)		2.0~ 5.0									
FWSJK			5.5~10									
FWSJM	21~30 (1mm Increment)		2.0~ 5.0									
FWSJW			5.5~10									
FWSJD	31~40 (1mm Increment)		2.0~ 5.0									
FWSJT			5.5~10									
FWSJB	41~50 (1mm Increment)		2.0~ 5.0									
FWSJN			5.5~10									
FWSJF	51~60 (1mm Increment)		2.0~ 5.0									
FWSJP			5.5~10									
FWSJE	61~80 (1mm Increment)		2.0~ 5.0									
			5.5~10									
	81~100 (1mm Increment)		2.0~ 5.0									
			5.5~10									

Order Example: Part Number FWSJN - D D10 - V V5 - T T5.5

Days to Ship: ■ Dimension Configurable Type — 8 Days

Price

■Dimension Configurable Type

■Volume Discount

(Round down to one Cent.) P.87

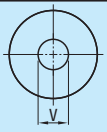
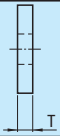
Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number WSJJ6 - V 4 - T 2 - (VKC / TKC) VKC

Alterations are applicable to WSJJ, WSJM, FWSJJ and FWSJM only.

Alterations	Inner Diameter Tolerance	Thickness Tolerance Change
		
Code	VKC	TKC
Spec.	Changes the inner diameter tolerance to +0.1 0 Ordering Code VKC If D≤50, D-V≥6 If 51≤D≤80, D-V≥10 If 80≤D≤100, D-V≥16	Changes thickness tolerance to ±0.05. Ordering Code TKC If D≤50, D-V≥6 If D≤80, D-V≥10 If D≤100, D-V≥16
Price Adder	1,00	1,00

Resin Washers
-Flanged Solid / Flanged-

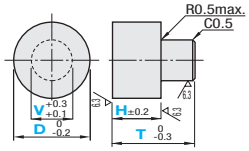
CAD Data



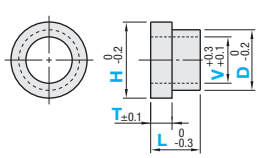
Flanged Solid	Flanged	Material		Color
FWNJJ	FWHJ	Polyacetal		White
FWNJK	FWHJK			Black
FWNJM	FWHJM	MC Nylon Standard Grade		Blue
FWNJW	FWHJW			Ivory
FWNJD	FWHJD	MC Nylon Conductive Grade	CDR2	Black
FWNJT	FWHJT		CDR6	
FWNJB	FWHJB	Bakelite	Paper Base	Brown
FWNJN	FWHJN		Cloth Base	Light Brown
FWNJF	FWHJF	Fluoro Resin		White
FWNJP	FWHJP	PEEK		Gray
FWNJE	FWHJE	Epoxy Glass		Green

Material Properties ☞ P.129

Flanged Solid



Flanged



■Flanged Solid

Part Number	D	V 0.5mm Increment	H 0.5mm Increment	T 0.5mm Increment	€ Unit Price FWNJJ FWNJK	FWNJM FWNJW	FWNJD	FWNJT	FWNJB	FWNJN	FWNJF	FWNJP	FWNJE
FWNJJ FWNJK FWNJM FWNJW FWNJD FWNJT FWNJB FWNJN FWNJF FWNJP FWNJE	6.0~10.0 (0.5mm Increment)	2.0~8.0	2.0~28.0	3.0~10.0									
				10.5~20									
				20.5~30									
	10.5~20 (0.5mm Increment)	4.0~18.0		3.0~10.0									
				10.5~20									
				20.5~30									
	21~30 (1mm Increment)	10.0~28.0		3.0~10.0									
				10.5~20									
				20.5~30									
	31~40 (1mm Increment)	15.0~38.0	2.0~38.0	5.0~10.0									
				10.5~20									
				20.5~30									
				30.5~40									
	41~50 (1mm Increment)	20.0~48.0	2.0~48.0	10.0~20.0									
				20.5~30									
				30.5~40									
				40.5~50									
	51~60 (1mm Increment)	30.0~58.0		10.0~20.0									
				20.5~30									
				30.5~40									
				40.5~50									

Machining Conditions ⓥ V≤D-2 ⓥ Vx3≥T-H≥1 ⓥ V≤2.5···T≤10 ⓥ V=3.0···T≤20

Order Example

Part Number	-	D	-	V	-	H	-	T
FWNJN	-	D19.5	-	V11.5	-	H10.5	-	T25.0

Days to Ship

- Flanged Solid

8 Days

Price

- Flanged Solid

■Volume Discount (ⓥRound down to one Cent.) P.87

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

ⓥFor orders larger than indicated quantity, please request a quotation.

■Flanged

Part Number	D	H	V 0.5mm Increment (V 3 or more)	T 0.5mm Increment	L 0.5mm Increment	€ Unit Price FWHJ FWHJK	FWHJM FWHJW	FWHJD	FWHJT	FWHJB	FWHJN	FWHJF	FWHJP	FWHJE
FWHJ FWHJK FWHJM FWHJW FWHJD FWHJT FWHJB FWHJN FWHJF FWHJP FWHJE	4.0~10.0 (0.5mm Increment)	60.~20 (0.5mm Increment)	0 2.0 2.6 3.0~55.0	1.0~8.0	2.0~5.5									
					6.0~10.0									
	10.5~20 (0.5mm Increment)	12.5~30 (0.5mm Increment)			2.0~5.5									
					6.0~10.0									
	21~30 (1mm Increment)	23~40 (1mm Increment)			2.0~5.5									
					6.0~10.0									
	31~40 (1mm Increment)	33~50 (1mm Increment)			2.0~5.5									
					6.0~10.0									
	41~50 (1mm Increment)	43~60 (1mm Increment)			2.0~5.5									
					6.0~10.0									
	51~60 (1mm Increment)	53~70 (1mm Increment)			2.0~5.5									
					6.0~10.0									

Machining Conditions ⓥ H-D≥2 ⓥ D-V≥2 ⓥ L-T≥1 ⓥ FWHJT · FWHJF · FWHJP and FWHJE are H.≤50

Order Example

Part Number	-	D	-	H	-	V	-	T	-	L
FWHJN	-	D20.0	-	H30.0	-	V10.5	-	T2.5	-	L8.5

Days to Ship

- Flanged

8 Days | Express A | 2,00 EUR/piece ☞ P.88

ⓥA Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

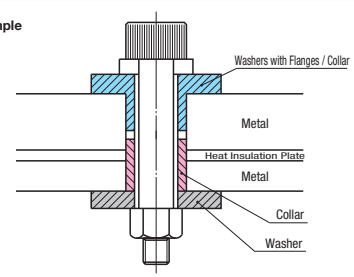
- Flanged

■Volume Discount (ⓥRound down to one Cent.) P.87

Quantity	1~19	20~29	30~39	40~99
Discount rate	€ Unit Price	5%	10%	15%

ⓥFor orders larger than indicated quantity, please request a quotation.

Example



Resin Washers / Resin Collars

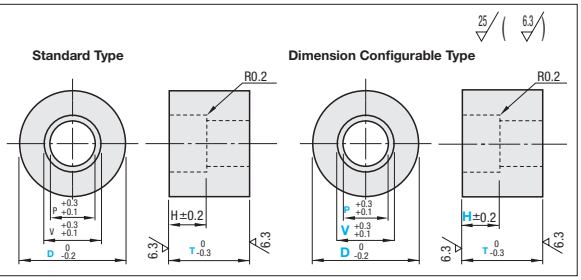
-Counterbored- -Female Thread-

CAD Data



Standard Type	Dimension Configurable	Material		Color
WZJJ	FWZJJ	Polyacetal		White
-	FWZJK			Black
WZJM	FWZJM	MC Nylon Standard Grade		Blue
-	FWZJW			Ivory
WZJD	FWZJD	MC Nylon Conductive Grade	CDR2	Black
-	FWZJT		CDR6	
WZJB	FWZJB	Bakelite	Paper Base	Brown
WZJN	FWZJN		Cloth Base	Light Brown
-	FWZJF	Fluoro Resin		White
-	FWZJP	PEEK		Gray
-	FWZJE	Epoxy Glass		Green

Material Properties P.129



■Standard Type

Part Number Type	D	T Selection	H	V	P	€ Unit Price WZJJ	WZJM	WZJD	WZJB	WZJN
WZJJ WZJM WZJD WZJB WZJN	10	6 8	4	6	3.5					
	12	8 10	5	8	4.5					
	14	8 10	6	10	5.5					
	15	10 12	8	11	6.5					
	20	10 12 15	8	11	6.5					
	30	12 15	10	14	9					
	40	15 20	12	18	11					
	50	15 20	12	18	11					
	60	15 20	12	18	11					

Order Example: Part Number - T → WZJB15 - 12

Days to Ship: 8 Days — Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price — - Standard Type

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Dimension Configurable Type

Part Number	D	V 0.5mm Increment	P 0.5mm Increment	H 0.5mm Increment	T 0.5mm Increment	€ Unit Price FWZJJ FWZJK	FWZJM FWZJW	FWZJD	FWZJT	FWZJB	FWZJN	FWZJF	FWZJP	FWZJE
FWZJJ FWZJK FWZJM FWZJW FWZJD FWZJT FWZJB FWZJN FWZJF FWZJP FWZJE	10.0~20 (0.5mm Increment)	5.0~55.0 (V≤D-2)	3.0~53.0 (P≤V-2)	1.0~48.0 (T-H≤Px8)	3.0~10.0									
					10.5~20									
					20.5~30									
					30.5~40									
					40.5~50									
	21~30 (1mm Increment)				3.0~10.0									
					10.5~20									
					20.5~30									
					30.5~40									
					40.5~50									
	31~40 (1mm Increment)				3.0~10.0									
					10.5~20									
					20.5~30									
					30.5~40									
					40.5~50									
	41~50 (1mm Increment)				3.0~10.0									
					10.5~20									
					20.5~30									
					30.5~40									
					40.5~50									
	51~60 (1mm Increment)				3.0~10.0									
					10.5~20									
					20.5~30									
					30.5~40									
					40.5~50									

Machining Conditions: V≤D-2 P≤V-2 2≤(T-H)≤Px8

Items without listed price are not available.

Order Example: Part Number - D - V - P - H - T → FWZJJ - D25 - V10.5 - P6.5 - H5.0 - T15.5

Alterations: Part Number - D - V - P (PM · PMA) - H - T → FWZJM - D20 - V16 - PM8 - H5 - T15

Not available for Bakelite, Epoxy Glass and Fluoro Resin.

Days to Ship: -Dimension Configurable Type — 8 Days

Price: -Dimension Configurable Type

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

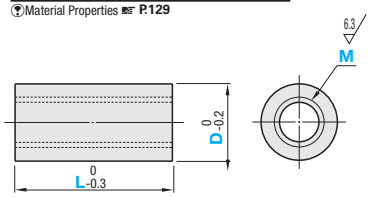
Alterations	Code	Spec.	Price Adder
PM (Coarse) PMA (Fine) T-H	PM (Coarse) PMA (Fine)	Adds a tapped hole on P Hole part. Ordering Code PM4 Specify PM instead of P. For machining limits of T-H, please see the table on the right. Tap diameter ≤ D/2	Female Thread Hole Diameter: PM · PMA; 4 · 5 · 6 · 8: 2,00; 10 · 12 · 16 · 18 · 20: 3,00

Female Thread Hole Diameter PM / PMA	PM Pitch (Coarse)	PMA Pitch (Fine)	T-H Max
4	0.7	0.5	20
5	0.8		30
6	1.0	0.75	35
8	1.25		40
10	1.5	1.0	50
12	1.75		
16	2.0	1.5	
18	-		
20	2.5		



Type	Material
CLJTJ	Polyacetal
CLJTM	MC Nylon (Standard Grade - Blue)

Material Properties P.129



■Resin Collars-Female Thread-

Part Number Type	M (x Pitch)	D	L 0.5mm Increment	€ Unit Price CLJTJ	CLJTM
CLJTJ CLJTM	4 (x0.7) 5 (x0.8) 6 (x1.0) 8 (x1.25)	10.0~20.0 (0.5mm Increment)	10.0~25.0		
			25.5~50		
		21~30 (1mm Increment)	10.0~25.0		
			25.5~50		
			50.5~60		
	8A(x1.0) 10 (x1.5) 12 (x1.75)	31~40 (1mm Increment)	10.0~25.0		
			25.5~50		
			50.5~60		
	12A(x1.0) 16 (x2.0) 18A(x1.0) 20 (x2.5)	41~50 (1mm Increment)	10.0~25.0		
			25.5~50		
			50.5~60		
		51~60 (1mm Increment)	10.0~25.0		
			25.5~50		
			50.5~60		

D-M ≥6 L≤Mx3

Order Example: Part Number - D - L → CLJTM10 - D30 - L30

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

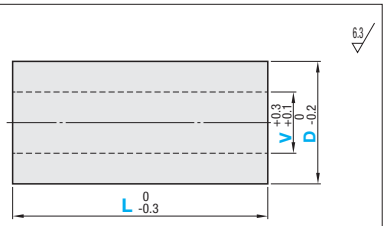
Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Resin Collars
-Standard Type-



Dimension Selectable Type	Dimension Configurable Type	Material		Color
CLJJ	FCLJJ	Polyacetal		White
CLJK	FCLJK			Black
CLJM	FCLJM	MC Nylon Standard Grade		Blue
CLJW	FCLJW			Ivory
CLJD	FCLJD	MC Nylon Conductive Grade	CDR2	Black
CLJT	FCLJT		CDR6	
CLJB	FCLJB	Bakelite	Paper Base	Brown
CLJN	FCLJN		Cloth Base	Light Brown
CLJF	FCLJF	Fluoro Resin		White
CLJP	FCLJP	PEEK		Gray
CLJE	FCLJE	Epoxy Glass		Green



Material Properties P.129

Dimension Selectable Type

Part Number Type	V	D Selection	L 0.5mm Increment	€ Unit Price CLJJ CLJK	CLJM CLJW	CLJD	CLJB	CLJN	CLJT	CLJF	CLJP	CLJE
CLJJ CLJK CLJM CLJW CLJD CLJT CLJB CLJN CLJF CLJP CLJE	2 3	(4) 5 6 8 10 11 12 (4)···V2 only	10.0 ~ 25.0									
			25.5 ~ 30.0									
	4 5	(6) 8 10 11 12 13 14 15 16 20 (6)···V4 only	10.0 ~ 25.0									
			25.5 ~ 50.0									
	6	8 10 11 12 13 14 15 16 20 25	10.0 ~ 25.0									
			25.5 ~ 50.0									
	8	10 11 12 13 14 15 16 20 25 30	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
	10	12 13 14 15 16 20 25 30	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
		35 40 50	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
	12	15 16 20 25 30	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
		35 40 50	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
	15 16	20 25 30	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
		35 40 50	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
		60	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
	20 25	(25) 30 (25)···V20 only	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
		35 40 50	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
		60	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
	30	40 50	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									
		60	10.0 ~ 25.0									
			25.5 ~ 50.0									
			50.5 ~ 75.0									
			75.5 ~ 100.0									

Items without listed price are not available.

Order Example: Part Number CLJJ10 - D 16 - L 20.0

Price

- Dimension Selectable Type

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Dimension Selectable Type

8 Days P.88

Express A 2,00 EUR/ piece

A Express Charge of 5,40 EUR for 3 or more identical pieces.

CAD Data

Dimension Configurable Type

Part Number	V V2.6 or less / Selection V3.0 or more / 0.5mm Increment	D D4~20 / 0.5mm Increment D21 or more / 1mm Increment	L 0.5mm Increment	€ Unit Price FCLJJ FCLJK	FCLJM FCLJW	FCLJD	FCLJB	FCLJN	FCLJT	FCLJF	FCLJP	FCLJE
FCLJJ FCLJK FCLJM FCLJW FCLJD FCLJT FCLJB FCLJN FCLJF FCLJP	0 (No Hole Machining) 2.0 2.6 3.0~55.0 (0.5mm Increment) ▼L≤50.0 ⋯› V≤D−2 ▼L≥50.5 ⋯› V≤D−6	4.0~10.0 (0.5mm Increment) ▼D≤5⋯›L≤50	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		10.5~20.0 (0.5mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		21~30 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		31~40 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		41~50 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		51~60 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
FCLJE	0 (No Hole Machining) 3.0~90.0 (0.5mm Increment) ▼V≤D−6	61~80 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		81~100 (1mm Increment)	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
	Machining Conditions	▼ L≤Vx8							▼Items without listed price are not available.			

Order Example

Part Number	-	V	-	D	-	L
FCLJB	-	V20.0	-	D30	-	L18.5

Price

-Dimension Configurable Type

Volume Discount (▼Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

▼For orders larger than indicated quantity, please request a quotation.

Days to Ship

-Dimension Configurable Type

8 Days

Alterations

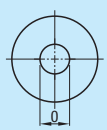
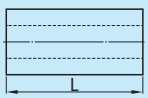
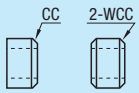
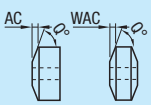
- Dimension Selectable Type

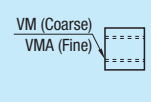
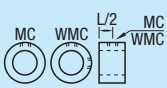
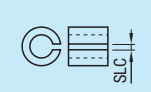
Part Number	-	D	-	L	-	(CC · WCC · AC…etc.)
CLJJ12	-	30	-	45	-	AC10 - Q15

- Dimension Configurable Type

Part Number	-	V (VM / VMA)	-	D	-	L	-	(CC · WCC · AC…etc.)
FCLJP	-	VM10	-	D35	-	L60	-	CC2.5

⊗Not available for Bakelite, Epoxy Glass and Fluoro Resin. ▼Alterations except VKC and LKC are available from D10.

Alterations	Code	Spec.	Price Adder
	VKC	Changes the inner diameter tolerance to $^{+0.1}_{0}$ ▼This is only applicable to CLJJ, CLJM, FCLJJ and FCLJM. Ordering Code VKC ▼L≤50 ▼If D≤50, D-V≥6 ▼If D≤80, D-V≥10 ▼If D≤100, D-V≥16	1,00
	LKC	Changes the overall length tolerance to ±0.05. ▼This is only applicable to CLJJ, CLJM, FCLJJ and FCLJM. Ordering Code LKC ▼L≤50 ▼If D≤50, D-V≥6 ▼If D≤80, D-V≥10 ▼If D≤100, D-V≥16	1,00
	CC WCC	Chamfers C plane. Ordering Code CC1.5 WCC2.5 ▼CC / WCC=0.5mm Increment ▼CC / WCC<(D−V)/2	CC 1,00 WCC 2,00
	AC WAC	Adds a taper. Ordering Code AC3.5-Q60 WAC5.0-Q30 ▼AC, WAC=0.5mm Increment ▼Q=Selection from 15, 20, 30 and 60 ▼AC≤L−5 ▼(D-V)/2-AC, WAC tan Q≥1 Ref.:tan15°=0.268 tan20°=0.364 tan30°=0.577 tan60°=1.732	AC 2,00 WAC 4,00

Alterations	Code	Spec.	Price Adder
▼Applicable only to Dimension Configurable Type. 	VM (Coarse) VMA (Fine)	Adds a tapped hole (Through). Ordering Code Specify VM4 V instead of VM / VMA. Ex.: FCLJJ-VMA4-D10-L18 ▼For machining limits of tap diameter and full length (L), please see the table on the right. Tap diameter ≤ D/2	Female Thread Hole Diameter VM/VMA: 4 · 5 · 6 · 8 → 2,00; 10 · 12 · 16 · 18 · 20 → 3,00
	MC WMC	Adds a tapped hole (coarse thread) at D part. Ordering Code MC3 WMC5 ▼Condition of thickness (D−V)/2: as table below. ▼L ≥ MC / WMCx3 ▼MC / WMC=Select from table below.	Female Thread Hole Diameter: 3 · 4 · 5 · 6 → MC 1,00, WMC 1,50; 8 · 10 · 12 → MC 2,00, WMC 2,00
▼Combination with other alteration is not available. 	SLC	Adds a slit. Ordering Code SLC ▼Condition of thickness (D−V)/2: as table below. ▼Slit width is fixed. ▼Inner and outer tolerances are the values before alteration. The tolerances may change after alterations depending on the materials.	1,50

MC / WMC	(D-V)/2
3, 4	3 or More
5, 6, 8	5 or More
10, 12	8 or More

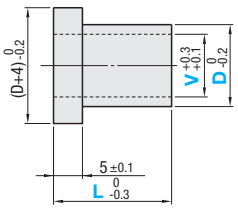
Outer Diameter D	SLC	(D-V)/2
10.0~20.0	1	5 or Less
20.5~40	2	10 or Less
41~	5	20 or Less

Resin Collars
-Flanged-

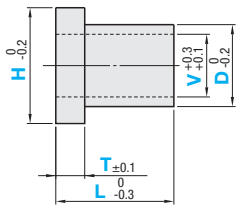


Dimension Selectable Type	Dim. Configurable Type	Material		Color
CLJHJ	FCLJHJ	Polyacetal		White
CLJHK	FCLJHK			Black
CLJHM	FCLJHM	MC Nylon		Blue
CLJHW	FCLJHW	Standard Grade		Ivory
CLJHD	FCLJHD	MC Nylon Conductive Grade	CDR2	Black
CLJHT	FCLJHT		CDR6	
CLJHB	FCLJHB	Bakelite	Paper Base	Brown
CLJHN	FCLJHN		Cloth Base	Light Brown
CLJHF	FCLJHF	Fluoro Resin		White
CLJHP	FCLJHP	PEEK		Gray
CLJHE	FCLJHE	Epoxy Glass		Green

Dimension Selectable Type



Dimension Configurable Type



Material Properties P.129

■Dimension Selectable Type

Part Number Type	V	D Selection	L 0.5mm Increment	€ Unit Price CLJHJ CLJHK	CLJHM CLJHW	CLJHD	CLJHB	CLJHN	CLJHT	CLJHF	CLJHP	CLJHE
CLJHJ CLJHK CLJHM CLJHW CLJHD CLJHT CLJHB CLJHN CLJHF CLJHP CLJHE	2 3	(4) 5 6 8 10 (4)···V2 only	10.0~ 25.0									
			25.5~ 30.0									
	4 5	(6) 8 10 11 12 13 14 15 16 20 25 (6)···V4 only	10.0~ 25.0									
			25.5~ 50.0									
	6	8 10 11 12 13 14 15 16 20 25	10.0~ 25.0									
			25.5~ 50.0									
	8	10 11 12 13 14 15 16 20 25 30	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
	10	12 13 14 15 16 20 25 30	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
		35 40 50	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
	12	15 16 20 25 30	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
		35 40 50	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
	15	20 25 30	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
	16	35 40 50	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
		60	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
	20	(25) 30 (25)···V20 only	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
	25	35 40 50	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
		60	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
	30	40 50	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									
		60	10.0~ 25.0									
			25.5~ 50.0									
			50.5~ 75.0									
			75.5~100.0									

H≤50 for CLJHT, CLJHF, CLJHP and CLJHE.

Items without listed price are not available.

Order Example

Part Number	-	D	-	L
CLJHM10	-	16	-	20.0

Price

- Dimension Selectable Type

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Dimension Selectable Type

8 Days | Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

CAD Data

■Dimension Configurable Type

Part Number	V V2.6 or less / Selection V3.0 or more / 0.5mm Incr.	D 0.5mm Incr. D21 or more / 1mm Incr.	H D4~20 / 0.5mm Incr. D21 or more / 1mm Incr.	T 1mm Increment	L 0.5mm Increment	€ Unit Price FCLJHJ FCLJHK	FCLJHM FCLJHW	FCLJHD	FCLJHT	FCLJHB	FCLJHN	FCLJHF	FCLJHP	FCLJHE
FCLJHJ FCLJHK FCLJHM FCLJHW FCLJHD FCLJHT FCLJHB FCLJHN FCLJHF FCLJHP FCLJHE	0 (No Hole Machining) 2.0 2.6 3.0~58.0 (0.5mm Increment) 10.0≤L≤50.0 ···› V≤D-2 50.5≤L≤100 ···›V≤D–6 58.5~90.0 V≤D–6	4.0~10.0 (0.5mm Increment)	6.0~20.0 (0.5mm Increment)	2~20 L–T≥1	10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		10.5~20.0 (0.5mm Increment)	12.5~30.0 (0.5mm Increment)		10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		21~30 (1mm Increment)	23~40 (0.5mm Increment)		10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		31~40 (1mm Increment)	33~50 (0.5mm Increment)		10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		41~50 (1mm Increment)	43~60 (0.5mm Increment)		10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		51~60 (1mm Increment)	53~70 (0.5mm Increment)		10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		61~80 (1mm Increment)	63~90 (0.5mm Increment)		10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									
		81~100 (1mm Increment)	83~110 (1mm Increment)		10.0~ 25.0 25.5~ 50.0 50.5~ 75.0 75.5~100.0									

Machining Conditions ⓟ H–D≥2 ⓟ D4~5···Lmax=50 ⓟ L≤Vx8 ⓟ H≤50 for FCLJHT, FCLJHF, FCLJHP and FCLJHE.

ⓟItems without listed price are not available.

Order Example

Part Number	-	V	-	D	-	H	-	T	-	L
FCLJHM	-	V15	-	D21	-	H26	-	T6	-	L50.5

Price

-Dimension Configurable Type

■Volume Discount (ⓟRound down to one Cent.) P87

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

ⓟFor orders larger than indicated quantity, please request a quotation.

Days to Ship

-Dimension Configurable Type

8 Days

Alterations

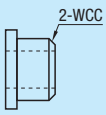
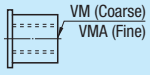
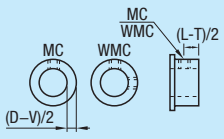
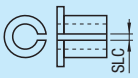
- Dimension Selectable Type

Part Number	-	D	-	L	- (CC · SLC…etc.)
CLJHM15	-	35	-	75.5	- SLC

- Dimension Configurable Type

Part Number	-	V (VM / VMA)	-	D	-	H	-	T	-	L	- (CC · SLC…etc.)
FCLJHT	-	VMA18	-	D25	-	H28	-	T5	-	L15	- MC3

⊗Not available for Bakelite, Epoxy Glass and Fluoro Resin. ⓟAlteration is available from D10.

Alterations	C Chamfering (1-One Side Both Sides)	Tapping	Set Screw Hole Alteration (1-set 2-set)	Slitting
		ⓟApplicable only to Dimension Configurable Type. 		ⓟCombination with other alterations is not available. 
Code	CC	VM (Coarse) VMA (Fine)	MC · WMC	SLC
Spec.	Chamfers C plane. Ordering Code CC1.5 ⓟCC=0.5 mm Increment ⓟ0.5≤CC<(D–V)/2	Adds a tapped hole (Through). Ordering Code Specify VM4 V instead of VM · VMA. Ex.: FCLJHJ–VM4–D10–H15–T6–L8 ⓟFor the Machining Limits of tap dia. and full length (L), see the table below. Tap Ø ≤ D/2	Adds a tapped hole (coarse thread) at D part. Ordering Code MC3 WMC5 ⓟCondition of thickness (D–V)/2: as table below. ⓟL ≥ MC / WMCx3 ⓟMC · WMC=Select from table below.	Adds a slit. Ordering Code SLC ⓟCondition of thickness (D–V)/2: as table below. ⓟSlit width is fixed.
Price Adder	1,00			1,50

Female Thread Hole Ø VM/VMA	VM Pitch (Coarse)	VMA Pitch (Fine)	L max
4	0.7	0.5	20
5	0.8		30
6	1.0	0.75	35
8	1.25		45
10	1.5	1.0	60
12	1.75		70
16	2.0	1.5	90
18	-		100
20	2.5		

MC · WMC	(D-V)/2
3 · 4	3 or More
5 · 6 · 8	5 or More
10 · 12	8 or More

Outer Diameter D	SLC	(D-V)/2
10.0~20.0	1	5 or Less
20.5~40	2	10 or Less
41~	5	20 or Less

ⓟInner and outer tolerances are the values before alteration. They may change after alteration depending on materials.

Female Thread Hole Ø	VM · VMA
4 · 5 · 6 · 8	2,00
10 · 12 · 16 · 18 · 20	3,00

Female Thread Hole Ø	MC	WMC
3 · 4 · 5 · 6	1,00	1,50
8 · 10 · 12	2,00	2,00

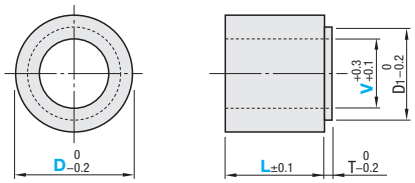
Resin Collars
-With Guide-

CAD Data



Type	Material	Color
CLJGJ	Polyacetal	White
CLJGM	MC Nylon Standard Grade	Blue

Material Properties P.129



Part Number Type	D	V	L 0.5mm Increment	D_1	T	€ Unit Price CLJGJ L2~10	CLJGJ L10.5~20	CLJGJ L20.5~30	CLJGJ L30.5~40	CLJGJ L40.5~50	CLJGM L2~10	CLJGM L10.5~20	CLJGM L20.5~30	CLJGM L30.5~40	CLJGM L40.5~50
CLJGJ CLJGM	8	3	2~30	5	1										
		4		6											
	10	3		5											
		4		7											
		5		8											
	12	4		7											
		5		8											
		6		9											
	14	4	5~40	7	1.5										
		5		8											
		6		9											
		8		11											
	15	5		8											
		6		9											
		8		11											
		10		13											
	16	5		8											
		6		9											
		8		11											
		10		13											
	20	6	10~50	9	2										
		8		11											
		10		13											
		12		16											
	25	8		11											
		10		13											
		12		16											
		15		21											
		16		22											
	30	10		13											
		12		16											
		15		21											
		16		22											
		20		25											

Order Example

Part Number	-	V	-	L
CLJGJ15	-	8	-	20

Days to Ship 8 Days

Price euros

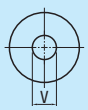
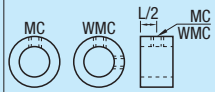
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

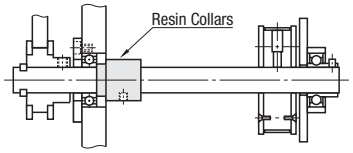
Alterations

Part Number	-	V	-	L	-	(VKC · MC · WMC · TC)
CLJGM20	-	10	-	25	-	TC5

Alterations	Inner Diameter Tolerance	Set Screw Hole Alteration (1-set 2-set)	T Dimension Change
			
Code	VKC	MC · WMC	TC
Spec.	Changes the inner diameter tolerance to $^{+0.1}_{0}$ Ordering Code VKC D−V≥6	Adds a tapped hole (coarse thread) at D part. Ordering Code MC3 WMC5 Condition of thickness (D−V)/2: as table below. L ≥ MC / WMCx3 MC / WMC=Select from table below. MC / WMC: (D−V)/2 3 · 4: 3 or More 5 · 6 · 8: 5 or More 10 · 12: 8 or More	Changes the T dimension. Ordering Code TC3 Specifiable Range 0.5~10mm (Specify in 0.5mm increments.)
Price Adder	1,00	Female Thread Hole Diameter: 3 · 4 · 5 · 6: MC 1,00, WMC 1,50; 8 · 10 · 12: MC 2,00, WMC 2,00	1,00

Example

For bearing inner ring retention



Thermal Insulation · Fluororesin · PPS

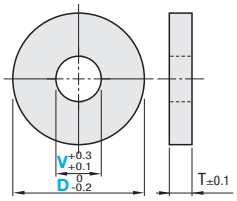
CAD Data



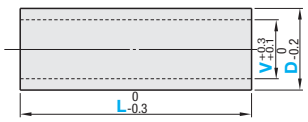
Washers	Collar	Collar with Flange	Material
EPOW	EPOC	EPOB	Epoxy Glass
PTW	PTC	PTB	Fluoro-Resin (Polytetrafluoroethylene)
PKW	PKC	PKB	PEEK

6.3

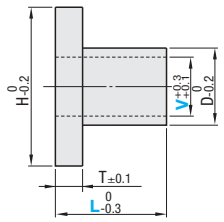
Washers



Collar



Collar with Flange



Material Properties P.129

Washers

Part Number Type	D	V Selection	T	€ Unit Price EPOW	PTW	PKW
EPOW PTW PKW	10	3 4 5 6	3			
	12	4 5 6 8				
	14	4 5 6 8 10				
	15	4 5 6 8 10				
	16	5 6 8 10				
	20	5 6 8 10 12				
	25	6 8 10 12				
	30	10 12 16				
	35	12 16	5			
	40	16				

Order Example: Part Number - V → PTW10 - 3

Days to Ship: - Washers → 6 Days P.88

Price: - Washers

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~69	70~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Collar

Part Number Type	V	D Selection	L 1 mm Increment
EPOC PTC PKC	2	5 6 8 10	5~30
	3	5 6 8 10 12 14	5~50
	4	6 8 10 12 14 15	
	5	8 10 12 14 15 16 20	
	6	8 10 12 14 15 16 20 25	
	8	12 14 15 16 20 25 30	
	10	14 15 16 20 25 30	
	12	20 25 30	5~100
	16	20 25 30	
	20	25 30	

Machining Conditions L≤Dx3, only for PTC

Order Example: Part Number - D - L → EPOC16 - 25 - 55

Days to Ship: - Collar → 8 Days

Express A 2,00 EUR/ piece P.87

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price: - Collar

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	V	€ Unit Price EPOC L5~25	EPOC L26~50	EPOC L51~75	EPOC L76~100	PTC L5~25	PTC L26~50	PTC L51~75	PTC L76~100	PKC L5~25	PKC L26~50	PKC L51~75	PKC L76~100
EPOC PTC PKC	2												
	3												
	4												
	5												
	6												
	8												
	10												
	12												
	16												
	20												

Collar with Flange

Part Number Type	V	L Selection	H	D	T	€ Unit Price EPOB	PTB	PKB
EPOB PTB PKB	3	8 10 15 20	10	6	5			
	4		12	8				
	5		15	10				
	6		20	10				
	8	10 15 20 25	25	12				
	10		30	14				
	12	15 20 25	35	20				
	16		40	20				

Order Example: Part Number - L → PKB10 - 10

Days to Ship: - Collar with Flange → 6 Days P.87

Price: - Collar with Flange

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Ceramic Washers / Sheets / Collars

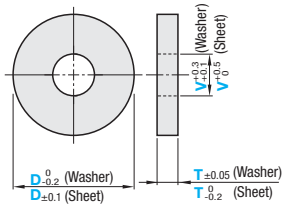
CAD Data



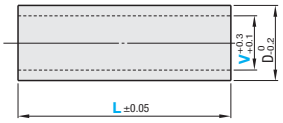
Type		Material	
Washers	SCERAW	Ceramics	Alumina 96
	CERAW		Alumina 92
Collar with Flange	CERAB		
Collar	CERAC		
Sheet	SWSCE	Ceramic Fiber	

* D dimensions for ceramics (CERAB) are fixed to V dimensions.

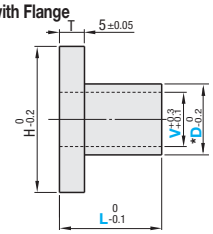
Washer / Sheet



Collar



Collar with Flange



■Washer (Alumina 92)

Part Number Type	D	V	T	€ Unit Price
CERAW	10	3	3	
	12	4		
	15	5		
	20	6		
	25	8		
	30	10		
	35	12	5	
	40	16		
	45	20		

Order Example: Part Number: CERAW10

Days to Ship: - Washer (Alumina 92): 6 Days P.88

Price: - Washer (Alumina 92)

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Collar with Flange (Alumina 92)

Part Number Type	V	L Selection	H	D	€ Unit Price
CERAB	3	8 10 15	10	6	
	4		12	8	
	5		15	10	
	6		20	10	
	8	10 15 20	25	12	
	10		30	14	
	12	15 20 25	35	20	
	16		40	20	
	20		45	25	

Order Example: Part Number: CERAB6 - L: 10

Days to Ship: - Collar with Flange (Alumina 92): 6 Days P.88

Price: - Collar with Flange (Alumina 92)

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Collar (Alumina 92)

Part Number Type	V	L 1 mm Increment	D	€ Unit Price L5~29	L30~54	L55~79	L80~100
CERAC	3	5~50	6				
	4		8				
	5		10				
	6		10				
	8		12				
	10		14				
	12	5~100	20				
	16		20				
	20		25				

Order Example: Part Number: CERAC16 - L: 55

Days to Ship: - Collar (Alumina 92): 10 Days

Price: - Collar (Alumina 92)

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Washer (Alumina 96)

Part Number Type	D	V Selection	T	€ Unit Price
SCERAW	10	3 4 5	3	
	12	4 5 6		
	15	5 6 8		
	20	6 8		

Order Example: Part Number: SCERAW10 - V: 5

Days to Ship: - Washer (Alumina 96): 6 Days P.88

Price: - Washer (Alumina 96)

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Sheet (Ceramic Fiber)

Part Number Type	D	V Selection	T	€ Unit Price
SWSCE	8	3 4	1	
	10	4 5 6		
	12	4 5 6 8		
	15	5 6 8 10		
	20	6 8 10 12		
	25	8 10 12 15		
	30	8 10 12 15 20		

Order Example: Part Number: SWSCE10 - V: 4 - T: 1

Days to Ship: - Sheet (Ceramic Fiber): 8 Days

Price: - Sheet (Ceramic Fiber)

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49	50~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Property values of Alumina 92 / Alumina 96 / Ceramic Fiber (Reference: The data in the table are the values of materials.)

Properties	Material Name	Alumina 92	Alumina 96	Ceramic Fiber
Dielectric breakdown parallel to lamination	KV/mm	~10	10	-
Volume Resistance Force	Ω–cm	~10^{14}	~10^{14}	-
Bending Strength	KN/cm^2	24~34	33	-
Compression Strength	KN/cm^2	147~245	210	
Tensile Strength	Mpa	1000~1200	1500	0.6
Expansion Coefficient	1/°C	8x10^{-6}	7.6x10^{-6}	-
Thermal Conductivity	cal/cm · sec · °C	3.6~5.0x10-2	5.0x10^{-2}	1.7x10^{-4}
Heat Resistance	°C	1000~1200	1500	1300
Water Absorption Ratio	%	0	0	-
Specific Gravity	-	3.7	3.8	0.25
Main Material	-	Al_2O_3 (92%)	Al_2O_3 (96%)	-

These materials are fragile. Please handle with care.

Thermal Insulation Washers / Collars

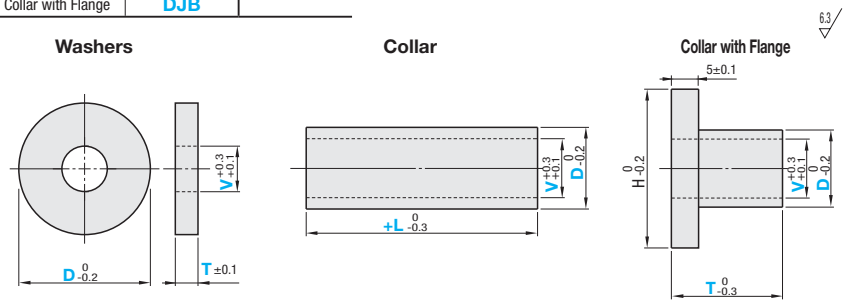
CAD Data

RoHS



Type		Material
Washers	DJW	Heat Insulation Material
Collar	DJC	
Collar with Flange	DJB	

This material excels in insulation resistance as well as heat insulation.



Washer (Heat Insulation Material)

Part Number Type	D	V Selection	T Selection	€ Unit Price
DJW	10	3 4 5	3 5	
	12	4 5 6	3 5	
	16	5 6 8	3 5	
	20	5 6 8	3 5	
	25	5	5	
		6 8 10	3 5	

Order Example: Part Number DJW10 - V 3 - T 5

Days to Ship: 6 Days P.87

Collar (Heat Insulation Material)

Part Number Type	D	V Selection	L	€ Unit Price L10	€ Unit Price L30
DJC	8	3 4 5	10 30		
	10	4 5 6			
	12	4 5 6 8			
	16	5 6 8			
	20	5 6 8 10			

Order Example: Part Number DJC8 - V 3 - L 10

Days to Ship: 6 Days P.87

About Direction of Material Lamination

Laminated directions of washers and collars are different (Figure below).
Therefore, mechanical strength varies depending on direction of the lamination.

- Washers are laminated in the vertical direction.



- Collars and Collars with Flange are laminated in the radial direction. Please note that the mechanical strength is less than washers'.



The above are reference images. Actual products slightly differ from the images.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Collar with Flange (Heat Insulation Material)

Part Number Type	V	D Selection	L Selection	H	€ Unit Price L10	€ Unit Price L15	€ Unit Price L20
DJB	3	8	10	12			
	4	8 10	10 15	14			
	5	10 12	10 15 20	15			
	6	10 12	10 15 20	20			
	8	12	10 15 20	25			
	10	20	10 15 20	30			

Order Example: Part Number DJB4 - D 8 - L 15

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Characteristics of Heat Insulation Material (Values shown below are for reference only.)

Mechanical Properties				Thermal and Electrical Characteristics		
Tensile Strength		Mpa	108	Deflection Temperature (1.82Mpa)	°C	400~
Elongation		%	0.7	Linear Expansion Coefficient	10 –5 /°C	2.6~3.5 *2
Bending Strength	Vertical	MPa	145~130 *1	Thermal Conductivity	W/m · k (cal/cm · sec · °C)	0.24 ($5.7x10^{-4}$)
	Parallel		145~130 *1	Dielectric Constant (106 Hz)	-	3.8
Flexural Modulus			17900	Dissipation Factor (106 Hz)	-	0.005
Compression Strength [5% Deformation]	Vertical		439~410 *1	Volume Resistivity	Ω·cm	1.01014
	Parallel		98 ~ 90 *1	Dielectric Breakdown Strength	KV/mm	15
Izot Impact Strength (Notched)		J/m	29	Arc Resistance	sec	345
Rockwell Hardness		R	R113	Water Absorption (At 23°C x 24h)	%	0.05
Glass Fiber Content		-	Available	Ambient Operation Temperature	°C	~400
Specific Gravity		-	2.0			

* 1 Bending Strength maintains the minimum value even at 400 degrees Celsius.
* 2 2.6 = ambient temperature ~200°C, 3.5 = ambient temperature ~400°C

Extra Thin Resin Washers / Sheets

Price Reduction 30%

CAD Data

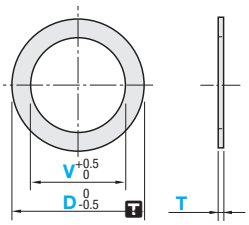
■Extra thin washer with excellent low friction and abrasion resistance.

■Extra Thin Resin Washers -Abrasion Resistance-

RoHS



SWSPS



Material : Polyslider® (Nylon Resin)

Polyslider® is a registered trademark of ASAHI POLYSLIDER COMPANY, LIMITED.

Part Number Type	D	V	T	€ Unit Price
SWSPS	8	3 4 5	0.13 0.25 0.5 1.0	
	10	4 5 6		
	12	4 5 6 8		
	15	5 6 8 10		
	20	8 10 12		

■Tolerance

T Thickness(T) Tolerance			
0.13	0.25	0.5	1.0
±0.013	±0.025	±0.025	±0.050

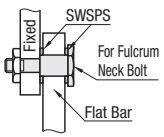
■Comparison Table

Item	Polyslider®	Fluoro Resin
Abrasion Resistance	◎	○
Compression Strength	◎	X
Sliding Properties	○	◎
Properties	Crush, abrasion resistant.	Low friction, not crush resistant.

■Property Data

Item	Unit	Values
Tensile Strength	Mpa	98
Elongation	%	60
Friction Coefficient	μ	0.16~0.4
Insulation Resistance	KV/mm	45

Example

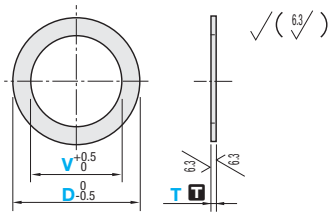


■Extra Thin Resin Washers / Sheets - Polyacetal / Fluoro Resin / Polycarbonate-

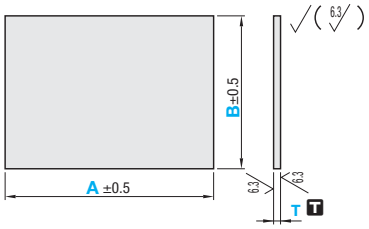
RoHS

Type			M Material	Color	T Thickness(T) Tolerance				
Washers	Washer Package	Sheet			0.1	0.2	0.3	0.5	1
SWSJJ	PACK-SWSJJ	CIRAJ	Polyacetal	White	-	±0.03	±0.04	±0.07	±0.10
SWSPT	PACK-SWSPT	CIRAT	Fluoro Resin	White	±0.01	±0.02	±0.03	±0.05	
SWSPP	PACK-SWSPP	CIRAP	Polycarbonate	Transparent					

■Washers



■Sheet



■Washers

PACK-SWS__: order from 1 pack (1 pack = 10pcs.)

Part Number Type	D	V Selection	T Selection	€ Unit Price SWSJJ T0.2 · 0.3	SWSJJ T0.5 · 1.0	SWSPT SWSPP T0.1~0.3	SWSPT SWSPP T0.5 · 1.0	PACK-SWSJJ T0.2 · 0.3	PACK-SWSJJ T0.5 · 1.0	PACK-SWSPT PACK-SWSPP T0.1~0.3	PACK-SWSPT PACK-SWSPP T0.5 · 1.0
SWSJJ SWSPT SWSPP PACK-SWSJJ PACK-SWSPT PACK-SWSPP	8	0 3 4	* 0.1 0.2 0.3 0.5 1.0								
	10	0 3 4 5 6									
	12	0 4 5 6 8									
	15	0 5 6 8 10									
	16	0 5 6 8 10 12									
	20	0 6 8 10 12 15 16									
	25	0 8 10 12 15 16									
	30	0 8 10 12 15 16 20									
	35	0 20 25 30									
	40	0 20 25 30									
	50	0 30 35 40									

* SWSJJ and PACK-SWSJJ are not available for T0.1.

■Sheet

Part Number Type	T	A	B	€ Unit Price CIRAJ T0.2	CIRAJ 0.3	CIRAJ 0.5	CIRAJ 1.0	CIRAT T0.1, 0.2	CIRAT 0.3	CIRAT 0.5	CIRAT 1.0	CIRAP T0.1, 0.2	CIRAP 0.3	CIRAP 0.5	CIRAP 1.0
CIRAJ CIRAT CIRAP	*0.1 0.2 0.3 0.5 1.0	20 · 30	20												
		40 · 50													
		60 · 70 · 80													
		90 · 100													
		150													
		30 · 40	30												
		50 · 60													
		70 · 80 · 90													
		100 · 150													
		40 · 50	40												
		60 · 70 · 80													
		90 · 100													
		150													
		50 · 60	50												
		70 · 80 · 90													
		100													
		150 · 200													
		60 · 100	60												
		200													
		100	100												
		200													

* CIRAJ is not available for T0.1.

For package, minimum order unit is 1 pack.

Order Example

Part No.	-	V	-	T
SWSPS8	-	3	-	0.5
PACK-SWSJJ8	-	3	-	0.5

Part No.	-	A	-	B
CIRAJ0.2	-	100	-	20

Days to Ship

8 Days

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Express A 2,00 EUR/piece P. 88

Price

SWSPS

■Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~49	50~99	100~199
Discount rate	€ Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

SWSJJ / SWSPT / SWSPP

■Volume Discount (Round down to one Cent.) P. 87

Quantity	1~49	50~69	70~99	100~199
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

PACK-SWS__ / CIRA_

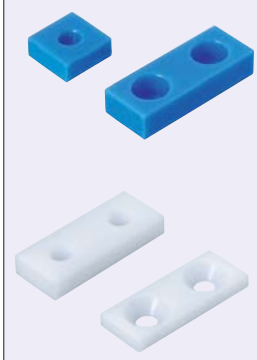
■Volume Discount (Round down to one Cent.) P. 87

Quantity	1~4	5~9	10~19	20~30
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Square Resin Washers

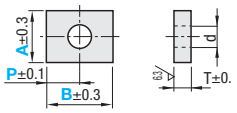
CAD Data



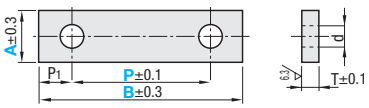
One Through Hole	Two Through Holes	Two Countersink Holes	Two Counterbored Holes	Material	Color
WSRJJ	WSRRJ	WSRPJ	WSRZJ	Polyacetal	White
WSRJM	WSRRM	WSRPM	WSRZM	MC Nylon Standard Grade	Blue

Material Properties P.129~

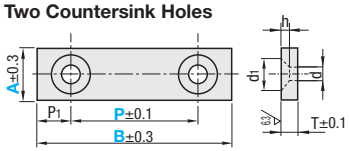
One Through Hole



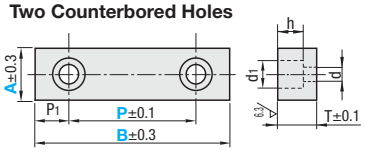
Two Through Holes



Two Countersink Holes



Two Counterbored Holes



One Through Hole

Part Number Type	A	B 1mm Increment	P 0.5mm Increment (P≤B/2)	T	Screw Nominal Ø	d	€ Unit Price WSRJJ	€ Unit Price WSRJM
WSRJJ WSRJM	6	6~20	3.0~10.0	2	3	3.5		
	8	8~25	4.0~12.5	3	3	3.5		
	10	10~30	5.0~15.0	4	4	4.5		
	12	12~35	6.0~17.5	5	4	4.5		
	15	15~45	7.5~22.5	6	5	5.5		
	20	20~60	10.0~30.0	8	6	6.5		
	25	25~75	12.5~37.5	10	8	9		

Two Through Holes

Part Number Type	A	B 1mm Increment	P 0.5mm Increment (P≤B-2P1)	T	Screw Nominal Ø	d	P1	€ Unit Price WSRRJ	€ Unit Price WSRRM
WSRRJ WSRRM	6	12~24	6.0~18.0	2	3	3.5	3		
	8	16~32	8.0~24.0	3	3	3.5	4		
	10	20~40	10.0~30.0	4	4	4.5	5		
	12	24~48	12.0~36.0	5	4	4.5	6		
	15	30~60	15.0~45.0	6	5	5.5	7.5		
	20	40~80	20.0~60.0	8	6	6.5	10		
	25	50~100	25.0~75.0	10	8	9	12.5		

Two Countersink Holes

Part Number Type	A	B 1mm Increment	P 0.5mm Increment (P≤B-2P1)	T	Screw Nom. Ø	d	d1	h	P1	€ Unit Price WSRPJ	€ Unit Price WSRPM
WSRPJ WSRPM	10	20~40	10.0~30.0	3	3	3.5	7.5	2	5		
	12	24~48	12.0~36.0	4	4	4.5	9.5	2.5	6		
	15	30~60	15.0~45.0	4	5	5.5	11.5	3	7.5		
	20	40~80	20.0~60.0	5	6	6.5	13.5	3.5	10		
	25	50~100	25.0~75.0	6	8	9	19	5	12.5		

Two Counterbored Holes

Part Number Type	A	B 1mm Increment	P 0.5mm Increment (P≤B-2P1)	T	Screw Nom. Ø	d	d1	h	P1	€ Unit Price WSRZJ	€ Unit Price WSRZM
WSRZJ WSRZM	10	20~40	10.0~30.0	6	3	3.5	6.5	4	5		
	12	24~48	12.0~36.0	8	4	4.5	8	5	6		
	15	30~60	15.0~45.0	8	5	5.5	9.5	6	7.5		
	20	40~80	20.0~60.0	10	6	6.5	11	7	10		
	25	50~100	25.0~75.0	12	8	9	14	9	12.5		

Order Example

Part Number	-	B	-	P
WSRJJ10	-	25	-	12.5

Days to Ship 8 Days

Express Serviceis not available.

Price

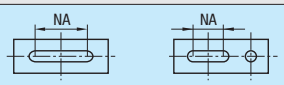
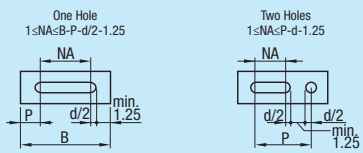
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

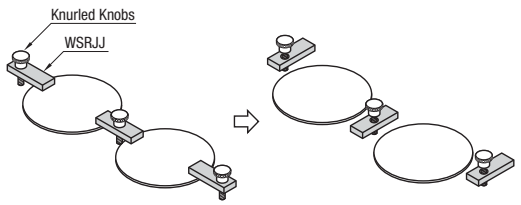
Alterations

Part Number	-	B	-	P	-	(NA)
WSRJM20	-	60	-	15.0	-	NA30

Alterations	Slotted Hole 
Code	NA
Specifications	Changes the through hole to the slotted hole. (Applicable to One Through Hole and Two Through Holes only.) Ordering Code (Specify in 0.5mm increments.) NA15 Machining Conditions 
Price Adder	3,00

Example

Work Holders



Shim Rings
-Standard · Configurable-

CAD Data

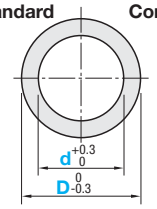
■Standard · Configurable

RoHS

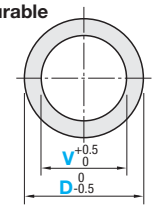


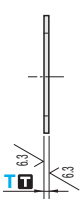
Standard Type	Configurable Type	M Material	H Hardness	T Thickness (T) Tolerance									
				0.01	0.02	0.03	0.05	0.1	0.2	0.3	0.5	0.8	1.0
CIMRS	CIMRSF	1.4301/X5CrNi18-10-H	370~430HV	±0.003		±0.005		±0.02	±0.03	±0.035	±0.04		±0.05
CIMRB	CIMRBF	Brass (CW505L or CW507L)	-	-	-	-	±0.005	±0.02	±0.03	±0.04	±0.05	-	±0.08
CIMR	CIMRF	1.0330/DC01	-	-	-	-	-	±0.03		±0.04	±0.06	-	±0.11

Standard



Configurable







■Standard

No specification available for plate thickness(T) without value.

Part Number Type	D	D Selection	T Selection	€ Unit Price CIMRS T0.01 · 0.05	CIMRS T0.02 / 0.03	CIMRS T0.1~0.3	CIMRS T0.5	CIMRS T1.0	CIMRB T0.05	CIMRB T0.1~0.3	CIMRB T0.5	CIMRB T1.0	CIMR T0.1~0.3	CIMR T0.5	CIMR T1.0
CIMRS CIMRB CIMR	2	3 4 5 6	(0.01) (0.02) (0.03) For CIMRS only												
	3	4 5 6 7 8 10													
	4	6 7 8 10 12													
	5	7 8 10 12 14 16													
	6	8 10 12 14 16													
	8	12 14 16 18 20													
	10	12 14 16 18 20													
	12	16 18 20 21 22	(0.05) For CIMRS · CIMRB only												
	15	18 20 21 22 24													
	16	20 21 22 24 28													
	17	20 21 22 24 28 30 32													
	20	24 28 30 32 35 40	0.1 0.2 0.3 0.5 1.0												
	22	28 30 32 35 40													
	25	30 32 35 40 42													
	28	32 35 40 42 45													
	30	35 40 42 45 50													
	35	42 45 50 55													
	40	45 50 55													
	45	50 55													

Order Example: Part Number - D - T
CIMR5 - 12 - 0.1

Days to Ship - Standard Type: 8 Days / 2 Days
Express A 2,00 EUR/piece
When ordering Express A on our website, enter "- - -".

Price - Standard Type

■Volume Discount
(Round down to one Cent.) P.87

Quantity	1~19	20~99	100~249	250~499
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Configurable

Part Number	D Specify 0.5mm Increment	V V2.6 or less / Selection V3.0 or more / 0.5mm Increment	T Selection	€ Unit Price CIMRSF T0.05	CIMRSF T0.1~0.3	CIMRSF T0.5	CIMRSF T0.8 · T1.0	CIMRBF T0.05	CIMRBF T0.1~0.3	CIMRBF T0.5	CIMRBF T1.0	CIMRF T0.1~0.3	CIMRF T0.5	CIMRF T1.0
CIMRSF CIMRBF CIMRF	4.0~ 20	0 (No Hole)	(0.05) For CIMRBF · CIMRSF only											
	20.5~ 40													
	40.5~ 60													
	60.5~ 80													
	80.5~100	2.0	(0.8) For CIMRSF only											
	100.5~120	2.6												
	120.5~140													
	140.5~160		0.1											
	160.5~180	3.0~248.0	0.2											
	180.5~200	T≤0.2··· V≤D−2	0.3											
	200.5~214	0.3≤T··· V≤D-3	0.5											
	214.5~230	(V2.6···D≥5)	1.0											
	230.5~250													

Order Example: Part Number - D - V - T
CIMRF - D73 - V43 - T1.0

Days to Ship - Configurable Type: 8 Days
Express A 4,00 EUR/piece
When ordering Express A on our website, enter "- - -".

Price - Configurable Type

■Volume Discount
(Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Discount rate	€ Unit Price	10%	20%	30%

For orders of 101 or more identical pieces, please request a quotation.

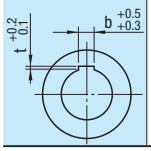
Alterations

Part Number - D - V - T - (KC)
CIMRSF - D22 - V18 - T0.1 - KC

8 Days ⊗Express Service is not available.

Applicable only to Dimension Configurable Type.

Alteration	Code	Spec.	Price Adder
Internal Notch	KC	Adds an internal notch. Ordering Code KC	1,00



Machining Conditions 8≤V≤49.5

V	b	T	D-V
8 ~10.5	3	2.0	7 or More
11~12.5	4	2.5	8 or More
13~17.5	5	3.0	10 or More
18~22.5	6	3.5	12 or More
23~30.5	8	4.0	14 or More
31~38.5	10	4.0	14 or More
39~42.5	12	4.0	14 or More
43~49.5	14	4.5	16 or More

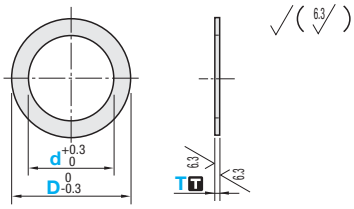
Shim Rings Package
-Standard Type-

CAD Data

■Standard, Sold by Package (30 pcs.) RoHS



Standard	Material	Hardness	Thickness(T) Tolerance									
			0.01	0.02	0.03	0.05	0.1	0.2	0.3	0.5	0.8	1.0
PCIMRS	1.4301/X5CrNi18-10-H	370~430HV	±0.003		±0.005		±0.02	±0.03	±0.035	±0.04		±0.05
PCIMRB	Brass (CW505L or CW507L)	-	-	-	-	±0.005	±0.02	±0.03	±0.04	±0.05	-	±0.08
PCIMR	1.0330/DC01	-	-	-	-	-	±0.03		±0.04	±0.06	-	±0.11



■1.4301/X5CrNi18-10-H (?)30 pcs. per package

(?) No specification available for plate thickness(T) without value.

Part Number Type	d	D Selection	T Selection	€ Unit Price PCIMRS T0.01 · 0.05	T0.1~0.3	T0.5	T1.0
PCIMRS	2	3 4 5 6	0.01 0.05 0.1 0.2 0.3 0.5 1.0				
	3	4 5 6 7 8 10					
	4	6 7 8 10 12					
	5	7 8 10 12 14 16					
	6	8 10 12 14 16					
	8	12 14 16 18 20					
	10	12 14 16 18 20					
	12	16 18 20 21 22					
	15	18 20 21 22 24					
	17	20 21 22 24 28 30 32					
	20	24 28 30 32 35 40					
	22	28 30 32					
	25	30 32 35 40 42					
	30	35 40 42 45 50					
	35	42 45 50 55					
	40	45 50 55					
	45	50 55					

Order Example: Part Number PCIMRS5 - D 12 - T 0.1

Days to Ship - PCIMRS: 6 Days P.88

Price

■Volume Discount (?)Round down to one Cent. P.87

Quantity	1~4	5~9	10~19
Discount rate	€ Unit Price	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

■Brass- 1.0330/DC01 (?)30 pcs. per package

Part Number Type	d	D Selection	T Selection	€ Unit Price PCIMRB T0.05	T0.1~0.3	T0.5	T1.0	PCIMR T0.1~0.3	T0.5	T1.0
PCIMRB PCIMR	3	5 6 8 10	(0.05) For PCIMRB only. 0.1 0.2 0.3 0.5 1.0							
	4	6 8 10 12								
	5	8 10 12 14								
	6	10 12 14 16								
	8	12 14 16								
	10	14 16 18 20								
	12	16 18 20 21 22								

Order Example: Part Number PCIMR5 - D 12 - T 0.1

Days to Ship - PCIMR: 6 Days P.88

- PCIMRB: 8 Days | Express A | 2,00 EUR/piece

(?)When ordering Express A on our website, enter "- - -".

Price

■Volume Discount (?)Round down to one Cent. P.87

Quantity	1~4	5~9	10~19
Discount rate	€ Unit Price	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

Precision Shim Rings / Wave Washers

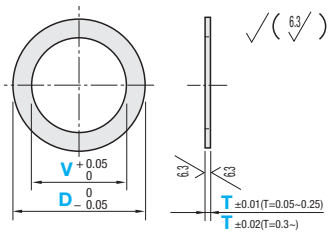
-Standard · Configurable-

Price Reduction 10%

CAD Data

■Precision Class Shim Rings RoHS





Standard, Sold by Package	Dimension Configurable	M Material	H Hardness
PCIMAS	CIMASF	1.4301/X10CrNi18-10-H	370~430HV
-	CIMAKF	JIS SK	480~520HV

■Standard, Sold by Package

1 package contains 10 pieces.

Part Number Type	D	V (Inner Dia.) Selection	T Selection	€ Unit Price T0.05	T0.1~0.3	T0.5 · 1.0
PCIMAS	5	3	0.05 0.1 0.2 0.3 0.5 1.0			
	6	3 4				
	7	3 4 5				
	8	4 5 6				
	9	4 5 6				
	10	4 5 6 7 8				
	11	5 6 7 8				
	12	5 6 7 8				
	13	7 8				
	14	7 8 10				
	15	8 10 12				
	16	8 10 12				
	20	8 10 12				
	22	8 10 12				
	25	8 10 12 18 21				
	28	21 23				
	30	24				

■Configurable

Part Number	D	V	T		€ Unit Price	
	0.5mm Increment		CIMASF	CIMAKF	T0.05~0.3	T0.4~1.0
CIMASF (1.4301/X5CrNi18-10-H) CIMAKF (SK)	5 ~10	0 (No Hole) 3.0~48.0	0.05 0.06 0.07 0.08 0.09 0.1 0.15 0.2 0.25 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0	0.05 0.1 0.2 0.3 0.5 1.0		
	10.5~20					
	20.5~30					
	30.5~40					
	40.5~50					

T≤0.2···V≤D-2 0.3≤T···V≤D-4

Order Example

Part Number	-	D	-	V	-	T
PCIMAS	-	D25	-	V10	-	T0.2
CIMASF	-	D25	-	V10	-	T0.2

Price

■Volume Discount

Round down to one Cent. P.87

Quantity	1~4	5~9	10~19	20~49
Discount rate	€ Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

■Standard, Sold by Package

8 Days | Express A | Free of charge | P.88

When ordering Express A on our website, enter "- - -".

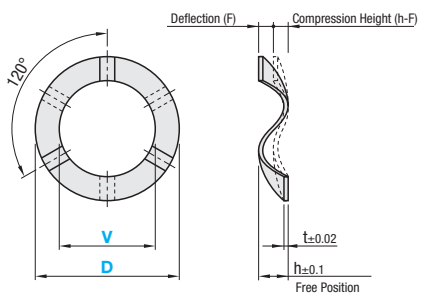
■Configurable

8 Days

Express Services is not available.

■Wave Washers RoHS





M Material: 1.4301/X5CRNI18-10-H H Hardness: 370~430HV

■Standard, Sold by Package

30 pcs. per package

Part Number Type	V Inner Ø	V Tol.	D Outer Ø	D Tol.	T Thickness	h Free State Height	Load (*Reference) Deflection F (mm)	Load (*Reference) Compressed Height h-F	Load (N)	Deflection F (mm)	Compr. Height h-F	Load (N)	€ Unit Price 1~9 packs	Volume Discount 10 packs or more
PACK-WVWS	3	+0.2 0	3.6	0 -0.2	0.05	0.5	0.1	0.4	0.35	0.3	0.2	0.77		
			4.2						0.73			1.96		
	4	+0.3 0	5	0 -0.3		0.7	0.2	0.5	0.47	0.4	0.3	0.91		
			6						0.87			1.62		
	5		7						0.60			1.11		
			8						0.69			1.25		
			10						0.75			1.42		
	6		8		0.1	1.0	0.3	0.7	3.68	0.7	0.3	8.39		
			10						5.23			15.33		
			12						5.10			19.00		
	8		10						1.88			4.93		
			12						2.93			8.72		
			16						2.84			11.00		
	10		12						1.03			2.71		
			14						1.31			4.46		
			16						1.76			5.82		
	12		14						0.69			1.71		
			15						0.98			2.58		
			17						1.20			3.58		
	16	+0.5 0	18	0 -0.5	0.15	1.5	0.5	1.0	1.33	1.0	0.5	2.82		
			20						2.56			5.95		
			28						4.28			12.61		
	20		24						1.43			3.31		
			28						2.34			5.94		
	22		28						1.48			3.76		
			30						1.74			4.59		
	25	+0.9 0	30	0 -0.9	0.2	3.0	1.0	2.0	5.40	2.0	1.0	8.78		
			35						8.20			16.25		
	30		35						2.92			5.77		
			38						4.30			9.29		

Order Example

Part Number	-	V	-	D
PACK-WVWS	-	V3	-	D4.2

Days to Ship

6 Days P.88

Shim (Split Type)
-Standard · Configurable-

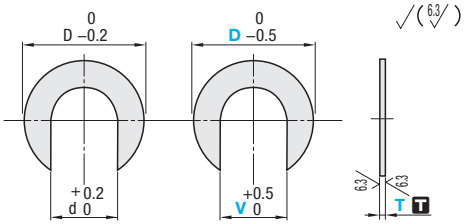
Price Reduction 20%

CAD Data

Split Type

RoHS





Part Number		Material	Hardness	Thickness(T) Tolerance					
Standard	Configurable			0.05	0.1	0.2	0.3	0.5	1.0
CIMW	CIMWF	1.0330/DC01	-	-	±0.03		±0.04	±0.06	±0.11
CIMWB	CIMWBF	Brass (CW505L/CuZn30 or CW507L/CuZn36)	-	±0.005	±0.02	±0.03	±0.04	±0.05	±0.08
CIMWS	CIMWSF	1.4301/X5CRNI18-10-H	370~430HV	±0.005	±0.02	±0.03	±0.035	±0.04	±0.05
PACK-CIMWS	-								

Standard

Part Number Type	No.	T	d	D	€ Unit Price CIMW	CIMWB	CIMWS
CIMW CIMWB CIMWS	6	(0.05)	6.5	12			
	8	For CIMWB /	8.5	15			
	10	CIMWS Only	10.5	20			
	12	0.1	13	25			
	16	0.2	17	30			
	20	0.3	21	35			
	24	0.5	25	40			
	30	1.0	31	50			

Order Example: Part Number CIMW10 - T 0.2

Days to Ship: 8 Days

Express A: Free of charge

When ordering Express A on our website, enter "- - -".

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~99	100~199	200~249	250~499
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Standard Sold by package

1 package contains 10 pieces.

Part Number Type	No.	T Selection	d	D	€ Unit Price T0.05	T0.1~0.3	T0.5	T1.0
PACK-CIMWS	6		6.5	12				
	8	0.05	8.5	15				
	10	0.1	10.5	20				
	12	0.2	13	25				
	16	0.3	17	30				
	20	0.5	21	35				
	24	1.0	25	40				
	30		31	50				

Order Example: Part Number PACK-CIMWS12 - T 0.1

Please specify no. of packages to order. Quantity 1 means one package.

Days to Ship: 6 Days P.88

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Configurable

Part Number	T Selection	V 0.5mm Increment	D 1 mm Increment	€ Unit Price CIMWF T0.1~0.3	CIMWF T0.5	CIMWF T1.0	CIMWBF T0.05	CIMWBF T0.1~0.3	CIMWBF T0.5	CIMWBF T1.0	CIMWSF T0.05	CIMWSF T0.1~0.3	CIMWSF T0.5	CIMWSF T1.0
CIMWF CIMWBF CIMWSF	(0.05) For CIMWBF / CIMWSF Only	3~31	10~20											
	0.1													
	0.2													
	0.3		21~50											
	0.5													
	1.0													

V≤D–4

Order Example: Part Number CIMWF - T 0.2 - V 8.5 - D 20

Days to Ship: 8 Days

Express A: Free of charge P.88

When ordering Express A on our website, enter "- - -".

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

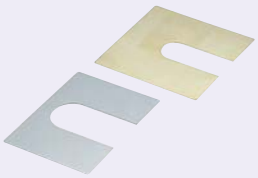
Square Shims

-For Motor Base · For Pillow Block-

CAD Data

■ For Motor Base
■ For Pillow Block

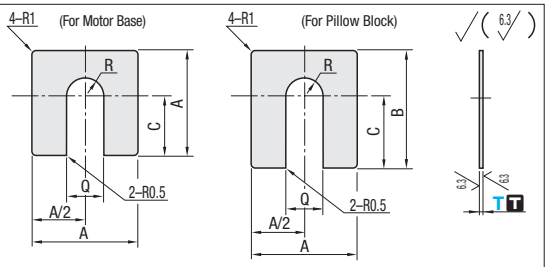
RoHS



Type		M	H
For Motor Base	For Pillow Block	Material	Hardness
CIMM	CIMSN	1.0330/DC01	-
CIMMB	CIMSB	Brass (CW505L/CuZn30 or CW507L/CuZn36)	-
CIMMS	CIMSS	1.4301	370~430HV

T Thickness Tolerance

T	1.0330/DC01	Brass	1.4301-H
0.05	-	±0.005	±0.005
0.1	±0.03	±0.02	±0.02
0.2	±0.03	±0.03	±0.03
0.5	±0.06	±0.05	±0.04
1.0	±0.11	±0.08	±0.05



■ For Motor Base

Part Number		T Selection	A	C	Q	€ Unit Price													
Type	No.					CIMM				CIMMB					CIMMS				
						T0.1	T0.2	T0.5	T1.0	T0.05	T0.1	T0.2	T0.5	T1.0	T0.05	T0.1	T0.2	T0.5	T1.0
CIMM CIMMB CIMMS	2009	(0.05) For CIMMB · CIMMS Only 0.1 0.2 0.5 1.0	20	10	9														
	3013		30	15	13														
	4312		43	22	12														
	4814		48	24	14														
	5314		53	27	14														
	6816		68	34	16														
	8320		83	42	20														
	9825		98	49	25														
	11830		118	54	30														
	20036		200	100	36														

■ For Pillow Block

Part Number		T Selection	A	B	C	Q	Applicable Pillow Block	€ Unit Price													
Type	No.							CIMSN				CIMSB					CIMSS				
								T0.1	T0.2	T0.5	T1.0	T0.05	T0.1	T0.2	T0.5	T1.0	T0.05	T0.1	T0.2	T0.5	T1.0
CIMSN CIMSB CIMSS	204A	(0.05) For CIMSB / CIMSS Only 0.1 0.2 0.5 1.0	40	27	15	13	UCPA204 UCUP204														
	205A		45	30	16	13	UCPA205 UCUP205														
	206A		50	36	22	17	UCPA206 UCUP206														
	207A		55	41	26	17	UCPA207 UCUP207														
	208A		58	41	25	17	UCPA208 UCUP208														
	204		38	42	26	13	UCP-204														
	205		38	42	25	13	UCP-205														
	206		48	54	32	17	UCP-206														
	207		48	54	34	17	UCP-207														
	208		54	58	35	17	UCP-208														
	209		54	60	38	17	UCP-209														
	210		60	65	42	20	UCP-210														

Order Example

Part Number	-	T
CIMM2009	-	0.5
CIMSN204A	-	0.1

Days to Ship

8 Days

Express A — Free of charge

When ordering Express A on our website, enter "- - -".

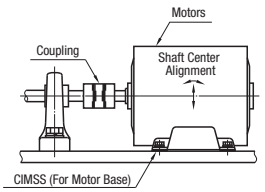
Price

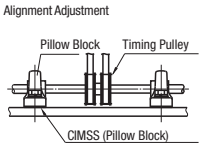
■ Volume Discount (Round down to one Cent.) P.87

Quantity	1~99	100~199	200~249	250~499
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Example





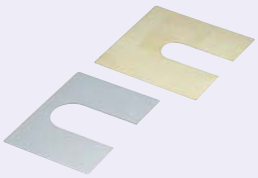
Square Shims Package / Square Shim (Adjustment)

-For Motor Base · For Pillow Block-

Part Number Change Printed in Purple

CAD Data

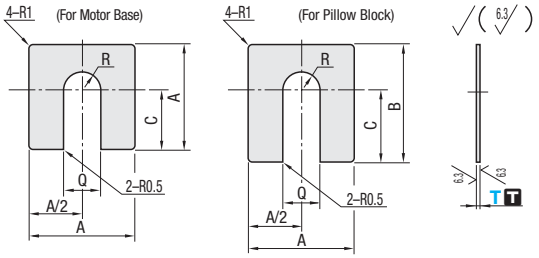
■ Sold by package
(1 pack = 10 pcs.)



Type		Material	Hardness
For Motor Base	For Pillow Block		
PACK-CIMMS	PACK-CIMSS	1.4301	370~430HV

T Thickness Tolerance

T	1.4301
0.05	±0.005
0.1	±0.02
0.2	±0.03
0.5	±0.04
1.0	±0.05



■ For Motor Base · For Pillow Block Package ?1 package contains 10 pieces.

Part Number Type	No.	T Selection	A	B	C	Q	€ Unit Price T0.05	T0.1	T0.2	T0.5	T1.0
For Motor Base (1.4301-H) PACK-CIMMS	2009	0.05 0.1 0.2 0.5 1.0	20	-	10	9					
	3013		30	-	15	13					
	4312		43	-	22	12					
	4814		48	-	24	14					
	5314		53	-	27	14					
	6816		68	-	34	16					
	8320		83	-	42	20					
	9825		98	-	49	25					
For Pillow Block (1.4301-H) PACK-CIMSS	204A		40	27	15	13					
	205A		45	30	16	13					
	206A		50	36	22	17					
	207A		55	41	26	17					
	208A		58	41	25	17					
	204		38	42	26	13					
	205		38	42	25	13					
	206		48	54	32	17					
	207		48	54	34	17					
	208		54	58	35	17					
	209		54	60	38	17					
	210		60	65	42	20					

Order Example

Part Number	-	T
PACK-CIMMS2009	-	0.5
PACK-CIMSS204A	-	0.1

Days to Ship: 6 Days P87

Price

■ Volume Discount (?Round down to one Cent.) P87

Quantity	1~9	10~19	20~49	50~99
Discount rate	€ Unit Price	5%	10%	15%

?For orders larger than indicated quantity, please request a quotation.

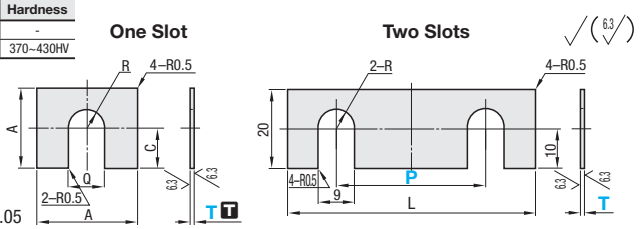
?Please specify no. of packages to order. Quantity 1 means one package.

■ Adjustment Type RoHS



Type		Material	Hardness
One Slot	Two Slots		
ASA	ASF	1.0330/DC01	-
ASAS	-	1.4301	370~430HV

T Tolerance: T1±0.1 T0.5±0.05



Part Number Type	T	No.	A	C	Q	ASA T0.5 € Unit Price Qty. 1~49	ASA T0.5 Volume Discount 50~	ASA T1.0 € Unit Price Qty. 1~49	ASA T1.0 Volume Discount 50~	ASAS T0.5 € Unit Price Qty. 1~49	ASAS T0.5 Volume Discount 50~	ASAS T1.0 € Unit Price Qty. 1~49	ASAS T1.0 Volume Discount 50~
ASA ASAS	0.5 1.0	1035	10	5	3.5								
		1245	12	6	4.5								
		1455	14	7	5.5								
		1665	16	8	6.5								
		2009	20	10	9								

Part Number Type	T	P	L	€ Unit Price Qty. 1~49	Volume Discount 50~
ASF	0.5	30	50		
		40	60		
		50	70		
	1.0	30	50		
		40	60		
		50	70		

Order Example

Part Number	-	No.
ASA0.5	-	1035

?The part number for ASA has been revised.

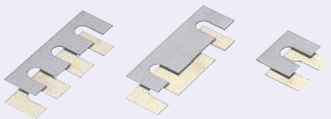
Old Part Number	New Part Number
ASA0.5	ASA0.5-2009

Part Number	-	P
ASF0.5	-	30

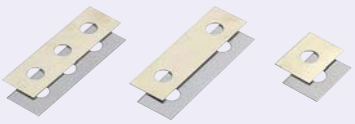
Days to Ship: 6 Days P87 2 Days

Square Shims
-Slotted Hole / Round Hole-

■Slotted



■Round Hole

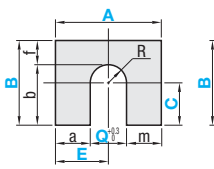


RoHS

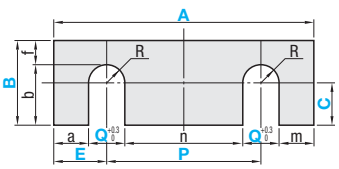
Part Number			Material	Hardness	Thickness(T) Tolerance							
One Slot	Two Slots	Three Slots			0.05	0.1	0.2	0.3	0.5	1.0	2.0	3.0
ASAFR	ASFFR	ASCFR	1.0330/DC01	-	-	±0.03		±0.04	±0.06	±0.11	±0.17	-
ASAFB	ASFFB	ASCFB	Brass (CW505L/CuZn30 or CW507L/CuZn36a)	-	±0.005	±0.02	±0.03	±0.04	±0.05	±0.08	±0.12	±0.15
ASAFS	ASFFS	ASCFS	T=0.05~1.0 1.4301/X5CrNi18-10 T=2.0 · 3.0 1.4301/X5CrNi18-10	370~430HV -	±0.005	±0.02	±0.03	±0.035	±0.04	±0.05	±0.20	±0.25

Machining Conditions of Slotted Hole Type
(P) f≥3 (P) a≥3
(P) m≥3 (P) n≥3

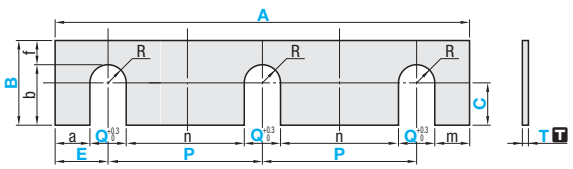
One Slot



Two Slots



Three Slots



Part Number Type				A 1 mm Increment	B 1 mm Increment	T (Selection)	0.5mm Increment Q	0.1mm Increment E	0.1mm Increment C	0.1mm Increment P
	1.0330/DC01	Brass	1.4301/ X5CrNi18-10(H)							(P) For One Hole Type, specification is not necessary.
One Hole	ASAFR	ASAFB	ASAFS	10~150	10~150	(0.05) 0.1 0.2 0.3 0.5 1.0 2.0 (3.0)	3~31	Q/2+3	0 ~ B-(Q/2+3)	
Two Holes	ASFFR	ASFFB	ASFFS	16~200	10~200					Q+3~
Three Holes	ASCFR	ASCFB	ASCFS							

(P) 1.0330/DC01 is not available for T (0.05) and T (3.0).

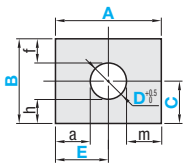
Order Example

Part Number	-	A	-	B	-	T	-	Q	-	E	-	C	-	P
ASFFB	-	A100	-	B25	-	T1.0	-	Q12	-	E15	-	C12	-	P70

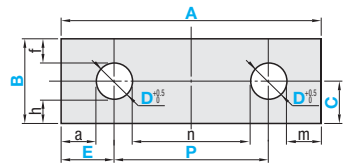
Part Number			Material	Hardness	Thickness(T) Tolerance							
One Round Hole	Two Round Holes	Three Round Holes			0.05	0.1	0.2	0.3	0.5	1.0	2.0	3.0
ASACR	ASFCR	ASCCR	1.0330/DC01	-	-	±0.03		±0.04	±0.06	±0.11	±0.17	-
ASACB	ASFCB	ASCCB	Brass (CW505L/CuZn30 or CW507L/CuZn36)	-	±0.005	±0.02	±0.03	±0.04	±0.05	±0.08	±0.12	±0.15
ASACS	ASFCS	ASCCS	T=0.05~1.0 1.4301/X5CrNi18-10 T=2.0 / 3.0 1.4301/X5CrNi18-10	370~430HV -	±0.005	±0.02	±0.03	±0.035	±0.04	±0.05	±0.20	±0.25

Machining Conditions of Round Hole Type
(P) f≥2 (P) a≥2
(P) m≥2 (P) n≥2
(P) h≥2

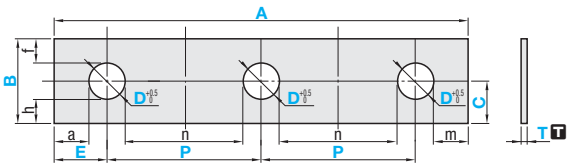
One Round Hole



Two Round Holes



Three Round Holes



Part Number Type				A 1 mm Increment	B 1 mm Increment	T (Selection)	D 0.5mm Increment	0.1mm Increment E	0.1mm Increment C	0.1mm Increment P
	1.0330/DC01	Brass	1.4301/ X5CrNi18-10(H)							(P) For One Hole Type, specification is not necessary.
One Hole	ASACR	ASACB	ASACS	10~150	10~150	(0.05) 0.1 0.2 0.3 0.5 1.0 2.0 (3.0)	3~100	D/2+2~	0 ~ B-(D/2+2)	
Two Holes	ASFCR	ASFCB	ASFCS	15~200	10~200					D+3~
Three Holes	ASCCR	ASCCB	ASCCS							

(P) 1.0330/DC01 is not available for T (0.05) and T (3.0).

Order Example

Part Number	-	A	-	B	-	T	-	D	-	E	-	C	-	P
ASACR	-	A50	-	B25	-	T0.1	-	D7.5	-	E25	-	C11		
ASCCS	-	A120	-	B15	-	T3.0	-	D10	-	E15	-	C7	-	P45

Days to Ship **8 Days**

Express A | Free of charge P.88

When ordering Express A on our website, enter "- - -".

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Discount rate	€ Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

One Slot · One Round Hole

A	B	€ Unit Price										
		ASAFR / ASACR			ASAFB / ASACB				ASAFS / ASACS			
		T0.1~0.5	T1.0	T2.0	T0.05	T0.1~0.5	T1.0	T2.0~3.0	T0.05	T0.1~0.5	T1.0	T2.0~3.0
10~50	10~ 50											
	51~100											
	101~150											
51~70	10~ 50											
	51~100											
	101~150											
71~100	10~ 50											
	51~100											
	101~150											
101~130	10~ 50											
	51~100											
	101~150											
131~150	10~ 50											
	51~100											
	101~150											

Two Slots · Two Round Holes

A	B	€ Unit Price										
		ASFFR / ASFCR			ASFFB / ASFCB				ASFFS / ASFCS			
		T0.1~0.5	T1.0	T2.0	T0.05	T0.1~0.5	T1.0	T2.0~3.0	T0.05	T0.1~0.5	T1.0	T2.0~3.0
15~ 50	10~50											
	51~100											
	101~150											
51~70	10~ 50											
	51~100											
	101~150											
71~100	10~ 50											
	51~100											
	101~150											
101~130	10~ 50											
	51~100											
	101~150											
131~150	10~ 50											
	51~100											
	101~150											
151~200	10~ 50											
	51~100											
	101~150											
	151~200											

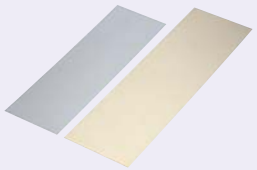
Three Slots · Three Round Holes

A	B	€ Unit Price										
		ASCFR / ASCCR			ASCFB / ASCCB				ASCFS / ASCCS			
		T0.1~0.5	T1.0	T2.0	T0.05	T0.1~0.5	T1.0	T2.0~3.0	T0.05	T0.1~0.5	T1.0	T2.0~3.0
15~ 50	10~ 50											
	51~100											
	101~150											
51~70	10~ 50											
	51~100											
	101~150											
71~100	10~ 50											
	51~100											
	101~150											
101~130	10~ 50											
	51~100											
	101~150											
131~150	10~ 50											
	51~100											
	101~150											
151~200	10~50											
	51~100											
	101~150											
	151~200											

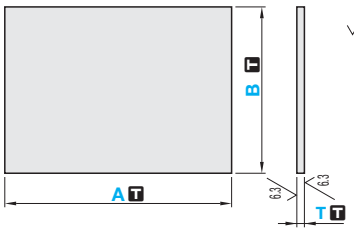
Shim Plates
-Standard · Configurable-

■Shim Plates

RoHS



Type		M Material	H Hardness	T Thickness(T) Tolerance					
Standard Type	Dimension Configurable			0.05	0.1	0.2	0.3	0.5	1.0
CIRA	CIRAF	1.0330/DC01	-	-	±0.03		±0.04	±0.06	±0.11
CIRAB	CIRABF	Brass (CW505L/CuZn30 or CW507L/CuZn36)	-	±0.005	±0.02	±0.03	±0.04	±0.05	±0.08
CIRAS	CIRASF	1.4301/X5CrNi18-10-H	370~430HV	±0.005	±0.02	±0.03	±0.035	±0.04	±0.05



A / B	T A · B Tolerances		
	Standard Type		Configurable Type
	CIRA • CIRAS	CIRAB	
20~	+0.5 0		±0.5
400~	-	-	±0.8
800~	±1.2	+5 0	±1.2

■Standard Type

Part Number		Selection		€ Unit Price																	
Type	T	A	B	CIRA					CIRAB						CIRAS						
				0.1	0.2	0.3	0.5	1.0	0.05	0.1	0.2	0.3	0.5	1.0	0.05	0.1	0.2	0.3	0.5	1.0
CIRA CIRAB CIRAS	(0.05) CIRA is not available. 0.1 0.2 0.3 0.5 1.0	20 30 40	20 30																		
		50 60 70																			
		80 90 100																			
		120 150																			
		40 50 60	40 50																		
		70 80 90																			
		100 120																			
		60 70 80	60 70																		
		90 100																			
		120 150																			
		200																			
		80 90 100	80 90																		
		120 150																			
		200																			
		100 120	100 120																		
		150																			
		200																			
		150	150																		
		200																			
		200	200																		
		1000	300																		
			320																		
		1200	365																		

Specify as A≥B. — No specification available for those without value.

Order Example: Part Number - A - B → CIRAB0.5 - 40 - 20

Days to Ship: 8 Days; Express A Free of charge

When ordering Express A on our website, enter "- - -".

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~5	6~10	11~20	21~30
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Configurable

Part Number	1 mm Increment		Selection	€ Unit Price								
	A	B	T	CIRAF			CIRABF			CIRASF		
				T0.1~0.3	T0.5	T1.0	T0.05~0.3	T0.5	T1.0	T0.05~0.3	T0.5	T1.0
CIRAF CIRABF CIRASF	10~ 100	10~100	(0.05) CIRAF is not available. 0.1 0.2 0.3 0.5 1.0									
	101~ 200	20~100										
		101~200										
	201~ 300	20~100										
		101~200										
		201~300										
	301~ 400	20~100										
		101~200										
		201~300										
	401~ 500	20~100										
		101~200										
		201~300										
	501~ 600	20~100										
		101~200										
		201~300										
	601~ 800	20~100										
		101~200										
		201~300										
	801~1000	20~100										
		101~200										
		201~300										

T=0.05··· B≤300

Order Example: Part Number - A - B - T → CIRASF - 527 - 118 - 0.2

Days to Ship: 8 Days; Express A Free of charge

When ordering Express A on our website, enter "- - -".

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~5	6~10	11~20	21~30
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Shim Plates (JIS SK Hardening Steel) / Shim Tapes · Shim Tape Boxes
-Standard · Configurable-

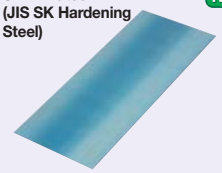
NEW

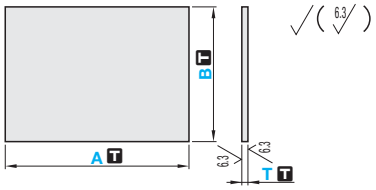
Price Reduction 9%

CAD Data

Shim Plates (JIS SK Hardening Steel)

RoHS





Standard Type	Dimension Configurable	M Material	H Hardness
CIRAK	CIRAKF	JIS SK	480~520HV

T Thickness(T) Tolerance				
0.1	0.2	0.3	0.5	1.0
±0.01	±0.015	±0.025	±0.03	±0.05

Standard Type

Part Number Type	T	Selection A	Selection B	€ Unit Price 0.1	0.2	0.3	0.5	1.0
CIRAK	0.1 0.2 0.3 0.5 1.0	100 250 500 1000	100					

Standard Type

T A / B Tolerances		
A	100~1000	±1
B	100	+2 -1

Configurable Type

T A / B Tolerances		
A	10 ~ 399	±0.5
	400 ~ 799	±0.8
	800 ~1000	±1.2
B	10 ~ 90	±0.5
	91 ~ 100	+2 -1

Configurable

Part Number	1 mm Increment A	Selection B	Selection T	€ Unit Price T0.1	T0.2	T0.3	T0.5	T1.0
CIRAKF	10~ 100	10 ~ 50 51 ~ 100	0.1 0.2 0.3 0.5 1.0					
	101~ 200	10 ~ 50 51 ~ 100						
	201~ 300	10 ~ 50 51 ~ 100						
	301~ 400	10 ~ 50 51 ~ 100						
	401~ 500	10 ~ 50 51 ~ 100						
	501~ 600	10 ~ 50 51 ~ 100						
	601~ 800	10 ~ 50 51 ~ 100						
	801~1000	10 ~ 50 51 ~ 100						

Specify as A≥B.

Order Example

Part Number	A	B
CIRAK0.1	- 100	- 100

Part Number	A	B	T
CIRAKF	- 100	- 50	- 0.1

Days to Ship

8 Days

Express A — Free of charge

When ordering Express A on our website, enter "- - -".

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~5	6~10	11~20	21~30
Discount rate	€ Unit Price	5%	10%	15%

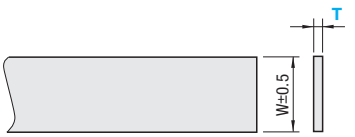
For orders larger than indicated quantity, please request a quotation.

Shim Tape

RoHS



Type	W	Length	M Material H Hardness
FGSM	12.7	1m	T=0.005 ··· M 1.4301/X5CrNi18-10-H
FGSMW	45.0		T=0.01~0.5 ··· H 370~420HV
FGSML	12.7	5m	M JIS SK H 480~600HV
SFGSM	12.7	1m	M 1.4301/X5CrNi18-10-H H 370~420HV
SFGSMW	45.0		
SFGSML	12.7	5m	
DFGSMW	45.0	1m	M CW505L/CuZn30 or CW507L/CuZn36 H-



Standard Type (Length 1m)

Part Number Type	T	T Tolerance	€ Unit Price FGSM	FGSMW	SFGSM	SFGSMW	DFGSMW
FGSM SFGSM (W=12.7mm) FGSMW SFGSMW DFGSMW (W=45.0mm)	0.005	±0.0005					
	0.01	±0.003					
	0.015						
	0.02	±0.005					
	0.03						
	0.04						
	0.05						
	0.06						
	0.07						
	0.08						
	0.09						
	0.1						
	0.15						
	0.2	±0.015					
	0.25						
	0.3						
	0.35						
	0.4						
	0.45						
	0.5						

No specification available for those without value.

Long Type (Length 5m)

Part Number Type	T	T Tolerance	€ Unit Price FGSML	SFGSML
FGSML SFGSML (W=12.7mm)	0.005	±0.0005		
	0.01	±0.003		
	0.015			
	0.02	±0.005		
	0.03			
	0.04			
	0.05			
	0.06			
	0.07			
	0.08			
	0.09			
	0.1			
	0.15			
	0.2	±0.015		

No specification available for those without value.

Order Example Part Number FGSM0.01

Days to Ship 6 Days P.88

Price 2 Days

Volume Discount (Round down to one Cent.) P.87

Quantity	1~5	6~10	11~20	21~30
Discount rate	€ Unit Price	5%	10%	15%

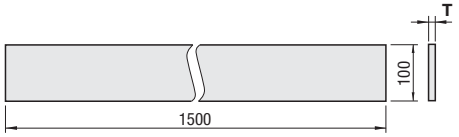
For orders larger than indicated quantity, please request a quotation.

Boxes of Shim Tape

RoHS



CMBOXS



M Material: 1.4301/X5CrNi18-10 H Hardness: 370~420HV

Part Number Type	No.	T	T Tolerance	Width	Length	€ Unit Price
CMBOXS	30	0.03	±0.005	100mm	1500mm	
	40	0.04				
	50	0.05				
	60	0.06				
	80	0.08				
	100	0.10				
	150	0.15				
	200	0.20	±0.020			

- Solid shim tape in a box.

Major Usage
- Tool Installation
- Tolerance Adjustments
- Arrangement of Machines and Equipment
- Adjustment of Equipment
- Installation of equipment bases
- Bearing clearance adjustments

Order Example Part Number CMBOXS50

Days to Ship 6 Days P.88

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~5	6~10	11~20	21~30
Discount rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Screws · Washers · Nuts

Screws · Washers · Nuts



Product Name	(Box) Hexagon Socket Head Cap Screws	(Box) Socket Head Cap Screws - Stainless Steel	(Box) Low Head / Extra Low Head Hexagon Screws	(Box) Cover Screws - Socket Head Type	(Box) Hexagon Socket Button Head Cap Screws	(Box) Hexagon Socket Flat Head Cap Screws	(Box) Washer Assembled Hexagon Socket Head Cap Screws
Page	157	158	159	160	161	162	163



(Box) Washer Assembled Cross Recessed Pan Head Screws / Cross Recessed Pan Head Screws	(Box) Cross Recessed Truss Machine Screws	(Box) Cross Recessed Pan Head Machine Screws	(Box) Hexagon Socket Set Screw s - Flat End	(Box) Hexagon Socket Set Screws - Cup Point	(Box) Nuts JIS Class 1/Class 3	(Box) Spring Washers / Flat Washers	(Box) Retaining Ring C Type For Shaft/ Retaining Ring E Type
164	165	166	167	168	169	170	171



(Box) Thread Inserts / Tangless Inserts	Hexagon Socket Head Cap Screws	Hexagon Socket Head Cap Screws -Stainless Steel-	Hexagon Socket Cap Screws / Pkg.	Hexagon Socket Head Cap Screws -Full Thread-	-High Strength Stainless Steel-	–Configurable Length–	Washer Assembled Hexagon Socket Head Cap Screws -with Flat Washer/with Spring Washer-
172	173	174	175-176	177	177	177	178



-Spring Built-in Type Washer-	-Large Washer Assembled - Large Washer Thick Type Assembled-	1.4401/X5CrNiMo17-12-2 Hexagon Socket Head Cap Screws / Hexagon Screws / Nuts / Washers	Hexagon Socket Cap Screws / Nuts / Washers -Titanium · Aluminum-	Socket Head Cap Screws - w / Thread Locking Compound
178	178	179	180	181



Hexagon Socket Cap Screws with Hole	Female Thread Socket Head Screws	Socket Head Cap Screws - Fine Thread -	-Left-Hand Thread-	Cover Caps for Hexagon Socket Cap Screws	Cover Caps for Counterbore Holes	Hexagon Socket Button Head Cap Screws	–Flanged–
181	181	182	182	182	182	183-184	185



Hexagon Socket Flat Head Cap Screws	Hexagon Socket Flat Head Cap Screws / Pack	Hexagon Screws	Extra Low Head Hexagon Screws	Hexagon Screws with Hole	Hexagon Socket Low Head Cap Screws	–Configurable Length–	Hexagon Socket Extra Low Head Cap Screws
185	186	187	188	188	189	189	190



Ultra Low Head Cap Screws	Hex Wrenches	Small Head Cap Screws	Small Head - Low Smal Head Cap Screws - Configurable Length	Screws with Through Hole -Extra Low Head - Low Head - Hexagon Socket-	Screws with Through Hole -Hexagon - Full Thread Type-	Long Knurled Screws
191	191	192	192	193	193	194



Length Configurable Long Knurled Screws	Stepped Knurled Screws	Cover Screws -with Hexagon Socket - Knurled - Button Head Cap Screw - Configurable Length-	Cover Screws-Extra Low Head - Low Head - Recessed - Long knurled	Hexagon Socket Cap Screws with Retaining Ring Groove
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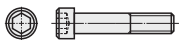
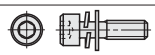
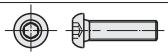
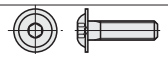
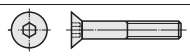
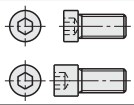
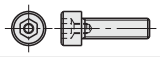
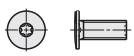
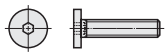
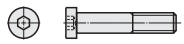
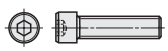
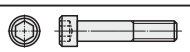
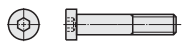
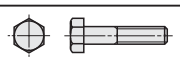
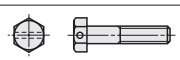
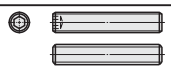
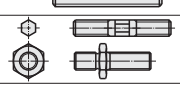
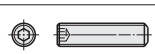
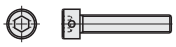
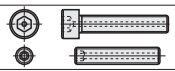
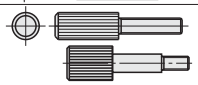
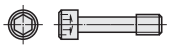
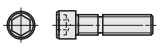
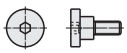
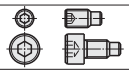
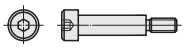
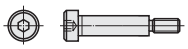
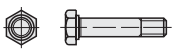
Screws · Washers · Nuts -Guide

■Shape and Material Select Table

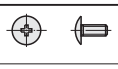
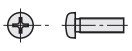
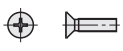
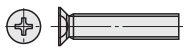
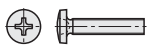
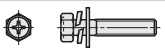
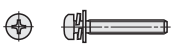
Cap Screw Series

	Shape	Type	Material: Steel: Standard	Material: Steel: Electroless Nickel Plating	Material: Stainless	Dimension: Standard	Dimension: Configurable	Page: Single Item	Page: Box (Pkg.)
[Standard]		Hexagon Socket Head Cap Screws	○	○ (Trivalent Chromat)	○	○	○	P.173	P.157
		Hexagon Socket Head Full Thread	○	-	○	○	-	P.177	-
		Hexagon Socket Head Cap Screws Fine Thread Type	○	-	○	○	-	P.182	-
		Hexagon Socket Head Cap Screws Left-Hand Thread Type	○	-	○	○	-	P.182	-
		Washer Assembled Hexagon Socket Head Cap Screws	○	-	○	○	-	P.178	P.163
		Hexagon Socket Button Head Cap Screws	○	-	○	○	-	P.183	P.161
		Hexagon Socket Button Head Cap Screws Flanged Type	○	-	○	○	-	P.185	-
		Hexagon Socket Flat Head Cap Screws	○	-	○	○	-	P.185	P.162
[Space Saving]		Small Head Cap Screws	○	○	○	○	○	P.192	-
		Cap Screws with Female Thread Holes	○	○	○	○	-	P.181	-
		Ultra Low Head Cap Screws -Hexalobular-Hexagon Socket-	○	○ Nickel Plating	○	○	-	P.191	-
		Hexagon Socket Extra Low Head Cap Screws	○	○ (Trivalent Chromate)	○	○	-	P.190	P.159
		Hexagon Socket Low Head Cap Screws	○	○	○	○	○	P.189	P.159
[Special Material Screw]		Hexagon Socket 1.4404/X2CrNiMo17-12-2 Head Cap Screws	1.4404/X2CrNiMo17-12-2			○	-	P.179	-
		Titanium Hexagon Socket Cap Screws	Titanium			○	-	P.180	-
		Aluminum Hexagon Socket Cap Screws	Aluminum			○	-	P.180	-
		Plastic Hexagon Socket Head Cap Screws	Plastic			○	-	P.213	-
		Plastic Cross Recessed Pan Head Screws	Plastic			○	-	-	P.215
[High Strength]		High Strength Hexagon Socket Head Cap Screws	1.4404/X2CrNiMo17-12-2			○	-	P.177	-
		High Strength Low Head Hexagon Socket Head Cap Screws	○	-	1.4404/X2CrNiMo 17-12-2	0	-	P.189	-
Hexagon Screws		Hexagon Screws	○	-	○	○	-	P.187	-
		Hexagon 1.4404/X2CrNiMo17-12-2 Screws	1.4404/X2CrNiMo17-12-2			○	-	P.179	-
		Hexagon Screws with Hole	○	-	○	○	-	P.188	-
		Extra Low Head Hexagon Screws	-	-	○	○	-	P.188	-
Full Thread Screw Series		Configurable Length Screws with Hexagon Sockets Configurable Length Screws	○	○	○	-	○	P.201 P.202	-
		Stud Bolts	○	○	○	○	-	P.200	-
		Full Thread Screws with Scale	○	-	○	○	-	P.203	-
		Configurable Length Screws with Hexagon Sockets Tip Shape Selection Type	○	-	○	-	○	P.204	-

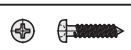
Special Material Screws

Shape	Type	Material: Steel: Standard	Material: Steel: Electroless Nickel Plating	Material: Stainless	Dimension: Standard	Dimension: Configurable	Page: Single Item	Page: Box (Pkg.)
	Hexagon Socket Head Cap Screws with Hole	○	-	○	○	-	P.181	-
	Screws with Through Hole	-	-	○ (Titanium)	○	-	P.193	-
	Long Knurled Screws	-	○	○	○	○	P.194	-
	Cover Screws	-	○	○	○	○	P.195	P.160
	Hexagon Socket Head Cap Screws with Retaining Ring Groove	-	-	○	-	○	P.198	-
	Stepped Screws	○	○	○	-	○	P.199	-
	Hexagon Socket Screws -Dog Point	○	-	○	○	○	P.207	-
	Shoulder Screws	○	○	○	○	○	P.209	-
	Low Head Shoulder Screws	○	-	○	○	○	P.211	-
	Reamer Bolts	○	-	○	○	○	P.212	-

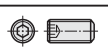
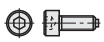
Cross Recessed Screws

Shape	Type	Material: Steel: Standard	Material: Steel: Electroless Nickel Plating	Material: Stainless	Dimension: Standard	Dimension: Configurable	Page: Single Item	Page: Box (Pkg.)
	Cross Recessed Truss Machine Screws	-	○ (Trivalent Chromate)	○	○	-	P.219	P.165
	Cross Recessed Pan Head Screws	-	○ (Trivalent Chromate)	○	○	-	P.217	P.164
	Cross Recessed Flat Head Machine Screws	-	○ (Trivalent Chromate)	○	○	-	P.218	P.166
	Cross Recessed Round Flat Head Machine Screws	-	○ (Trivalent Chromate)	○	○	-	P.220	-
	Cross Recessed Low Flat Head Machine Screws	-	○ (Trivalent Chromate)	○	○	-	P.221	-
	Cross Recessed Binding Head Screws	-	○ (Trivalent Chromate)	○	○	-	P.222	-
	Washer Assembled Cross Recessed Hexagon Head Screws	-	○ (Trivalent Chromate)	○	○	-	P.224	-
	Washer Assembled Cross Recessed Pan Head Screws	-	○ (Trivalent Chromate)	○ (Box only)	○	-	P.223	P.164
	Stepped Screws Cross Recessed Screws	○	○	○	-	○	P.199	-
	Ornamental Screws	-	Copper ○ (Nickel Plating)	○	○	-	P.225	-

Self Tapping Screws

Shape	Type	Material: Steel: Standard	Material: Steel: Electroless Nickel Plating	Material: Stainless	Dimension: Standard	Dimension: Configurable	Page: Single Item	Page: Box (Pkg.)
	Self Tapping Screws - Pan Head	-	○ (Trivalent Chromate)	○	○	-	P.226	-
	Self Tapping Screws - Flat Head	-	○ (Trivalent Chromate)	○	○	-	P.226	-
	Self Tapping Screws - Truss Head	-	○ (Trivalent Chromate)	○	○	-	P.226	-

Set Screws

		Single Item	Box (Pkg.)
	Hexagon Socket Set Screws Flat Point / Cone Point / Cup Point / Soft Point Type	P.205	P.168
	Hexagon Socket Set Screws Screw Type	P.206	-

Nuts · Washers

		Single Item	Box (Pkg.)
	Nuts	P.229	P.169
	Washers	P.232	P.170

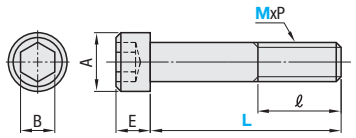
Hexagon Socket Head Cap Screws (Box)

CAD Data



Type	M Material	S Surface Treatment	H Hardness
BOX-CBF	1.7220/34CrMo4	Black Oxide	38~43HRC

Strength Class 12.9



MxP (Coarse)	A	E	B
2 x0.4	3.8	2	1.5
2.5x0.45	4.5	2.5	2
2.6x0.45	4.5	2.5	2
3 x0.5	5.5	3	2.5
4 x0.7	7	4	3
5 x0.8	8.5	5	4
6 x1.0	10	6	5
8 x1.25	13	8	6
10 x1.5	16	10	8

Can be ordered as single item. P.173

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-CBF3-6

Days to Ship: 6 Days P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

ℓ	Part Number Type	Part Number M-L	€ Unit Price Price per pc.	€ Unit Price 1 box	Pcs. / box
Full Thread Screws	BOX-CBF	2- 5			1,000 pcs. / box
		8			
		10			
		12			
		15			
		2.5- 5			
		8			
		10			
		2.6- 5			
		8			
		10			
		3- 5			
		6			
		8			
		10			
		12			
		15			
		20			
18		25			500 pcs. / box
		30			
Full Thread Screws		4- 5			1,000 pcs. / box
		6			
		8			
		10			
		12			
		15			
		20			500 pcs. / box
		25			
20		30			400 pcs. / box
		35			
		40			
Full Thread Screws		5- 8			1,000 pcs. / box
		10			
		12			
		15			
		20			800 pcs. / box
		25			
22		30			600 pcs. / box
		35			
		40			
Full Thread Screws		6- 8			1,000 pcs. / box
		10			
		12			
		15			800 pcs. / box
		20			
		25			600 pcs. / box
		30			
24		35			400 pcs. / box
		40			
Full Thread Screws		8-12			500 pcs. / box
		15			400 pcs. / box
		20			
		25			300 pcs. / box
		30			
28		35			200 pcs. / box
		40			
Full Thread Screws		10-20			
		25			
		30			
		35			150 pcs. / box
		40			

Hexagon Socket Head Cap Screws (Box)

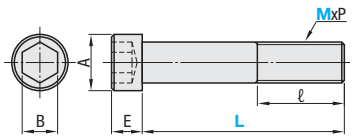
-Stainless Steel-

CAD Data



Type	Material
BOX-SCB	1.4567/X3CrNiCu18-9-4

Strength Class A2–70



MxP (Coarse)	A	E	B
2 x0.4	3.8	2	1.5
2.5x0.45	4.5	2.5	2
2.6x0.45	4.5	(2.6)	2
3 x0.5	5.5	3	2.5
4 x0.7	7	4	3
5 x0.8	8.5	5	4
6 x1.0	10	6	5
8 x1.25	13	8	6
10 x1.5	16	10	8

( ) is different from part number SCB which is sold as single item.

Please note that the number of pieces per box and the unit price have been changed.

Can be ordered as single item. ☞ P.174

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-SCB3-6

Days to Ship: 6 Days ☞ P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

ℓ	Part Number Type	Part Number M-L	€ Unit Price Price per pc.	€ Unit Price 1 box	Pcs. / box
Full Thread Screws	BOX-SCB (Stainless Steel)	2- 5			1,000 pcs. / box
		8			
		10			
		12			
		15			
		2.5- 5			
		8			
		10			
		2.6- 5			
		8			
		10			
		3- 5			
		6			
		8			
		10			
		12			
		15			
		20			
18		25			500 pcs. / box
		30			
Full Thread Screws		4- 5			1,000 pcs. / box
		6			
		8			
		10			
		12			
		15			
		20			500 pcs. / box
		25			
20		30			400 pcs. / box
		35			
		40			
Full Thread Screws		5- 8			1,000 pcs. / box
		10			
		12			
		15			
		20			800 pcs. / box
		25			
22		30			600 pcs. / box
		35			
		40			
Full Thread Screws		6- 8			1,000 pcs. / box
		10			
		12			
		15			800 pcs. / box
		20			
		25			600 pcs. / box
		30			
24		35			400 pcs. / box
		40			
Full Thread Screws		8-12			500 pcs. / box
		15			400 pcs. / box
		20			
		25			300 pcs. / box
		30			
28		35			200 pcs. / box
		40			
Full Thread Screws		10-20			
		25			
		30			
		35			150 pcs. / box
		40			

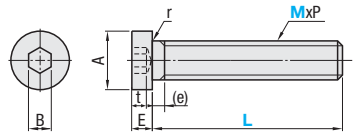
Hexagon Socket Low Head / Extra Low Head Cap Screws (Box)

CAD Data



Hexagon Socket Low Head Cap Screws

Type	Material	Strength Class
BOX-CBSST	1.4567/X3CrNiCu18-9-4	A2-50



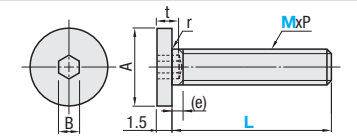
MxP (Coarse)	A	E	B	t	(e) max.	r
3x0.5	5.5	2	2	1.5	1	0.1 or more
4x0.7	7	2.8	2.5	2.3	1.4	0.2 or more
5x0.8	8.5	3.5	3	2.7	1.6	0.2 or more
6x1.0	10	4	4	3	2	0.25 or more
8x1.25	13	5	5	3.8	2.5	0.4 or more

Can be ordered as single item. P.189



Hexagon Socket Extra Low Head Cap Screws

Type	Material	Tensile Strength
BOX-CBSTS	1.4301/X5CrNi18-10 equivalent	400N/mm²



MxP (Coarse)	A	B	t max.	(e) max.	r
3x0.5	6	1.5	2	1.6	0.1 or more
4x0.7	8	2	2.5	1.6	0.2 or more
5x0.8	9	3	3	2	0.2 or more
6x1.0	10	3	4	2.5	0.25 or more
8x1.25	13	4	5	3	0.4 or more
10x1.5	15	5	5	3.5	0.4 or more

Can be ordered as single item. P.190

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-CBSST5-10, BOX-CBSTS5-10

Days to Ship: 6 Days P.87

Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number Type	M-L	€ Unit Price Price per pc.	€ Unit Price 1 box	Pcs. / box
BOX-CBSST (Stainless Steel)	3- 6			1,000 pcs. / box
	3- 8			
	3- 10			
	3- 12			
	3- 16			
	3- 20			
	4- 6			
	4- 8			
	4- 10			
	4- 12			
	4- 16			
	4- 20			500 pcs. / box
	5- 8			
	5- 10			
	5- 12			
	5- 16			
	5- 20			
	6- 8			
	6- 10			
	6- 12			
	6- 16			
	6- 20			300 pcs. / box
	6- 25			
	8-10			
	8-12			
	8-16			250 pcs. / box
	8-20			200 pcs. / box
	8-25			
	8-30			150 pcs. / box

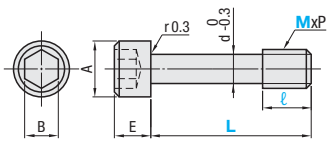
Part Number Type	M-L	€ Unit Price Price per pc.	€ Unit Price 1 box	Pcs. / box
BOX-CBSTS (Stainless Steel)	3- 5			500 pcs. / box
	3- 6			
	3- 8			
	3- 10			
	3- 12			
	4- 5			
	4- 6			
	4- 8			
	4- 10			
	4- 12			
	4- 16			
	5- 6			
	5- 8			
	5- 10			
	5- 12			
	5- 16			
	5- 20			
	6- 8			
	6- 10			
	6- 12			
	6- 16			
	6- 20			
	6- 25			
	8-10			200 pcs. / box
	8-12			
	8-16			
	8-20			
	8-25			
	10-16			
	10-20			
	10-25			150 pcs. / box

Cover Screws (Box)

CAD Data

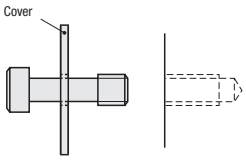


Type	Material	Strength Class
BOX-GUTB	1.4567/X3CrNiCu18-9-4	A2-70 equivalent



MxP (Coarse)	A	E	B	d
3x0.5	5.5	3	2.5	2.2
4x0.7	7	4	3	3
5x0.8	8.5	5	4	3.9
6x1.0	10	6	5	4.5
8x1.25	13	8	6	6.3

The screw will not drop off from the cover when the cover is removed from the frame.
(The cover requires tap machining to prevent screw from falling off.)



Can be ordered as single item. P.195

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-GUTB5-6-20

Days to Ship — 6 Days P.87

Box package is cost-saving for in-house stock or when you need in large quantities.

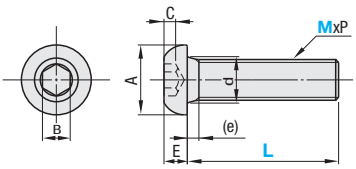
Part Number				€ Unit Price		Pcs. / box
Type	M	ℓ	L	Price per pc.	1 box	
BOX-GUTB (Stainless Steel)	3	4	10			200 pcs. / box
			12			
			15			
			20			
	4	3	8			
			10			
			12			
			15			
		5	10			
			12			
			15			
			20			
	5	6	12			
			15			
			20			
			25			
	6	8	20			
			25			
			30			
	8	10	25			
			30			
			40			

Hexagon Socket Button Head Cap Screws (Box)

CAD Data



Type	M Material	H Hardness	S Surface Treatment
BOX-BCB	1.7220/ 34CrMo4	34~44HRC	Black Oxide
BOX-SBCB	1.4567/ X3CrNiCu18-9-4	-	-



MxP (Coarse)	A	E	B	C (Min.)	d	(e)
3x0.5	5.7	1.65	2	1.04	3.6	1
4x0.7	7.6	2.2	2.5	1.3	4.7	1.4
5x0.8	9.5	2.75	3	1.56	5.7	1.6
6x1.0	10.5	3.3	4	2.08	6.8	2

Can be ordered as single item. ☞ P.183

When you order it, please specify by box.
Minimum order is 1 box.

Order Example

Part Number
BOX-BCB5-10
BOX-SBCB5-10

Days to Ship: 6 Days ☞ P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-BCB	3- 5			1,000 pcs. / box
	3- 6			
	3- 8			
	3- 10			
	3- 12			
	3- 15			
	3- 20			
	3- 25			
	4- 6			
	4- 8			
	4- 10			
	4- 12			
	4- 15			
	4- 20			500 pcs. / box
	4- 25			
	4- 30			
	5- 8			
	5- 10			
	5- 12			
	5- 15			
	5- 20			
	5- 25			200 pcs. / box
	5- 30			
	6-10			500 pcs. / box
	6-12			
	6-15			
	6-20			200 pcs. / box
	6-25			
	6-30			

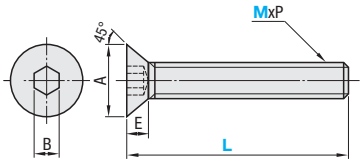
Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-SBCB (Stainless Steel)	3- 5			1,000 pcs. / box
	3- 6			
	3- 8			
	3- 10			
	3- 12			
	3- 15			
	3- 20			
	3- 25			
	4- 6			
	4- 8			
	4- 10			
	4- 12			
	4- 15			
	4- 20			500 pcs. / box
	4- 25			
	4- 30			
	5- 8			
	5- 10			
	5- 12			
	5- 15			
	5- 20			
	5- 25			200 pcs. / box
	5- 30			
	6-10			500 pcs. / box
	6-12			
	6-15			
	6-20			200 pcs. / box
	6-25			
	6-30			

Hexagon Socket Flat Head Cap Screws (Box)

CAD Data



Type	Material
BOX-SFB	1.4567/X3CrNiCu18-9-4



MxP (Coarse)	A		E (Max.)	B
	Min.	Max.		
3x0.5	5.54	6.72	1.86	2
4x0.7	7.53	8.96	2.48	2.5
5x0.8	9.43	11.2	3.1	3
6x1.0	11.34	13.44	3.72	4
8x1.25	15.24	17.92	4.96	5
10x1.5	19.22	22.4	6.2	6

Available as a single item and in package. P.186

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-SFB5-10

Days to Ship: 6 Days P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-SFB (Stainless Steel)	3- 6			1,000 pcs. / box
	8			
	10			
	12			
	15			
	4- 8			
	10			
	12			
	15			
	5-10			500 pcs. / box
	12			
	15			
	20			
	6-10			
	12			
	15			
	20			
	25			300 pcs. / box

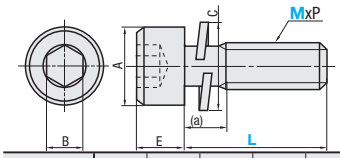
Washer Assembled Hexagon Socket Head Cap Screws (Box)

CAD Data



■Spring Washer Assembled Type

Type	Part Number	Material
BOX-SCBZ	Screws	1.4567/X3CrNiCu18-9-4
	Spring Washers	1.4301/X5CrNi18-10



MxP (Coarse)	A	E	B	C	(a)
3x0.5	5.5	3	2.5	5.5	2.4
4x0.7	7	4	3	7	3.5
5x0.8	8.5	5	4	8.5	4.3
6x1.0	10	6	5	11.5	5.1

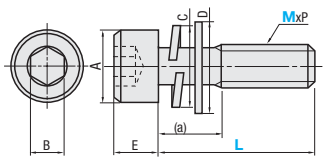
(a) is the max length (reference) between head surface and the complete thread.

Can be ordered as single item. P.178



■Spring · Washer Assembled Type

Type	Part Number	Material
BOX-SCBS	Screws	1.4567/X3CrNiCu18-9-4
	Spring Washers	1.4301/X5CrNi18-10
	Flat Washers	



MxP (Coarse)	A	E	B	C	D	(a)
3x0.5	5.5	3	2.5	5.5	7	3
4x0.7	7	4	3	7	9	4.4
5x0.8	8.5	5	4	8.5	10	5.4
6x1.0	10	6	5	11.5	12.5	6.9

(a) is the max length (reference) between head surface and the complete thread.

Can be ordered as single item. P.178

When you order it, please specify by box. Minimum order is 1 box.

Order Example

Part Number
BOX-SCBZ5-10
BOX-SCBS5-10

Days to Ship: 6 Days P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-SCBZ	3- 6			500 pcs. / box
	8			
	10			
	12			
	4- 8			
	10			
	12			
	15			
	20			
	5- 10			
	12			
	15			200 pcs. / box
	20			
	6- 12			
	15			
	20			
	25			

Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-SCBS	3- 6			500 pcs. / box
	8			
	10			
	12			
	4- 8			
	10			
	12			
	15			
	20			
	5- 10			
	12			
	15			200 pcs. / box
	20			
	6- 12			
	15			
	20			
	25			

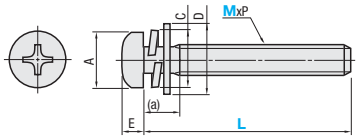
NEW Washer Assembled Cross Recessed Pan Head Screws / Cross Recessed Pan Head Screws (Box)



RoHS

■Washer Assembled Cross Recessed Pan Head Screws

Type	Part Number	Material
BOX-SCBJ	Screws	1.4567/X3CrNiCu18-9-4
	Spring Washers	1.4301/X5CrNi18-10
	Flat Washers	



MxP (Coarse)	A	E	C	D	(a)	Cross Recess Number
2 x0.4	3.5	1.3	4	6	2.1	1
2.5x0.45	4.5	1.7	4.8	7.5	2.7	1
2.6x0.45	4.5	1.7	4.8	7.5	2.7	1
3 x0.5	5.5	2	5.5	8	3	2
4 x0.7	7	2.6	7	10	4.4	2
5 x0.8	9	3.3	8.5	12	5.4	2
6 x1.0	10.5	3.9	11.5	13	6.9	3

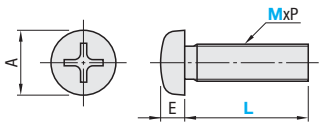
(a) is the max length (reference) between head surface and the complete thread.
Can be ordered as single item. P.223



RoHS

■Cross Recessed Pan Head Screws

Type	Material
BOX-NKJ	1.4301/X5CrNi18-10



MxP (Coarse)	A	E	Cross Recess Number
2 x0.4	3.5	1.3	1
2.5x0.45	4.5	1.7	1
2.6x0.45	4.5	1.7	1
3 x0.5	5.5	2	2
4 x0.7	7	2.6	2
5 x0.8	9	3.3	2
6 x1.0	10.5	3.9	3

Can be ordered as single item. P.217
When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-SCBJ5-10, BOX-NKJ5-10

Days to Ship: 6 Days P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

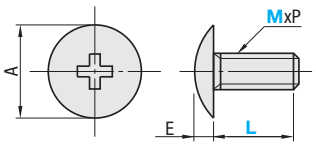
Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-SCBJ (Stainless Steel)	2- 4, 5, 6, 8			500 pcs. / box
	2.5- 4, 5, 6, 8, 10			
	2.6- 4, 5, 6, 8, 10			
	3- 5, 6, 8, 10			
	4- 5, 6, 8, 10			
	5- 8, 10, 12, 15			
	6- 10, 12, 15			200 pcs. / box

Part Number		€ Unit Price		Pcs. per box.
Type	M-L	Price per pc.	1 box	
BOX-NKJ (Stainless Steel)	2- 3, 4, 5, 6, 8			2,000 pcs./box
	2.5- 3, 4, 5, 6, 8, 10			
	2.6- 3, 4, 5, 6, 8, 10			
	3- 5, 6, 8, 10			
	4- 5, 6, 8, 10			1,000 pcs. / box
	5- 8, 10, 12, 15			500 pcs. / box
	6- 10, 12, 15			300 pcs. / box

Cross Recessed Truss Machine Screws (Box)



Type	Material
BOX-TRSS	1.4301/X5CrNi18-10



MxP (Coarse)	A	E	Cross Recess Number
2 x0.4	4.5	1.2	1
2.5x0.45	5.7	1.5	1
2.6x0.45	5.9	1.6	1
3 x0.5	6.9	1.9	1
4 x0.7	9.4	2.5	2
5 x0.8	11.8	3.1	2
6 x1.0	14	3.7	3

Can be ordered as single item. P.219

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-TRSS5-10

Days to Ship: 6 Days P.87

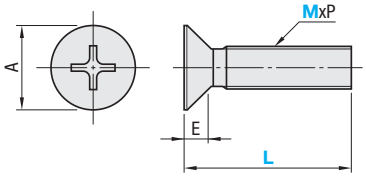
Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-TRSS (Stainless Steel)	2 - 3			2,000 pcs./box
	4			
	5			
	6			
	8			
	2.5 - 3			
	4			
	5			
	6			
	8			
	10			
	2.6 - 3			
	4			
	5			
	6			
	8			
	10			
	3 - 5			
	6			
	8			
	10			
	4 - 5			1,000 pcs. / box
	6			
	8			
	10			
	5 - 8			500 pcs. / box
	10			
	12			
	15			
	20			
	6 -10			300 pcs. / box
	12			
	15			
	20			

Cross Recessed Flat Head Machine Screws (Box)



Type	Material
BOX-SFBJ	1.4301/X5CrNi18-10



MxP (Coarse)	A	E	Cross Recess Number
2 x0.4	4	1.2	1
2.5x0.45	5	1.45	1
2.6x0.45	5.2	1.5	1
3 x0.5	6	1.75	2
4 x0.7	8	2.3	2
5 x0.8	10	2.8	2
6 x1.0	12	3.4	3

Can be ordered as single item. P.218

When you order it, please specify by box.
Minimum order is 1 box.

Order Example

Part Number
BOX-SFBJ5-10

Days to Ship: 6 Days P.87

Box package is cost-saving for in-house stock or when you need in large quantities.

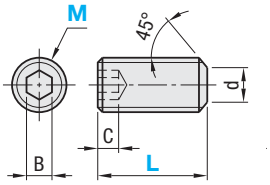
Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-SFBJ (Stainless Steel)	2 - 3			2,000 pcs./box
	4			
	5			
	6			
	8			
	2.5 - 3			
	4			
	5			
	6			
	8			
	10			
	2.6- 3			
	4			
	5			
	6			
	8			
	10			
	3 - 5			
	6			
	8			
	10			
	4 - 5			1,000 pcs. / box
	6			
	8			
	10			
	5 - 8			500 pcs. / box
	10			
	12			
	15			
	6 -10			300 pcs. / box
	12			
	15			

Hexagon Socket Set Screws (Box)
-Flat End-

CAD Data



Type	M Material	H Hardness	S Surface Treatment
BOX-MSSF	1.7220/ 34CrMo4	45HRC~	Black Oxide
BOX-MSSFS	1.4301/ X5CrNi18-10	-	-



MxP (Coarse)	B	C (Min.)	d (Max.)
2 x0.4	0.9	0.8	1
2.5x0.45	1.3	1.2	1.5
2.6x0.45	1.3	1.2	1.5
3 x0.5	1.5	1.2	2
4 x0.7	2	1.5	2.5
5 x0.8	2.5	2	3.5

Can be ordered as single item. P.205

When you order it, please specify by box.
Minimum order is 1 box.

Order Example

Part Number
BOX-MSSF3-10
BOX-MSSFS2.5-5

Days to Ship: 6 Days P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-MSSF	2- 2			1,000 pcs. / box
	3			
	4			
	5			
	6			
	2.5- 3			
	4			
	5			
	6			
	2.6- 3			
	4			
	5			
	6			
	3- 3			
	4			
	5			
	6			
	8			
	10			
	4- 4			
	5			
	6			
	8			
	10			
	5- 5			
	6			
	8			
	10			

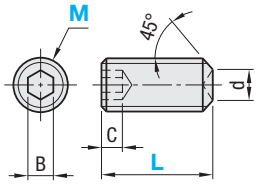
Part Number		€ Unit Price		Pcs. / box
Type	M-L	Price per pc.	1 box	
BOX-MSSFS (Stainless Steel)	2- 2			1,000 pcs. / box
	3			
	4			
	5			
	6			
	2.5- 3			
	4			
	5			
	6			
	2.6- 3			
	4			
	5			
	6			
	3- 3			
	4			
	5			
	6			
	8			
	10			
	4- 4			
	5			
	6			
	8			
	10			
	5- 5			
	6			
	8			
	10			

Hexagon Socket Set Screws (Box)
-Cup Point-

CAD Data



Type	Material	Hardness	Surface Treatment
BOX-MSSK	1.7220/ 34CrMo4	45HRC~	Black Oxide
BOX-MSSU	1.4301/ X5CrNi18-10	-	-



MxP (Coarse)	B	C (Min.)	d (Max.)
2 x0.4	0.9	0.8	1
2.5x0.45	1.3	1.2	1.2
2.6x0.45	1.3	1.2	1.2
3 x0.5	1.5	1.2	1.4
4 x0.7	2	1.5	2
5 x0.8	2.5	2	2.5

Can be ordered as single item. P.205

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-MSSK5-5, BOX-MSSU2-3

Days to Ship: 6 Days P.87

■Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number Type	M-L	€ Unit Price Price per pc.	1 box	Pcs. / box
BOX-MSSK	2- 2			1,000 pcs. / box
	3			
	4			
	5			
	6			
	2.5- 3			
	4			
	5			
	6			
	2.6- 3			
	4			
	5			
	6			
	3- 3			
	4			
	5			
	6			
	8			
	10			
	4- 4			
	5			
	6			
	8			
	10			
	5- 5			
	6			
	8			
	10			

Part Number Type	M-L	€ Unit Price Price per pc.	1 box	Pcs. / box
BOX-MSSU (Stainless Steel)	2- 2			1,000 pcs. / box
	3			
	4			
	5			
	6			
	2.5- 3			
	4			
	5			
	6			
	2.6- 3			
	4			
	5			
	6			
	3- 3			
	4			
	5			
	6			
	8			
	10			
	4- 4			
	5			
	6			
	8			
	10			
	5- 5			
	6			
	8			
	10			

Box set Nuts - JIS Class 1 / JIS Class 3

Price Reduction 22% on average

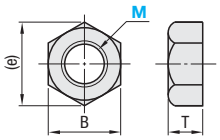
CAD Data



Nuts - JIS Class 1

Type	M Material	S Surface Treatment
BOX-LBNR	1.0303/C4C (1.0303/C4C equivalent)	Trivalent Chromate
BOX-SLBNR	1.4301/X5CrNi18-10	-

BOX-LBNR
BOX-SLBNR



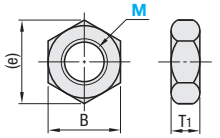
MxP (Coarse)	B	(e)	T
2 x0.4	4	4.6	1.6
2.5x0.45	5	5.8	2
2.6x0.45	5	5.8	2
3 x0.5	5.5	6.4	2.4
4 x0.7	7	8.1	3.2
5 x0.8	8	9.2	4
6 x1.0	10	11.5	5
8 x1.25	13	15	6.5
10 x1.5	17	19.6	8

Can be ordered as single item . P.227

Nuts - JIS Class 3

Type	M Material	S Surface Treatment
BOX-KNTR	1.0303/C4C (1.0303/C4C equivalent)	Trivalent Chromate
BOX-SKNTR	1.4301/X5CrNi18-10	-

BOX-KNTR
BOX-SKNTR



MxP (Coarse)	B	(e)	T_1
3x0.5	5.5	6.4	1.8
4x0.7	7	8.1	2.4
5x0.8	8	9.2	3.2
6x1.0	10	11.5	3.6
8x1.25	13	15	5
10x1.5	17	19.6	6

Can be ordered as single item. P.227

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-LBNR2.5, BOX-SKNTR10

Days to Ship: 6 Days P.87

Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-LBNR	2			1,000 pcs. / box
	2.5			
	2.6			
	3			
	4			
	5			
	6			
	8			500 pcs. / box
	10			200 pcs. / box

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-SLBNR (Stainless Steel)	2			1,000 pcs. / box
	2.5			
	2.6			
	3			
	4			
	5			
	6			
	8			500 pcs. / box
	10			200 pcs. / box

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-KNTR	3			1,000 pcs. / box
	4			
	5			
	6			
	8			500 pcs. / box
	10			200 pcs. / box

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-SKNTR (Stainless Steel)	3			1,000 pcs. / box
	4			
	5			
	6			
	8			500 pcs. / box
	10			200 pcs. / box

Spring Washers / Flat Washers (Box)

Price Reduction
25% on average

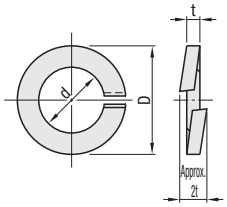
CAD Data



Spring Washers

Type	M Material	S Surface Treatment
BOX-SLW	JIS SWHR57~C43	Trivalent Chromate
BOX-SSLW	1.4301/X5CrNi18-10	-

BOX-SLW
BOX-SSLW



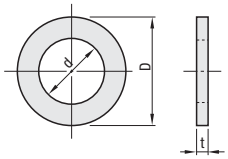
No.	d	D	t
3	3.1	5.9	0.7
4	4.1	7.6	1
5	5.1	9.2	1.3
6	6.1	12.2	1.5
8	8.2	15.4	2
10	10.2	18.4	2.5
12	12.2	21.5	3

Can be ordered as single item. P.232

Flat Washers

Type	M Material	S Surface Treatment
BOX-PWF	1.0330/DC01 equivalent	Trivalent Chromate
BOX-SPWF	1.4301/X5CrNi18-10	-

BOX-PWF
BOX-SPWF



No.	d	D		t
		BOX-PWF	BOX-SPWF	
3	3.2	6	7	0.5
4	4.3	8	9	0.8
5	5.3	10	10	1
6	6.4	12.5	12.5	1.6
8	8.4	15.5	17	1.6
10	10.5	18	21	2
12	13.0	21	24	2.5

Can be ordered as single item. P.232

When you order it, please specify by box.
Minimum order is 1 box.

Order Example

Part Number
BOX-SSLW8
BOX-PWF3

Days to Ship

6 Days P.87

Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-SLW	3			2,000 pcs. / box
	4			
	5			
	6			
	8			
	10			1,000 pcs. / box
	12			700 pcs. / box

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-SSLW (Stainless Steel)	3			2,000 pcs. / box
	4			
	5			
	6			
	8			
	10			1,000 pcs. / box
	12			700 pcs. / box

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-PWF	3			2,000 pcs. / box
	4			
	5			
	6			
	8			
	10			1,000 pcs. / box
	12			700 pcs. / box

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-SPWF (Stainless Steel)	3			2,000 pcs. / box
	4			
	5			
	6			
	8			
	10			1,000 pcs. / box
	12			700 pcs. / box

Retaining Ring C Type (for Shaft) / Retaining Ring E Type (Box)

CAD Data

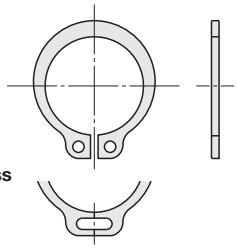


RoHS

Retaining Ring C Type (for Shaft)

Type	M Material	H Hardness
BOX-STWN	Spring Steel	44~53HRC
BOX-STWS	1.4301-CSP	36~44HRC

BOX-STWN
BOX-STWS(Stainless Steel)



No.8 or less

Confirm detailed dimensions. P.253
Can be ordered as single item. P.253

Retaining Ring E Type

Type	M Material	H Hardness	S Surface Treatment
BOX-NETW	Spring Steel	44~53HRC	Trivalent Chromate
BOX-NETWS	1.4301-CSP	37~46HRC	-

BOX-NETW
BOX-NETWS(Stainless Steel)



Confirm detailed dimensions. P.253
Can be ordered as single item. P.253

When you order it, please specify by box.
Minimum order is 1 box.

Order Example — Part Number: BOX-STWN10, BOX-NETWS3

Days to Ship: 6 Days P.87

Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-STWN	3			2,000 pcs. / box
	4			
	5			
	6			
	8			
	10			1,000 pcs. / box
	12			
	15			500 pcs. / box
	20			
	25			

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-STWS (Stainless Steel)	4			2,000 pcs. / box
	5			
	6			
	8			
	10			1,000 pcs. / box
	12			
	15			500 pcs. / box
	20			
	25			

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-NETW	1.2			2,000 pcs. / box
	1.5			
	2			
	2.5			
	3			
	4			
	5			
	6			
	7			1,000 pcs. / box
	8			

Part Number		€ Unit Price		Pcs. / box
Type	No.	Price per pc.	1 box	
BOX-NETWS (Stainless Steel)	1.2			2,000 pcs. / box
	1.5			
	2			
	2.5			
	3			
	4			
	5			
	6			
	7			1,000 pcs. / box
	8			

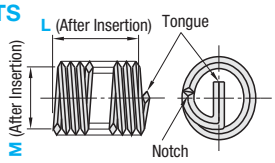
Thread Inserts / Tangless Inserts (Box)



Thread Inserts

Type	Material
BOX-HLTS	1.4301/X5CrNi18-10

BOX-HLTS



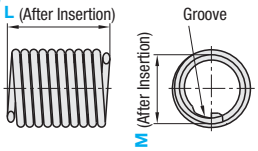
M (Coarse)	Tap Pilot Hole Diameter (Reference)
3	3.11~3.20
4	4.16~4.29
5	5.18~5.33
6	6.22~6.40
8	8.28~8.48

- * M and L are sizes when inserted into tapped holes.
- L dimension before insertion is shorter than that after insertion.
- See special wrenches and how to use. P.255
- Can be ordered as single item. P.255

Tangless Inserts

Type	Material
BOX-TLTS	1.4301/X5CrNi18-10

BOX-TLTS



M (Coarse)	Tap Pilot Hole Diameter (Reference)
2.5	2.60~2.65
3	3.12~3.20
4	4.17~4.30
5	5.16~5.33
6	6.25~6.42
8	8.31~8.52

- * M and L are sizes when inserted into tapped holes.
- L dimension before insertion is shorter than that after insertion.
- See special wrenches and how to use. P.256
- Can be ordered as single item. P.256

- When you order it, please specify by box. Minimum order is 1 box.

Order Example

Part Number
BOX-HLTS5-10
BOX-TLTS2.5-3.8

Days to Ship: 6 Days P.87

Box package is cost-saving for in-house stock or when you need in large quantities.

Part Number		€ Unit Price		Pcs. / box
Type	*M- L	Price per pc.	1 box	
BOX-HLTS (Stainless Steel)	3- 3			100 pcs. / box
	4.5			
	6			
	4- 4			
	6			
	8			
	5- 5			
	7.5			
	10			
	6- 6			
	9			
	12			
	8- 8			
	12			
	16			

Part Number		€ Unit Price		Pcs. / box
Type	*M- L	Price per pc.	1 box	
BOX-TLTS (Stainless Steel)	2.5- 2.5			100 pcs. / box
	3.8			
	5			
	3- 3			
	4.5			
	6			
	4- 4			
	6			
	8			
	5- 5			
	7.5			
	10			
	6- 6			
	9			
	12			
	8- 8			
	12			
	16			

Hexagon Socket Head Cap Screws

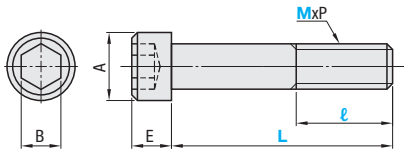
CAD Data

When you need in large quantity, box packaging offers more cost-savings. ☞P.157

RoHS



CB



M Material: 1.7220/34CrMo4 (M2~M12)
H Hardness: 38~43HRC (M2~M12)
Thread JIS B 0205 Class 2
S Surface Treatment: Black Oxide
(Precision of Screws JIS B 1176 Strength Class 12.9 (M3~M12))

Part Number Type	M-	L	ℓ	€ Unit Price 1 pcs. or more
CB	2-	5	Full Thread Screws	
		8		
		10		
		12		
		15		
CB	2.5-	5	Full Thread Screws	
		8		
		10		
CB	2.6-	5	Full Thread Screws	
		8		
		10		
		12		
		15		
CB	3-	5	Full Thread Screws	
		6		
		8		
		10		
		12		
		14		
		15		
		16		
		18		
		20		
		22		
		25	18	
		30		
		35		
		40		
		45		
		50		
		55		
CB	4-	5	Full Thread Screws	
		6		
		8		
		10		
		12		
		14		
		15		
		16		
		18		
		20		
		22		
		25		
		30	20	
		35		
		40		
		45		
		50		
		55		
		60		

Part Number Type	M-	L	ℓ	€ Unit Price 1 pcs. or more
CB	5-	5	Full Thread Screws	
		6		
		8		
		10		
		12		
		14		
		15		
		16		
		18		
		20		
		22		
		25		
		30	22	
		35		
		40		
		45		
		50		
		55		
		60		
		65		
		70		
		75		
		80		
CB	6-	6	Full Thread Screws	
		8		
		10		
		12		
		14		
		15		
		16		
		18		
		20		
		22		
		25		
		30	24	
		35		
		40		
		45		
		50		
		55		
		60		
		65		
		70		
		75		
		80		
		85		
		90		
		95		

Part Number Type	M-	L	ℓ	€ Unit Price 1 pcs. or more
CB	8-	8	Full Thread Screws	
		10		
		12		
		15		
		16		
		18		
		20		
		22		
		25		
		30		
		35		
		40	28	
		45		
		50		
		55		
		60		
		65		
		70		
		75		
CB	10-	10	Full Thread Screws	
		12		
		15		
		20		
		25		
		30		
		35		
		40		
		45	32	
		50		
		55		
		60		
		65		
		70		
CB	12-	15	Full Thread Screws	
		20		
		25		
		30		
		35		
		40		
		45		
		*50		

* ℓ part is based on JIS B 1176 (2000).

Order Example — Part Number: CB8-40

Days to Ship — 6 Days ☞P.87

Hexagon Socket Head Cap Screws
-Stainless Steel-

Price Reduction
14% on average

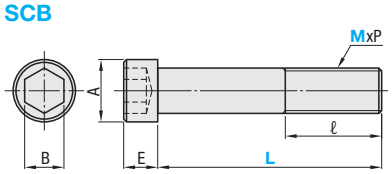
CAD Data

When you need in large quantity, box packaging offers more cost-savings. ☞ P.158

RoHS

SCB





M Material: 1.4567/X3CrNiCu18-9-4
JIS B 1176
* Strength Class A2-70

MxP	A	E	B
2x0.4	3.8	2	1.5
2.5x0.45	4.5	2.5	2
2.6x0.45	4.5	2.5	2
3x0.5	5.5	3	2.5
4x0.7	7	4	3
5x0.8	8.5	5	4
6x1.0	10	6	5
8x1.25	13	8	6
10x1.5	16	10	8
12x1.75	18	12	10

* The strength class signifies the screw's tensile strength.

(Ex.) 12.9
- This indicates that the minimum value for yielding point or proof stress is 90% of tensile strength.
- This indicates that the minimum value of tensile strength is 1220N/mm².

(Ex.) 10.9
- This indicates that the minimum value for yielding point or proof stress is 90% of tensile strength.
- This indicates that the minimum value of tensile strength is 1040N/mm².

Reference: Dimensions of Counterbore and Cap Screw Hole for Hexagon Socket Head Cap Screws P.1783

Part Number Type	M-	L	ℓ	€ Unit Price 1~9 pcs.	Volume Discount 10~29 pcs.	30~99 pcs.	100 pcs. or more
SCB	2-	4	Full Thread Screws				
		5					
		6					
		8					
		10					
		12					
		15					
SCB	2.5-	4	Full Thread Screws				
		5					
		6					
		8					
		10					
SCB	2.6-	4	Full Thread Screws				
		5					
		6					
		8					
		10					
		12					
		15					
SCB	3-	4	Full Thread Screws				
		5					
		6					
		8					
		10					
		12					
		15					
		16					
		18					
		20					
		25	18				
		30					
		35					
		40					
SCB	4-	5	Full Thread Screws				
		6					
		8					
		10					
		12					
		15					
		16					
		18					
		20					
		22					
		25					

Part Number Type	M-	L	ℓ	€ Unit Price 1~9 pcs.	Volume Discount 10~29 pcs.	30~99 pcs.	100 pcs. or more
SCB	4-	30	20				
		35					
		40					
		45					
		50					
SCB	5-	6	Full Thread Screws				
		8					
		10					
		12					
		14					
		15					
		16					
		18					
		20					
		22					
		25					
		30	22				
		35					
		40					
		45					
		50					
SCB	6-	8	Full Thread Screws				
		10					
		12					
		14					
		15					
		16					
		18					
		20					
		22					
		25					
		30					
		35	24				
		40					
		45					
		50					
		55					
		60					
		65					
		70					
SCB	8-	10	Full Thread Screws				
		12					
		15					
		16					

Part Number Type	M-	L	ℓ	€ Unit Price 1~9 pcs.	Volume Discount 10~29 pcs.	30~99 pcs.	100 pcs. or more
SCB	8-	18	Full Thread Screws				
		20					
		22					
		25					
		30					
		35					
		40					
		45					
		50					
		55					
		60	28				
		65					
		70					
		75					
		80					
SCB	10-	15	Full Thread Screws				
		16					
		18					
		20					
		25					
		30					
		35					
		40					
		45					
		50					
		55					
		60	32				
		65					
		70					
		75					
SCB	12-	25	Full Thread Screws				
		30					
		35					
		40					
		45					
		50					
		55					
		60	36				

Order Example — Part Number: SCB3-5

Days to Ship — 6 Days ☞ P.87

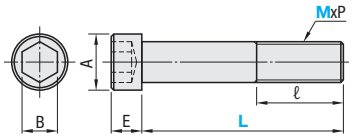
Hexagon Socket Head Cap Screws
-Trivalent Chromate-

CAD Data

RoHS



CBE



M Material: 1.7220/34CrMo4
S Surface Treatment: Trivalent Chromate
H Hardness: HRC32~39
* Strength Class 10.9

MxP	A	E	B
2x0.4	3.8	2	1.5
2.6x0.45	4.5	2.6	2
3x0.5	5.5	3	2.5
4x0.7	7	4	3
5x0.8	8.5	5	4
6x1.0	10	6	5
8x1.25	13	8	6
10x1.5	16	10	8
12x1.75	18	12	10

* The strength class signifies the screw's tensile strength.

(Ex.) 10. 9
- This indicates that the minimum value for yielding point or proof stress is 90% of tensile strength.
- This indicates that the minimum value of tensile strength is 1040N/mm².

Reference: Dimensions of Counterbore and Cap Screw Hole for Hexagon Socket Head Cap Screws **P.1783**

Part Number Type M- L	ℓ	€ Unit Price 1~9 pcs.	Volume Discount 10~19 pcs.	20~49 pcs.	50 pcs. or more
CBE 2- 5	Full Thread Screws				
6					
8					
10					
CBE 2.6- 5	Full Thread Screws				
6					
8					
10					
CBE 3- 4	Full Thread Screws				
5					
6					
8					
10					
12					
15					
18					
20					
25	18				
30					
35					
CBE 4- 5	Full Thread Screws				
6					
8					
10					
12					
15					
18					
20					
25					
30					
35					
40	20				
45					
50					
CBE 5- 6	Full Thread Screws				
8					
10					
12					

Part Number Type M- L	ℓ	€ Unit Price 1~9 pcs.	Volume Discount 10~19 pcs.	20~49 pcs.	50 pcs. or more
CBE 5- 15	Full Thread Screws				
18					
20					
25					
30	22				
35					
40					
45					
50					
CBE 6- 8	Full Thread Screws				
10					
12					
15					
18					
20					
25					
30					
35	24				
40					
45					
50					
55					
60					
65					
70					
75					
CBE 8- 10	Full Thread Screws				
12					
15					
18					
20					
25					
30					
35					
40	28				
45					
50					
55					

Part Number Type M- L	ℓ	€ Unit Price 1~9 pcs.	Volume Discount 10~19 pcs.	20~49 pcs.	50 pcs. or more
CBE 8- 60	28				
65					
70					
75					
80					
CBE 10- 15	Full Thread Screws				
20					
25					
30					
35					
40					
45	32				
50					
55					
60					
65					
70					
75					
CBE 12- 15	Full Thread Screws				
20					
25					
30					
35					
40					
45					
50					
55	36				
60					

Order Example

Part Number
CBE4-10

Days to Ship

6 Days P.87

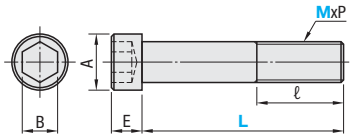
Hexagon Socket Head Cap Screws (Package) / Hexagon Socket Head Cap Screws
-Trivalent Chromate / STKM Bright Chromate Plating-

CAD Data



RoHS

PACK-SCBE

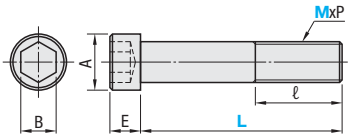


M Material: 1.7220/34CrMo4
S Surface Treatment: Trivalent Chromate
H Hardness: HRC32~39
* Strength Class 10.9



CBM

CBM is not compliant with RoHS.



M Material: 1.7220/34CrMo4
S Surface Treatment: JIS STKM Bright Chromate Plating
H Hardness: HRC32~39
* Strength Class 10.9

Part Number Type	M-L	ℓ	PACK-SCBE pcs. per package	PACK-SCBE € Unit Price 1~4 pkgs.	PACK-SCBE Volume Discount 5 pkgs. or more
PACK-SCBE	2-5	Full Thread Screws	PACK-SCBE 50 pcs.		
	6				
	8				
	10				
PACK-SCBE	2.6-5	Full Thread Screws			
	6				
	8				
	10				
PACK-SCBE	3-5	Full Thread Screws			
	6				
	8				
	10				
	12				
	15				
	20				
	25	18			
	30				
	35				
PACK-SCBE	4-6	Full Thread Screws			
	8				
	10				
	12				
	15				
	20				
	25				
	30	20			
	35				
	40				
	45				
PACK-SCBE	5-8	Full Thread Screws			
	10				
	12				
	15				
	20				
	25				
	30				
	35				
	40	22			
	45				
	50				

Part Number Type	M-L	ℓ	PACK-SCBE pcs. per package	PACK-SCBE € Unit Price 1~4 pkgs.	PACK-SCBE Volume Discount 5 pkgs. or more
PACK-SCBE	6-8	Full Thread Screws	PACK-SCBE 50 pcs.		
	10				
	12				
	15				
	20				
	25				
	30				
	35				
	40				
	45	24			
	50				
	60				
PACK-SCBE	8-12	Full Thread Screws			
	15				
	20				
	25				
	30				
	35				
	40				
	45				
	50	28			
	55				
	60				
PACK-SCBE	10-15	Full Thread Screws	PACK-SCBE 20 pcs.		
	20				
	25				
	30				
	35				
	40				
	45				
	50				
	55				
	60	32			
PACK-SCBE	12-15	Full Thread Screws			
	20				
	25				
	30				
	35				
	40				
	45				
	*50				
	55				
	60	36			

Part Number Type	M-L	ℓ	CBM € Unit Price 1~99 pcs.	CBM Volume Discount 100 pcs. or more
CBM	3-6	Full Thread Screws		
	8			
	10			
	12			
	15			
	20			
	25	18		
	30			
	35			
CBM	4-6	Full Thread Screws		
	8			
	10			
	12			
	15			
	20			
	25			
	30	20		
	35			
	40			
	45			
CBM	5-8	Full Thread Screws		
	10			
	12			
	15			
	20			
	25			
	30	22		
	35			
	40			
	45			
	50			
CBM	6-8	Full Thread Screws		
	10			
	12			
	15			
	20			
	25			
	30			
	35			
	40			
	45	24		
	50			
	60			

Part Number Type	M-L	ℓ	CBM € Unit Price 1~99 pcs.	CBM Volume Discount 100 pcs. or more
CBM	8-12	Full Thread Screws		
	15			
	20			
	25			
	30			
	35			
	40			
	45			
	50	28		
	55			
	60			
CBM	10-15	Full Thread Screws		
	20			
	25			
	30			
	35			
	40			
	45			
	50	32		
	55			
	60			
CBM	12-15	Full Thread Screws		
	20			
	25			
	30			
	35			
	40			
	45			
	*50			
	55	36		
	60			

* ℓ part is based on JIS B 1176 (2000).

Order Example

Part Number
PACK-SCBE6-10
CBM8-20

Days to Ship

6 Days

P.87

PACK-SCBE is sold by package, and CBM is sold as single item
For package sales, minimum order is 1 pack.

NEW

Hexagon Socket Head Cap Screws

-Full Thread / High Strength Stainless Steel / Configurable Length-

Price Reduction
Up to 35%

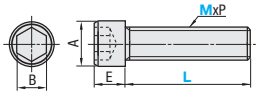
CAD Data

■Hexagon Socket Head Cap Screws -Full Thread-

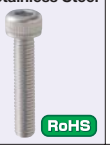


RoHS

Type	M Material	S Surface Treatment	H Hardness	Strength Class
ACB	1.7220/ 34CrMo4	Black Oxide	32~44HRC	12.9 (M3~M20) 10.9 (M24)
ASCB	1.4567/X3CrNiCu18-9-4	-	-	A2-70

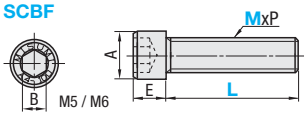


■Hexagon Socket Head Cap Screws -High Strength Stainless Steel-



RoHS

SCBF





M Material: 1.4404/X2CrNiMo17-12-2 JIS B 1176 * Strength Class A4-100 (10.9 equivalent)

Part Number Type	M-L	ACB € Unit Price 1~99 pcs.	ACB Volume Discount from 100 pcs.
ACB	3-25		
	30		
	35		
	40		
	45		
	50		
	4-30		
	35		
	40		
	45		
	50		
	55		
	60		
	5-30		
	35		
	40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
	90		
	6-35		
	40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
	85		
	90		
	100		
	8-40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
	85		
	90		
	100		
	110		
	10-45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
	85		
	90		
	100		
	110		
	120		

Part Number Type	M-L	ACB € Unit Price 1~99 pcs.	ACB Volume Discount from 100 pcs.
ACB	12-50		
	55		
	60		
	65		
	70		
	75		
	80		
	85		
	90		
	100		
	110		
	120		
	16-60		
	65		
	70		
	75		
	80		
	85		
	90		
	100		
	110		
	120		
	20-70		
	75		
	80		
	85		
	90		
	100		
	110		
	120		
	24-100		
	110		
	120		

Part Number Type	M-L	ASCB € Unit Price 1~99 pcs.	ASCB Volume Discount from 100 pcs.
ASCB	5-30		
	35		
	6-35		
	40		
	8-40		
	45		
	50		
	10-45		
	50		

No specification available for sizes with no prices shown.

Part Number Type	M-L	€ Unit Price 1~4 pcs.	Volume Discount 5~49 pcs	50~99 pcs	100 pcs. or more
SCBF	3-5				
	6				
	8				
	10				
	12				
	15				
	20				
	4-8				
	10				
	12				
	15				
	20				
	5-8				
	10				
	12				
	15				
	20				
	25				
	6-10				
	12				
	15				
	20				
	25				
	30				

■Mechanical Properties (Reference)

Type	M Material	Strength Class	Tensile Strength (N/mm²)	0.2% Proof Stress (N/mm²)	Corrosion Resistance	Non-magnetic
SCB	1.4567/X3CrNiCu18-9-4	A2-70	700	450	○	○
SSCB	1.4404/X2CrNiMo17-12-2	A4-70	700	450	◎	◎
SCBF	1.4404/X2CrNiMo17-12-2	A4-100 (10.9 eq.)	1000	900	◎	◎

SCB ☞P.174 SSCB ☞P.179

◎: Excellent ○: Good

MxP	A	E	B
3x0.5	5.5	3	2.5
4x0.7	7	4	3
5x0.8	8.5	5	4
6x1.0	10	6	5
8x1.25	13	8	6
10x1.5	16	10	8
12x1.75	18	12	10
16x2.0	24	16	14
20x2.5	30	20	17
24x3.0	36	24	19

Order Example — Part No.
SCBF4-8
ACB8-40
ASCB6-35

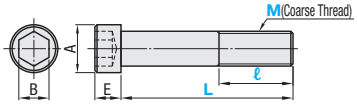
Days to Ship: 6 Days ☞P.87

■Hexagon Socket Head Cap Screws –Configurable Length–



RoHS

Type	M Material	S Surface Treatment	H Hardness	Strength Class
FBAB	1.7220/34CrMo4	Black Oxide	38~43HRC	12.9
FBAM		Electroless Nickel Plating		
FBAS	1.4567/X3CrNiCu18-9-4	-	-	A2-70



When ℓ=L, there is an incomplete threaded portion (max.2 pitch long) under the head.

MxP	A	E	B
4x0.7	7	4	3
5x0.8	8.5	5	4
6x1.0	10	6	5
8x1.25	13	8	6
10x1.5	16	10	8

Part Number Type	M (Coarse)	L 1mm Increment	ℓ 1mm Increment	€ Unit Price FBAB L100 or less ~100	FBAB L101~	FBAM L100 or less ~100	FBAM L101~	FBAS L100 or less ~100	FBAS L101~
FBAB FBAM FBAS	4	30~100	10~40 ? ℓ≤L						
	5	30~100							
	6	35~150							
	8	40~150							
	10	45~210							

Order Example — Part No. FBAS6 - L 100 - ℓ 22

Days to Ship: 8 Days — Express A 5,00 EUR/ piece ☞P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Washer Assembled Hexagon Socket Head Cap Screws

-Spring Built-in Type Washer / With Flat and Spring Washer / With Large and Large Washer Thick Type-

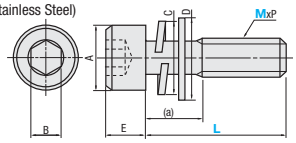
CAD Data

■Washer Assembled Hexagon Socket Head Cap Screws -Flat Washer / Spring Washer Assembled-



RoHS

CBST
SCBS (Stainless Steel)



MxP	A	E	b	C	d	(a)
2x0.4	3.8	2	1.5	3.8	5	2.1
2.5x0.45	4.5	3	2	4.5	6.5	2.7
3x0.5	5.5	3	2.5	5.5	7	3
4x0.7	7	4	3	7	9	4.4
5x0.8	8.5	5	4	8.5	10	5.4
6x1.0	10	6	5	11.5	12.5	6.9
8x1.25	13	8	6	14.5	17	8.4

(a) is the max length (reference) between head surface and the complete thread.

CBST

Screws	M Material: Structural Alloy Steel H Hardness: 32~44HRC *Strength class 10.9JIS 0209 (6g)
Washers	Spring Washers JIS B 1251 Flat Washers JIS B 1256
S Surface Treatment	Black Oxide

SCBS

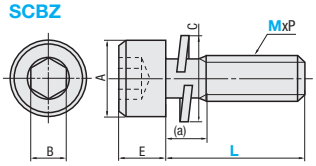
Screws	M Material 1.4567/X3CrNiCu18-9-4 *Strength Class A2–70 JIS 0209 (6g)
Washers	Spring Washers JIS B1251 Flat Washers JIS B 1256
S Surface Treatment	Barrel, Passivated

■Washer Assembled Hexagon Socket Head Cap Screws -Spring Built-in Type Washer-



RoHS

SCBZ



MxP	A	E	B	C	(a)
3x0.5	5.5	3	2.5	5.5	2.4
4x0.7	7	4	3	7	3.5
5x0.8	8.5	5	4	8.5	4.3
6x1.0	10	6	5	11.5	5.1
8x1.25	13	8	6	14.5	6.2

(a) is the max length (reference) between head surface and the complete thread.

Screws	M Material 1.4567/X3CrNiCu18-9-4 *Strength Class A2–70 JIS 0209 (6g)
Washers	Spring Washers JIS B 1251
S Surface Treatment	Barrel, Passivated

Part No. Type M-L	CBST € Unit Price 1~9 pcs.	CBST Volume Disount 10 pcs. or more	SCBS € Unit Price 1~9 pcs.	SCBS Volume Disount 10 pcs. or more
SCBS 2-4				
5				
6				
8				
SCBS 2.5-5				
6				
8				
10				
CBST 3-5				
SCBS 6				
8				
10				
12				
15				
16				
CBST 4-6				
SCBS 8				
10				
12				
15				
16				
20				

Part No. Type M-L	CBST € Unit Price 1~9 pcs.	CBST Volume Disount 10 pcs. or more	SCBS € Unit Price 1~9 pcs.	SCBS Volume Disount 10 pcs. or more
CBST 5-8				
SCBS 10				
12				
15				
16				
20				
25				
CBST 6-10				
SCBS 12				
15				
16				
20				
25				
30				
CBST 8-15				
SCBS 16				
20				
25				
30				
35				

No specification available for sizes with no prices shown.

Part Number Type M-L	€ Unit Price 1~9 pcs.	Volume Discount 10 pcs. or more
SCBZ 3-6		
8		
10		
12		
SCBZ 4-8		
10		
12		
15		
20		
SCBZ 5-10		
12		
15		
16		
20		

Part Number Type M-L	€ Unit Price 1~9 pcs.	Volume Discount 10 pcs. or more
SCBZ 6-12		
15		
16		
20		
25		
SCBZ 8-20		
25		

Order Example — Part Number: CBST6-20

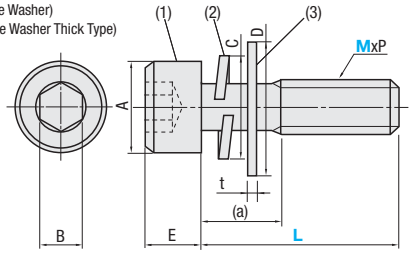
Days to Ship — 6 Days | 2 Days P.87

■Washer Assembled Hexagon Socket Head Cap Screws –Large Washer, Large Washer Thick Type–



RoHS

SCBST (Large Washer)
SCBSA (Large Washer Thick Type)



(1) Screws	M Material: 1.4567/X3CrNiCu18-9-4 *Strength Class A2–70 JIS 0209 (6g)
Washers	(2) Spring Washers Stainless Steel (3) Flat Washers Stainless Steel
S Surface Treatment	Barrel, Passivated

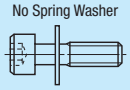
Part Number Type	M	L 1mm Increment	MxP	A	E	B	C (Max.)	D (Max.)	t SCBST	t SCBSA	(a) SCBST	(a) SCBSA	€ Unit Price SCBST	€ Unit Price SCBSA
SCBST SCBSA	3	10~25	3x0.5	5.5	3	2.5	5.5	10	1	2	4	5		
	4		4x0.7	7	4	3	7	12	1	2	4.4	5.4		
	5		5x0.8	8.5	5	4	8.5	13	1	2	5.4	6.4		
	6	10~30	6x1.0	10	6	5	11.5	16	1	2.5	6.9	8.4		
	8	15~35	8x1.25	13	8	6	14.5	22	1.5	2.5	8.4	9.4		

Order Example — Part Number: SCBST4 - L: 12

Days to Ship — 8 Days | Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations — Part Number: SCBST4 - L: 12 - (NSW): NSW

Alteration	Code	Spec.	Price Adder
No Spring Washer 	NSW	(2) No Spring Washer Only the part (1) + (3)	Free of Charge

Price

■Volume Discount (Round down to one Cent.) P.87

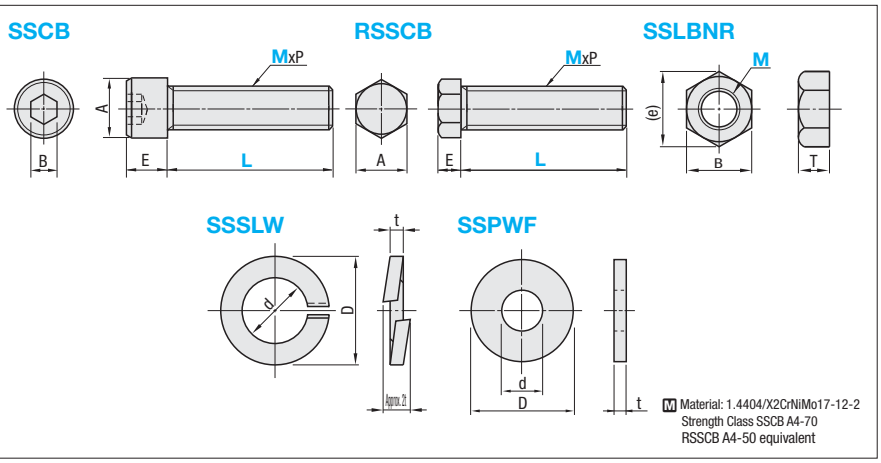
Qty.	1~19	20~29	30~39	40~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

1.4404/X2CrNiMo17-12-2 Hexagon Socket Head Cap Screws / Hexagon Screws / Nuts / Washers

CAD Data





M Material: 1.4404/X2CrNiMo17-12-2
Strength Class SSCB A4-70
RSSCB A4-50 equivalent

1.4404/X2CrNiMo17-12-2 Hexagon Socket Head Cap Screws

Part Number Type	M-L	MxP	A	E	B	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
SSCB	3- 6	3x0.5	5.5	3	2.5		
	8						
	10						
	12						
	15						
	20						
SSCB	4- 8	4x0.7	7	4	3		
	10						
	12						
	15						
	20						
SSCB	5- 8	5x0.8	8.5	5	4		
	10						
	12						
	15						
	20						
	25						
SSCB	6- 10	6x1.0	10	6	5		
	12						
	15						
	20						
	25						
SSCB	8- 15	8x1.25	13	8	6		
	20						
	25						
	30						
SSCB	10- 20	10x1.5	16	10	8		
	25						
	30						
	35						
SSCB	12- 20	12x1.75	18	12	10		
	25						
	30						
	35						
	40						

1.4404/X2CrNiMo17-12-2 Hexagon Screws

Part Number Type	M-L	MxP	A	E	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
RSSCB	4-10	4x0.7	7	2.8		
	12					
	15					
	20					
RSSCB	5-10	5x0.8	8	3.5		
	12					
	15					
	20					
	25					
RSSCB	6-10	6x1.0	10	4.0		
	12					
	15					
	20					
	25					
RSSCB	8-15	8x1.25	13	5.5		
	20					
	25					
	30					
RSSCB	10-20	10x1.5	17	7.0		
	25					
	30					
	35					

1.4404/X2CrNiMo17-12-2 Nuts

Part Number Type	M	B	(e)	T	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
SSLBNR	3	5.5	6.4	2.4		
	4	7	8.1	3.2		
	5	8	9.2	4		
	6	10	11.5	5		
	8	13	15	6.5		
	10	17	19.6	8		
	12	19	21.9	10		

1.4404/X2CrNiMo17-12-2 Spring Washers

Part Number Type	No.	d	D	t	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
SSSLW	3	3.1	5.9	0.7		
	4	4.1	7.6	1.0		
	5	5.1	9.2	1.3		
	6	6.1	12.2	1.5		
	8	8.2	15.4	2.0		
	10	10.2	18.4	2.5		
	12	12.2	21.5	3.0		

1.4404/X2CrNiMo17-12-2 Washers

Part Number Type	No.	D	d	t	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
SSPWF	3	7	3.2	0.5		
	4	9	4.3	0.8		
	5	10	5.3	1.0		
	6	12.5	6.4	1.5		
	8	17	8.4	1.5		
	10	21	10.5	2.0		
	12	24	13.0	2.5		

Order Example — Part Number: SSCB5-12, SSSLW8

Days to Ship: 6 Days P.87

Properties of 1.4404/X2CrNiMo17-12-2

- 1.4404/X2CrNiMo17-12-2 is composed of 1.4301/X5CrNi18-10 with Molybdenum added, having high corrosion resistance.

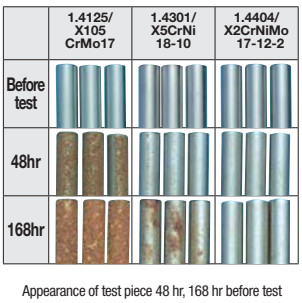
<Reference: Corrosion Resistance of Stainless Steel>

Testing Method

Conforms to the JIS H 8502 Cycle Test Method for a complex corrosion test.

Test Conditions

(1) Salt Water Spray Test (5%NaCl. 35°C) 2hr
(2) Dry (60°C) 4hr
(3) Wet (95%RH. 35°C) 2hr
One cycle takes 8hr.



Appearance of test piece 48 hr, 168 hr before test

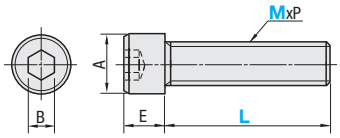
Hexagon Socket Head Cap Screws / Nuts / Washers
-Titanium · Aluminum-

CAD Data

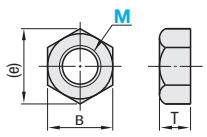


Type	Material	Surface Treatment
CBT · CBT_	3.7035/Ti99.5 (Ti2) (JIS H4650)	-
CBAL · CBAL_	EN AW-2017/AlCu4MgSi / EN AW-5056/AlMg5 (Nut)	-
CBALB · CBALWB		Black Anodize

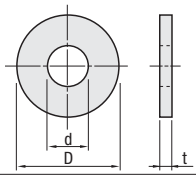
CBT (Titanium)
CBAL (Aluminum)
CBALB (Aluminum / Black Anodize)



CBTN (Titanium)
CBALN (Aluminum)



CBTW (Titanium)
CBALW (Aluminum)
CBALWB (Aluminum / Black Anodize)



Hexagon Socket Head Cap Screws

Part Number Type	M-L	M x P	A	E	B	CBT € Unit Price less than *	CBT Volume Discount * or more	CBAL € Unit Price less than *	CBAL Volume Discount * or more	CBALB € Unit Price less than *	CBALB Volume Discount * or more	*Quantity
CBT CBAL CBALB	3- 6 8 10 12 15 20	3 x 0.5	5.5	3	2.5							100
	4- 6 8 10 12 15 20	4 x 0.7	7	4	3							
	5- 8 10 12 15 20 25	5 x 0.8	8.5	5	4							
	6- 8 10 12 15 20 25	6 x 1.0	10	6	5							
	8- 15 20 25 30	8 x 1.25	13	8	6							50
	10- 20 25 30 35	10 x 1.5	16	10	8							

No specification available for sizes without price indication.

Nuts

Part Number Type	M	B	(e)	T	CBTN € Unit Price less than *	CBTN Volume Discount * or more	CBALN € Unit Price less than *	CBALN Volume Discount * or more	*Quantity
CBTN CBALN	3	5.5	6.4	2.4					100
	4	7	8.1	3.2					
	5	8	9.2	4					
	6	10	11.5	5					
	8	13	15	6.5					50
	10	17	19.6	8					

Washers

Part Number Type	No.	D	d	t	CBTW € Unit Price less than *	CBTW Volume Discount * or more	CBALW € Unit Price less than *	CBALW Volume Discount * or more	CBALWB € Unit Price less than *	CBALWB Volume Discount * or more	*Quantity
CBTW CBALW CBALWB	3										100
	4										
	5										
	6										
	8										50
	10										

Order Example — Part Number: CBT5-12, CBTN8, CBTW10

Days to Ship: 6 Days P.87

Comparison by metals

Item	Unit	Titanium	Aluminum	Steel
Specific Gravity	g/cm³	4.5	2.7	7.9
Tensile Strength	N/mm²	377	78	315
Thermal Conductivity	cal/cm, sec, °C	0.041	0.487	0.145
Young's Modulus	kN/mm²	106	69	205

Mechanical Characteristics of Hexagon Socket Cap Screws (Reference)

	Tensile Breaking Load N		Torsional Breaking Torque N·m	
	Titanium	Aluminum	Titanium	Aluminum
M3	3210	1650	2.4	1.0
M4	5610	2890	4.7	2.5
M5	9080	4680	9.8	6.7
M6	12800	6630	11.3	11.0
M8	23400	12000	22.8	30.0
M10	37100	23560	61.5	48.0

- Shown above are reference values and not guaranteed values.
- Recommended tightening torque is torsional breaking torque x50%.
- Use a torque driver or a torque wrench for tightening.
- The values of black aluminum anodized products are approx. 80% of the above values.

Characteristics of Titanium (JIS H4650 3.7035/Ti99.5 (Ti2))

- Titanium compares with low carbon steel in strength, and its specific gravity is approx. 60% of iron.
- It can be used at low and high temperatures.
- It has chemical resistance better than that of stainless steel.

Typical Physical Properties of Titanium

Item	Unit	Data
Purity	%	99.5 or more
Tensile Strength	N/mm²	340~510
Yield Stress	N/mm²	215 or more
Operating Temp.	°C	-200~350

Chemical Resistance of Titanium

Chemical Solution	Concentration (%)	Temperature (°C)	Titanium	1.4401/ X5CrNiMo17-12-2
Hydrochloric Acid	10	30	◎	X
Sulfuric Acid	20	30	○	X
Sodium Hydroxide	50	120	◎	○

◎: Corrosion resistant enough for use.
○: Corrosive but usable depending on conditions.
X : Unusable due to insufficient corrosion resistance.

Changes in Mechanical Characteristics of Titanium by Temperature

Item	Unit	Data		
		−200°C	Ambient Temperature	350°C
Tensile Strength	N/mm²	994	421	167
Elongation	%	25.7	46	54

Hexagon Socket Head Cap Screws / Hexagon Socket Head Cap Screws with Hole
-w/Thread Locking Compound-

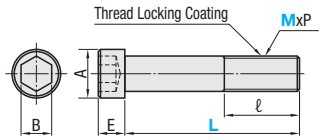
CAD Data

■Hexagon Socket Head Cap Screws -with Threadlocker Adhesive-

RoHS



Type	M Material	S Surface Treatment	H Hardness	Strength Class
LB	1.7220/34CrMo4	Black Oxide	38~43HRC	12.9
SUSLB	1.4567/X3CrNiCu18-9-4	-	-	A2-70



MxP (Coarse)	A	B	t max.	(e) max.	r
3x0.5	6	1.5	2	1.6	0.1 or more
4x0.7	8	2	2.5	1.6	0.2 or more
5x0.8	9	3	3	2	0.2 or more
6x1.0	10	3	4	2.5	0.25 or more
8x1.25	13	4	5	3	0.4 or more
10x1.5	15	5	5	3.5	0.4 or more

Ⓣ›Loosening Prevention Treatment‹
This treatment applies the special plastic excellent in elasticity, abrasion resistance and oil resistance to the thread grooves. It shows maximum effect in the initial use and gradually loses the effect after the fourth use.

Part Number Type	M-L	ℓ	LB € Unit Price	SUSLB € Unit Price 1~99 pcs.	SUSLB Volume Discount 100~200 pcs.
LB SUSLB	4-8	Full Thread Screws			
	10				
	12				
	15				
	20				
	25				
	30	20			
LB SUSLB	5-10	Full Thread Screws			
	12				
	15				
	20				
	25				
	30	22			
	35				
LB SUSLB	6-10	Full Thread Screws			
	15				
	20				
	25				
	30				
	35	24			
	40				
	45				
	50				

Ⓣ›No specification available for sizes with no prices shown.
Ⓣ›For orders larger than indicated quantity, please request a quotation.

Part Number Type	M-L	ℓ	LB € Unit Price	SUSLB € Unit Price 1~99 pcs.	SUSLB Volume Discount 100~200 pcs.
LB SUSLB	8-15	Full Thread Screws			
	20				
	25				
	30				
	35				
	40	28			
	45				
	50				
	55				
	60				
LB SUSLB	10-20	Full Thread Screws			
	25				
	30				
	35				
	40	32			
	45				
	50				
	55				
	60				
LB SUSLB	12-25	Full Thread Screws			
	30				
	35				
	40				
	45				
	50				
	55				
	60	36			

Ⓣ›No specification available for sizes with no prices shown.
Ⓣ›For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number: LB8-40

Days to Ship: 6 Days ☞P.87

Price

• LB

■Volume Discount (Ⓣ›Round down to one Cent.) P.87

Qty.	1~200	201~300
Applicable	€ Unit Price	Volume Discount
	Price List	5%

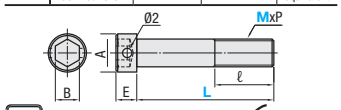
Ⓣ›For orders of 1~149 pieces: € Unit Price + Small Order Charge (0,15 EUR or 0,50 EUR/pc.)
[Calculation Example] When ordering 2 pcs. of LB4-8
€ Unit Price: 0,13 EUR + Small Order Charge: 0,50 EUR) x 2pcs. = 1,26 EUR
Ⓣ›For orders larger than indicated quantity, please request a quotation.

■Hexagon Socket Head Cap Screws with Hole

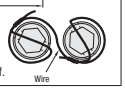
RoHS



Type	M Material	S Surface Treatment	H Hardness	Strength Class
CBLH	1.7220/34CrMo4	Black Oxide	22~32HRC	8.8 equivalent
SCBLH	1.4567/X3CrNiCu18-9-4	-	-	A2-70 equivalent



Example



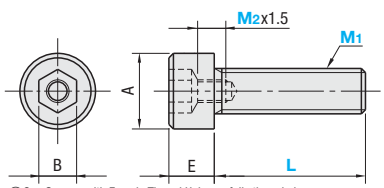
Ⓣ›Put wire through the hole in the screw head, which prevents the screw loosening or falling off.

■Female Thread Socket Head Screws

RoHS



Type	M Material	S Surface Treatment	Strength Class
TSCB	1.4567/X3CrNiCu18-9-4	-	A2-50 equivalent



Ⓣ›Cap Screws with Female Thread Hole are fully threaded.

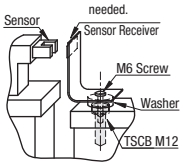
Part Number Type	M-L	ℓ	CBLH € Unit Price 1~49 pcs.	CBLH Volume Discount 50~100 pcs.	SCBLH € Unit Price 1~49 pcs.	SCBLH Volume Discount 50~100 pcs.
CBLH SCBLH	6-10	Full Thread Screws				
	12					
	15					
	20					
	25					
	30					
	35	24				
	40					
	45					
	50					
CBLH SCBLH	8-12	Full Thread Screws				
	15					
	20					
	25					
	30					
	35					
	40	28				
	45					
CBLH SCBLH	10-20	Full Thread Screws				
	25					
	30					
	35					
	40					
	45	32				
CBLH SCBLH	12-25	Full Thread Screws				
	30					
	35					
	40					
	45					
	50					

Part Number Type	M-L (Coarse)-L	M2 (Coarse) (Tap size)	A	E	B	TSCB € Unit Price 1~9 pcs.	TSCB Volume Discount 10 pcs. or more
TSCB	6-10	3	10	6	5		
	12						
	16						
	20						
	25						
	8- 10	4	13	8	6		
	16						
	25						
	30						
	10- 16	4	16	10	8		
	20	5					
	25						
	12- 20	6	18	12	10		
	16- 30	8	24	16	14		
	35						

Order Example — Part Number: CBLH8-12 / SCBLH8-40 / TSCB10-20 - M2: 5

Days to Ship: 6 Days ☞P.87

Example ■Space Saving
It can be used when space is limited or when two or more holes in installation seat are not needed.



Ⓣ›No specification available for sizes with no prices shown. Ⓣ›For orders larger than indicated quantity, please request a quotation.

Hexagon Socket Head Cap Screws / Cover Caps

-Fine Thread / Left-Hand Thread-

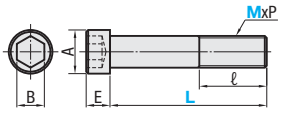
CAD Data

■Hexagon Socket Head Cap Screws -Fine Thread-

RoHS



Type	Material	Surface Treatment	Hardness	Strength Class
CBPK	1.7220/34CrMo4	Black Oxide	39~44HRC	12.9
SCBPK	1.4567/ X3CrNiCu18-9-4	-	-	A2-70



Part Number Type	M-L	MxP	ℓ	A	E	b	CBPK € Unit Price 1~9 pcs.	CBPK Volume Discount 10 pcs. or more	SCBPK € Unit Price 1~9 pcs.	SCBPK Volume Discount 10 pcs. or more
CBPK SCBPK	6-10 12 15 20 25	6 x 0.75	Full Thread Screws	10	6	5				
CBPK SCBPK	8-12 15 20 25 30	8 x 1.0	Full Thread Screws	13	8	6				
CBPK SCBPK	10-15 20 25 30 35 40 45 50	10 x 1.25	Full Thread Screws *32	16	10	8				
CBPK SCBPK	12-20 25 30 35 40 50	12 x 1.25	Full Thread Screws	18	12	10				

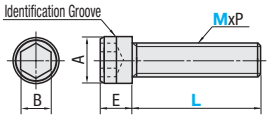
*SCBPK is Full Thread Type.

■Hexagon Socket Head Cap Screws -Left-Hand Thread-

RoHS



Type	Material	Surface Treatment	Hardness	Strength Class
BCBL	1.7220/34CrMo4	Black Oxide	38~43HRC	12.9 equivalent
SCBL	1.4567/ X3CrNiCu18-9-4	-	-	A2-70 equivalent



Part Number Type	M-L	MxP	A	E	B	BCBL € Unit Price 1~9 pcs.	BCBL Volume Discount 10 pcs. or more	SCBL € Unit Price 1~9 pcs.	SCBL Volume Discount 10 pcs. or more
BCBL SCBL	4-10 12 15 20	4 x 0.7	7	4	3				
BCBL SCBL	5-10 12 15 20	5 x 0.8	8.5	5	4				
BCBL SCBL	6-10 12 15 20 25	6 x 1.0	10	6	5				
BCBL SCBL	8-15 20 25 30	8 x 1.25	13	8	6				
BCBL SCBL	10-20 25 30 40	10 x 1.5	16	10	8				
BCBL SCBL	12-20 25 30 40	12 x 1.75	18	12	10				

No specification available for sizes with no prices shown.

Order Example

Part Number
CBPK6-15
SCBL8-20

Days to Ship

6 Days

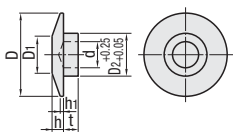
P.87

■Cover Caps for Hexagon Socket Cap Screws

RoHS



BTCSW(White)
BTCSB(Black)

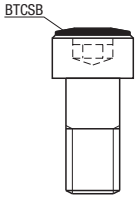


Material: Polyacetal (White / Black)

Part Number Type	No.	Applicable Screws	D	D1	D2	d	h	h1	t	€ Unit Price
BTCSW BTCSB	3	M 3	4.5	1.5	2.5	1.5	1	0.3	1	
	4	M 4	6	2	3	2	1.1			
	5	M 5	7.5	3	4	3	1.3	0.4	1.5	
	6	M 6	9	4	5	4	1.5		1.8	
	8	M 8	12	5	6	4.5	1.8	0.5	2.3	
	10	M10	15	6	8	6.5	2		2.9	
	12	M12	17	8	10	8.5	2.2	0.6	3.5	

Example

- It covers the hexagonal hole of a hexagon socket head cap screw and prevents dust from accumulation.
- Available in white and black for identification.
- Repetitive attaching and removing causes loose fit.



Order Example

Part Number
BTCSW8
MTCSW6

Days to Ship

6 Days 2 Days

P.87

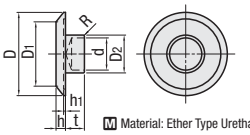
■Cover Caps for Counterbore Holes

RoHS



MTCSW(White)
MTCSB(Black)
MTCSC(Transparent)

M	D2 Tolerance	R
M3	+0.3 +0.1	0.2
M4 · 5	+0.4 +0.2	
M6~12	+0.5 +0.3	0.5

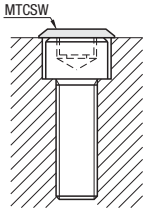


Material: Ether Type Urethane Shore A90

Part Number Type	No.	Applicable Screws	D	D1	D2	d	h	h1	t	€ Unit Price
MTCSW MTCSB MTCSC	3	M 3	9	7	2.5	1	1	0.2	1.2	
	4	M 4	10	8	3	1.5	1	0.2	1.7	
	5	M 5	12	9.5	4	2.5	1	0.2	2.2	
	6	M 6	14	11	5	3.5	1.3	0.3	2.7	
	8	M 8	17	13.5	6	4.8	1.5	0.3	3.5	
	10	M10	21	16	8	6.5	2	0.4	4	
	12	M12	23	17	10	8.5	2.5	0.5	5	

Example

- It is excellent in hydrolysis-proof.
- Ether type urethane is applicable to following test methods.
  - Japan-Food Sanitation Laws, Standard of Food and Additive (No.370 Notification of the Ministry of Health and Welfare, 1959)
  - Rubber Apparatus or Container and Package (Except nursing apparatus) (No.85 Notification of the Ministry of Health and Welfare, Japan 1986)



Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~29	30~49	50~
Discount Rate	€ Unit Price	5%	10%

Hexagon Socket Button Head Cap Screws

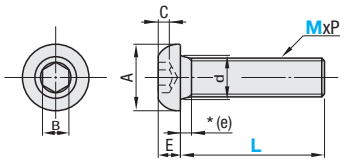
When you need in large quantity, box packaging offers more cost-savings. ☞ P.161

■Hexagon Socket Button Head Cap Screws

RoHS



Type	M Material	H Hardness	S Surface Treatment	Strength Class
BCB	1.7220/ 34CrMo4	34~44HRC	Black Oxide	10.9



JIS B 1174

MxP (Coarse)	A	E	B	C (Min.)	d	(e)
2x0.4	3.5	1.3	1.3	0.6	2.4	0.6
2.5x0.45	4.5	1.5	1.5	0.8	3	0.8
3x0.5	5.7	1.65	2	1.04	3.6	1
4x0.7	7.6	2.2	2.5	1.3	4.7	1.4
5x0.8	9.5	2.75	3	1.56	5.7	1.6
6x1.0	10.5	3.3	4	2.08	6.8	2
8x1.25	14.0	4.4	5	2.6	9.2	2.5
10x1.5	17.5	5.5	6	3.12	11.2	3.0

■BCB

Part Number		€ Unit Price	Volume Discount		
Type	M-L	1~199 pcs.	200~299 pcs.	300~499 pcs.	500 pcs. or more
BCB	2- 3				
	4				
	5				
	6				
	8				
	10				
	2.5- 4				
	5				
	6				
	8				
	3- 4				
	5				
	6				
	8				
	10				
	12				
	15				
	20				
	25				
	4- 6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	5- 6				
	8				
	10				

Part Number		€ Unit Price	Volume Discount		
Type	M-L	1~199 pcs.	200~299 pcs.	300~499 pcs.	500 pcs. or more
BCB	5- 12				
	15				
	20				
	25				
	30				
	6- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	35				
	8- 10				
	12				
	15				
	20				
	25				
	30				
	35				
	40				
	45				
	50				
	10- 15				
	20				
	25				
	30				
	35				
	40				

Price Reduction
6% on average

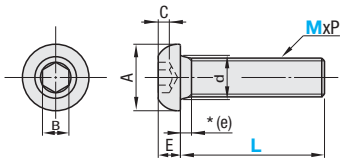
CAD Data

■Hexagon Socket Button Head Cap Screws -Stainless Steel-

RoHS



Type	Material	Hardness	Surface Treatment	Strength Class
SBCB	1.4567/ X3CrNiCu18-9-4	-	-	A2-50



JIS B 1174

MxP (Coarse)	A	E	B	C (Min.)	d	(e)
2x0.4	3.5	1.3	1.3	0.6	2.4	0.6
2.5x0.45	4.5	1.5	1.5	0.8	3	0.8
3x0.5	5.7	1.65	2	1.04	3.6	1
4x0.7	7.6	2.2	2.5	1.3	4.7	1.4
5x0.8	9.5	2.75	3	1.56	5.7	1.6
6x1.0	10.5	3.3	4	2.08	6.8	2
8x1.25	14.0	4.4	5	2.6	9.2	2.5
10x1.5	17.5	5.5	6	3.12	11.2	3.0

■SBCB

Part Number		€ Unit Price	Volume Discount		
Type	M-L	1~199 pcs.	200~299 pcs.	300~499 pcs.	500 pcs. or more
SBCB	2- 3				
	4				
	5				
	6				
	2.5- 4				
	5				
	6				
	8				
	3- 4				
	5				
	6				
	8				
	10				
	12				
	15				
	20				
	25				
	4- 6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	5- 6				

Part Number		€ Unit Price	Volume Discount		
Type	M-L	1~199 pcs.	200~299 pcs.	300~499 pcs.	500 pcs. or more
SBCB	5- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	6- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	35				
	8- 10				
	12				
	15				
	20				
	25				
	30				
	35				
	40				
	45				
	50				

Order Example

Part Number
BCB4-10
SBCB5-10

Days to Ship

6 Days

P.88

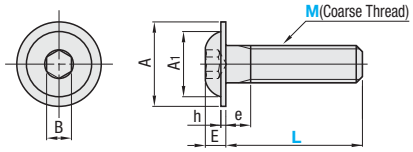
Hexagon Socket Button Head Cap Screws / Hexagon Socket Flat Head Cap Screws
–Flanged–

■Hexagon Socket Button Head Cap Screws -Flanged-

RoHS



Type	M Material	H Hardness	S Surface Treatment	Strength Class
BCBFB	1.7220/34CrMo4	32~39HRC	Black Oxide	10.9 equivalent
BCBFS	1.4567/X3CrNiCu18-9-4	-	-	A2-50 equivalent



* e (Incomplete Male Thread Portion) = Max. 2 Pitch

MxP (Coarse)	A	A1	E	h (Min.)	B
3x0.5	7	5.2	1.65	0.6	2
4x0.7	9.2	6.8	2.2	0.7	2.5
5x0.8	11.4	8.5	2.75	0.9	3
6x1.0	13.6	10.1	3.3	1	4

Part Number		BCBFB		BCBFS	
		€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	M-L	1~10 pcs.	11 pcs. or more	1~10 pcs.	11 pcs. or more
BCBFB BCBFS	3- 5				
	6				
	8				
	4- 6				
	8				
	10				
	12				
	5- 8				
	10				
	12				
	15				
	6- 8				
	10				
	12				
	15				

Order Example

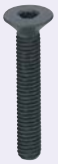
Part Number
BCBFB6-15
BCBFS3-8

Days to Ship

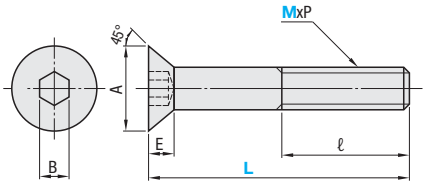
6 Days P.87

■Hexagon Socket Flat Head Cap Screws

RoHS



Type	M Material	H Hardness	S Surface Treatment	Strength Class
FB	1.7220/34CrMo4	32~39HRC	Black Oxide	10.9 equivalent



MxP (Coarse)	A	E	B
4x0.7	8	2.3	2.5
5x0.8	10	2.8	3.0
6x1.0	12	3.3	4.0
8x1.25	16	4.4	5.0
10x1.5	20	5.5	6.0

■FB (Black Oxide)

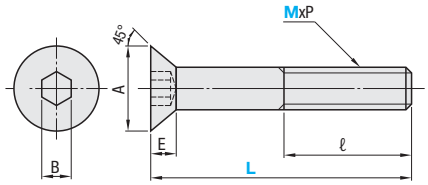
Part Number		ℓ	€ Unit Price	Volume Discount
Type	M-L		1~499 pcs.	500 pcs. or more
FB	4-10	Full Thread Screws		
	15			
	20			
	25			
	30	14		
	35			
	5-10	Full Thread Screws		
	12			
	15			
	16			
	20			
	25			
	30			
	35	16		
	40			
	6-10	Full Thread Screws		
	12			
	15			
	16			
	20			
	25			
	30			
	35			
	40			
	45	18		
	8-15	Full Thread Screws		
	20			
	25			
	30			
	35			
	40			
	45	22		
	50			
	10-20	Full Thread Screws		

■Hexagon Socket Flat Head Cap Screws -Stainless Steel-

RoHS



Type	M Material	H Hardness	S Surface Treatment	Strength Class
SFB PACK-SFB(Pack)	1.4567/ X3CrNiCu18-9-4	-	-	A2-50 equivalent



MxP (Coarse)	A		E	B
	Min.	Max.	(Max.)	(Nominal)
2x0.4	3.7	4.0	1.2	1.3
2.5x0.45	4.7	5.0	1.5	1.5
3x0.5	5.54	6.72	1.86	2.0
4x0.7	7.53	8.96	2.48	2.5
5x0.8	9.43	11.2	3.1	3.0
6x1.0	11.34	13.44	3.72	4.0
8x1.25	15.24	17.92	4.96	5.0
10x1.5	19.22	22.4	6.2	6.0

■SFB (Stainless Steel)

Part Number			Volume Discount		
Type	M-L	ℓ	1~29 pcs.	30~49 pcs.	50 pcs. or more
SFB	3- 5	Full Thread Screws			
	6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	4- 8	Full Thread Screws			
	10				
	12				
	15				
	20				
	25				
	30				
	5- 8	Full Thread Screws			
	10				
	12				
	15				
	20				
	25				
	30				
	6-10	Full Thread Screws			
	12				
	15				
	20				
	25				
	30				

■PACK-SFB (Pack)

Part Number			Qty per Pkg.	€ Unit Price	Volume Discount
Type	M-L	ℓ		1~2 Pkgs.	3 Pkgs. or more
PACK -SFB	2- 4	Full Thread Screws	100 pcs./ pack		
	5				
	6				
	2.5- 5				
	6				
	8				
	3- 5				
	6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	4- 6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	5- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	6-10				
	12				
	15				
	20				
	25				
	30				
	8-12		50 pcs./ pack		
	15				
	20				
	25				
	30				
	10-15		20 pcs./ pack		
	20				
	25				
	30				

When placing an order, please specify number of packages.

Order Example

Part Number
FB6-10
SFB3-5
PACK-SFB2-6

Days to Ship

6 Days P.87

Hexagon Screws

Add. Spec.

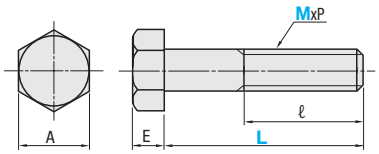
Spec.Change
Printed in Purple

Price Reduction
15% on average

CAD Data



Type	Material	Hardness	Surface Treatment	Strength Class
RCB	1.7220/34CrMo4	32~39HRC	Black Oxide	10.9
RSCB	1.4301/X5CrNi18-10 equivalent	-	-	A2-50



MxP	A	E
4x0.7	7.0	2.8
5x0.8	8.0	3.5
6x1.0	10	4.0
8x1.25	13	5.5
10x1.5	17	7.0
12x1.75	19	8.0
16x2.0	24	10

RCB (Black Oxide)

Part Number Type	M-L	ℓ	€ Unit Price 1~99 pcs.	Volume Discount 100~159 pcs.	160~199 pcs.	200 pcs. or more
RCB	5- 8	Full Thread Screws				
	10					
	12					
	15					
	20					
	25					
	30					
	35					
	40					
	6- 10	Full Thread Screws				
	12					
	15					
	20					
	25	18				
	30					
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	75					
	8- 10	Full Thread Screws				
	12					
	15					
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	55					
	60	22				
	65					
	70					
	75					
	80					
	90					
	100					
	10- 15	Full Thread Screws				
	20					
	25					
	30					

Part Number Type	M-L	ℓ	€ Unit Price 1~99 pcs.	Volume Discount 100~159 pcs.	160~199 pcs.	200 pcs. or more
RCB	10- 35	26				
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	75					
	80					
	90					
	100					
	12- 20	Full Thread Screws				
	25					
	30					
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70	30				
	75					
	80					
	90					
	100					
	110					
	120					
	130	36				
	16- 30	Full Thread Screws				
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	75	38				
	80					
	90					
	100					
	110					
	120					
	130	44				

RSCB (Stainless Steel)

Part Number Type	M-L	ℓ	€ Unit Price 1~49 pcs.	Volume Discount 50~99 pcs	100~199 pcs.	200 pcs. or more
RSCB	4- 8	Full Thread Screws				
	10					
	12					
	15					
	20					
	25					
	30					
	35					
	40					
	5- 8	Full Thread Screws				
	10					
	12					
	15					
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	6- 10	Full Thread Screws				
	12					
	15					
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	75					
	8- 10	Full Thread Screws				
	12					
	15					
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	55	30				

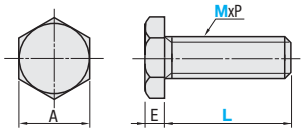
Hexagon Socket Extra Low Head Cap Screws / Hexagon Socket Head Cap Screws with Hole

CAD Data

Hexagon Socket Extra Low Head Cap Screws — RSCBT

Material: 1.4567/X3CrNiCu18-9-4
*Strength class A2-50 or equivalent





MxP	A	E
4x0.7	7	1.5
5x0.8	8	2.0
6x1.0	10	
8x1.25	13	

RoHS

Part Number Type	M-L	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
RSCBT	4-8		
	10		
	12		
	15		
	20		
	25		
	30		
RSCBT	5-8		
	10		
	12		
	15		
	20		
	25		
	30		

Part Number Type	M-L	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
RSCBT	6-10		
	12		
	15		
	20		
	25		
	30		
RSCBT	8-15		
	20		
	25		
	30		

Order Example: Part Number RSCBT5-15

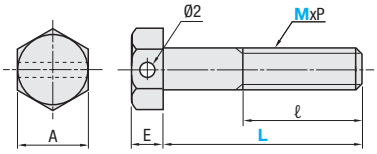
Days to Ship: 6 Days P.87

Hexagon Socket Head Cap Screws with Hole

Type	Material	Surface Treatment	Hardness	Strength Class
RCBH	1.1181/C35E	Black Oxide	22~32HRC	8.8 equivalent
RSCBH	1.4567/X3CrNiCu18-9-4	-	-	A2-50 equivalent

MxP	A	E
6x1.0	10	4.0
8x1.25	13	5.5
10x1.5	17	7.0
12x1.75	19	8.0





RoHS

Part Number Type	M-L	ℓ RCBH	ℓ RSCBH	€ Unit Price RCBH	€ Unit Price RSCBH
RCBH RSCBH	6-10	Full Thread Screws	Full Thread Screws		
	12				
	15				
	20				
	25	18			
	30				
	35				
	40				
	45				
	50				
	8-15	Full Thread Screws	Full Thread Screws		
	20				
	25				
	30	22			
	35				
	40				
	45				
	50				
	10-20	Full Thread Screws	Full Thread Screws		
	25				
	30				
	35	26	28		
	40				
	45				
	50				
	12-30	Full Thread Screws	Full Thread Screws		
	35				
	40				
	45	30	30		
	50				

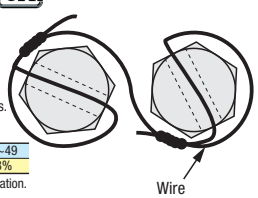
Order Example: Part Number RCBH6-10 · RSCBH12-40

Days to Ship: 8 Days

Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Example



Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~39	40~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Price

Part Number Type	M-L	ℓ	€ Unit Price 1~49 pcs.	Volume Discount 50~99 pcs	100~199 pcs.	200 pcs. or more
RSCB	8- 60	30				
	65					
	70					
	75					
	80					
	90					
	100					
	10- 15	Full Thread Screws				
	20					
	25					
	30					
	35					
	40	26				
	45					
	50					
	55					
	60					
	65					
	70					
	75					
	80					
	90					
	100					
	12- 20	Full Thread Screws				
	25					
	30					
	35					
	40	30				
	45					
	50					
	55					
	60					
	65					
	70					
	75					
	80					
	90					
	100					

Order Example: Part Number RSCB12-100

Days to Ship: 6 Days P.87

Hexagon Socket Low Head Cap Screws / Length Configurable Hexagon Socket Low Head Cap Screws
-High Strength-

CAD Data

CBSST can be ordered by a cost-saving box. P.159

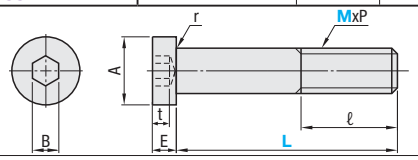
Hexagon Socket Low Head Cap Screws

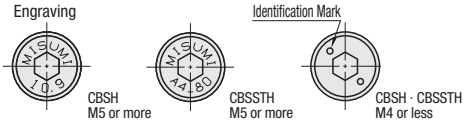
RoHS



Type	Material	Hardness	Surface Treatment	Strength Class
CBSH(High Strength)	1.7220/34CrMo4	32~39HRC	Black Oxide	10.9
CBS	1.1191/C45E (1.7220/34CrMo4~8, M12) SCM435 (M10)	22~32HRC	Black Oxide	8.8
CBSSTH(High Strength)	1.4404/X2CrNiMo17-12-2	-	-	A4-80 (8.8 equivalent)
CBSST	1.4567/X3CrNiCu18-9-4	-	-	A2-50

MxP	A	E	B	t max.	r
2x0.4	3.8	1.3	1.3	1	0.1 or more
2.5x0.45	4.5	1.6	1.5	1.3	0.1 or more
3x0.5	5.5	2	2	1.5	0.1 or more
4x0.7	7	2.8	2.5	2.3	0.2 or more
5x0.8	8.5	3.5	3	2.7	0.2 or more
6x1.0	10	4	4	3	0.25 or more
8x1.25	13	5	5	3.8	0.4 or more
10x1.5	16	6	6	4.5	0.4 or more
12x1.75	18	7	8	5	0.6 or more





Part Number Type	M-L	ℓ CBSH CBS	ℓ CBSSTH CBSST	€ Unit Price CBS	CBSST	CBSH	CBSSTH
CBSST	2-4	-	Full Thread Screws				
	5						
	6						
CBSST	2.5-4	-	Full Thread Screws				
	5						
	6						
	8						
	10						
CBS CBSST CBSH CBSSTH	3-5	Full Thread Screws	Full Thread Screws				
	6						
	8						
	10						
	12						
	16						
	20	12					
CBS CBSST CBSH CBSSTH	4-5	Full Thread Screws	Full Thread Screws				
	6						
	8						
	10						
	12						
	16						
	20						
	25						
CBS CBSST CBSH CBSSTH	5-5	Full Thread Screws	Full Thread Screws				
	6						
	8						
	10						
	12						
	16						
	20						
	25						
	30	16	24				
CBS CBSST CBSH CBSSTH	6-8	Full Thread Screws	Full Thread Screws				
	10						
	12						
	16						
	20						
	25						
	30						
	35						
	40	18	26				
	45						
CBS CBSST CBSH	8-10	Full Thread Screws	Full Thread Screws				
	12						
	16						
	20						
	25						
	30						
	35						
	40						
	45	22	30				
	50						

Part Number Type	M-L	ℓ CBS	ℓ CBSST	€ Unit Price CBS	CBSST	CBSH	CBSSTH
CBS CBSST	10-16	Full Thread Screws	Full Thread Screws				
	20						
	25						
	30						
	35						
	40						
	45	32	36				
	50						
CBS CBSST	12-20	Full Thread Screws	Full Thread Screws				
	25						
	30						
	35						
	40						
	45						
	50	30	40				

No specification available for sizes with no prices shown.

Order Example: Part Number CBSST4-10

Price

Days to Ship: 6 Days P.87

2 Days

Volume Discount (Round down to one Cent.) P.87

•CBS

Qty.	1~199	200~300
Applicable	€ Unit Price	Volume Discount
	Price List	5%

For orders larger than indicated quantity, please request a quotation.

•CBSST

Qty.	1~199	200~300
Applicable	€ Unit Price	Volume Discount
	Price List	5%

For orders larger than indicated quantity, please request a quotation.

•CBSH CBSSTH

Qty.	1~19	20~99	100~199	200~300
Discount Rate	€ Unit Price	20%	40%	45%

For orders larger than indicated quantity, please request a quotation.

Mechanical Properties (Reference)

Type	Tensile Strength (N/mm²)	0.2% Proof Stress (N/mm²)	Corrosion Resistance	Nonmagnetic
CBSH	1040	900	△	X
CBS	800	640	△	X
CBSSTH	800	640	◎	◎
CBSST	500	210	○	○

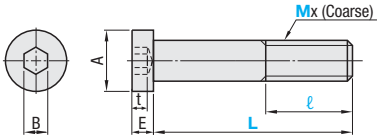
◎: Excellent ○: Good △: Questionable X: Unusable

Length Configurable Hexagon Socket Low Head Cap Screws

RoHS



Type	Material	Surface Treatment	Strength Class
FCBS	1.1191/C45E	Black Oxide	8.8
FCBSM		Electroless Nickel Plating	
FCBSST	1.4567/ X3CrNiCu18-9-4	-	A2-50



Part Number Type	M (Coarse)	L 1mm Increment	ℓ 1mm Increment	A	E	B	t max.	€ Unit Price L10~50 FCBS	FCBSM	FCBSST	51~L Max. FCBS	FCBSM	FCBSST
FCBS FCBSM FCBSST	4	10~50	10~40 ℓ≤L	7	2.8	2.5	2.3						
	5	10~60		8.5	3.5	3	2.7						
	6	10~80		10	4	4	3						
	8	10~90		13	5	5	3.8						

Order Example: Part Number FCBS8 - L 38 - ℓ 10

Days to Ship: 8 Days - FCBSM 10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Hexagon Socket Extra Low Head Cap Screws

CAD Data

CBSTS can be ordered by a cost-saving box. ☞P.159



RoHS

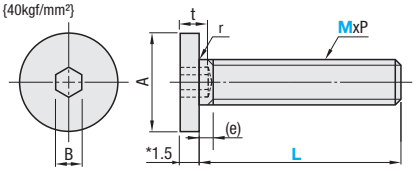
Part Number Not RoHS compliant

Type	M Material	H Hardness	S Surface Treatment	Strength Class	Strength Class
CBSS	1.7220/ 34CrMo4	32~39HRC	Black Oxide	10.9	5.8 (M10, 4.8)
CBSM			JIS STKM Bright Chromate Plating		
CBSA			Trivalent Chromate		
CBSR			LTBC		
CBSTS	1.4301/ or equivalent	-	-	(Note 1)	-

CBSM is not RoHS compliant (Note 1) Tensile Strength of CBSTS 400N/mm2 {40kgf/mm²}

M	r	r (CBSTS)
2	0.1 or more	-
2.5		0.2 or more
3		
4	0.2 or more	

M	r	r (CBSTS)
5	0.2 or more	0.2 or more
6	0.25 or more	
8	0.4 or more	
10		



* The dimension for M2 Type of CBSS and CBSA is 1.1, and M2.5 Type is 1.3.
* The dimension for M3 Type of CBSS · CBSM · CBSA and CBSR is 1.3.

Part Number Type	M-L	MxP	A	B	t max.	(e) max.	CBSS € Unit Price 50~300	CBSM € Unit Price 1~99 pcs.	CBSM Volume Discount 100~300	CBSA € Unit Price 1~99 pcs.	CBSA Volume Discount 100~300	CBSR € Unit Price 1~99 pcs.	CBSR Volume Discount 100~300	CBSTS € Unit Price 1~99 pcs.	CBSTS Volume Discount 100~300
CBSS CBSM CBSA CBSR CBSTS	2- 4	2x0.4	4	1.3	1.2	1.2									
	2- 5														
	2- 6														
	2- 8														
	2- 10														
	2- 12														
	2.5- 4	2.5x0.45	5	1.3	1.5	1.5									
	2.5- 5														
	2.5- 6														
	2.5- 8														
	2.5- 10														
	2.5- 12														
	3- 4	3x0.5	6	1.5	2.0	1.6									
	3- 5														
	3- 6														
	3- 8														
	3- 10														
	3- 12														
	4- 5	4x0.7	8	2.0	2.5	1.6									
	4- 6														
	4- 8														
	4- 10														
	4- 12														
	4- 14														
	4- 16														
	4- 20														
	5- 6	5x0.8	9	3.0	3.0	2.0									
	5- 8														
	5- 10														
	5- 12														
	5- 14														
	5- 16														
	5- 18														
	5- 20														
	6- 6	6x1.0	10	3.0	4.0	2.5									
	6- 8														
	6- 10														
	6- 12														
	6- 14														
	6- 16														
	6- 18														
	6- 20														
	6- 25														
	6- 30														
	8- 6	8x1.25	13	4.0	5.0	3.0									
	8- 8														
	8- 10														
	8- 12														
	8- 14														
	8- 16														
	8- 18														
	8- 20														
	8- 25														
	8- 30														
	10- 10	10x1.5	16 (15)	5.0	5.0	3.5									
	10- 12														
	10- 14														
	10- 16														
	10- 18														
	10- 20														
	10- 25														
	10- 30														

The dimensions of CBSTS is shown in ( ). No specification available for sizes without price indication. Hexagonal wrench for M2 and M2.5 ☞P.191
For orders larger than indicated quantity, please request a quotation.

Features

-Developed to reduce the screw head height space.
-They require no countersinking unlike flat head screws.

Order Example Part Number CBSA6-12

Days to Ship 6 Days 2 Days

P.87

NEW

Ultra Low Head Cap Screws / Dedicated Wrenches

-Hexalobular · Hexagon Sockets-

Price Reduction
Up to 80%

CAD Data

The head is extremely thin. Most suitable for the machine or equipment locations without clearance.

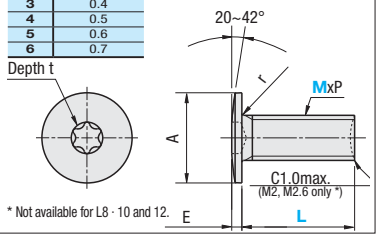
■Ultra Low Head Cap Screws -Hexalobular- RoHS



Type	Material	Hardness	Surface Treatment
CBSSE	Cold Forged JIS STKM Wire JIS SWCH12~18A	HV400~	Nickel Plating
CBSKE			Black Nickel Plating
CBSTSE	1.4567/X3CrNiCu18-9-4	-	-

M	r (Max.)
2	0.3
2.6	0.3
3	0.4
4	0.5
5	0.6
6	0.7

Ultra Low Head Cap Screws are fully threaded.

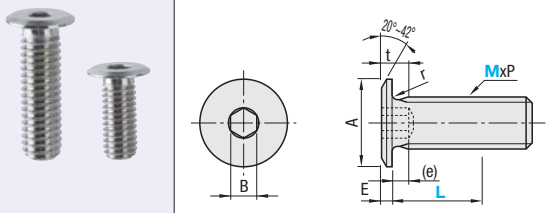


* Not available for L8 · 10 and 12.

■Ultra Low Head Cap Screws -Hexagon Sockets- RoHS

CBSTSR

M	r (Min.)
3	0.1
4	0.2
5	0.2
6	0.25



Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M-L	M x P	A	E	Hexalobular Socket	t min.	CBSSE € Unit Price 1~19 pcs.	CBSSE Volume Discount 20 pcs. or more	CBSKE € Unit Price 1~19 pcs.	CBSKE Volume Discount 20 pcs. or more	CBSTSE € Unit Price 1~9 pcs.	CBSTSE Volume Discount 10 pcs. or more
CBSTSE	2- 3 4 5 6 8 10 12	2 x 0.4	4.0	0.5	4	0.4						
CBSTSE	2.6-3 4 5 6 8 10 12	2.6 x 0.45	6.0	0.6	5	0.5						
CBSSE CBSKE CBSTSE	3- 5 6 8 10 12 16	3 x 0.5	7.0	0.8	6	0.75						
CBSSE CBSKE CBSTSE	4- 6 8 10 12 16 20 25	4 x 0.7	8.0	0.9	8	0.9						
CBSSE CBSKE CBSTSE	5- 8 10 12 16 20 25 30	5 x 0.8	9.0	1.0	10	1.0						
CBSTSE	6- 8 10 12 16 20 25 30 35 40	6 x 1.0	12	1.2	20	1.2						

No specification available for sizes with no prices shown.

For orders larger than indicated quantity, please request a quotation.

(Reference Values)

Thread	Tightening Torque N·m
M2	0.178
M2.6	0.36
M3	0.63
M4	1.50
M5	3
M6	5.2

CBSSE and CBSKE are carburized.[*1]

*1:Carburization is the process where carbon diffused into the steel surface is heat treated to make surface harder.

Part Number Type	M-L	M x P	A	b	E	t max.	(e) max.	CBSTSR € Unit Price 1~99 pcs.	CBSTSR Volume Discount 100~300 pcs.
CBSTSR	3- 5 6 8 10 12	3 x 0.5	6.0	1.5	0.8	2.0	1.4		
CBSTSR	4- 5 6 8 10 12 16	4 x 0.7	8.0	2.0	0.9	2.5	1.5		
CBSTSR	5- 6 8 10 12 16 20	5 x 0.8	9.0	2.5	1.0	3.0	1.8		
CBSTSR	6- 8 10 12 16 20 25	6 x 1.0	10	3.0	1.2	4.0	2.2		

For orders larger than indicated quantity, please request a quotation.

(Reference Values)

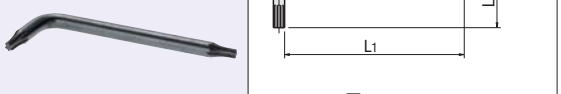
Thread	Tightening Torque N·m	Tensile Strength N/mm²
M3	0.6	350
M4	1.1	
M5	2.2	
M6	5	

Order Example: Part Number — CBSKE5-16, CBSTSR3-8

Days to Ship: 6 Days P.87

■Hexalobular Key Wrenches RoHS

CMM-_



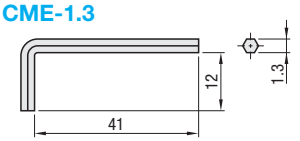
Material: Tool Steel
Hardness 45~52HRC

Part Number	Hexalobular Socket	(L1)	(L2)	d	€ Unit Price 1~9 pcs.	Volume Discount 10 pcs. or more
CMM-4	4	48	16	3		
CMM-5	5	48	16	3		
CMM-6	6	42	16	3		
CMM-8	8	48	16	3		
CMM-10	10	51	16	4		
CMM-15	15	54	18	4		
CMM-20	20	57	19	4		

L_1 and L_2 are reference values.

■Hexagonal Wrench 1.3mm RoHS

CME-1.3



Material: Tool Steel
Hardness 45~52HRC

Part Number	€ Unit Price 1~9 pcs.	Volume Discount 10 pcs. or more
CME-1.3		

Can be used for Hexagon Socket Extra Low Head Cap Screws M2 and M2.5. P.190

Order Example: Part Number — CMM-5, CME-1.3

Days to Ship: 6 Days P.87

Low Small Head Cap Screws / Small Head Cap Screws

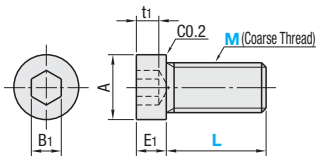
CAD Data



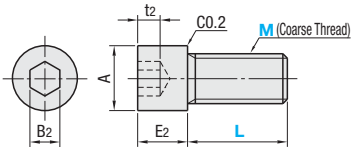
Product Name	Type	Material	Surface Treatment	Hardness	Strength Class
Low Small Head Cap Screws	KBB	1.7220/34CrMo4	Black Oxide	22~32HRC	8.8 equivalent
	KBBS	1.4567/X3CrNiCu18-9-4	-	-	A2-50 equivalent
Small Head Cap Screws	SBB	1.7220/34CrMo4	Black Oxide	22~32HRC	8.8 equivalent
	SBBSS	1.4567/X3CrNiCu18-9-4	-	-	A2-70 equivalent

M	A	Low Small Head			Small Head		
		E_1	B_1	t_1	E_2	B_2	t_2
3	4.5	2	2	(1.5)	3	2.5	(1.5)
4	5.5	2.8	2.5	(2)	4	3	(2)
5	7	3.5	3	(2.5)	5	4	(2.5)
6	8.5	4	4	(3)	6	5	(3)
8	10	5	5	(4)	8	6	(4)
10	13	6	6	(4.5)	10	8	(5)
12	16	7	8	(5)	12	10	(6)

KBB
KBBS (Low Small Head Cap Screws)



SBB
SBBSS (Small Head Cap Screws)



Low Small Head Cap Screws and Small Head Cap Screws are fully threaded.

The head is not knurled.

Type	M (Coarse)	L	KBB € Unit Price 1~19 pcs.	KBB Volume Discount 20 pcs. or more	KBBS € Unit Price 1~19 pcs.	KBBS Volume Discount 20 pcs. or more	SBB € Unit Price 1~19 pcs.	SBB Volume Discount 20 pcs. or more	SBBSS € Unit Price 1~19 pcs.	SBBSS Volume Discount 20 pcs. or more
KBB KBBS SBB SBBSS	3	5 6 8 10								
	4	6 8 10 12 16 20								
	5	8 10 12 16 20								
	6	8 10 12 16 20 25								
	8	10 12 16 20 25 30								
	10	16 20 25 30 35								
	12	20 25 30								

Order Example — Part Number: KBBS6-20

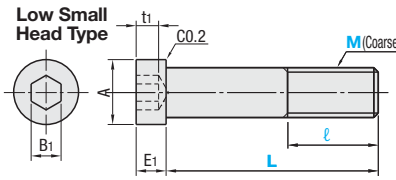
Days to Ship: 6 Days P.87

Configurable Length Small Head Cap Screws

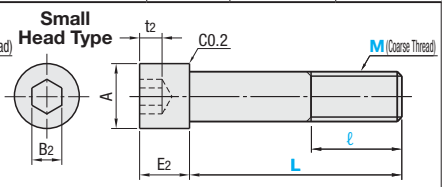


Type: Low Small Head Type	Type: Small Head Type	Material	Surface Treatment	Hardness	Strength Class: Low Small Head	Strength Class: Small Head
FKBB	FSBB	1.1191/C45E	Black Oxide	22~32HRC	8.8 equivalent	
FKBBM	FSBBM		Electroless Nickel Plating			
FKBBS	FSBBSS	1.4567/X3CrNiCu18-9-4	-	-	A2-50 equivalent	A2-70 equivalent

Low Small Head Type



Small Head Type



The head is not knurled.

Type	M (Coarse)	1mm Increment L: Low Small Head	1mm Increment L: Small Head	ℓ	A	E_1	E_2	B_1	B_2	t_1	t_2
FKBB FKBBM FKBBS	4	10~50	10~100	10~40 ℓ≤L	5.5	2.8	4	2.5	3	(2)	(2)
	5	10~60	10~100		7	3.5	5	3	4	(2.5)	(2.5)
FSBB FSBBM FSBBSS	6	10~80	10~150		8.5	4	6	4	5	(3)	(3)
	8	10~90	10~150		10	5	8	5	6	(4)	(4)

M	€ Unit Price L10~50 FKBB	FKBBM	FKBBS	FSBB	FSBBM	FSBBSS	L51~Lmax. FKBB	FKBBM	FKBBS	FSBB	FSBBM	FSBBSS
4												
5												
6												
8												

Order Example — Part Number: FKBB4 - 40 - 36

Days to Ship: -FKBB · FKBBS · FSBB · FSBBSS: 8 Days; -FKBBM · FSBBM: 10 Days

Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Screws with Through Hole

-Extra Low Head Cap Screws · Low Head Cap Screws · Hexagon Socket · Hexagon · Full Thread-

CAD Data

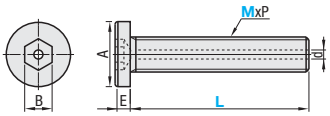
Use in vacuum equipment or vacuum container where air in the tapped hole is required to be removed.

■with Through Hole Extra Low Head Cap Screws



RoHS

CBASG



M Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M-L	M x P	A	E	B	d	€ Unit Price 1~49 pcs.	Volume Discount 50~100 pcs.
CBASG	3- 6	3 x 0.5	6	1.3	1.5	1.2		
	8							
	10							
	12							
CBASG	4- 6	4 x 0.7	8	1.5	2	1.5		
	8							
	10							
	12							
	16							
CBASG	5- 10	5 x 0.8	9	1.5	3	1.5		
	12							
	16							
	20							
CBASG	6- 10	6 x 1.0	10	1.5	3	2		
	12							
	16							
	20							
	30							

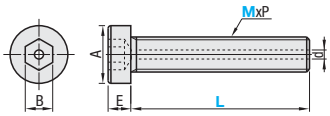
For orders larger than indicated quantity, please request a quotation.

■with Through Hole Low Head Cap Screws



RoHS

CBAST



M Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M-L	M x P	A	E	B	d	€ Unit Price 1~49 pcs.	Volume Discount 50~100 pcs.
CBAST	3- 6	3 x 0.5	5.5	2	2	1.2		
	8							
	10							
	12							
	16							
CBAST	4- 6	4 x 0.7	7	2.8	2.5	1.5		
	8							
	10							
	12							
	16							
	20							
CBAST	5- 10	5 x 0.8	8.5	3.5	3	1.5		
	12							
	16							
	20							
	25							
CBAST	6- 10	6 x 1.0	10	4	4	2		
	12							
	16							
	20							
	30							

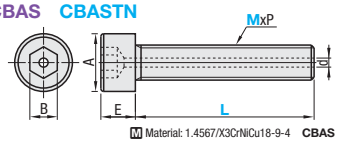
For orders larger than indicated quantity, please request a quotation.

■with Through Hole Hexagon Socket Head Cap Screws



RoHS

CBAS CBASTN



M Material: 1.4567/X3CrNiCu18-9-4 **CBAS**
3.7035/Ti99.5 (Ti2) **CBASTN**

Part Number Type	M-L	M x P	A	E	B	d	CBAS € Unit Price 1~49 pcs.	CBAS Volume Disc. 50~100 pcs.	CBASTN € Unit Price 1~49 pcs.	CBASTN Volume Disc. 50~100 pcs.
CBAS CBASTN	3- 6	3 x 0.5	5.5	3	2.5	1.2				
	8									
	10									
	12									
	15									
CBAS CBASTN	4- 6	4 x 0.7	7	4	3	1.5				
	8									
	10									
	12									
	15									
	20									
CBAS CBASTN	5- 8	5 x 0.8	8.5	5	4	1.5				
	10									
	12									
	15									
	20									
	25									
CBAS CBASTN	6- 8	6 x 1.0	10	6	5	2				
	10									
	12									
	15									
	20									
	25									
	30									
CBAS CBASTN	8- 12	8 x 1.25	13	8	6	2				
	15									
	20									
	25									
	30									
CBAS CBASTN	10- 15	10 x 1.5	16	10	8	2				
	20									
	25									
	30									

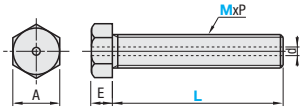
No specification available for sizes with no prices shown.
For orders larger than indicated quantity, please request a quotation.

■with Through Hole Hexagon Screws



RoHS

RCBAS



M Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M-L	M x P	A	E	d	€ Unit Price 1~49 pcs.	Volume Discount 50~100 pcs.
RCBAS	3- 6	3 x 0.5	5.5	2	1.2		
	8						
	10						
	12						
	16						
RCBAS	4- 6	4 x 0.7	7	2.8	1.5		
	8						
	10						
	12						
	15						
	20						
RCBAS	5- 8	5 x 0.8	8	3.5	2		
	10						
	12						
	16						
	20						
	25						
RCBAS	6- 8	6 x 1.0	10	4	2		
	10						
	12						
	16						
	20						
	25						
	30						
RCBAS	8- 15	8 x 1.25	13	5.5	2		
	20						
	25						
	30						

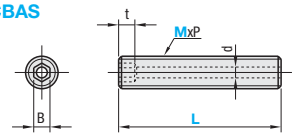
For orders larger than indicated quantity, please request a quotation.

■with Through Hole Full Thread Screws



RoHS

MCBAS

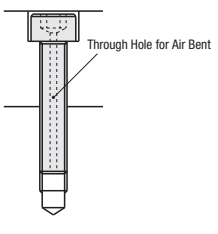


M Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M-L	M x P	B	t	d	€ Unit Price 1~49 pcs.	Volume Discount 50~100 pcs.
MCBAS	3- 8	3 x 0.5	1.5	0.7	1.2		
	10						
	15						
MCBAS	4-12	4 x 0.7	2.0	2.2	1.5		
	15						
	20						
	25						
MCBAS	5-15	5 x 0.8	2.5	2.8	1.5		
	20						
	25						
	30						
MCBAS	6-15	6 x 1.0	3.0	3.0	2		
	20						
	25						
	30						
MCBAS	8-20	8 x 1.25	4.0	4.0	2		
	25						
	30						
	35						

For orders larger than indicated quantity, please request a quotation.

Example



Reference	Tensile Breaking Load (N)
	Extra Low Head · Low Head
M3	1440
M5	4630

Order Example

Part Number
CBAS5-10
RCBAS4-6
MCBAS8-30

Days to Ship

6 Days
2 Days

P.87

Long Knurled Screws / Stepped Knurled Screws

CAD Data

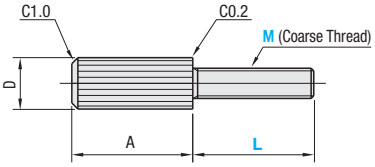
Long Knurled Screws

RoHS



Type	Material	Surface Treatment
LRLM	1.7220/34CrMo4	Electroless Nickel Plating
LRLB	1.4305/X10CrNiS18-9	-





Part Number Type	M (Coarse)	L	D	A	LRLM € Unit Price 1~9 pcs.	LRLM Volume Discount 10~30 pcs.	LRLB € Unit Price 1~9 pcs.	LRLB Volume Discount 10~30 pcs.
LRLM LRLB	3	6 10	5.5	10				
	4	6 10 16	7	16				
	5	10 16 20	8.5	20				
	6	10 16 20 25 30	10	30				
	8	20 25 30	13	36				
	10	20 25 30 40	16	40				

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number - L → LRLB3 - 10

Days to Ship: 6 Days P.87

Length Configurable Long Knurled Screws

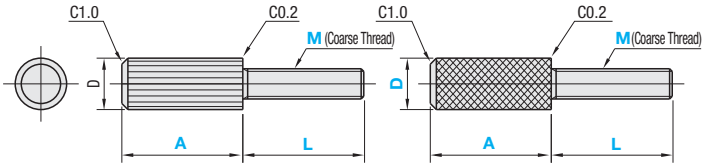
RoHS



Type	Material	Surface Treatment
LRLMF	1.7220/34CrMo4	Electroless Nickel Plating
LRLBS · LRLBF	1.4305/X10CrNiS18-9	-

LRLBS (O.A.L. Configurable Type)

LRLMF (Configurable Type)
LRLBF (Configurable Type Stainless Steel)



*The head has a checkered pattern.

L Dimension Configurable Type

Part Number Type	M (Coarse)	A 1mm Increment	L 1mm Increment	D	€ Unit Price
LRLBS	3	10~40	6~40	5.5	
	4		6~40	7	
	5		10~50	8.5	
	6		10~50	10	

Order Example: Part Number - A - L - D → LRLBS3 - A15 - L10; LRLBF5 - A10 - L35 - D12

Days to Ship: - LRLBS · LRLBF: 8 Days; - LRLMF: 10 Days

Configurable Type

Part Number Type	M (Coarse)	A 1mm Increment	L 1mm Increment	D 1mm Increment	€ Unit Price LRLMF	€ Unit Price LRLBF
LRLMF LRLBF	3	10~60	6~40	5~10		
	4		6~40	5~10		
	5		10~50	10~25		
	6		10~50	10~25		

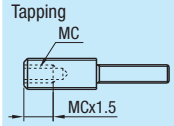
Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Alteration	Code	Spec.	Price Adder
Tapping 	MC	Adds a tapped hole for the screw head. Ordering Code MC4 ※2≤D−MC ※Only applicable to LRLMF and LRLBF.	3,00

M	MC (Selection Range)
3	3
4	3, 4
5	3, 4, 5
6	3, 4, 5, 6

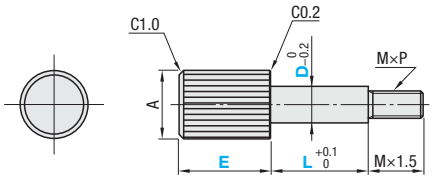
Part Number - A - L - d - (MC) → LRLMF4 - A10 - L30 - D8 - MC3

Stepped Knurled Screws

RoHS



LRLBD



Material: 1.4305/X10CrNiS18-9

Part Number Type	D	1mm Increment E	1mm Increment L	A	MxP	€ Unit Price
LRLBD	4	8~30	10~30	5.5	2.5x0.45	
	5			7.0	3x0.5	
	6			8.5	4x0.7	
	8			10.0	6x1.0	

Order Example: Part Number - E - L → LRLBD4 - E8 - L10

Days to Ship: 8 Days

Express A: 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Cover Screws

-Hexagon Socket Head / Knurled-

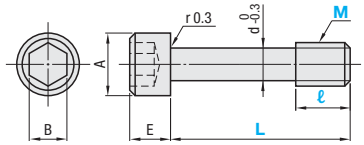
CAD Data

GUTB can be ordered by a cost-saving box. P.160

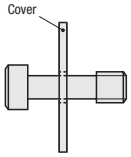
Hexagon Socket Head RoHS



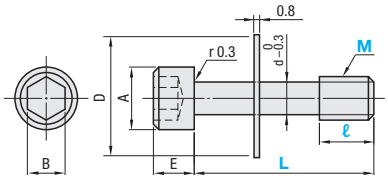
GUTB



M	A	E	B	d	D
2	3.8	2	1.5	1.5	-
2.6	4.5	2.5	2	1.8	-
3	5.5	3	2.5	2.2	7
4	7	4	3	3	10
5	8.5	5	4	3.9	12
6	10	6	5	4.5	12
8	13	8	6	6.3	14



GUTBN (With Nylon Washer)



The screw will not drop off from the cover when the cover is removed from the frame.
(The cover requires tap machining to prevent screws from falling off.)



Strength Class A2–70 equivalent

M Material: 1.4567/X3CrNiCu18-9-4

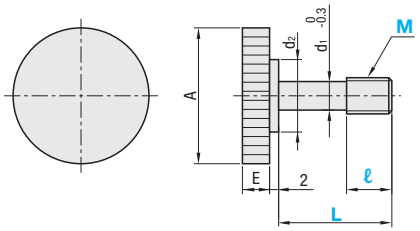
Part Number Type	M (Coarse)	ℓ	L	GUTB Unit Price 1~29 pcs.	GUTB Volume Discount 30 pcs. or more
GUTB	2	2.5	4 6 8 10 12 15		
	2.6	3	6 8 10 12 15		
	3	2	4 6 8 10 12 15		
		3.5	6 8 10 12 15		
		4	8 10 12 15 20		
	4	3	6 8 10 12 15		
		5	10 12 15 20		
	5	3	8 10 12 15 20		
		6	12 15 20 25		
	6	4	8 10 12 15 20		
		8	12 15 20 25 30		
	8	5	8 10 12 15 20		
		10	12 15 20 25 30 40		

Part Number Type	M (Coarse)	ℓ	L	GUTBN € Unit Price 1~29 pcs.	GUTBN Volume Discount 30 pcs. or more
GUTBN	3	2	4 8 12 15		
		3.5	6 8 10 12 15		
		4	8 10 12 15 20		
	4	3	6 8 10 12 15		
		5	10 12 15 20		
	5	3	8 10 12 15 20		
		6	12 15 20 25		
	6	4	8 10 12 15 20		
		8	12 15 20 30		
	8	5	8 10 12 20		
		10	15 20 30 40		

Knurled RoHS



RNCB



M Material: 1.4305/X10CrNiS18-9

Part Number Type	M	ℓ	L	A	d1	d2	E	€ Unit Price 1~29 pcs.	Volume Discount 30 pcs. or more
RNCB	3	2	4 6 8 10	12	2.2	6	2.5		
		3.5	6 8 10 12 15						
		4	8 10 12 15 20						
	4	3	6 8 10 12 15	16	3	8	3.5		
		5	10 12 15 20						
	5	3	8 10 12 15	20	3.9	10	4		
		6	12 15 20 25						
	6	8	12 15	24	4.5	12	5		
	8	10	15 20	30	6.3	16	6		

Order Example

Part Number	-	ℓ	-	L
GUTB5	-	6	-	12
GUTBN3	-	4	-	12
RNCB4	-	5	-	15

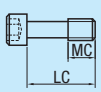
Days to Ship: 6 Days P.87

Alterations

Part Number	-	MC
GUTB5	-	MC5-LC10

8 Days

Applicable to GUTB only.

Alteration	Code	Spec.	Price Adder
	MC	Thread length and L dimension can be specified in 1 mm increments. Ordering Code MC3-LC10	3,00

M	MC	LC	M	MC	LC
2	2~ 6	4~15	5	3~15	8~25
2.6	2~ 8	6~15	6	4~18	8~30
3	2~ 9	4~20	8	5~24	8~40
4	3~12	6~20			

LC–MC≥1

Cover Screws

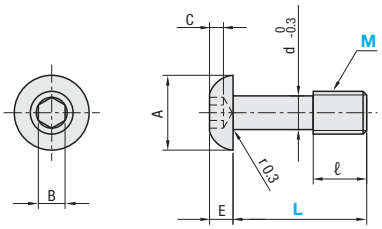
-Button Head Cap Screws / Configurable Length-

CAD Data

■Button Head Cap Screw RoHS



CBBT



Strength Class A2–50 equivalent
Ⓜ Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M	L	ℓ	A	E (Max.)	B	C (Min.)	d	€ Unit Price 1~29 pcs.	Volume Discount 30 pcs. or more
CBBT	3	8 10 12 15 20	4	5.5	1.6	2	1.04	2.2		
	4	10 12 15 20	5	7.5	2.2	2.5	1.3	3		
	5	12 15 20 25	6	9.5	2.7	3	1.56	3.9		
	6	12 15 20 25	8	10.5	3.3	4	2.08	4.5		
	8	12 15 20 25	10	14	4.4	5	2.6	6.3		

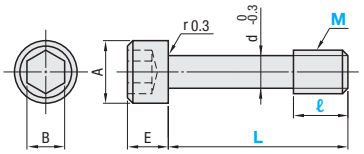
Order Example: Part Number CBBT5 - L 20

Days to Ship: 6 Days P87

■Configurable Length Hexagon Socket Head RoHS



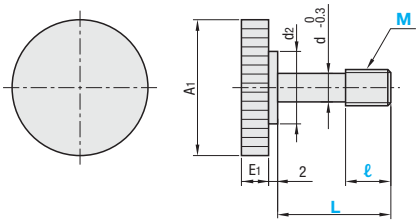
Type	Ⓜ Material	Ⓢ Surface Treatment	Strength Class
FGUTM	1.7220/ 34CrMo4	Electroless Nickel Plating	8.8 equivalent
FGUTS	1.4567/ X3CrNiCu18-9-4	-	A2-70 equivalent



■Configurable Length Knurled RoHS



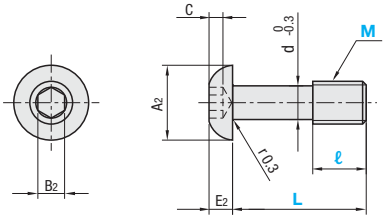
Type	Ⓜ Material
FRNCS	1.4305/ X10CrNiS18-9



■Configurable Length Button Head Cap Screw RoHS



Type	Ⓜ Material	Strength Class
FCBBS	1.4567/ X3CrNiCu18-9-4	A2-50 equivalent



Part Number Type	M	1mm Increment ℓ FGUTM FGUTS	ℓ FRNCS	ℓ FCBBS	L FGUTM FGUTS	L FRNCS	L FCBBS	ℓ / L Machining Conditions	€ Unit Price FGUTM	FGUTS	FRNCS	FCBBS
FGUTM FGUTS FRNCS FCBBS	3	2~18	5~16	5~20	4~20	6~20	6~25	ℓ≤L				
	4	3~18	5~16	5~25	6~20	6~20	6~30					
	5	3~23	5~20	5~25	8~25	8~25	8~30					
	6	4~28	8~20	8~30	8~30	8~25	8~35					
	8	5~38	10~20	10~45	8~40	8~25	8~50					

M	A	A_1	A_2	E	E_1	E_2 (Max.)	B	B_2	C (Min.)	d	d_2
3	5.5	12	5.5	3	2.5	1.6	2.5	2	1.04	2.2	6
4	7	16	7.5	4	3.5	2.2	3	2.5	1.3	3	8
5	8.5	20	9.5	5	4	2.7	4	3	1.56	3.9	10
6	10	24	10.5	6	5	3.3	5	4	2.08	4.5	12
8	13	30	14	8	6	4.4	6	5	2.6	6.3	16

Order Example: Part Number FRNCS6 - ℓ 8 - L 20

Days to Ship: 8 Days - FGUTM 10 Days

Price

■Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Cover Screws

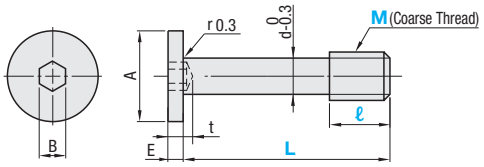
-Extra Low Head / Low Head-

CAD Data

■Extra Low Head RoHS



GUTBG



Reference	Tensile Breaking Load (N)
M3	1160
M5	2520

*The above data are for reference, not guaranteed.

M Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M	ℓ	L	A	E	B	d	t max.	€ Unit Price 1~29 pcs.	Volume Discount 30 pcs. or more
GUTBG	3	2	5 6 8 10	6	1.3	1.5	2.2	2		
		3.5	6 8 10							
		4	8 10							
	4	3	6 8 10 12	8	1.5	2	3	2.5		
		5	10 12							
	5	3	8 10 12 16	9		3	3.9	3		
		6	12 16							
	6	4	8 10 12 16 20	10		3	4.5	4		
		8	12 16 20 25							
	8	5	10 12 16 20	13		4	6.3	5		
		10	12 16 20 25							

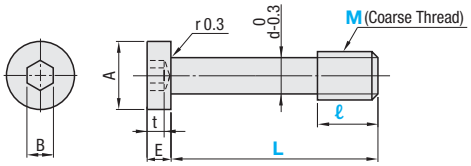
Order Example: Part Number GUTBG5 - ℓ 3 - L 16

Days to Ship: 6 Days P.87

■Low Head RoHS



GUTBT



Reference	Tensile Breaking Load (N)
M3	1390
M5	4300

*The above data are for reference, not guaranteed.

M Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M	ℓ	L	A	E	B	d	t max.	€ Unit Price 1~29 pcs.	Volume Discount 30 pcs. or more
GUTBT	3	2	6 8	5.5	2	2	2.2	1.5		
		3.5	6 8 10 12							
		4	8 10 12 16							
	4	3	6 8 10 12 16	7	2.8	2.5	3	2.3		
		5	10 12 16 20							
	5	6	12 16 20 25	8.5	3.5	3	3.9	2.7		
	6	4	12 16	10	4	4	4.5	3		
		8	12 20 25 30							
	8	5	10 12 16	13	5	5	6.3	3.8		
		10	20 30 40							

Order Example: Part Number GUTBT8 - ℓ 10 - L 20

Days to Ship: 6 Days P.87

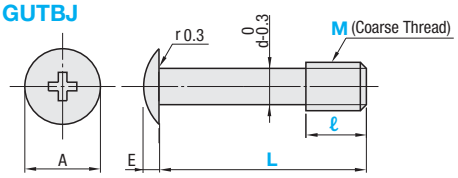
Cover Screws / Hexagon Socket Head Cap Screws with Retaining Ring Groove
-Cross Recessed / Long Knurled-

CAD Data

■Cross Recessed RoHS



GUTBJ



Reference	Tensile Breaking Load (N)
M3	1390
M5	4300

*The above data are for reference, not guaranteed.

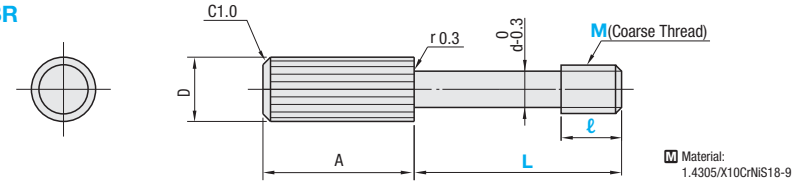
M Material: 1.4567/X3CrNiCu18-9-4

Part Number Type	M	ℓ	L	A	E	d	€ Unit Price 1~29 pcs.	Volume Discount 30 pcs. or more
GUTBJ	3	2	5 8 10	6.9	1.9	2.2		
		3.5	6 8 10					
		4	8 10 12					
	4	3	6 8 10 12 16	9.4	2.5	3		
		5	10 16					
	5	3	8 10 12	11.8	3.1	3.9		
		6	12 16 20					
	6	4	10 12 16 20	14	3.7	4.5		
		8	12 16 20 25 30					
	8	5	16	17.8	4.8	6.3		
		10	40					

■Long Knurled RoHS



GUTBR



M Material: 1.4305/X10CrNiS18-9

Part Number Type	M	ℓ	L	d	A	d	€ Unit Price 1~29 pcs.	Volume Discount 30 pcs. or more
GUTBR	3	2	6 8 10 12	5.5	10	2.2		
		3.5	6 8 10 12					
		4	8 10 12					
	4	3	6 8 10 12 16	7	16	3		
		5	10 12 16					
	5	3	8 10 12 16 20	8.5	20	3.9		
		6	12 16 20					
	6	4	8 10 12 16 20	10	30	4.5		
		8	12 16 20 25					
	8	5	10 12 16 20	13	36	6.3		
		10	20 25 30					

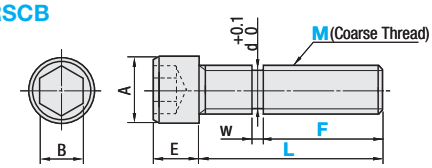
Order Example: Part Number - ℓ - L
GUTBJ3 - 4 - 8
GUTBR4 - 5 - 16

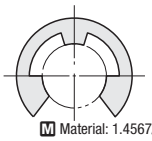
Days to Ship: 6 Days P.87

■Retaining Ring Groove Length Configurable Hexagon Socket Head Cap Screws RoHS



ERSCB





M Material: 1.4567/X3CrNiCu18-9-4
A Accessory: E Type Retaining Rings 1.4301/X5CrNi18-10

Part Number Type	M (Coarse)	1mm Increment F	1mm Increment L	L-F Machining Conditions	A	E	B	d	W	Applicable E Type Retaining Ring (Nominal Dia.) (For details, refer to P.253)	€ Unit Price
ERSCB	3	2~19	10~20	L-F≥8	5.5	3	2.5	2	0.5	2	
	4	3~19	10~20	L-F≥7	7	4	3	3	0.7	3	
	5	3~24	10~25	L-F≥7	8.5	5	4	4	0.7	4	
	6	3~29	10~30	L-F≥7	10	6	5	4	0.7	4	
	8	4~34	10~35	L-F≥6	13	8	6	6	0.9	6	

Order Example: Part Number - F - L
ERSCB6 - 5 - 25

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

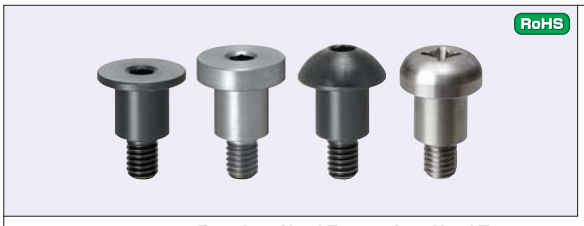
For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days

Stepped Screws

-Extra Low Head · Low Head · Button Head Cap Screw · Cross Recessed-

CAD Data



RoHS

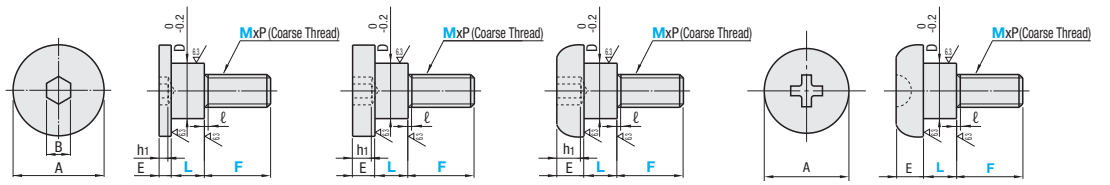
Extra Low Head	Low Head Type	Button Head Cap Screw	Cross Recessed	Material	Surface Treatment
DBGB	DBTB	DBBB	DBJB	1.1191/ C45E	Black Oxide
DBGM	DBTM	DBBM	DBJM		Electroless Nickel Plating
DBGS	DBTS	DBBS	DBJS	1.4305/ X10CrNiS18-9	-

Reference **Tensile Breaking Load (N)**

	Extra Low Head	Low Head	Button	Cross Recessed
M3	1950			
M5	4630			

* Data above are not guaranteed values but reference values.

- Extra Low Head Type - Low Head Type - Button Head Cap Screw Type - Cross Recessed Type



■Extra Low Head

Part Number Type	M (Coarse)	1mm Increment L	F	E	D	A	B	ℓ	h1	€ Unit Price DBGB	DBGM	DBGS
DBGB DBGM DBGS	3	5~20	3~6	1.5	5	8	1.5	1	1.5			
	4		4~8		6	10	2	1.2	2			
	5		5~10		8	12	3	1.4	3			
	6		6~12		10	16	3	1.5	3			
	8		8~12		12	18	4		3.5			
	10		10~15		15	20	5		4			

■Low Head

Part Number Type	M (Coarse)	1mm Increment L	F	E	D	A	B	ℓ	h1	€ Unit Price DBTB	DBTM	DBTS
DBTB DBTM DBTS	3	3~20	3~6	2	5	8	2	1	2			
	4		4~8	2.8	6	10	2.5	1.2	2.5			
	5		5~10	3.5	8	12	3	1.4	3			
	6		6~12	4	10	16	4	1.5	3.5			
	8		8~12	5	12	18	5		4			
	10		10~15	6	15	20	6		4.5			

■Button Head Cap Screw

Part Number Type	M (Coarse)	1mm Increment L	F	E	D	A	B	ℓ	h1	€ Unit Price DBBB	DBBM	DBBS
DBBB DBBM DBBS	3	5~20	3~6	2.8	5	8	2	1	2			
	4		4~8	3.5	6	10	2.5	1.2	2.5			
	5		5~10	4.7	8	12	3	1.4	3			
	6		6~12	5.6	10	16	4	1.5	3.5			
	8		8~12	6.2	12	18	5		4			
	10		10~15	6.9	15	20	6		4.5			

■Cross Recessed

Part Number Type	M (Coarse)	1mm Increment L	F	E	D	A	ℓ	€ Unit Price DBJB	DBJM	DBJS
DBJB DBJM DBJS	3	1~20	3~6	2.8	5	8	1			
	4		4~8	3.5	6	10	1.2			
	5		5~10	4.7	8	12	1.4			
	6		6~12	5.6	10	16	1.5			
	8		8~12	6.2	12	18				
	10		10~15	6.9	15	20				

Order Example

Part Number	-	L	-	F
DBTS6	-	3	-	10

Days to Ship: **8 Days**

Price

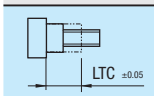
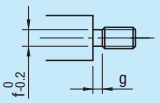
■Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	L	-	F	-	(LTC · PC)
DBJM6	-	3.4	-	10	-	LTC

Alterations	Code	Spec.	Price Adder
	LTC	L Dimension Increment LTC=0.1 mm Increment	3,00
	PC	Adds a relief on M.	2,00

D	MxPitch	g	f
5	M3 x 0.5	1	2.3
6	M4 x 0.7	1.2	3.2
8	M5 x 0.8	1.4	4.0
10	M6 x 1.0	1.7	4.8
12	M8 x1.25		6.5
15	M10 x 1.5	2	8.2

Studs -Fully Male Thread- / Stud Bolts / Hexagon Head Stud Bolts

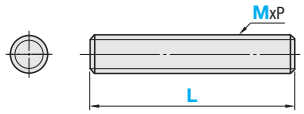
CAD Data

Full Thread Screws

RoHS



Type	M Material	S Surface Treatment
ANE	1.0038/S235JR	Black Oxide
ANES	1.4301/X5CrNi18-10	-



Screw Precision Thread gauge class 3 used

Order Example

Part Number
ANE10-300
ANES16-500

Days to Ship

6 Days P.87

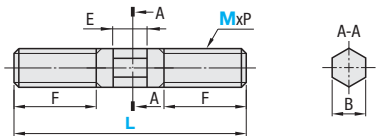
Part Number Type	M-L	MxP	ANE € Unit Price 1~49 pcs.	ANE Volume Discount 50 pcs. or more	ANES € Unit Price 1~49 pcs.	ANES Volume Discount 50 pcs. or more
ANE ANES	6-100	6x1.0				
	200					
	300					
	8-100	8x1.25				
	200					
	300					
	10-100	10x1.5				
	200					
	300					
	500					
	12-100	12x1.75				
	200					
	300					
	500					
	16-100	16x2.0				
	200					
	300					
	500					

Stud Bolts

RoHS



STDN (Both Ends Right-Hand Screws)



M	P
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5

M Material: 1.1191/C45E
H Hardness: 32~38HRC
S Surface Treatment: Black Oxide

Part Number Type	M	L	F	E	B	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
STDN	16	75	30	8	13		
		100	40	10			
		125	40	15			
		150	40	15			
		175	40	20			
		200	40	20			
		225	60	20			
		250	60	25			
		300	60	25			
	20	100	40	10	17		
		125	40	15			
		150	40	15			
		175	40	20			
		200	40	20			
		225	60	20			
		250	60	25			
		300	60	25			

When L=100 or less, no straight part exists.

Part Number Type	M	L	F	E	B	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
STDN	8	50	20	6	6		
		75	30	6			
		100	40	10			
		125	40	15			
		150	40	15			
	10	50	20	6	8		
		75	30	6			
		100	40	10			
		125	40	15			
		150	40	15			
		175	40	20			
		200	40	20			
	12	50	20	6	10		
		75	30	6			
		100	40	10			
		125	40	15			
		150	40	15			
		175	40	20			
		200	40	20			

Order Example

Part Number - L
STDN10 - 100

Days to Ship

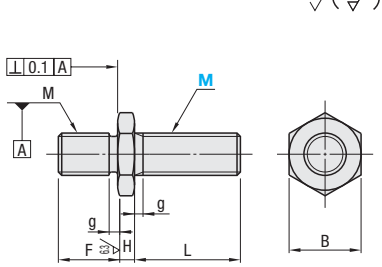
6 Days P.87

Hexagon Head Stud Bolts

RoHS



Type	M Material	H Hardness	S Surface Treatment
RSBB	1.1191/C45E	35~40HRC	Black Oxide
RSBM			Electroless Nickel Plating



Part Number Type	M	MxPitch	L	F	H	B	g	€ Unit Price RSBB · RSBM
RSBB RSBM	3	3x0.5	7.5	4	2	6	1	
	4	4x0.7	10	5		7	1.2	
	5	5x0.8	12.5	7	3	8	1.4	
	6	6x1.0	15	8		10	1.5	
	8	8x1.25	20	11	4	13		
	10	10x1.5	25	14		17	2	

Order Example

Part Number
RSBB8

Days to Ship

8 Days — Express A — 2,00 EUR/ piece P.88

2 Days

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Configurable Length Screws with Hexagon Sockets

Add. Spec.

Reduced Delivery Time

CAD Data

Configurable Length Screws with Hexagon Sockets

-Length Selectable / Configurable-

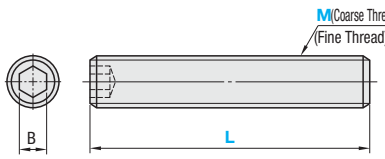
RoHS



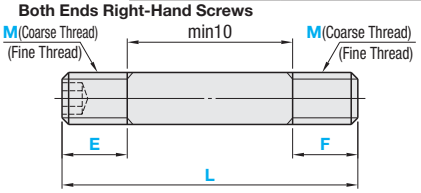
Type				M Material	S Surface Treatment
Full Thread Screws		Both Ends Right-Hand Screws			
Thread gauge class 2 used		Thread gauge class 2 used			
Coarse	Fine	Coarse	Fine		
FABB	FABBP	FWBB	FWBBP	1.1191/C45E	Black Oxide
FABBN	-	FWBBN	-		Electroless Nickel Plating
FABBS	FABBSP	FWBBS	-	1.4301/X5CrNi18-10 equivalent	-

M	Thread Pitch		B
	Coarse	Fine	
4	0.7	-	2
5	0.8	0.5	2.5
6	1	0.75	3
8	1.25	1	4
10	1.5	1.25	5
12	1.75		6
16	2	1.5	8
20	2.5		10

Full Thread Screws



Both Ends Right-Hand Screws



Length Selectable Full Thread Screws

Part Number Type	M	L	€ Unit Price
(Coarse) FABB	5	30 35 50	
	6	30 35 40 50 60 100	
	8	35 40 50 60 70 80 100	
	10	30 40 50 60 70 80 100 120	
	12	30 40 60 70 80 100 120 150	
	16	80 100 120 150	

Part Number Type	M	L	€ Unit Price
(Coarse) FABBS	5	35 40 45 50 60	
	6	30 35 40 45 50 60 80	
	8	50 60 80	
	10	50 80 100	

Order Example: Part Number FABB5 - L 30 — Days to Ship: 6 Days P.87

Length Configurable Full Thread Screws

Part Number Type	M	L 1mm Increment	€ Unit Price L20~100					L101~200					L201~400				
			FABB	FABBN	FABBS	FABBP	FABBSP	FABB	FABBN	FABBS	FABBP	FABBSP	FABB	FABBN	FABBS	FABBP	FABBSP
(Coarse) FABB FABBN FABBS (Fine) FABBP FABBSP	4	20~45															
	5	20~250															
	6																
	8	20~400															
	10																
	12																
	16																
	20																

Length Configurable Both Ends Right-Hand Screws

Part Number Type	M	1mm Increment L	E	F	€ Unit Price L20~100 FWBB	FWBBN	FWBBS	FWBBP	L101~200 FWBB	FWBBN	FWBBS	FWBBP	L201~400 FWBB	FWBBN	FWBBS	FWBBP
(Coarse) FWBB FWBBN FWBBS (Fine) FWBBP	4	20~150	0~100	0~100												
	5	20~250														
	6															
	8	20~400														
	10															
	12															
	16															
	20															

E≤Mx5 F≤Mx5 When E=0(F=0), threads are not machined on the dimension E(F) side.

Order Example: Part Number FABB6 - L 75 - E - F FWBBS6 - 100 - E10 - F10 — Days to Ship: 8 Days

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price (euros)

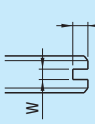
Volume Discount

(Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Alterations	Code	Spec.	Price Adder
Slit 	SWC	W dimensions are as follows. M: 4, 5 → W: 1; 6, 8 → 1.5; 10 → 2; 12, 16 → 2.5; 20 → 3	2,00

Alterations	Code	Spec.	Price Adder
	RAC	Adds hexagonal sockets on the right end. The phase of hexagonal sockets on both ends are arbitrary. Not applicable to L≤50.	3,00

Part Number FABB8 - L 100 - (JIS SWC · RAC) SWC

Days to Ship: 8 Days

Configurable Length Screws

Add. Spec.

Reduced Delivery Time

CAD Data

Configurable Length Screws

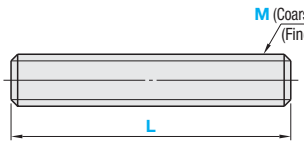
RoHS



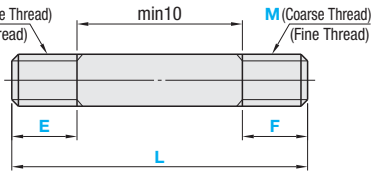
Type					Material	Surface Treatment
Full Thread Screws		Both Ends Right-Hand Screws				
Thread gauge class 2 used		Class 3	Thread gauge class 2 used			
Coarse	Fine	Coarse	Coarse	Fine		
FAB	FABP	FABM	FWB	FWBP	1.1191/C45E	Black Oxide
FABN	-	-	FWBN	-		Electroless Nickel Plating
FABS	FABSP	FABMS	FWBS	FWBSP	1.4301/X5CrNi18-10 equivalent	-

M	Thread Pitch Coarse	Fine
3	0.5	-
4	0.7	-
5	0.8	0.5
6	1	0.75
8	1.25	1
10	1.5	1.25
12	1.75	1.25
16	2	1.5
20	2.5	1.5

Full Thread Screws



Both Ends Right-Hand Screws



Full Thread Screws

Part Number Type	M	L 1mm Increment	€ Unit Price FAB L20~100	L101~200	L201~400	L401~600	L601~800	FABN L20~100	L101~200	L201~400	L401~600	FABS L20~100	L101~200	L201~400	L401~600	L601~800
(Class 2, Coarse) FAB FABN FABS	3	20~150														
	4	20~150														
	5	20~250														
	6															
	8	20~600														
	10															
	12	20~800														
	16															
	20															

Part Number Type	M	L 1mm Increment	€ Unit Price FABM L20~100	L101~200	L201~400	L401~600	L601~800	FABMS L20~100	L101~200	L201~400	L401~600	L601~800	FABP L20~100	L101~200	L201~400	L401~600	FABSP L20~100	L101~200	L201~400	L401~600
(Class 3, Coarse) FABM FABMS (Class 2, Coarse) FABP FABSP	4	20~150																		
	5	20~250																		
	6																			
	8	20~600 (400)																		
	10																			
	12	20~800																		
	16																			
	20																			

Both Ends Right-Hand Screws

Part Number Type	M	1mm Increment L	E	F	€ Unit Price FWB L20~100	L101~200	L201~400	L401~600	L601~800	FWBN L20~100	L101~200	L201~400	L401~600	L601~800	FWBS L20~100	L101~200	L201~400	L401~600	L601~800
(Class 2, Coarse) FWB FWBN FWBS	3	20~100	5~15	0~15															
	4	20~150	5~100	0~100															
	5	20~250																	
	6																		
	8	20~600																	
	10																		
	12	20~800																	
	16																		
	20																		
	24																		
	30																		

E≤Mx5 F≤Mx5 When F=0, threads are not machined on the dimension F side.

Part Number Type	M	1mm Increment L	E	F	€ Unit Price FWBP L20~100	L101~200	L201~400	L401~600	L601~800	FWBSP L20~100	L101~200	L201~400	L401~600	L601~800
(Class 2, Coarse) FWBP FWBSP	5	20~250	5~100	0~100										
	6													
	8	20~600												
	10													
	12	20~800												
	16													
	20													

E≤Mx5 F≤Mx5 When F=0, threads are not machined on the dimension F side.

Order Example

Part Number	L	E	F
FAB6	100		
FWBS6	100	E10	F10

Alterations

Part Number	L	E	F	(JIS SWC · SC)
FAB10	200			SWC

Days to Ship

8 Days

Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

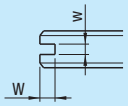
Price

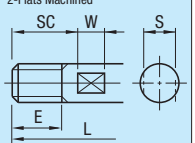
Volume Discount

(Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations	Code	Spec.	Price Adder
Slit 	SWC	W dimensions are as follows. M: W — 4,5: 1; 6,8: 1.5; 10: 2; 12,16: 2.5; 20: 3. Applicable to FAB · FABN · FABS · FABP · FABSP · FABM · FABMS. Not applicable to M3.	2,00

Alterations	Code	Spec.	Price Adder
2-Flats Machined 		SC=1 mm Increment. M: W: S — 4: -: 3; 5: 3.5: 4; 6: -: 5; 8: 4: 6; 10: 4.5: 8; 12: 5: 10; 16: 8: 14; 20: 8.5: 18; 24: 11: 21; 30: 12: 27. Ordering Code SC12. 0≤SC≤L−W. Not applicable to M3.	3,00

Full Thread Screws with Scale / Flanged Brackets

-Bracket Type-

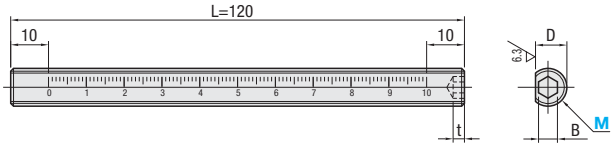
CAD Data

■Full Thread Screws with Scale

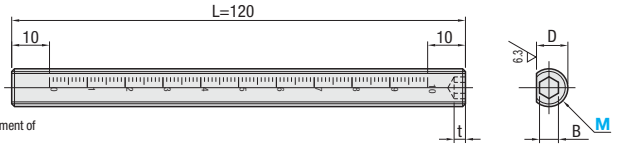


RoHS

Direction of Scale Display
Y(Horizontal)



Direction of Scale Display
T (Vertical)



Type	M Material	S Surface Treatment
ASSB	1.7220/34CrMo4	Black Oxide
ASSS	1.4301/X5CrNi18-10	-

*Use as measuring tool for adjustment of machines and equipment.

Part Number Type	Direction of Scale Display	M (Coarse)	L	B	D	t	ASSB € Unit Price 1~4 pcs.	ASSB Volume Discount 5 pcs. or more	ASSS € Unit Price 1~4 pcs.	ASSS Volume Discount 5 pcs. or more
ASSB ASSS	Y (Horizontal) T (Vertical)	8	120	4	6.6	5				
		10		5	8.3	6				
		12		6	10	8				
		16		8	14	10				

Order Example

Part Number			
Type	-	Direction of Scale Display	- M
ASSS	-	T	- 8

Days to Ship: 6 Days P.87

■Round Flange

RoHS



■Square Flange



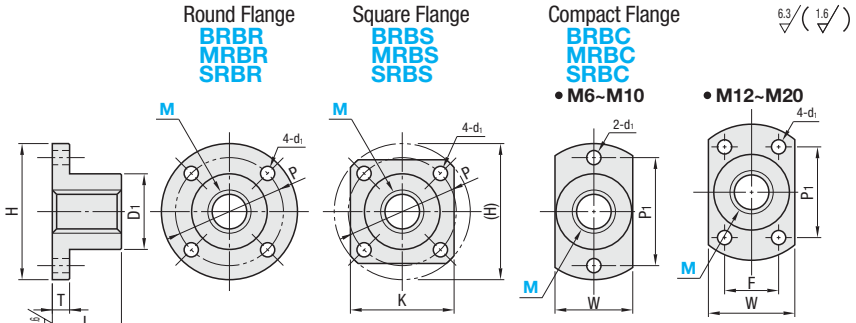
■Compact Flange



Round Flange
BRBR
MRBR
SRBR

Square Flange
BRBS
MRBS
SRBS

Compact Flange
BRBC
MRBC
SRBC
• M6~M10
• M12~M20



Type Round Flange	Square Flange	Compact Flange	M Material	S Surface Treatment
BRBR	BRBS	BRBC	1.0038/S235JR	Black Oxide
MRBR	MRBS	MRBC		Electroless Nickel Plating
SRBR	SRBS	SRBC	1.4301/X5CrNi18-10	-

Part Number Type		M	MxPitch	L	D_1	H	T	P	K	W	P_1	F	d_1	€ Unit Price BRBR	MRBR	SRBR	BRBS	MRBS	SRBS	BRBC	MRBC	SRBC
Round Flange	BRBR	6	6x1.0	12	12	28	4	20	22	12	20	-	3.5									
	MRBR	8	8x1.25	14	15	32	5	25	25	15	25											
	SRBR	10	10x1.5	18	20	38		30	30	20	30		4.5									
Square Flange	BRBS	10A	10x1.25																			
	MRBS	12	12x1.75	20	22	40	6	32	32	25	28	16										
	SRBS	14A	14x1.5	22	26	50		40	39	32	33	22	5.5									
Compact Flange	BRBC	16	16x2.0	26	28	63	8	50	48	40	42	25	6.6									
	MRBC	18A	18x1.5	30	32																	
	SRBC	20	20x2.5	32	35																	

Thread pitches 10A · 14A and 18A are fine.

Order Example: Part Number SRBR10

Days to Ship: 8 Days — Express A — 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

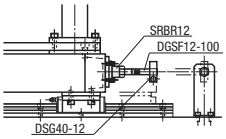
Price

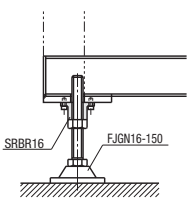
■Volume Discount (Round down to one Cent.) P.87

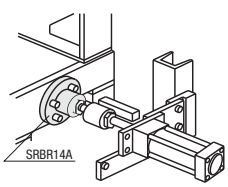
Qty.	1~14	15~19	20~50
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example





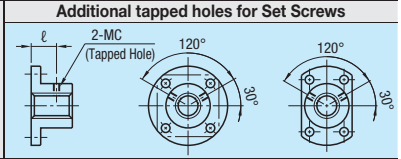


Alterations

Part Number - (MC)
SRBR16 - MC

10 Days

Alteration	Additional tapped holes for Set Screws
Code	MC
Spec.	Adds 2 tapped holes for set screws. Ordering Code MC
Price Adder	6,00



M	MC	ℓ
6	M3	9
8		10
10		13
10A		
12	M4	14
14A		15
16		16
18A	M5	20
20		

Configurable Length Screws with Hexagon Sockets
-Tip Shape Selectable-

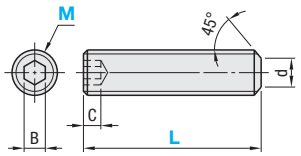
CAD Data

■Configurable Length Screws with Hexagon Sockets -Tip Shape Selectable- RoHS

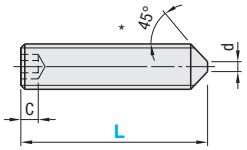


Type	M Material	S Surface Treatment	Pad
FSSF FSST FSSC FSSG	1.1191/C45E	Black Oxide	-
FSSM	1.7220/34CrMo4	Black Oxide	White Polyacetal
FSSU			Free-cutting Brass (CW614N/CuZn39Pb3 BD Brass (JIS))
FSSFS FSSTS FSSGS	1.4567/ X3CrNiCu18-9-4	-	-
FSSMS			White Polyacetal
FSSUS			Free-cutting Brass (CW614N/CuZn39Pb3 BD Brass (JIS))

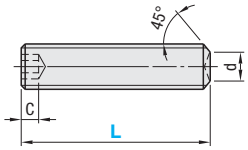
FSSF (Flat End)
FSSFS (Flat End / Stainless Steel)



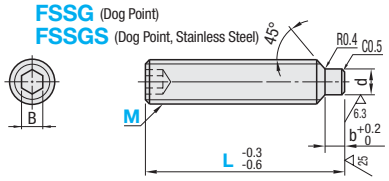
FSST (Cone Point)
FSSTS (Cone Point / Stainless Steel)



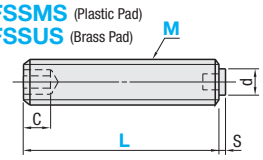
FSSC (Cup Point)



FSSG (Dog Point)
FSSGS (Dog Point, Stainless Steel)



FSSM FSSMS (Plastic Pad)
FSSU FSSUS (Brass Pad)



* FSST · FSSTS (Cone Point) M=L size is 60°.

Part Number Type	M	L 1mm Increment	B	C (Min.)	d (Max.) Flat End	Cone Point	Cup Point	Dog Point	Plastic · Brass with Pad	S (Plastic · Brass with Pad)	b (Dog Point)
FSSF (Flat End) FSSFS (Flat End · Stainless Steel) FSST (Cone Point) FSSTS (Cone Point · Stainless Steel) FSSC (Cup Point) FSSG (Dog Point) FSSGS (Dog Point · Stainless Steel) FSSM FSSMS (Plastic Pad) FSSU FSSUS (Brass Pad)	5	20~250	2.5	3	3.5	1.25	2.5	4	3	1	4
	6		3.0	3.5	4.0	1.5	3	4	4	1	4
	8	20~400	4.0	5	5.5	2.0	5	6	5	2	5
	10		5.0	6	7	2.5	6	8	6	2	6
	12		6.0	8	8.5	3	8	8	8	2	7
	16		8.0	10	12	4	10	10	10	3	9
	20		10.0	12	15	5	14	12	13	3	11

Order Example: Part Number FSSTS6 - L 100 — Days to Ship: 8 Days — Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

M	L	€ Unit Price FSSF	FSST	FSSC	FSSG	FSSM	FSSU	FSSFS	FSSTS	FSSGS	FSSMS	FSSUS
5	20~100											
	101~200											
	201~250											
6	20~100											
	101~200											
	201~250											
8	20~100											
	101~200											
	201~400											
10	20~100											
	101~200											
	201~400											
12	20~100											
	101~200											
	201~400											
16	20~100											
	101~200											
	201~400											
20	20~100											
	101~200											
	201~400											

Alterations: Part Number FSST6 - L 100 - (SKH) SKH — 13 Days

Alteration Code	Tip Induction Hardening SKH
Spec.	Induction hardening at 2~3mm away from the tip. Hardness: 40~45HRC Ordering Code SKH Applicable to FSSF, FSST, FSSG only.
Price Adder	4,00

NEW

Hexagon Socket Set Screws

-Cup Point / Flat Point / Cone Point-

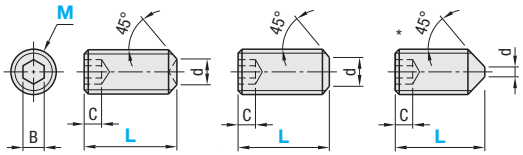
Price Reduction 29% on average

MSSF, MSSFS, MSSK and MSSU can be ordered by a cost-saving box. P.167-168

RoHS



MSSK **MSSF** **MSST**
MSSU(Stainless Steel) **MSSFS**(Stainless Steel) **MSSTS**(Stainless Steel)



* MSST / MSSTS (Cone Point) M=L size is 60°.

Type	M Material	H Hardness	S Surface Treatment
MSSK MSSF MSST	*1.7220/34CrMo4	45HRC~	Black Oxide
MSSU MSSFS MSSTS	1.4301/ X5CrNi18-10 equivalent	-	-

* When M=10 or more, 1.7220/34CrMo4 or equivalent.

MxP (Coarse)	B	C (Min.)	d (Max.)		
			Flat End	Cone Point	Cup Point
2x0.4	0.9	0.8	1	0.8	1
2.6x0.45	1.3	1.2	1.5	1.2	1.2
3x0.5	1.5	1.2	2	0.75	1.4
4x0.7	2	1.5	2.5	1	2
5x0.8	2.5	2	3.5	1.25	2.5
6x1.0	3	2	4	1.5	3
8x1.25	4	3	5.5	2	5
10x1.5	5	4	7	2.5	6
12x1.75	6	4.8	8.5	3	8

Part Number		MSSK(Cup Point)			MSSF(Flat End)			MSST(Cone Point)			MSSU(Cup Point)			MSSFS(Flat End)			MSSTS(Cone Point)		
		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount	
Type	M - L	1~9 pcs.	10~199 pcs.	200 pcs.	1~9 pcs.	10~199 pcs.	200 pcs.	1~9 pcs.	10~199 pcs.	200 pcs.	1~9 pcs.	10~199 pcs.	200 pcs.	1~9 pcs.	10~199 pcs.	200 pcs.	1~9 pcs.	10~199 pcs.	200 pcs.
MSSF MSST MSSK (Stainless Steel) MSSFS MSSTS MSSU	2 - 2																		
	3																		
	4																		
	2.6 - 3																		
	4																		
	5																		
	3 - 3																		
	4																		
	5																		
	6																		
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	25																		
	30																		

Order Example

Part Number
MSSF5 -10

Days to Ship
6 Days
2 Days

P.88

Hexagon Socket Set Screws / Hexagon Socket Cap Screws / Crush Pads
-Soft Tips-

Price Revision

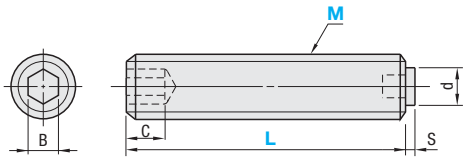
: New Price

CAD Data

Hexagon Socket Set Screws -Soft Tips- RoHS



Type	Thread	Surface Treatment	Pad
SBPP	1.7220/ 34CrMo4	Black Oxide	Polyacetal (White)
SBCP			Free-cutting Brass (CW614N/ CuZn39Pb3 BD Brass (JIS))
SBCT			Urethane (Shore A70 / Black)
SBPPS	1.4567/ X3CrNiCu18-9-4	-	Polyacetal (White)
SBCPS			Free-cutting Brass (CW614N/ CuZn39Pb3 BD Brass (JIS))
SBCTS			Urethane (Shore A70 / Black)



Part Number Type		M (Coarse)	L (Dimensions in ( ) are only available for SBPP and SBCP.)	S	d	B	C (Min.)
SBPP	SBCP	3	5 6 8 10 12 16 20	0.5	1.5	1.5	2.0
SBPPS	SBCPS	4	6 8 10 12 16 20	1	2	2	2.5
SBPP	SBCP	5	8 10 12 16 20 25	1	3	2.5	3.0
SBPPS	SBCPS	6	8 10 12 16 20 25 30 40 50	1	4	3	3.5
		8	10 12 16 20 25 30 40 50 (60)	2	6	4	5.0
SBCT		10	12 16 20 25 30 40 50 (60) (80)	2	8	5	6.0
SBCTS		12	16 20 25 30 40 50 (60) (80) (100)	2	10	6	8.0

M (Coarse)	€ Unit Price SBPP	SBCP	SBCT	SBPPS	SBCPS	SBCTS
3						
4						
5						
6						
8						
10						
12						

Order Example: Part Number SBPP10 - L 50

Days to Ship: 6 Days P.87 2 Days

Price

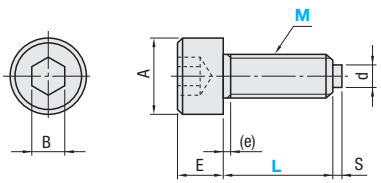
Volume Discount (Round down to one Cent.) P.87

Qty.	1~5	6~49	50~99	100 pcs. or more
Applicable Price	€ Unit Price	Volume Discount		
	Price List	5%	10%	40%

Hexagon Socket Cap Screws -Soft Tips- RoHS



Type	Thread	Surface Treatment	Pad
CBPP	1.7220/34CrMo4	Black Oxide	Polyacetal (White)
CBCP			Free-cutting Brass (CW614N/CuZn39Pb3 BD Brass (JIS))
CBPPS	1.4567/ X3CrNiCu18-9-4	-	Polyacetal (White)
CBCPS			Free-cutting Brass (CW614N/CuZn39Pb3 BD Brass (JIS))



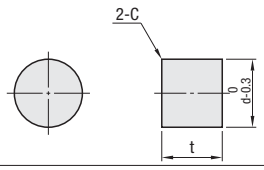
Part Number Type	M (Coarse)	L	A	E	S	d	B	(e)	CBPP € Unit Price 1~99 pcs.	CBPP Volume Discount 100 pcs. or more	CBCP € Unit Price 1~99 pcs.	CBCP Volume Discount 100 pcs. or more	CBPPS € Unit Price 1~99 pcs.	CBPPS Volume Discount 100 pcs. or more	CBCPS € Unit Price 1~99 pcs.	CBCPS Volume Discount 100 pcs. or more
CBPP (Plastic Pad) CBPPS	3	10 15 20	5.5	3	0.5	1.5	2.5	0.5								
	4	10 15 20	7	4	1	2	3	0.6								
CBCP (Brass Pad) CBCPS	5	15 20 30	8.5	5	1	3	4	0.6								
	6	15 20 30	10	6	1	4	5	0.7								
	8	20 30 40	13	8	2	6	6	1.0								

Crush Pads RoHS

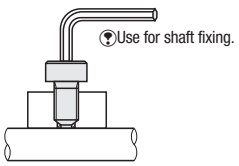


50 pcs. per package

SEPN
SEPNS (Thin)
(50 pcs. per package)
PACK-SEPN
PACK-SEPNS



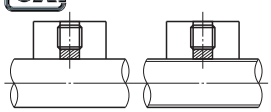
Example



Use for shaft fixing.

Part Number Type	Applicable M	d	t SEPN	t SEPNS	C	€ Unit Price (1 piece) SEPN · SEPNS	PACK-SEPN · PACK-SEPNS € Unit Price 1~3 packs.	PACK-SEPN · PACK-SEPNS Volume Discount 4 packs. or more
SEPN	*3	2.2	2.0	0.5	*0.2			
SEPNS	*4	3.0	2.5					
PACK-SEPN (50 pcs. per package)	*5	3.9	3.0	1.0				
	*6	4.7	3.5					
	8	6.4	4.5	-				
PACK-SEPNS (50 pcs. per package)	10	8.2	5.5	-	0.3			
	12	9.9	6.5	-				

Example



Use this set piece to prevent set screw from damaging the mating material.

* SEPNS is available for M3~6 only. * For SEPNS, C<0.1.
* PACK-SEPNS is available for M3~6 only.
When placing an order for PACK-SEPN or PACK-SEPNS, please specify number of packages. Minimum order is 1 package (50pcs.).

Order Example: Part Number CBPP3-10 SEPN5 PACK-SEPN4

Days to Ship: 6 Days P.88

Hexagon Socket Screws -Dog Point

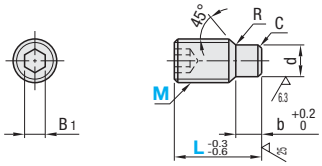
-Hexagon Socket Set Screw / Hexagon Socket Head Cap Screw / Configurable-

CAD Data

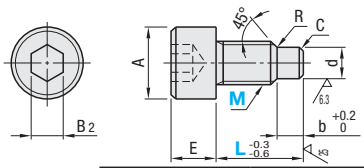
■Hexagon Socket Screws - Dog Point RoHS



MSSG (Hexagon Socket Set Screw Type)



CBBG (Hexagon Socket Head Cap Screw Type)
CBBGS (Hexagon Socket Head Cap Screw Type, Stainless Steel)



These differ from JIS dog point set screws in dimension of nose portion.
Use for rough locking of shafts, etc. where continuous load is not imparted to the nose portion.

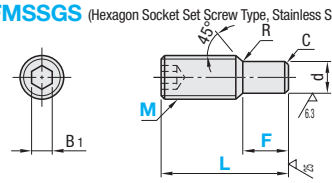
Type	M Material	H Hardness	S Surface Treatment
MSSG	1.7220/ 34CrMo4	45HRC~ 38~43HRC	Black Oxide
CBBG			
CBBGS	1.4567	-	-

Part Number Type	Part Number M (Coarse)	L	B_1	B_2	A	E	d Reference Dim.	d Tolerance	b	C	R	€ Unit Price MSSG	€ Unit Price CBBG	€ Unit Price CBBGS
MSSG CBBG CBBGS	4	12 16 20 25 30	2	3	7	4	3	-0.1 -0.2	3	0.3	0.5			
	5	12 16 20 25 30	2.5	4	8.5	5	4		4					
	6	12 16 20 25 30 35 40	3	5	10	6								
	8	16 20 25 30 35 40 45	4	6	13	8	6	-0.1 -0.3	5	0.5				
	10	20 25 30 35 40 45 50	5	8	16	10	8		6		1			

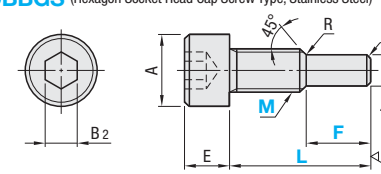
■Hexagon Socket Screws -Dog Point -Configurable- RoHS



FMSSG (Hexagon Socket Set Screw Type)
FMSSGS (Hexagon Socket Set Screw Type, Stainless Steel)



FCBBG (Hexagon Socket Head Cap Screw Type)
FCBBGS (Hexagon Socket Head Cap Screw Type, Stainless Steel)



Use for rough locking of shafts, etc. where continuous load is not imparted to the nose portion.

Type	M Material	H Hardness	S Surface Treatment
FMSSG	1.7220/ 34CrMo4	45HRC~ 38~43HRC	Black Oxide
FCBBG			
FMSSGS FCBBGS	1.4567	-	-

Part Number Type	Part Number M (Coarse)	L 1mm Increment FMSSG · FMSSGS	L 1mm Increment FCBBG · FCBBGS	F 1mm Increment	B_1	B_2	A	E	d Reference Dim.	d Tolerance	C	R	€ Unit Price FMSSG	€ Unit Price FMSSGS	€ Unit Price FCBBG	€ Unit Price FCBBGS
FMSSG FMSSGS FCBBG FCBBGS	4	-	12~25	2~30 ※10≤L−F	-	3	7	4	3	-0.1 -0.2	0.3	0.5				
			26~50													
	5	12~25	12~25		2.5	4	8.5	5	4							
		26~50	26~50													
	6	12~40	12~30		3	5	10	6								
		41~80	31~70													
	8	12~50	12~35		4	6	13	8	6	-0.1 -0.3	0.5					
		51~100	36~75													
	10	12~50	12~40		5	8	16	10	8			1				
		51~100	41~75													

Order Example

Part Number	-	L	-	F
MSSG5	-	16		
FMSSG6	-	50	-	20

Days to Ship

-MSSG · CBBG · CBBGS: 6 Days P.87 / 2 Days

-FMSSG · FMSSGS · FCBBG · FCBBGS: 8 Days

Express A 2,00 EUR/ piece P.87

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

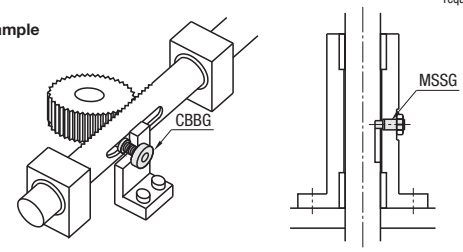
Price

■Volume Discount (※Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

※For orders larger than indicated quantity, please request a quotation.

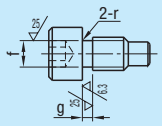
Example



Alterations

Part Number	-	L	-	(RS)
CBBG8	-	20	-	RS

8 Days

Alteration	Undercut
	
Code	RS
Spec.	Adds an undercut below the head of CBBG. ※Applicable to CBBG, FCBBG and FCBBGS only. Ordering Code RS

M	f	g	r
4	3.2	1.5	0.2~0.3
5	4.1		
6	4.9	2	0.2~0.5
8	6.6	2.5	
10	8.3		

Price Adder	3,00

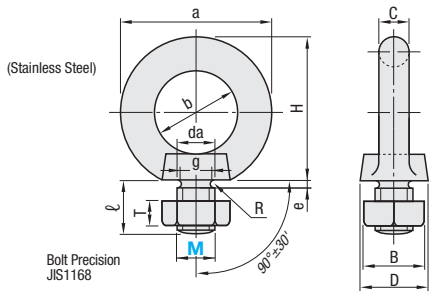
Lifting Eye Bolts / Plastic Hexagonal Spacers

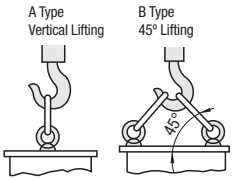
-Both Ends Female Thread-

CAD Data

Lifting Eye Bolts RoHS







M Material: 1.0038/S235JR
S Surface Treatment: Trivalent Chromate Plating
A Accessory: Nut 1 pcs.

M Material: 1.4301/X5CrNi18-10 (Electrolityc Polishing)
A Accessory: Nut 1 pc. (1.4301/X5CrNi18-10)

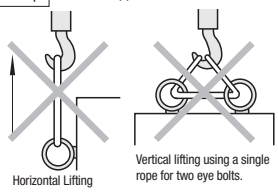
Part Number Type	M	MxP	a	b	C	D	H	ℓ	e	g	R	da	Nuts B	Nuts T	A Type N/1P {kgf/1P}	B Type N/2P {kgf/2P}	€ Unit Price 1~19 pcs.	Volume Discount 20 pcs. or more	€ Unit Price 1~19 pcs.	Volume Discount 20 pcs. or more
	8	8x1.25	32.6	20	6.3	16	33.3	15	3	6	1	9.2	13	6.5	785 {80}	785 {80}				
	10	10x1.5	41	25	8	20	41.5	18	4	7.7	1.2	11.2	17	8	1471 {150}	1471 {150}				
	12	12x1.75	50	30	10	25	51	22	5	9.4	1.4	14.2	19	10	2157 {220}	2157 {220}				
	16	16x2.0	60	35	12.5	30	60	27	5	13	1.6	18.2	24	13	4413 {450}	4413 {450}				
	20	20x2.5	72	40	16	35	71	30	6	16.4	2	22.4	30	16	6178 {630}	6178 {630}				

Public Liability Policy

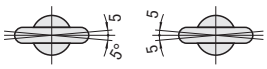
- Maximum amount of compensation
  100000,00 EUR for one person
  400000,00 EUR for one accident
  100000,00 EUR for property damage
- This public liability policy is only applicable to insurable contingency occurred in Japan.

Caution

Bad Example Avoid the applications shown below.



When using a pair of eye bolts for lifting, mount them in alignment as shown.



Order Example Part Number

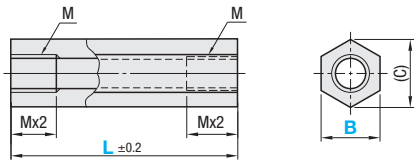
Days to Ship 6 Days P.87

Piping U-Bolts UB and UBSU have moved to P.1130

Plastic Hexagonal Spacers RoHS



PEKP



6.3

<Note>
-The surface color may change depending on production lot and other conditions.
-For material data, refer to **P.215**
The pilot hole for tapping goes through.

M Material: PEEK (Polyetheretherketone)

Part Number Type	B	L Selection	M (Coarse)	(C)	€ Unit Price L15	L20	L25	L30	L50	L100	L150	L200
PEKP	6	15 20 25 30 50	3	6.9								
	7	20 25 30 50 100 150	4	8.1								
	8	20 25 30 50 100 150	5	9.2								
	10	25 30 50 100 150 200	6	11.5								
	13	50 100 150 200	8	15.0								

Order Example Part Number - L

PEKP6 - 20

Days to Ship 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~29	30~39	40~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations Part Number - LC - LC35 — 8 Days

Only applicable to PEKP.

Alteration	Code	Spec.	Price Adder
L Dimension Specified 	LC	Cuts L dimension in 1mm increment. The thread length does not change. Ordering Code LC55 LC Specification Range: B 6: LC 15<LC<50; B 7: LC 20<LC<150; B 8: LC 20<LC<150; B 10: LC 25<LC<200; B 13: LC 35≤LC<200	4,00

Shoulder Bolts
-Shaft Dia. Tolerance e9-

CAD Data

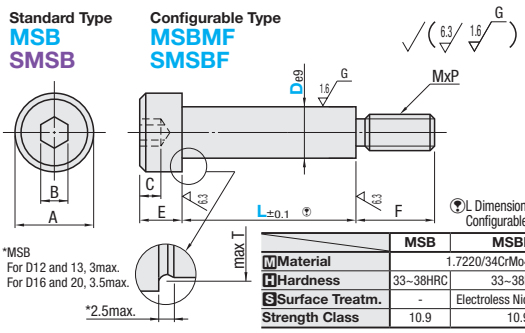
Shoulder Bolts
-Shaft Dia. Tolerance e9-

RoHS



Standard Type
MSB
SMSB

Configurable Type
MSBMF
SMSBF



*MSB
For D12 and 13, 3max.
For D16 and 20, 3.5max.

L Dimension Tolerance of Configurable Type is ±0.05.

	MSB	MSBMF	SMSB · SMSBF
M Material	1.7220/34CrMo4		1.4567
H Hardness	33~38HRC	33~38HRC	-
S Surface Treatm.	-	Electroless Nickel Plating	-
Strength Class	10.9	10.9	A2-50

- Standard Type

De9		A	B	C	E	MxP	T
4	-0.020 -0.050	6.5	2.5	1.6	3	2.5x0.45	4.5
4.5		7				3x0.5	5
5		8			3.5		5.5
5.5		9	3	2.2	4	4x0.7	6
6				2			6.5
6.5	-0.025 -0.061	10	4	2.5	5	5x0.8	7
8		13	5	3	6	6x1.0	8.7
10		16	6	4	8	8x1.25	10.8
12		17					12.8
13	-0.032 -0.075	18	8	5	10	10x1.5	14
16		24	10	7	14	12x1.75	17
20	-0.040 -0.092	27	14	9	18	16x2.0	21

Standard Type

Part Number Type	D	L (SMSB is only applicable to sizes marked with **.)	F	€ Unit Price MSB	€ Unit Price SMSB
MSB / SMSB	4	*10 *15 *20 *25 *30 35 *40 45	5		
	4.5	*10 *15 *20 *25 *30 *35 *40 45 50	6		
	5	*10 *15 *20 *25 *30 35 *40 45 50			
	5.5	*10 *15 *20 *25 *30 *35 *40 45 50 55	7		
	6	*10 *15 *20 *25 *30 35 *40 45 50 55 60 65 70			
	6.5	*10 *15 *20 *25 *30 *35 *40 *45 *50 55 60 65 70 75 80	9		
	8	*10 *15 *20 *25 *30 *35 *40 *45 *50 *55 *60 *65 *70 *75 *80 85 90 95 100 110 120			
	10	*10 *15 *20 *25 *30 *35 *40 *45 *50 *55 *60 *65 *70 *75 *80 *85 *90 95 100 110 120	12		
	12	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100			
	13	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 110 120 130	16		
	16	15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 110 120 130 140 150	18		
	20	40 50 60 70 80 90 100 110 120 130 140 150	24		

Configurable Type

Part Number Type	De9	L 0.1mm Increment	F 0.5mm Increment	A	B	C	E	T	L+F Machining Conditions	€ Unit Price MSBMF	€ Unit Price SMSBF
MSBMF SMSBF	4	10~40	M≤F≤Mx3	7	2.5	1.6	3	4.5	L+F≤46		
	4.5	10~40						5	L+F≤46		
	5	10~40		9	3	2.2	4	5.5	L+F≤47		
	5.5	10~40						6	L+F≤47		
	6	10~50		10	4	2.5	5	6.5	L+F≤59		
	6.5	10~50						7	L+F≤59		
	8	10~60		13	5	3	6	8.7	L+F≤70		
	10	10~60		16	6	4	8	10.8	L+F≤72		

Configurable Type may have different part dimensions from the Standard Type.

Order Example
Part Number - L - F
MSB10 - 50
SMSBF5.5 - L30 - F10

Days to Ship
- MSB · SMSB: 6 Days 2 Days P.88
- SMSBF: 8 Days
- MSBMF: 10 Days

Price
- MSB
Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~199	200~500
Applicable	€ Unit Price	Volume Discount	
	Price List	5%	10%

For orders larger than indicated quantity, please request a quotation.

- SMSB
Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99	100~199	200~500
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

- MSBMF · SMSBF
Volume Discount (Round down to one Cent.) P.87

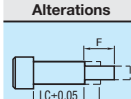
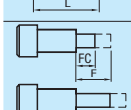
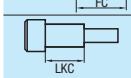
Qty.	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations
Part Number - L (LC) - F - (FC / LKC)
MSB10 - LC50.1 - FC10
SMSBF8 - L30 - F10 - LKC

- MSB · SMSB · SMSBF: 8 Days
- MSBMF: 10 Days

When alteration is ordered, small order charge will not be added even when ordering 1~19 pieces.

Alterations	Code	Spec.	Price Adder	
	LC	Changes L dimension (machining) O.A.L. (LC) tolerance is ±0.05. Lmin≤LC≤Lmax 0.1mm Increment This alteration does not change the F dimension. To change the F dim., combine FC alteration. Applicable to MSB only.	D4~10	3,00
			D12~16	4,00
			D20	5,00
	FC	Changes the thread part length. M≤FC≤Mx3, 0.5mm Increment Only When D=4 3≤FC≤7.5 Applicable only when LC is combined.	FC<F	0,00
			FC>F	0,60
	LKC	Changes L Dimension Tolerance L dimension tolerance is from ±0.05 to $^{0}_{-0.1}$. Applicable to MSBMF, SMSBF only.	Free of Charge	

Shoulder Bolts

-Shaft Dia. Tolerance g6 · h7 · e9-

CAD Data

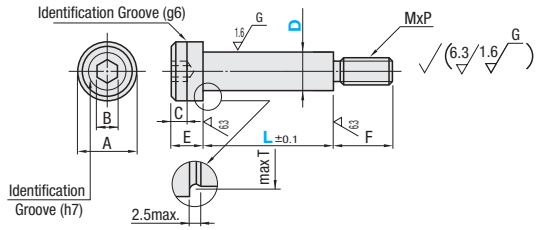
Shoulder Bolts Dim. Selectable

-Shaft Dia. Tolerance g6 / h7-

RoHS



Type	D Tolerance	Material	Hardness	Strength Class
GMSB	g6	1.7220/34CrMo4	33~38HRC	10.9
SGMSB		1.4567/X3CrNiCu18-9-4	-	A2-50
MSBH	h7	1.7220/34CrMo4	33~38HRC	10.9
SHMSB		1.4567/X3CrNiCu18-9-4	-	A2-50



D Tolerance D	g6	h7	A	B	C	E	F	MxP	T
4	-0.004 -0.012	0 -0.012	6.5	2.5	1.6	3	5	2.5x0.45	4.5
5			8			3.5	6	3x0.5	5.5
6			9	3	2	4	7	4x0.7	6.5
8	-0.005 -0.014	0 -0.015	13	5	3	6	9	6x1.0	8.7
10			16	6	4	8	12	8x1.25	10.8

Part Number Type	D	L (Dimensions in ( ) are only available for GMSB.)	€ Unit Price GMSB	€ Unit Price SGMSB
GMSB SGMSB	4	10 15 20 (25) (30)		
	5	10 15 20 (25) (30)		
	6	10 15 20 25 30 35 40		
	8	10 15 20 25 30 35 40 45 50		
	10	10 15 20 25 30 35 40 45 50 55 60		

Part Number Type	D	L	€ Unit Price MSBH	€ Unit Price SHMSB
MSBH SHMSB	4	10 15 20		
	5	10 15 20		
	6	10 15 20 25		
	8	10 15 20 25 30		
	10	10 15 20 25 30 35		

Order Example: Part Number - L; GMSB10 - 50; SGMSB8 - 30

Days to Ship: 6 Days / 2 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99	100~199	200~500
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

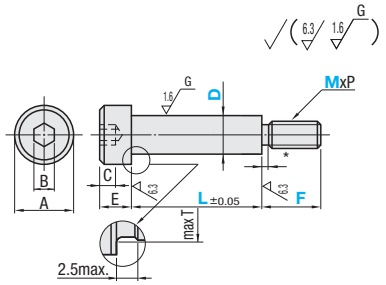
Shoulder Bolts Configurable Type

-Shaft Dia. Tolerance g6 / h7-

RoHS

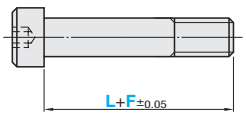


Type	D Tol.	Material	Hardness	Strength Class
GDMSB	g6	1.7220/34CrMo4	33~38HRC	10.9
GDSMSB		1.4567/X3CrNiCu18-9-4	-	A2-50
HDMSB	h7	1.7220/34CrMo4	33~38HRC	10.9
HDSMSB		1.4567/X3CrNiCu18-9-4	-	A2-50



MxP	D	g6	h7	A	B	C	E	T	L+F Machining Conditions
	4	-0.004 -0.012	0 -0.012	7	2.5	1.6	3	4.5	L+F≤46
4x0.5	4.5								
5x0.8	5			9			3.5	5.5	L+F≤47
6x1.0	5.5								
8x1.25	6			10	3	2	4	6.5	L+F≤59
10x1.5	6.5	-0.005 -0.014	0 -0.015	13	5	3	6	8.7	L+F≤70
	8			16	6	4	8	10.8	L+F≤72
	10								

When M=D



* M=D has no groove.

Part Number Type	D	L 0.1mm Increment	F 0.5mm Increment	M	€ Unit Price GDMSB	€ Unit Price GDSMSB	€ Unit Price HDMSB	€ Unit Price HDSMSB
GDMSB GDSMSB HDMSB HDSMSB	4	10~40	3~9	3 4				
	4.5	10~40	3~9	3 4				
	5	10~40	4~12	3 4 5				
	5.5	10~40	4~12	3 4 5				
	6	10~50	5~15	4 5 6				
	6.5	10~50	5~15	4 5 6				
	8	10~60	6~18	5 6 8				
	10	10~60	8~24	6 8 10				

Order Example: Part Number - L - F - M; HDSMSB6.5 - 30 - F12 - M5

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

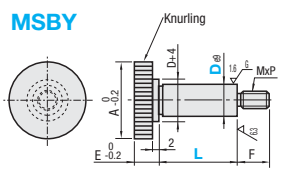
Large Head Shoulder Screws

-Shaft Dia. Tolerance e9-



RoHS

MSBY



M Material: 1.1191/C45E
H Hardness: 40HRC~
S Surface Treatment
Knurled Head: Black Oxide

Part Number Type	De9		L Selection	MxP	A	E	F	€ Unit Price
MSBY	6	-0.020 -0.050	15 20	4x0.7	24	7	7	
	8	-0.025	25 30 35 40	6x1.0	30	8	9	
	10	-0.061	25 30 35 40	8x1.25	36	10	12	

It can be tightened by hand since A dimension is larger than that of MSB.

Order Example: Part Number - L; MSBY6 - 20

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99	100~199	200~500
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

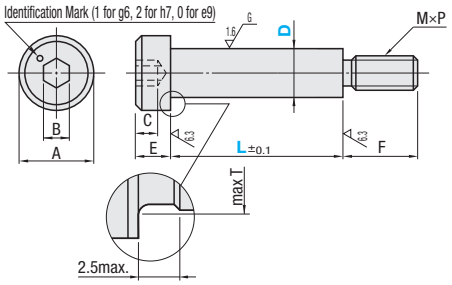
Low Head Shoulder Screws
-Shaft Dia. Tolerance g6 · h7 · e9-

CAD Data

Low Head Shoulder Screws -Shaft Dia. Tolerance g6 · h7 · e9-

RoHS

Type	D Tolerance	Material	Hardness	Strength Class
LMSB	e9	1.7220/34CrMo4	28~37HRC	9.8 equivalent
LSMSB		1.4567/X3CrNiCu18-9-4	-	A2-50
LMSBG	g6	1.7220/34CrMo4	28~37HRC	9.8 equivalent
LSMSBG		1.4567/X3CrNiCu18-9-4	-	A2-50
LMSBH	h7	1.7220/34CrMo4	28~37HRC	9.8 equivalent
LSMSBH		1.4567/X3CrNiCu18-9-4	-	A2-50



D Tolerance D	e9	g6	h7	A	B	C	E	F	MxP	T
4	-0.020 -0.050	-0.004 -0.012	0 -0.012	6.5	2.5	1.6	2	5	2.5x0.45	4.5
4.5				7			2	6	3x0.5	5.0
5				8			2	6		5.5
5.5				9	3	2.2	2.5	6	4x0.7	6.0
6						2	2.5	7		6.5
6.5	-0.025 -0.061	-0.005 -0.014	0 -0.015	10	4	2.5	3	9	5x0.8	7.0
8				13	5	3	4	9	6x1.0	8.7
10				16	6	4	5	12	8x1.25	10.8

Part Number Type	D	L (g6 and h7 tolerance is only applicable to sizes marked with * .)	LMSB € Unit Price 1~9 pcs.	LMSB Volume Discount 10~100 pcs.	LSMSB € Unit Price 1~9 pcs.	LSMSB Volume Discount 10~100 pcs.	LMSBG € Unit Price 1~9 pcs.	LMSBG Volume Discount 10~100 pcs.	LSMSBG € Unit Price 1~9 pcs.	LSMSBG Volume Discount 10~100 pcs.	LMSBH € Unit Price 1~9 pcs.	LMSBH Volume Discount 10~100 pcs.	LSMSBH € Unit Price 1~9 pcs.	LSMSBH Volume Discount 10~100 pcs.
LMSB LSMSB LMSBG LSMSBG LMSBH LSMSBH	4	*10 *15 *20												
	4.5	*10 *15 *20 25 30 35 40												
	5	*10 *15 *20 *25												
	5.5	*10 *15 *20 *25 30 35 40												
	6	*10 *15 *20 *25												
	6.5	*10 *15 *20 *25 30 35 40												
	8	*10 *15 *20 *25 30 35 40												
	10	*10 *15 *20 *25 30 35 40												

Order Example: Part Number - L → LSMSB6.5 - 30

Days to Ship: 6 Days P.87

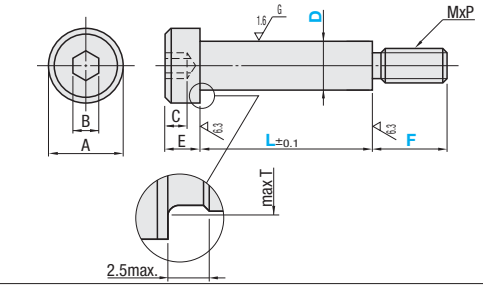
Price

For larger quantity orders "Days to Ship" may differ from published catalog term. P.87

Low Head Shoulder Screws -Shaft Dia. Tolerance g6 · h7 · e9- L · F Dimension Configurable Type

RoHS

Type	D Tolerance	Material	Hardness	Strength Class
FMSB	e9	1.7220/34CrMo4	28~37HRC	9.8 equivalent
FSMSB		1.4567/X3CrNiCu18-9-4	-	A2-50
FMSBG	g6	1.7220/34CrMo4	28~37HRC	9.8 equivalent
FSMSBG		1.4567/X3CrNiCu18-9-4	-	A2-50
FMSBH	h7	1.7220/34CrMo4	28~37HRC	9.8 equivalent
FSMSBH		1.4567/X3CrNiCu18-9-4	-	A2-50



D Tolerance D	e9	g6	h7	A	B	C	E	MxP	T
4	-0.020 -0.050	-0.004 -0.012	0 -0.012	6.5	2.5	1.6	2	2.5x0.45	4.5
4.5				7			2	3x0.5	5.0
5				8			2		5.5
5.5				9	3	2.2	2.5	4x0.7	6.0
6						2	2.5		6.5
6.5	-0.025 -0.061	-0.005 -0.014	0 -0.015	10	4	2.5	3	5x0.8	7.0
8				13	5	3	4	6x1.0	8.7
10				16	6	4	5	8x1.25	10.8

Part Number Type	D	L 0.1mm Increment	F 1mm Increment	L+F Machining Conditions	€ Unit Price FMSB	FSMSB	FMSBG	FSMSBG	FMSBH	FSMSBH
FMSB FSMSB FMSBG FSMSBG FMSBH FSMSBH	4	10~40	M≤F≤Mx3	L+F≤45						
	4.5	10~40		L+F≤46						
	5	10~40		L+F≤46						
	5.5	10~40		L+F≤47						
	6	10~40		L+F≤47						
	6.5	10~50		L+F≤59						
	8	10~60		L+F≤70						
	10	10~60		L+F≤72						

Order Example: Part Number - L - F → FMSB4.5 - 30.5 - 4

Price

Days to Ship: 8 Days

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~39	40~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Reamer Bolts

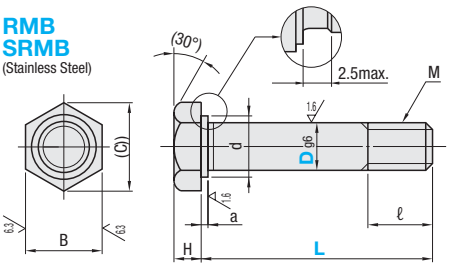
CAD Data

Reamer Bolts

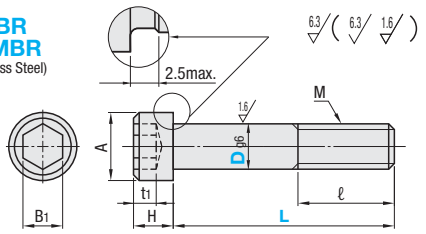
RoHS



RMB
SRMB
(Stainless Steel)



RMBR
SRMBR
(Stainless Steel)



The head is not knurled.

Type	Material	Surface Treatment
RMB · RMBR	1.1191/C45E	Black Oxide
SRMB · SRMBR	1.4567/X3CrNiCu18-9-4	-

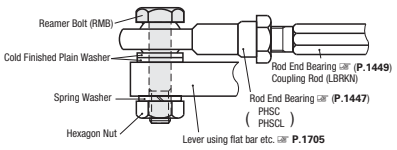
Part Number Type	Dg6		L	M (Coarse)	ℓ	B	B1	(C)	A	h	t1 max	d	a	€ Unit Price RMB	SRMB	RMBR	SRMBR
RMB(D5~16) SRMB(D5~10)	5	-0.004 -0.012	23 26 29	M5	6	10	3	11.5	8.5	3.5	2.4	9.0	0.5				
	6		23 26 29 32 35	M6	8		4		10	4.0	3						
	8	-0.005 -0.014	32 35 36 38	M8	10	13	5	15.0	13	5.0	3.75	10.4					
RMBR(D5~8) SRMBR(D5~8)	10		36 38 39 42	M10	12	17		19.6		6.5		12.9					
	12	-0.006 -0.017	39 42 45 48 52 55	M12	16	19	-	21.9	-	8.0	-	15.4	1.0				
	16		52 55 58	M16	20	22		25.4		10.0		19.4					

Order Example

Part Number	-	L
RMB10	-	39

Example

L dimension of reamer bolt is specified with the assumption of use as below.



Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~99	100~149	150~199	200~500
Discount Rate	€ Unit Price	5%	10%	18%

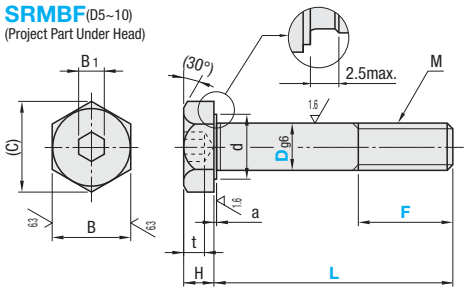
For orders larger than indicated quantity, please request a quotation.

Hexagon Socket Head Reamer Bolts -Configurable Length-

RoHS



RMBF
SRMBF(D5~10)
(Project Part Under Head)

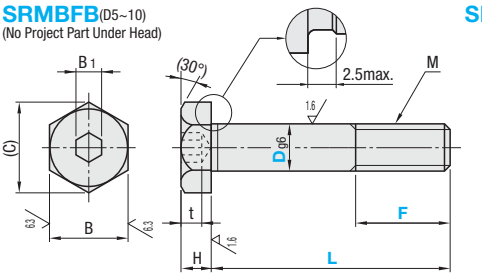


6.3 (6.3 1.6)

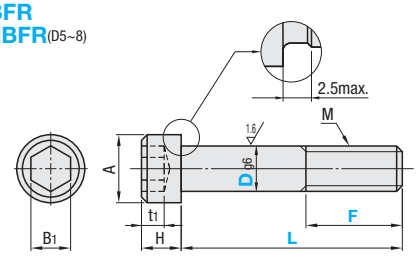
The outer hexagon head (B) and the hexagon socket (B1) are not accurately aligned.

Type	Material	Surface Treatment
RMBF RMBFB RMBFR	1.1191/C45E	Black Oxide
SRMBF SRMBFB SRMBFR	1.4567/ X3CrNiCu18-9-4	-

RMBFB
SRMBFB(D5~10)
(No Project Part Under Head)



RMBFR
SRMBFR(D5~8)



The head is not knurled.

Part Number Type	Dg6		1mm Increment L	F	M (Coarse)	B	B1	(C)	A	H	t max	t1 max	d	a	€ Unit Price RMBF · RMBFB	SRMBF · SRMBFB	RMBFR	SRMBFR
RMBF SRMBF(D5~10)	5	-0.004 -0.012	20~29	M≤F≤L-5	M5	10	3	11.5	8.5	3.5	2.7	2.4	9.0	0.5				
	6		20~35		M6		4		10	4	3	3						
RMBFB SRMBFB(D5~10)	8	-0.005 -0.014	20~38	M≤F≤L-10 (RMBFR SRMBFR)	M8	13	5	15.0	13	5	3.8	3.75	10.4					
	10		20~42		M10	17	6	19.6		6.5	4.5		12.9					
RMBFR SRMBFR(D5~8)	12	-0.006 -0.017	20~55		M12	19	8	21.9	-	8	5	-	15.4	1.0				
	16		20~58		M16	22	10	25.4		10	6		19.4					

Order Example

Part Number	-	L	-	F
RMBF5	-	28	-	F10

Days to Ship: 8 Days | Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

RMBFR · SRMBFR: 8 Days

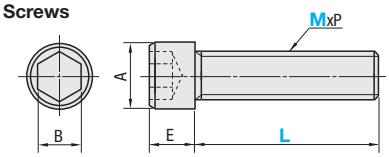
Plastic Hexagon Socket Head Cap Screws / Plastic Hexagon Socket Head Set Screws
-Material: RENY · PPS · PEEK-

CAD Data

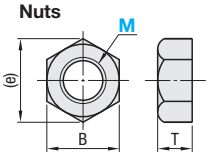


Type				Material
Screws	Nuts	Washers	Set Screws	
RENB	RENN	RENW	-	RENY (Glassfiber Reinforced Polyamide MXD)
PPSB	PPSN	PPSW	-	(Polyphenylenesulfide)
PEKB	PEKN	PEKW	PEKSF	PEEK (Polyetheretherketone)

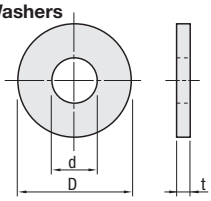
Screws



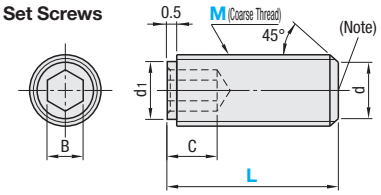
Nuts



Washers



Set Screws



(Note) Gate mark remains.

* Usable as One End Male Thread Posts in combination with Both Ends Plastic Hexagonal Spacers on. P.208

‹Cautions›
-The surface colors of plastic screws, nuts and washers may change somewhat depending on production lot and other conditions.
-Sometimes black spots may be seen on the surface, which does not affect its performance.

Plastic Hexagon Socket Head Cap Screws

Part Number Type	M-L	M x P	A	E	B	€ Unit Price * less than RENB	PPSB	PEKB	Volume Discount * or more RENB	PPSB	PEKB	*Quantity
RENB PPSB PEKB	3- 6 8 10 12 15 20	3 x 0.5	5.5	3	2.5							100
RENB PPSB PEKB	4- 6 8 10 12 15 20	4 x 0.7	7	4	3							100
RENB PPSB PEKB	5- 8 10 12 15 20 25 30	5 x 0.8	8.5	5	4							100
RENB PPSB PEKB	6-10 12 15 20 25 30 40	6 x 1.0	10	6	5							100
RENB PPSB PEKB	8-15 20 25 30 40	8 x 1.25	13	8	6							50
RENB	10-15 20 25 30 35 40	10 x 1.5	16	10	8							50
RENB	12-20 25 30 35 40	12 x 1.75	18	12	10							50

- RENY--Glassfiber Reinforced Polyamide MXD6
RENY is based on polyamide MXD6, and crystalline engineered plastic reinforced with 50% fiber glass. It has the highest strength and elasticity among engineered plastics, and excels in oil and heat resistance, thus can be used as an alternative to metal.
- PPS--Polyphenylenesulfide
PPS is a crystalline super engineered plastic. It has excellent heat resistance, and does not deteriorate in physical properties even when it is used for long durations in high temperature atmosphere. In addition, it excels in chemical resistance, mechanical characteristics, electrical properties and dimensional stability.

Plastic Nuts

Part Number Type	M	B	(e)	T	€ Unit Price 1~99 pcs. RENN	PPSN	PEKN	Volume Discount 100 pcs. or more RENN	PPSN	PEKN
RENN PPSN PEKN	3	5.5	6.4	2.4						
	4	7	8.1	3.2						
	5	8	9.2	4						
	6	10	11.5	5						
	8	13	15	6.5						
	10	17	19.6	8						
	12	19	21.9	10						

Plastic Washers

Part Number Type	No.	D	d	t	€ Unit Price 1~99 pcs. RENW	PPSW	PEKW	Volume Discount 100 pcs. or more RENW	PPSW	PEKW
RENW PPSW PEKW	3	7	3.2	0.5						
	4	9	4.3	0.8						
	5	10	5.3	1						
	6	12.5	6.4	1.6						
	8	17	8.4	1.6						
	10	21	10.5	2.0						
	12	24	13	2.5						

Plastic Set Screws

Part Number Type	M-L	B	d1	C (Min.)	d (Max.)	€ Unit Price 1~99 pcs.	Volume Discount 100 pcs. or more
PEKSF	3-15	1.5	2.2	2	2		
	4-20	2	2.8	2.5	2.5		
	5-20	2.5	3.6	3	3.5		
	6-25	3	4.4	3.5	4		
	8-30	4	6	5	5.5		

Order Example

Part Number
PPSB3-10
PPSN3
PPSW3
PEKSF4-20

Days to Ship: 6 Days / 2 Days P.87

- PEEK--Polyetheretherketone
PEEK is semicrystalline super engineered plastic with the highest performance. Has the highest chemical resistance among all engineered plastics. The only generally used chemical that dissolves PEEK is concentrated sulfuric acid. It also excels in heat resistance, abrasion resistance, flame resistance, and hydrolysis resistance.

Characteristic Value of Plastics P.215

Plastic Hexagon Socket Head Cap Screws / Plastic Screws (Pkg.)

-Without Knurling- -Low Head · Extra Low Head-

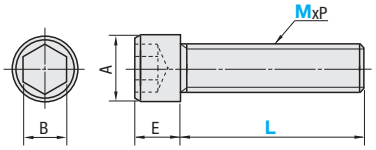
CAD Data

■Without Knurling

RoHS



Type	Material
PPSBL	(Polyphenylenesulfide) Non-Glass Fiber
PEKBL	PEEK (Polyetheretherketone)



The head is not knurled.
More economical than Knurled type.

Part Number Type	M-L	MxP	A	E	B	PPSBL € Unit Price 1~19 pcs.	PPSBL Volume Discount 20~49	PPSBL Volume Discount 50~100	PEKBL € Unit Price 1~19 pcs.	PEKBL Volume Discount 20~49	PEKBL Volume Discount 50~100
PPSBL PEKBL	5-10 15 20 25 30	5x0.8	8.5	5	4						
	6-15 20	6x1.0	10	6	5						

Order Example — Part Number: PPSBL5-20 — Days to Ship: 6 Days P.87

■Low Head (Pkg.)

RoHS



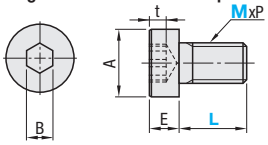
■Extra Low Head (Pkg.)



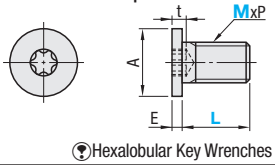
20 pieces per package

Type: Hexagon Socket Low Head Cap Screws	Type: Extra Low Head Cap Screws	Material
PACK-RENS	PACK-RENE	RENY (Glassfiber Reinforced Polyamide MXD6)
PACK-PPSS	PACK-PPSE	(Polyphenylenesulfide)
PACK-PEKST	PACK-PEKE	PEEK (Polyetheretherketone)

Hexagon Socket Low Head Cap Screws



Extra Low Head Cap Screws



Hexalobular Key Wrenches P.191

Part Number Type	M-L	MxP	A	E	B	t	PACK-RENS € Unit Price 1~2 Pkgs.	PACK-RENS Volume Discount 3 Pkgs. or more	PACK-PPSS € Unit Price 1~2 Pkgs.	PACK-PPSS Volume Discount 3 Pkgs. or more	PACK-PEKST € Unit Price 1~2 Pkgs.	PACK-PEKST Volume Discount 3 Pkgs. or more
PACK-RENS PACK-PPSS PACK-PEKST	3- 6 8 10	3 x 0.5	5.5	2	2	1.5						
	4- 6 8 10 12	4 x 0.7	7	2.8	2.5	2.3						
	5-8 10 12	5 x 0.8	8.5	3.5	3	2.7						
	6-10 12 16	6 x 1.0	10	4	4	3						

Part Number Type	M-L	MxP	A	E	Hexalobular Socket	t	PACK-RENE € Unit Price 1~2 Pkgs.	PACK-RENE Volume Discount 3 Pkgs. or more	PACK-PPSE € Unit Price 1~2 Pkgs.	PACK-PPSE Volume Discount 3 Pkgs. or more	PACK-PEKE € Unit Price 1~2 Pkgs.	PACK-PEKE Volume Discount 3 Pkgs. or more
PACK-RENE PACK-PPSE PACK-PEKE	3- 6 8 10	3 x 0.5	6	1.3	8	1.3						
	4- 6 8 10 12	4 x 0.7	8	1.5	10	1.5						
	5-8 10 12	5 x 0.8	9	1.5	15	1.5						
	6-10 12 16	6 x 1.0	10	1.5	20	1.5						

Order Example — Part Number: PACK-RENS 3-6 (20 pieces per package) — Days to Ship: 6 Days P.87

■Mechanical Characteristics (Reference)

	Tensile Breaking Load N											Torsional Breaking Torque N·m										
	RENB	PPSB	PEKB	PPSBL	PEKBL	PACK-RENS	PACK-PPSS	PACK-PEKST	PACK-RENE	PACK-PPSE	PACK-PEKE	RENB	PPSB	PEKB	PPSBL	PEKBL	PACK-RENS	PACK-PPSS	PACK-PEKST	PACK-RENE	PACK-PPSE	PACK-PEKE
M3	635	570	430	-	-	740	447	370	365	265	317	0.39	0.36	0.3	-	-	0.31	0.243	0.15	0.2	0.143	0.15
M4	1470	980	765	-	-	1325	725	730	697	447	624	0.79	0.71	0.64	-	-	0.62	0.436	0.54	0.62	0.285	0.5
M5	2450	1570	1230	836	1208	2050	990	1170	1065	579	1146	1.77	1.42	1.28	0.78	0.8	1.2	0.986	1.11	0.66	0.636	1.09
M6	3140	2250	1670	1580	1835	2798	1747	1666	1604	889	1455	2.94	2.11	2.26	1.86	1.96	2.15	1.496	1.72	1.09	0.876	1.71
M8	5100	3720	3090	-	-	-	-	-	-	-	-	7.85	5.29	5.98	-	-	-	-	-	-	-	-
M10	6900	-	-	-	-	-	-	-	-	-	-	12.75	-	-	-	-	-	-	-	-	-	-
M12	8700	-	-	-	-	-	-	-	-	-	-	24.5	-	-	-	-	-	-	-	-	-	-

Shown above are reference values and not guaranteed values. Recommended tightening torque is torsional breaking torque x 50%. Use a torque driver and torque wrench for tightening.
Mechanical characteristics change depending on the operating environment. Testing the product before use under actual usage state is recommended.

Plastic Cross Recessed Pan Head Screws (Pkg.)

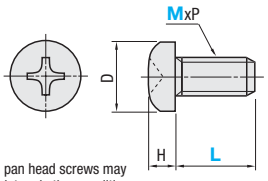
-Material: PPS · PEEK-

CAD Data



100 pcs. per package

Type	Material
PACK-PPSA	(Polyphenylenesulfide)
PACK-PEKS	PEEK (Polyetheretherketone)



- 100 pcs. per package
- The surface colors of plastic cross recessed pan head screws may change somewhat depending on production lot and other conditions.
- Sometimes black spots on the surface may be seen, which does not affect its performance.

Part Number Type	M-L	M x P	D	H	PACK-PPSA € Unit Price 1~9	PACK-PPSA Volume Discount 10 or more	PACK-PEKS € Unit Price 1~9	PACK-PEKS Volume Discount 10 or more
PACK-PPSA PACK-PEKS	2.6- 6	2.6 x 0.45	4.5	1.7				
	8							
	10							
	12							
PACK-PPSA PACK-PEKS	3- 6	3 x 0.5	5.5	2				
	8							
	10							
	12							
	15							
	20							

Part Number Type	M-L	M x P	D	H	PACK-PPSA € Unit Price 1~9	PACK-PPSA Volume Discount 10 or more	PACK-PEKS € Unit Price 1~9	PACK-PEKS Volume Discount 10 or more
PACK-PPSA PACK-PEKS	4- 6	4 x 0.7	7	2.6				
	8							
	10							
	12							
	15							
	20							
PACK-PPSA PACK-PEKS	5- 8	5 x 0.8	9	3.3				
	10							
	12							
	15							

Part Number Type	M-L	M x P	D	H	PACK-PPSA € Unit Price 1~9	PACK-PPSA Volume Discount 10 or more	PACK-PEKS € Unit Price 1~9	PACK-PEKS Volume Discount 10 or more
PACK-PPSA PACK-PEKS	6-10	6 x 1.0	10.5	3.9				
	15							
	20							

Order Example

Part Number

PACK-PEKS4-20

100 pcs. per package

Days to Ship

6 Days P.87

Mechanical Characteristics (Reference)

	Tensile Breaking Load N		Torsional Breaking Torque N·m	
	PACK-PPSA	PACK-PEKS	PACK-PPSA	PACK-PEKS
M2.6	440	312	0.19	0.16
M3	570	430	0.36	0.3
M4	980	765	0.71	0.64
M5	1570	1230	1.42	1.28
M6	2250	1670	2.11	2.26

- Shown above are reference values and not guaranteed values.
- Recommended tightening torque is torsional breaking torque x50%. Use a torque driver or torque wrench for tightening.
- Mechanical characteristics change depending on the operating environment. Testing the product before use under actual usage state is recommended.

-RENY–Glassfiber Reinforced PolyamideMXD6
RENY is based on polyamide MXD6, and crystalline engineered plastic reinforced with 50% fiber glass. It has the highest strength and elasticity among engineered plastics, and excels in oil and heat resistance, thus can be used as an alternative to metal.

- PPS–Polyphenylenesulfide
PPS is a crystalline super engineered plastic. It has excellent heat resistance, and does not deteriorate in physical properties even when it is used for long durations in high temperature atmosphere. In addition, it excels in chemical resistance, mechanical characteristics, electrical properties and dimensional stability.

- PEEK–Polyetheretherketone
PEEK is semicrystalline super engineered plastic with the highest performance. Has the highest chemical resistance among all engineered plastics. The only generally used chemical that dissolves PEEK is concentrated sulfuric acid. It also excels in heat resistance, abrasion resistance, flame resistance, and hydrolysis resistance.

Guideline of Selection for Plastic Screws by Material (1)

Item	RENY		Non-Glass Fiber	PEEK
Lightness	△	△	○	○
Water Absorption Stability	◎	◎	◎	△
Strength · Rigidity	◎	◎	○	○
Impact Resistance	◎	○	○	○
Friction Resistance · Abrasion Resistance	◎	◎	◎	◎
Heat Resistance	△	◎	◎	◎
Flame Resistance	△	◎	◎	◎
Electrical Properties	○	◎	◎	◎
Weather Resistance	○	○	○	◎

◎: Excellent ○: Good △: Questionable X: Inferior

Guideline of Selection for Plastic Screws by Material (2)

Strength	RENY>PPS>PEEK>PPS Non-Glass Fiber
Heat Resistance	PPS · PPS Non-Glass Fiber>PEEK>RENY
Chemical Resistance	PEEK>PPS · PPS Non-Glass Fiber>RENY

- RENY and PPS contain glass fiber.
- Continuous Use Temperature RENY: 105°C, PPS /: PPS Non-Glass Fiber 200°C, PEEK:180°C
  Combustibility RENY: UL94HB, PPS / PPS Non-Glass Fiber / PEEK: UL94 V-0

Chemical Resistance Data (Reference)

Chemical Name	Temperature	Material RENY	Material / Non-Glass Fiber	Material PEEK
Hydrochloric Acid10%	80°C	X	○	◎
Hydrochloric Acid10%	Ambient Temperature	X	◎	◎
Nitric Acid 10%	80°C	X	△	◎
Nitric Acid 10%	Ambient Temperature	X	◎	◎
Sulfuric Acid 30%	80°C	X	○	○
Sulfuric Acid 10%	80°C	X	○	○
Sulfuric Acid 10%	Ambient Temperature	X	◎	○
Sodium Hydroxide 30%	80°C	△	○	◎
Sodium Hydroxide 10%	Ambient Temperature	○	◎	◎
Calcium Chloride (Saturation)	80°C	△	◎	◎
Acetone	Ambient Temperature	○	◎	◎
Methanol	60°C	○	◎	◎
Gasoline	Ambient Temperature	○	◎	◎
Light Oil	Ambient Temperature	○	◎	◎
Motor Oil	80°C	○	◎	◎
Gear Oil	100°C	○	◎	◎

Excellent: Not Affected Good: Little affected Questionable: Somewhat Deteriorated

- Chemical resistances vary depending on the condition of use. Be sure to test the product before use under expected application conditions.

Physical Properties Table (Reference)

Shown above are reference values and not guaranteed values.

Characteristics	Testing Method (ASTM)	Unit	Material RENY	Material PPS	Material PPS / PPS Non-Glass Fiber	Material PEEK
‹Mechanical Characteristics›						
Tensile Strength	D638	MPa	285	196	90	91
Elongation	D638	%	2.1	2.2	-	50~120
Bending Strength	D790	MPa	380	255	140	147
Flexural Modulus	D790	GPa	17.4	13.2	3.8	3.9
Izot Impact Strength (Notched)	D256	J/m	110	98	-	88
Rockwell Hardness	D785	R and M Scale	M111	M110	-	R126
‹Thermal Characteristics›						
Deflection Temperature Under Load (1.82Mpa)	D648	°C	234	270	100	152
Linear Expansion Coefficient	D696	10^{-5}/K	1.5	1.0	-	5.0
‹Electrical Characteristics›						
Dielectric Constant (106Hz)	D150	-	4	4.6	3.6	3.3
Dissipation Factor (106Hz)	D150	-	0.009	0.002	0.001	0.004
Volume Resistivity	D257	Ω•cm	$1.0x10^{9}$	$1.0x10^{16}$	$2.0x10^{16}$	$4.9x10^{16}$
Dielectric Breakdown Strength	D149	MV/mm	17	12	-	17
Arc Resistance	D495	sec	129	120	-	23
‹Others›						
Specific Gravity	D792	-	1.65	1.66	1.35	1.3
Water Absorption (At 23°C in water x 24h)	D570	%	0.14	0.015	0.02	0.500
Fiber Glass Content	-	%	50	40	-	-

Add. Spec.

Wing Screws / Wing Nuts / Button Head Cap Screws - Tamper Proof / Special Tools / Thumb Screws (Plastic Head)

Price Reduction 13% on average

CAD Data

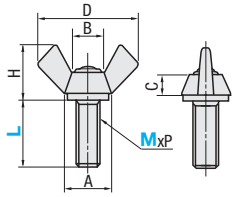
Wing Screws Wing Nuts

RoHS



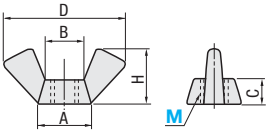
Wing Screws

Type	M Material	S Surface Treatment
CHOB	Cold Forging	Trivalent Chromate
CHBS	1.4301/X5CrNi18-10	-



Wing Nut

Type	M Material	S Surface Treatment
CHON	Cold Forging	Trivalent Chromate
CHNS	1.4301/X5CrNi18-10	-



Wing Screws Grade 2

MxP	A (Min.)	(B)	C (Min.)	D	H
3x0.5	6.5	4	3	17	9
4x0.7	8	6	4	21	11
5x0.8					
6x1.0	10	7	4.5	27	13
8x1.25	13	10	6	31	16
10x1.5	16	12	7.5	36	18

Wing Nuts Grade 2

MxP	A (Min.)	(B)	C (Min.)	D	H
3x0.5	7.5	4	3	17	9
4x0.7	8	6	4	21	11
5x0.8					
6x1.0	10	7	4.5	27	13
8x1.25	13	10	6	31	16
10x1.5	16	16	9	36	18
12x1.75	20			48	23

Part Number			CHOB				CHBS			
			€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
Type	M	- L	1~19 pcs.	20~49 pcs.	50~99 pcs	100 pcs. or more	1~49 pcs.	50~99 pcs	100~199 pcs.	200 pcs. or more
CHOB CHBS	3	- 6								
		8								
		10								
		12								
	4	- 8								
		10								
		12								
		15								
		20								
		25								
		30								
	5	- 8								
		10								
		12								
		15								
		20								
		25								
		30								
		35								
	6	- 10								
		12								
		15								
		20								
		25								
		30								
		35								
		40								
		45								
		50								
	8	- 12								
		15								
		20								
		25								
		30								
		35								
		40								
		45								
		50								
	10	- 20								
		30								
		40								
		50								

Wing Nut

Part Number		€ Unit Price	Volume Discount
Type	M	1~199 pcs.	200 pcs. or more
CHON	3		
	4		
	5		
	6		
	8		
	10		
	12		

Part Number		€ Unit Price	Volume Discount
Type	M	1~99 pcs.	100 pcs. or more
CHNS (Stainless Steel)	3		
	4		
	5		
	6		
	8		
	10		
	12		

Order Example — Part Number: CHOB6-12, CHON4

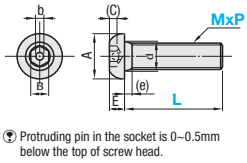
Days to Ship: 6 Days P.87

Tamper Proof Button Head Cap Screws

RoHS



IBNP



Protruding pin in the socket is 0~0.5mm below the top of screw head.

M Material: 1.4567/X3CrNiCu18-9-4

MxP (Coarse)	A	E	B	b	(C) (Min.)	d (Max.)	(e) (Max.)
3x0.5	5.7	1.65	2	1.0	1.04	3.6	1
4x0.7	7.6	2.2	2.5	1.1	1.3	4.7	1.4
5x0.8	9.5	2.75	3	1.3	1.56	5.7	1.6
6x1.0	10.5	3.3	4	1.6	2.08	6.8	2
8x1.25	14	4.4	5	2	2.6	9.2	2.5

Part Number		€ Unit Price	Volume Discount
Type	M-L	1~99 pcs.	100 pcs. or more
IBNP	3- 6		
	8		
	10		
	12		
	16		
	4- 8		
	10		
	12		
	16		
	20		
	25		
	30		
	5-10		
	12		
	16		
	20		
	25		
	30		
	40		

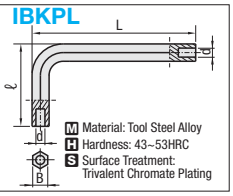
Part Number		€ Unit Price	Volume Discount
Type	M-L	1~99 pcs.	100 pcs. or more
IBNP	6-10		
	12		
	16		
	20		
	25		
	30		
	40		
	50		
	8-10		
	12		
	16		
	20		
	25		
	30		
	35		
	40		
	45		
	50		

Hex Wrenches

RoHS



IBKPL



M Material: Tool Steel Alloy
H Hardness: 43~53HRC
S Surface Treatment: Trivalent Chromate Plating

Part Number		Applicable Screws	L	ℓ	d	B	€ Unit Price	Volume Discount
Type	No.						1~9 pcs.	10 pcs. or more
IBKPL	3	M3	52	16	1.2	2		
	4	M4	58.5	20.5	1.3	2.5		
	5	M5	66	23	1.5	3		
	6	M6	74	29	1.8	4		
	8	M8	85	33	2.3	5		

Features

The hexagonal socket in the head has a protruding pin at the center, making it impossible to use a standard hex key wrench to assemble / disassemble. Troubles due to unintended or unauthorized disassembly can be prevented.

Order Example — Part Number: IBNP3-6, IBKPL3, CRKW3-6

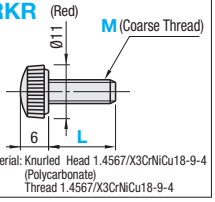
Days to Ship: 6 Days P.87

Thumb Screws (Plastic Head)

RoHS



CRKW (White)
CRKB (Black)
CRKR (Red)



M Material: Knurled Head 1.4567/X3CrNiCu18-9-4 (Polycarbonate)
Thread 1.4567/X3CrNiCu18-9-4

Part Number		€ Unit Price	Volume Discount
Type	M-L	1~99 pcs.	100 pcs. or more
CRKW (White) CRKB (Black) CRKR (Red)	3- 6		
	8		
	10		
	12		
	15		
	20		
	4- 6		
	8		
	10		
	12		
	15		
	20		

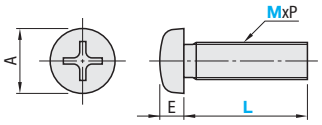
- Usable as screws for cover attachment.

Cross Recessed Pan Head Screws

CAD Data



Type	Material	Surface Treatment
BKJ	JIS SWCH equivalent	Trivalent Chromate
NKJ	1.4301/X5CrNi18-10 equivalent	-



MxP (Coarse)	A	E	Cross Recess Number
2x0.4	3.5	1.3	1
2.5x0.45	4.5	1.7	1
2.6x0.45	4.5	1.7	1
3x0.5	5.5	2	2
4x0.7	7	2.6	2
5x0.8	9	3.3	2
6x1.0	10.5	3.9	3

BKJ (Trivalent Chromate)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99 pcs.	100~299 pcs.	300 pcs. or more
BKJ	3 - 4				
	5				
	6				
	8				
	10				
	12				
	4 - 5				
	6				
	8				
	10				
	12				
	15				
	5 - 8				
	10				
	12				
	15				
	6 - 10				
	12				
	15				
	20				

NKJ (Stainless Steel)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99 pcs.	100~149 pcs.	150 pcs. or more
NKJ	2 - 3				
	4				
	5				
	6				
	8				
	2.5 - 3				
	4				
	5				
	6				
	8				
	10				
	2.6 - 3				
	4				
	5				
	6				
	8				
	10				
	3 - 4				
	5				
	6				
	8				
	10				
	12				
	4 - 5				
	6				
	8				
	10				
	12				
	15				
	5 - 8				
	10				
	12				
	15				
	20				
	6 - 10				
	12				
	15				
	20				

Order Example — Part Number: NKJ3-6

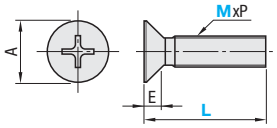
Days to Ship: 6 Days P.87

Cross Recessed Flat Head Machine Screws

CAD Data



Type	Material	Surface Treatment
BFBJ	JIS SWCH equivalent	Trivalent Chromate
SFBJ	1.4301/X5CrNi18-10 equivalent	-



MxP (Coarse)	A	E	Cross Recess Number
2x0.4	4	1.2	1
2.5x0.45	5	1.45	1
2.6x0.45	5.2	1.5	1
3x0.5	6	1.75	2
4x0.7	8	2.3	2
5x0.8	10	2.8	2
6x1.0	12	3.4	3

BFBJ (Trivalent Chromate)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99 pcs.	100~299 pcs.	300 pcs. or more
BFBJ	3 - 5				
	6				
	8				
	10				
	12				
	4 - 6				
	8				
	10				
	12				
	15				
	5 - 8				
	10				
	12				
	15				
	20				
	6 - 10				
	12				
	15				
	20				

SFBJ (Stainless Steel)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99 pcs.	100~149 pcs.	150 pcs. or more
SFBJ	2 - 3				
	4				
	5				
	6				
	8				
	2.5- 3				
	4				
	5				
	6				
	8				
	10				
	2.6- 3				
	4				
	5				
	6				
	8				
	10				
	3 - 5				
	6				
	8				
	10				
	12				
	4 - 5				
	6				
	8				
	10				
	12				
	15				
	5 - 8				
	10				
	12				
	15				
	20				
	6 - 10				
	12				
	15				
	20				

Order Example — Part Number: SFBJ4-10

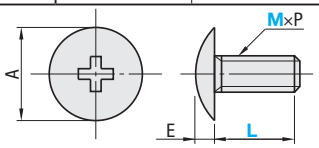
Days to Ship — 6 Days P.87

Cross Recessed Truss Machine Screws

CAD Data



Type	Material	Surface Treatment
BTRSS	JIS SWCH equivalent	Trivalent Chromate
TRSS	1.4301/X5CrNi18-10 equivalent	-



MxP (Coarse)	A	E	Cross Recess Number
2x0.4	4.5	1.2	1
2.5x0.45	5.7	1.5	1
2.6x0.45	5.9	1.6	1
3x0.5	6.9	1.9	1
4x0.7	9.4	2.5	2
5x0.8	11.8	3.1	2
6x1.0	14	3.7	3

BTRSS (Trivalent Chromate)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99	100~249	250~
BTRSS	3 - 5				
	6				
	8				
	10				
	12				
	4 - 5				
	6				
	8				
	10				
	12				
	15				
	5 - 6				
	8				
	10				
	12				
	15				
	20				
	6 - 10				
	12				
	15				
	20				

TRSS (Stainless Steel)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99	100~149	150~
TRSS	2 - 3				
	4				
	5				
	6				
	8				
	2.5 - 3				
	4				
	5				
	6				
	8				
	10				
	2.6 - 3				
	4				
	5				
	6				
	8				
	10				
	3 - 5				
	6				
	8				
	10				
	12				
	4 - 5				
	6				
	8				
	10				
	12				
	15				
	5 - 8				
	10				
	12				
	15				
	20				
	6 - 10				
	12				
	15				
	20				

Order Example | Part Number: TRSS5-10 | Days to Ship: 6 Days P.87

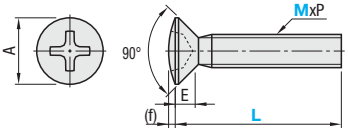
Cross Recessed Round Flat Head Machine Screws

CAD Data

RoHS



Type	Material	Surface Treatment
MSARA	JIS SWCH equivalent	Trivalent Chromate
MSARAS	1.4301/X5CrNi18-10 equivalent	-



MxP (Coarse)	A	(f)	E	Cross Recess Number
3x0.5	6	0.7	1.75	2
4x0.7	8	0.9	2.3	2
5x0.8	10	1.2	2.8	2
6x1.0	12	1.4	3.4	3

MSARA (Trivalent Chromate)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99	100~299	300~
MSARA	3 - 5				
	6				
	8				
	10				
	12				
	4 - 6				
	8				
	10				
	12				
	15				
	5 - 8				
	10				
	12				
	15				
	20				
	6 - 10				
	12				
	15				
	20				

MSARAS (Stainless Steel)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~29 pcs.	30~99	100~299	300~
MSARAS	3 - 5				
	6				
	8				
	10				
	12				
	4 - 6				
	8				
	10				
	12				
	15				
	5 - 8				
	10				
	12				
	15				
	20				
	6 - 10				
	12				
	15				
	20				

Order Example | Part Number: MSARAS4-8

Days to Ship: 6 Days P.87

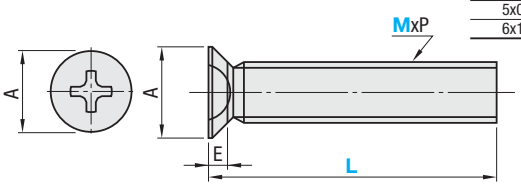
Cross Recessed Low Flat Head Machine Screws

CAD Data

RoHS



Type	M Material	S Surface Treatment
TSARA	JIS SWCH equivalent	Trivalent Chromate
TSARAS	1.4301/X5CrNi18-10 equivalent	-



MxP (Coarse)	A	E	Cross Recess Number
3x0.5	5	1.3	1
4x0.7	6	1.4	2
5x0.8	8	1.9	2
6x1.0	10	2.4	2

TSARA (Trivalent Chromate)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~19 pcs.	20~99 pcs.	100~199 pcs.	200 pcs. or more
TSARA	3- 5				
	6				
	8				
	10				
	12				
	15				
	4- 6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	5- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	6- 10				
	12				
	15				
	20				
	25				
	30				

TSARAS (Stainless Steel)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~19 pcs.	20~99 pcs.	100~199 pcs.	200 pcs. or more
TSARAS	3- 5				
	6				
	8				
	10				
	12				
	15				
	4- 6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	5- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	6- 10				
	12				
	15				
	20				
	25				
	30				

Order Example — Part Number: TSARA5-10

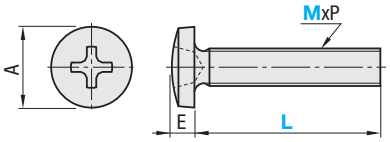
Days to Ship: 6 Days P.87

Cross Recessed Binding Head Screws

CAD Data



Type	Material	Surface Treatment
BDJ	JIS SWCH equivalent	Trivalent Chromate
BDJS	1.4301/X5CrNi18-10 equivalent	-



MxP (Coarse)	A	E	Cross Recess Number
3x0.5	6.3	1.9	2
4x0.7	8.3	2.5	2
5x0.8	10.3	3.1	2
6x1.0	12.4	3.7	3

BDJ (Trivalent Chromate)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~9 pcs.	10~29 pcs.	30~49 pcs.	50 pcs. or more
BDJ	3- 5				
	6				
	8				
	10				
	12				
	15				
	20				
	4- 6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	5- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	6- 10				
	12				
	15				
	20				
	25				
	30				

BDJS (Stainless Steel)

Part Number		€ Unit Price	Volume Discount		
Type	M - L	1~9 pcs.	10~29 pcs.	30~49 pcs.	50 pcs. or more
BDJS	3- 5				
	6				
	8				
	10				
	12				
	15				
	20				
	4- 6				
	8				
	10				
	12				
	15				
	20				
	25				
	30				
	5- 8				
	10				
	12				
	15				
	20				
	25				
	30				
	6- 10				
	12				
	15				
	20				
	25				
	30				

Order Example

Part Number
BDJ5-10

Days to Ship

6 Days

P.87

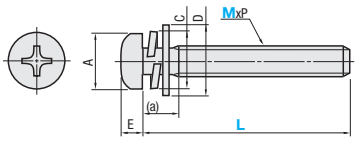
Washer Assembled Cross Recessed Pan Head Screws

■Washer Assembled Cross Recessed Pan Head Screws SW+JIS W Captured

RoHS



NSET
SCBJ



NSET

Screws	M Material: JIS-SWCH STKM
Washers	Spring Washers JIS B 1251 Flat Washers JIS B 1256
S Surface Treatment	Trivalent Chromate

SCBJ

Screws	M Material: 1.4301/X5CrNi18-10
Washers	Spring Washers JIS B 1251 Flat Washers JIS B 1256

MxP	A	E	C (Max.)	D	(a)	Cross Recess Number
2 x0.4	3.5	1.3	4.0	6.0	2.1	1
2.5 x0.45	4.5	1.7	4.8	6.5	2.7	1
2.6 x0.45	4.5	1.7	4.8	7.5	2.7	1
3 x0.5	5.5	2.0	5.5	8.0	3.0	2
4 x0.7	7.0	2.6	7.0	10.0	4.4	2
5 x0.8	9.0	3.3	8.5	12.0	5.4	2
6 x1.0	10.5	3.9	11.5	13.0	6.9	3

Part Number		NSET		SCBJ			
		€ Unit Price	Volume Discount	€ Unit Price	Volume Discount		
Type	M-L	1~99 pcs.	100 pcs. or more	1~29 pcs.	30~99 pcs.	100~149 pcs.	150 pcs. or more
NSET SCBJ	3 - 6						
	8						
	10						
	12						
	14						
	16						
	20						
	25						
	30						
	35						
	40						
	45						
	50						
	4 - 6						
	8						
	10						
	12						
	14						
	16						
	20						
	25						
	30						
	35						
	40						
	45						
	50						
	5 - 8						
	10						
	12						
	14						
	16						
	20						
	25						
	30						
	35						
	40						
	45						
	50						
	6 - 10						
	12						
	14						
	16						
	20						
	25						
	30						
	35						
	40						
	45						
	50						

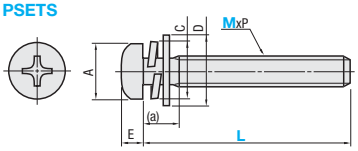
Order Example — Part Number: SCBJ6-10

Days to Ship: 6 Days P.87

■Washer Assembled Cross Recessed Pan Head Screws SW+JIS Compact W Captured

PSET
PSETS





RoHS

PSET

Screws	M Material: JIS-SWCH STKM
Washers	Spring Washers JIS B 1251 Flat Washers JIS B 1256
S Surface Treatment	Trivalent Chromate

PSETS

Screws	M Material: 1.4301/ X5CrNi18-10
Washers	Spring Washers JIS B 1251 Flat Washers JIS B 1256

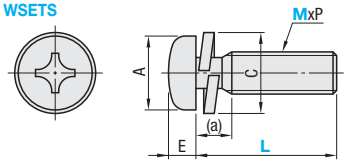
MxP	A	E	C (Max.)	D	(a)	Cross Recess Number
3x0.5	5.5	2.0	5.5	6.0	3.0	2
4x0.7	7.0	2.6	7.0	8.0	4.4	2
5x0.8	9.0	3.3	8.5	10.0	5.4	2
6x1.0	10.5	3.9	11.5	11.5	6.9	3

Part Number		PSET				PSETS			
		€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
Type	M-L	1~29 pcs.	30~99 pcs.	100~149 pcs.	150 pcs. or more	1~29 pcs.	30~99 pcs.	100~149 pcs.	150 pcs. or more
PSET PSETS	3 - 6								
	8								
	10								
	12								
	4 - 6								
	8								
	10								
	12								
	15								
	5 - 8								
	10								
	12								
	15								
	6 - 10								
	12								
	15								
	20								

■Washer Assembled Cross Recessed Pan Head Screws SW Captured

WSET
WSETS





RoHS

WSET

Screws	M Material: JIS-SWCH STKM
Washers	Spring Washers JIS B 1251 Flat Washers JIS B 1256
S Surface Treatment	Trivalent Chromate

WSETS

Screws	M Material: 1.4301/ X5CrNi18-10
Washers	Spring Washers JIS B 1251 Flat Washers JIS B 1256

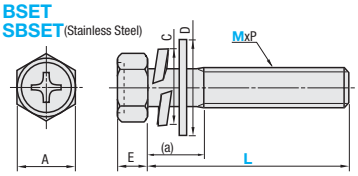
MxP	A	E	C (Max.)	(a)	Cross Recess Number
3x0.5	5.5	2.0	5.5	2.4	2
4x0.7	7.0	2.6	7.0	3.5	2
5x0.8	9.0	3.3	8.5	4.3	2
6x1.0	10.5	3.9	11.5	5.1	3

Part Number		WSET				WSETS			
		€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
Type	M-L	1~29 pcs.	30~99 pcs.	100~199 pcs.	200 pcs. or more	1~29 pcs.	30~99 pcs.	100~199 pcs.	200 pcs. or more
WSET WSETS	3 - 6								
	8								
	10								
	12								
	4 - 8								
	10								
	12								
	15								
	5 - 8								
	10								
	12								
	15								
	6 - 10								
	12								
	15								
	20								

■Washer Assembled Cross Recessed Hexagon Head Screws

BSET
SBSET (Stainless Steel)





RoHS

BSET

Screws	M Material: Structural Alloy Steel Screw JIS 0209 (6g)
Washers	Spring Washers JIS B1251 Flat Washers JIS B1256
S Surface Treatment	Trivalent Chromate

SBSET

Screws	M Material: 1.4567/X3CrNiCu18-9-4 *Strength class A2-50 equivalent Screw JIS 0209 (6g)
Washers	Spring Washers JIS B1251 Flat Washers JIS B1256
S Surface Treatment	Barrel, Passivated

MxP	A	E	C	D	(a)
4x0.7	7	2.8	7.0	10	3.0
5x0.8	8	3.5	8.5	12	4.4
6x1.0	10	4.0	11.5	13	5.4
8x1.25	13	5.5	14.5	18	8.4

(a) is the max length (reference) between head surface and the complete thread.

Part Number		BSET		SBSET	
		€ Unit Price	Volume Discount	€ Unit Price	Volume Disc.
Type	M-L	1~99 pcs.	100 pcs. or more	1~99 pcs.	100 pcs. or more
BSET SBSET	4- 8				
	10				
	12				
	14				
	16				
	20				
	25				
	30				
	35				
	40				
	45				
	50				
BSET SBSET	5-10				
	12				
	14				
	16				
	20				
	25				
	30				
	35				
	40				
	45				
	50				
BSET SBSET	6-10				
	12				
	14				
	16				

Part Number		BSET		SBSET	
		€ Unit Price	Volume Discount	€ Unit Price	Volume Disc.
Type	M-L	1~99 pcs.	100 pcs. or more	1~99 pcs.	100 pcs. or more
BSET SBSET	6-20				
	25				
	30				
	35				
	40				
	45				
	50				
	55				
	60				
	65				
	70				
	75				
BSET SBSET	8-12				
	14				
	16				
	20				
	25				
	30				
	35				
	40				
	45				
	50				
	55				
	60				
	65				
	70				
	75				

Order Example | Part Number: PSET5-10 | Days to Ship: 6 Days

P.87

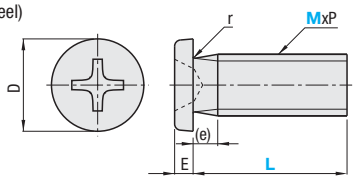
Precision Machine Screws (Package) / Ornamental Screws · Washers for Ornamental Screw

CAD Data

Precision Machine Screws (Pack) RoHS



PACK-MIB
PACK-SMIB
(Stainless Steel)



Type	M Material	S Surface Treatment
PACK-MIB	JIS SWCH16A ~C15	Trivalent Black
PACK-SMIB	1.4567/X3CrNiCu18-9-4	-

No. 0, Type 1 Pan Head Screw

Part Number Type	M	L	MxP	D	E	r (Max.)	(e) (Max.)	pcs. per package	€ Unit Price 1~2 Pkgs.	Vol. Discount 3 Pkgs. or more
PACK-MIB PACK-SMIB	1.2	2 3 4 5 *6 *8	1.2x0.25	1.8	0.5	0.05	0.4	50 pcs.		
	1.4	2 3 4 5 6 8	1.4x0.3	2			0.5			
	1.6	2 3 4 5 6 8	1.6x0.35	2.4	0.55					
	1.7	2 3 4 5 6 8	1.7x0.35	2.5	0.5		0.6			
	2.0	2 3 4 5 6 8	2.0x0.4	3	0.6					

*The sizes marked by * are available for PACK–SMIB only.

Order Example

Part Number
PACK – MIB1.6 – 5

When placing an order, please specify number of packages.
1 pack will be delivered for an order for 1.

Days to Ship

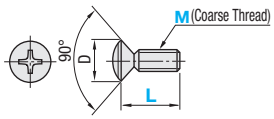
6 Days
2 Days

P.87

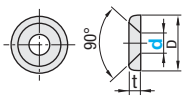
Ornamental Screws Ornamental Washer RoHS



VIS (Brass)
VISS (Stainless Steel)



VISZ (Brass)
VIZS (Stainless Steel)



M (Coarse)	P (Pitch)	D
3	0.5	6
4	0.7	8
5	0.8	10
6	1.0	12

Type	M Material	S Surface Treatment
VIS	CW508L/CuZn37	Nickel Plating
VISS	1.4567/X3CrNiCu18-9-4	-
VISZ	CW508L/CuZn37	Nickel Plating
VIZS	1.4305/X10CrNiS18-9	-

Ornamental Screws

Part Number Type	M-L	€ Unit Price 1~99 pcs.	Volume Discount 100 pcs. or more
VIS (Brass)	3-10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		
VIS (Brass)	4-10		
	15		
	20		
	30		
	35		
	40		
	45		
	50		
	55		
	60		

Part Number Type	M-L	€ Unit Price 1~99 pcs.	Volume Discount 100 pcs. or more
VIS (Brass)	5-10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	60		
VIS (Brass)	6-10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		

Part Number Type	M-L	€ Unit Price 1~99 pcs.	Volume Discount 100 pcs. or more
VISS (Stainless Steel)	3-10		
	15		
	20		
	25		
	30		
VISS (Stainless Steel)	4-10		
	15		
	20		
	25		
	30		
VISS (Stainless Steel)	5-10		
	15		
	20		
	25		
	30		
VISS (Stainless Steel)	6-10		
	15		
	20		
	25		
	30		

Ornamental Washer

Part Number Type	d	d	t	€ Unit Price *less than	Volume Discount *or more	*Quantity
VISZ (Brass)	3	10	2			2500
	4	12	2.5			1400
	5	14	3			800
	6	16	3.5			500
VIZS (Stainless Steel)	3	10	2			500
	4	12	2.5			400
	5	14	3			300
	6	16	3.5			200

Order Example

Part Number
VIS5-30
VISZ4

6 Days
2 Days

P.87

Self Tapping Screws

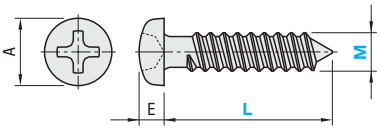
CAD Data

Self Tapping Screws - Pan Head

RoHS



TANB
TANBS



Type	Material	Surface Treatment
TANB	JIS SWCH equivalent	Trivalent Chromate
TANBS	1.4301/X5CrNi18-10 eq.	-

M	A	E	Cross Recess Number
3	5.5	2.0	2
3.5	6.0	2.3	2
4	7.0	2.6	2
5	9.0	3.3	2
6	10.5	3.9	3

Part Number		TANB				TANBS			
		€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
Type	M-L	1~29 pcs.	30~99	100~249	250~	1~29 pcs.	30~99	100~149	150~
TANB TANBS	3 - 5								
	6								
	8								
	10								
	12								
	3.5 - 6								
	8								
	10								
	12								
	4 - 6								
	8								
	10								
	12								
	16								
	5 - 8								
	10								
	12								
	16								
	20								

Order Example: Part Number TANBS4-10

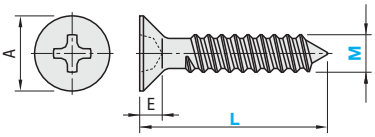
Days to Ship: 6 Days P.87

Self Tapping Screws - Flat Head

RoHS



TASA
TASAS



Type	Material	Surface Treatment
TASA	JIS SWCH equivalent	Trivalent Chromate
TASAS	1.4301/X5CrNi18-10 eq.	-

M	A	E	Cross Recess Number
3.0	6.0	1.75	2
3.5	7.0	2.00	2
4.0	8.0	2.30	2
5.0	10.0	2.80	2
6.0	12.0	3.40	3

Part Number		TASA				TASAS			
		€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
Type	M-L	1~29 pcs.	30~99	100~249	250~	1~29 pcs.	30~99	100~149	150~
TASA TASAS	3 - 6								
	8								
	10								
	12								
	3.5 - 8								
	10								
	12								
	4 - 8								
	10								
	12								
	16								
	5 - 10								
	12								
	16								
	20								

Order Example: Part Number TASAS4-10

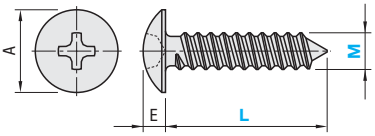
Days to Ship: 6 Days P.87

Self Tapping Screws - Truss Head

RoHS



TATR
TATRS



Type	Material	Surface Treatment
TATR	JIS SWCH equivalent	Trivalent Chromate
TATRS	1.4301/X5CrNi18-10 eq.	-

M	A	E	Cross Recess Number
3.0	6.9	1.9	1
3.5	8.1	2.2	2
4.0	9.4	2.5	2
5.0	11.8	3.1	2
6.0	14.0	3.7	3

Part Number		TATR				TATRS			
		€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
Type	M-L	1~29 pcs.	30~99	100~249	250~	1~29 pcs.	30~99	100~149	150~
TATR TATRS	3 - 6								
	8								
	10								
	12								
	3.5 - 6								
	8								
	10								
	12								
	4 - 6								
	8								
	10								
	12								
	16								
	5 - 8								
	10								
	12								
	16								
	20								

Order Example: Part Number TATR5-10

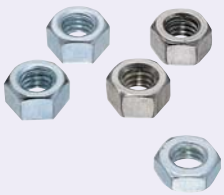
Days to Ship: 6 Days P.87

Add. Spec. Nuts

Nuts (LBNR, SLBNR, KNTR, SKNTR) can be ordered by cost saving boxes. P.169

Nuts

RoHS

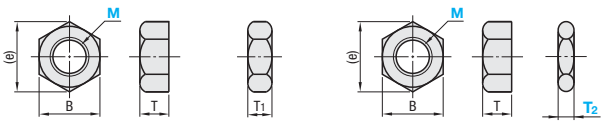


(JIS Class 1)
LBNR
(Right-Hand Thread)
SLBNR
(JIS SUS Right-Hand Thread)
LBNL
(Left-Hand Thread)
SLBNL
(JIS SUS Left-Hand Thread)

(JIS Class 3)
KNTR
(Right-Hand Thread)
SKNTR
(JIS SUS Right-Hand Thread)
KNTL (Left-Hand Thread)

ANN (Right-Hand Fine Thread)
SANN
(JIS SUS Right-Hand Fine Thread)
TNTR
(Thin Right-Hand Fine Thread)
STNTR
(JJIS SUS Thin Right-Hand Fine Thread)

(JIS Class 1) (JIS Class 3) (Fine) (Thin Type)



ANN
M Material: 1.0038/S235JR
S Surface Treatment: Trivalent Chromate Plating

LBNR · LBNL · KNTR · KNTL · TNTR
M Material: JIS-SWCH
S Surface Treatment: Trivalent Chromate Plating

SLBNR · SLBNL · SANN · SKNTR · STNTR
M Material: 1.4301/X5CrNi18-10

M	(Coarse) Pitch	B	(e)	T	T1
2	0.4	4	4.6	1.6	1.2
2.5	0.45	5	5.8	2	1.6
2.6	0.45	5	5.8	2	1.6
3	0.5	5.5	6.4	2.4	1.8
4	0.7	7	8.1	3.2	2.4
5	0.8	8	9.2	4	3.2
6	1.0	10	11.5	5	3.6
8	1.25	13	15	6.5	5
10	1.5	17	19.6	8	6
12	1.75	19	21.9	10	7
16	2.0	24	27.7	13	10
20	2.5	30	34.6	16	12
24	3.0	36	41.6	19	14

Part Number		LBNR			KNTR			SLBNR			SKNTR			LBNL		KNTL		SLBNL	
		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount		€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	M	1~9 pcs.	10~49 pcs.	50 pcs. or more	1~9 pcs.	10~49 pcs.	50 pcs. or more	1~49 pcs.	50~99 pcs.	100 pcs. or more	1~9 pcs.	10~49 pcs.	50 pcs. or more	1~99 pcs.	100 pcs. or more	1~99 pcs.	100 pcs. or more	1~99 pcs.	100 pcs. or more
LBNR LBNL (M3~M16) SLBNR (M2~M16) SLBNL (M3~M16) KNTR KNTL (M3~M20) SKNTR	2																		
	2.5																		
	2.6																		
	3																		
	4																		
	5																		
	6																		
	8																		
	10																		
	12																		
	16																		
	20																		
	24																		

No specification available for sizes with no prices shown.

Part Number		B	(e)	T	ANN		SANN	
					€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	M (Fine)				1~99 pcs.	100 pcs. or more	1~99 pcs.	100 pcs. or more
ANN SANN	4-0.5	7	8.1	4				
	5-0.5	8	9.2					
	6-0.75	10	11.5					
	8-0.75	13	15	5				
	8-1.0			6				
	10-1.0	17	19.6	6				
	10-1.25			8				
	12-1.0	19	21.9	6				
	12-1.25			10				
	12-1.5							
	14-1.5	22	25.0	11				
	16-1.5	24	27.7	8				
	20-1.5	30	34.6	10				

Part Number		B	(e)	TNTR		STNTR	
				€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	M-P-T2			1~99 pcs.	100 pcs. or more	1~99 pcs.	100 pcs. or more
TNTR STNTR	6-0.75-1.5	8	9.2				
	6-0.75-2	9	10.4				
	8-0.75-2	10	11.5				
	10-0.75-2	14	16.2				
	10-1.0-2	14	16.2				
	10-1.0-3	14	16.2				
	10-1.0-4	14	16.2				
	12-1.0-2	14	16.2				
	12-1.0-3	17	19.6				
	12-1.0-4	17	19.6				
	16-1.0-2.5	19	21.9				

Order Example — Part Number
SLBNR10
ANN10-1.25
TNTR10-1.0-4

Days to Ship
6 Days
2 Days
P.87

NEW

Price Reduction
22% on average

CAD Data

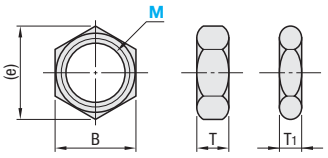
These nuts are designed with smaller hex envelope and thickness than JIS standard to be used in space-savings.

Compact Nuts

RoHS

SNTRC
SNTRCS(Thin)
PACK-SNTRC
PACK-SNTRCS(Thin)





M Material: 1.4301/X5CrNi18-10
*Strength Class SNTRC: 5T Equiv.
SNTRCS: 4T Equiv.

PACK- includes 10 pcs.

Part Number Type	M	(Coarse) Pitch	B	(e)	T	T1	SNTRC € Unit Price 1~4 pcs.	SNTRC Volume Discount 5 pcs. or more	SNTRCS € Unit Price 1~4 pcs.	SNTRCS Volume Discount 5 pcs. or more
SNTRC SNTRCS	4	0.7	6	6.9	2.4	2				
	5	0.8	7	8.1	3.2	2.5				
	6	1.0	8	9.2	3.6	3				
	8	1.25	10	11.5	5	4				

Part Number Type	M	(Coarse) Pitch	B	(e)	T	T1	Qty.	PACK-SNTRC € Unit Price 1~2 Pkgs.	PACK-SNTRC Volume Discount 3 Pkgs. or more	PACK-SNTRCS € Unit Price 1~2 Pkgs.	PACK-SNTRCS Volume Discount 3 Pkgs. or more
PACK-SNTRC PACK-SNTRCS	4	0.7	6	6.9	2.4	2	10				
	5	0.8	7	8.1	3.2	2.5	10				
	6	1.0	8	9.2	3.6	3	10				
	8	1.25	10	11.5	5	4	10				

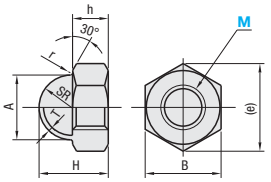
Order Example — Part Number: SNTRC5 / PACK-SNTRC4 — Days to Ship: 6 Days P.87

Domed (Acorn) Nuts

RoHS

Type	M Material	S Surface Treatment
FNT	1.4301/X5CrNi18-10	-





Hexagon nut section and the dome section are welded together.

JIS B 1183 (3 Type)

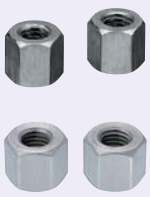
Part Number Type	M (Coarse)	H	h	B	A (min.)	T (min.)	(e) (Approx.)	r (Approx.)	€ Unit Price 1~5 pcs.	Volume Discount 6~9 pcs.	Volume Discount 10~29 pcs.	Volume Discount 30 pcs. or more
FNT	3	5.0	2.4	5.5	4.6	0.3	6.1	0.5				
	4	6.2	3.2	7	5.6		8.1					
	5	7.5	4	8	6.6	0.6	9.2					
	6	9.5	5	10	8.5		11.5	0.5				
	8	12.5	6.5	13	11.5	0.8	15					
	10	15.5	8	17	14.5	1.0	19.6					
	12	18.5	10	19	16.5	1.2	21.9					
	16	24	13	24	21.5	1.6	27.7	1.0				
	20	29	16	30	26.5		34.6					
	24	35.5	19	36	32.5	2.0	41.6					

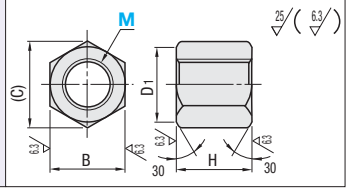
Order Example — Part Number: FNT20 — Days to Ship: 6 Days / 2 Days P.87

Tall Nuts

RoHS

Type	M Material	S Surface Treatment	H Hardness
NT	1.1191/C45E	Trivalent JIS-STKM Bright Chromate Plating	25~30HRC
SNT	1.4301/X5CrNi18-10	-	-





Part Number Type	M (Coarse)	H	B	(C)	D1	NT € Unit Price 1~49 pcs.	NT Volume Discount 50 pcs. or more	SNT € Unit Price 1~49 pcs.	SNT Volume Discount 50 pcs. or more
NT SNT	6	9	10	11.5	9.8				
	8	12	13	15	12.5				
	10	15	17	19.6	16.5				
	12	18	19	21.9	18				
	16	24	24	27.7	23				
	20	30	30	34.6	29				
	24	36	36	41.6	34				

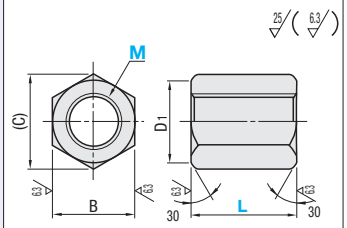
Order Example — Part Number: NT6 — Days to Ship: 6 Days P.87

Configurable Length Nuts

RoHS

Type	M Material	S Surface Treatment
NTFL	1.0038/S235JR	Electroless Nickel Plating
NTFLS	1.4301/X5CrNi18-10	-





Part Number Type	M (Coarse)	L 1mm Increment	B	(C)	D1	€ Unit Price NTFL	€ Unit Price NTFLS
NTFL NTFLS	3	3~10	6	6.9	5.3		
	4	4~15	7	8.1	6.8		
	5	5~20	8	9.2	7.8		
	6	6~25	10	11.5	9.8		
	8	8~30	13	15	12.5		
	10	10~40	17	19.6	16.5		
	12	10~50	19	21.9	18		
	16	10~50	24	27.7	23		

Order Example — Part Number: NTFL6 - 10 — Days to Ship: 8 Days

Express A: 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

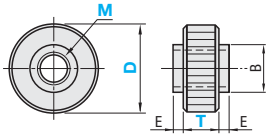
For orders larger than indicated quantity, please request a quotation.

Knurled

RoHS

Type	M Material	S Surface Treatment
FRNT	1.1191/C45E	Black Oxide
FRNTS	1.4301/X5CrNi18-10	-





Part Number Type	M (Coarse)	D	T	E	B	FRNT € Unit Price 1~49 pcs.	FRNT Volume Discount 50 pcs. or more	FRNTS € Unit Price 1~49 pcs.	FRNTS Volume Discount 50 pcs. or more
FRNT FRNTS	3	12	3 5	0.5	6				
	4	16	4 6	0.5	8				
	5	20	5 8	0.5	10				
	6	24	6 8	1	12				
	8	30	8 10	1	16				
	10	36	10 12	1	20				

Order Example — Part Number: FRNT8 - 30 - 10 — Days to Ship: 6 Days P.87

Nuts

-Cylindrical Nuts / Cylindrical Nuts with Hexagon Socket / Knurled Thumb Nuts with Side Holes-

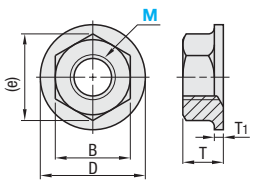
CAD Data

■Flanged Nuts RoHS



Type	M Material	S Surface Treatment
FRNUT	JIS SWCH10R ~C10	Trivalent Chromate
FRSNUT	1.4567/X3CrNiCu18-9-4	-

※Not serrated



Part Number Type	M	(Coarse)	D	B	(e)	T	T1 (Min.)	FRNUT € Unit Price 1~49 pcs.	FRNUT Volume Discount 50 pcs. or more	FRSNUT € Unit Price 1~49 pcs.	FRSNUT Volume Discount 50 pcs. or more
FRNUT FRSNUT	3	0.5	8	5.5	6.3	3.7	1				
	4	0.7	10	7	8	4.5	1.1				
	5	0.8	12	8	9.2	5.5	1.1				
	6	1	13	10	11.5	6	1.5				
	8	1.25	17	12	13.8	7.5	1.5				
	10	1.5	19	14	16.2	9	1.8				

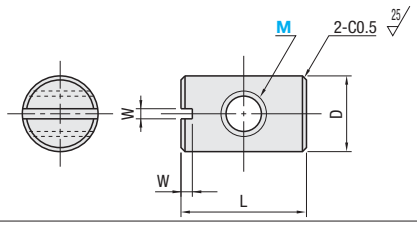
Order Example: Part Number FRNUT5

Days to Ship: 6 Days P.87

■Cylindrical Nuts RoHS



RBNT



M Material: 1.4301/X5CrNi18-10

Part Number Type	M	D	L	W	€ Unit Price
RBNT	6	12	12	1.5	
	8	14	16		
	10	18	20	2	
	12	20	24	2.5	

Order Example: Part Number RBNT10

Days to Ship: 6 Days / 2 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

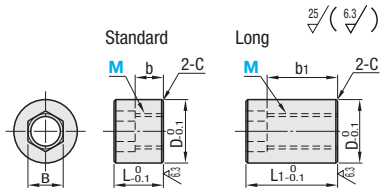
Qty.	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Round Nuts with Hexagon Sockets RoHS



Type Standard	Type Long	M Material	H Hardness	S Surface Treatment
RNSB	RNLB	1.1191/C45E	35~40HRC	Black Oxide
RNSM	RNLM			Electroless Nickel Plating



*Since D dimensions are made to correspond to the head diameter of hexagon socket head cap screws, counterbore tools can be used for recess holes. (For one size larger diameters, for example M4>>M5: Ø8.5)

Part Number Type	M (Coarse)	D	L	L1	B	b	b1	C	€ Unit Price RNSB · RNSM	€ Unit Price RNLB · RNLM
RNSB RNSM RNLB RNLM	4	8.5	5	10	4	3	8	0.3		
	5	10	7	13	5	4	10			
	6	13	9	16	6	5	12	0.5		
	8	16	12	22	8	6.5	16.5			
	10	18	14	26	10	8	20			

Order Example: Part Number RNSB6

Days to Ship: 8 Days / 2 Days — Express A 2,00 EUR/piece P.87

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

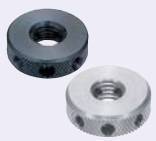
Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

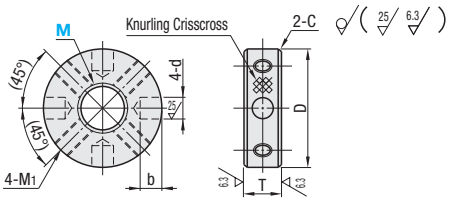
For orders larger than indicated quantity, please request a quotation.

■Round Nuts with Side Holes RoHS



Type Coarse	Type Fine	M Material	S Surface Treatment
CRNT	CRNTS	1.1191/C45E	Black Oxide
SCRNT	SCRNTS	1.4301/X5CrNi18-10	-

■Features
1. The nuts can be tightened with hex key wrenches using the holes, made to fit the wrenches, on the side.
2. The tapped holes can be used for retaining set screws.
3. Use in spaces where standard hexagon wrenches cannot reach.



Part Number Type	M	MxPitch Coarse	MxPitch Fine	D	T	d	b	Applicable Hex Key Wrench Size	M1	C	€ Unit Price CRNT	CRNTS	SCRNT	SCRNTS
CRNT(Coarse) CRNTS(Fine) SCRNT(Coarse) SCRNTS(Fine)	10	10x1.5	10x1.0	25	8	4.6	5	4	4	0.5				
	12	12x1.75	12x1.0	30	10	5.8	6	5	5					
	16	16x2	16x1.5	38	12	6.9	7	6	6	1				
	20	20x2.5	-	45	16	9.2	8	8						
	24	24x3	-	50	18		9		8					
	30	30x3.5	-	60	20	11.5	10	10						

Order Example: Part Number CRNT10

Days to Ship: 6 Days / 2 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

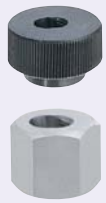
For orders larger than indicated quantity, please request a quotation.

Quick-Lock Nuts / T-Nuts / Tapered Washers / Tapered Nuts

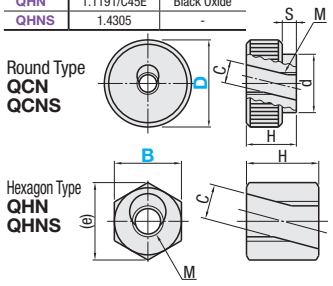
CAD Data

■Quick-Tight Nuts

RoHS



Type	M Material	S Surface Treatment
QCN	1.1181/C35E	Black Oxide
QCNS	1.4305	-
QHN	1.1191/C45E	Black Oxide
QHNS	1.4305	-

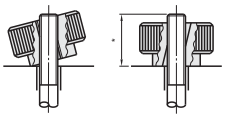


Part Number Type	D	M (Coarse)	H	S	d	C	Reference Tightening Torque N {kgf}/m	€ Unit Price QCN	€ Unit Price QCNS
QCN QCNS	24	6	14	4	16	6.7	4.8 {0.5}		
	30	8	17	5	20	8.7	9.0 {0.9}		
	36	10	20	6	28	11.0	17.5 {1.8}		
	40	12	24	8	32	13.7	17.5 {1.8}		

Part Number Type	B	M (Coarse)	H	C	(e)	Reference Tightening Torque N {kgf}/m	€ Unit Price QHN	€ Unit Price QHNS
QHN QHNS	17	6	14	6.7	19.6	4.9 {0.5}		
	19	8	17	8.7	21.9	9.8 {1.0}		
	24	10	20	11.0	27.7	15.6 {1.6}		
	27	12	24	13.7	31.2	19.6 {2.0}		

■Features and Precautions for Use

- Long threaded screws can be tightened quickly.
- Use under the reference tightening torque, avoid over tightening.
- Move the nut to the tightening position after inserting screw into the straight hole. Then rotate the knob perpendicular to the screw and tighten.
- Tightening strength will not be adequate if the thread length of the screw (*) is shorter than the nut's H dimension. Design the thread length of the screw (*) to be larger than the H dimension.



Order Example: Part Number QCN30 / QHN19

Days to Ship: 6 Days / 2 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

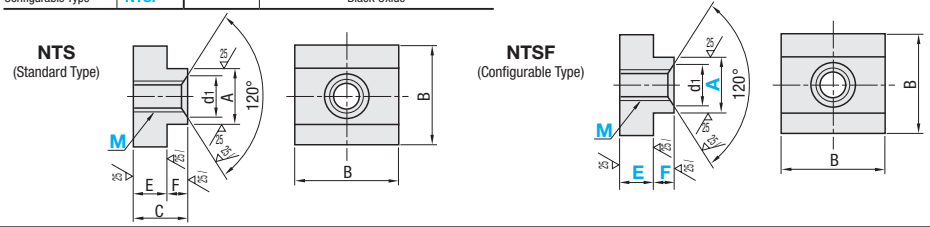
For orders larger than indicated quantity, please request a quotation.

■T-Nuts

RoHS



Type		M Material	S Surface Treatment
Standard Type	NTS	1.0038/ S235JR	Trivalent JIS STKM Bright Chromate Plating
Configurable Type	NTSF		Black Oxide



■Standard Type

Part Number Type	M (Coarse)	A	B	C	E	F	d1	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
NTS	3	3.9	7	5	3	2.0	3.5		
	4	4.8	8	6.5	4	2.5	4.5		
	5	5.8	10	8	5	3	5.5		
	6	7.7	13	9.5	6	3.5	7		
	8	9.7	13	10.5	6	4.5	9		
	10	11.7	16	12.5	7	5.5	11		
	12	17.6	25	18.5	10	8.5	14		
	16	21.6	32	24.5	14	10.5	18		
	20	24.6	35	30.5	20	10.5	22		

■Configurable Type

Part Number Type	M (Coarse)	0.1mm Increment A	E	F	B	d1	€ Unit Price 1~9 pcs.	Volume Discount 10 pcs. or more
NTSF	3	3.9~17.6	3~10	2~8.5	7	3.5		
	4				8	4.5		
	5				10	5.5		
	6				13	7		
	8				13	9		
	10				16	11		
	12				25	14		

A<B

Order Example: Part Number NTS8 / NTSF12 - A9.5 - E5.2 - F4.8

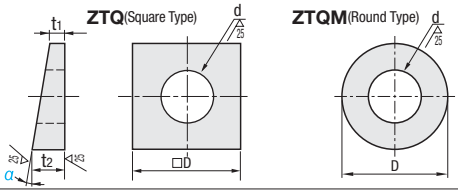
Days to Ship: - NTS 6 Days / 2 Days P.87; - NTSF 8 Days

■Tapered Washers

RoHS



Type	M Material	S Surface Treatment
ZTQ	1.0038/S235JR	Trivalent JIS STKM Bright Chromate Plating
ZTQM	1.1191/C45E	Trivalent Chromate



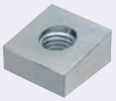
Part Number Type	No.	Angle α	d	D	Angle 3° t1	Angle 3° t2	Angle 5° t1	Angle 5° t2	Angle 8° t1	Angle 8° t2	ZTQ € Unit Price 1~49 pcs.	ZTQ Volume Discount 50 pcs. or more	ZTQM € Unit Price 1~49 pcs.	ZTQM Volume Discount 50 pcs. or more
ZTQ ZTQM	6	3° 5° 8°	7	16	1.2	2	1.6	3	1.7	4				
	8		9	18	1.1		1.4		1.5					
	10		11	22	1.8	3	2	4	1.9	5				
	12		14	26	1.6		1.7		2.3	6				
	16		18	32	3.3	5	3.2	6	3.5	8				
	20		21	40	2.9		2.5		3.4	9				
	24		27	52	3.3	6	3.5	8	3.7	11				

Order Example: Part Number ZTQ6 - α 5

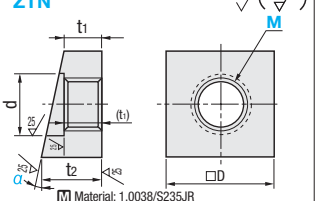
Days to Ship: 6 Days P.87

■Tapered Nuts

RoHS



ZTN



M Material: 1.0038/S235JR

S Surface Treatment: Trivalent JIS STKM Bright Chromate Plating

Part Number Type	M (Coarse)	Angle α	D	Angle 3° t1	Angle 3° t2	Angle 5° t1	Angle 5° t2	Angle 8° t1	Angle 8° t2	d	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
ZTN	6	3° 5° 8°	16	5	5.8	5	6.4	5	7.2	7		
	8		18	6.5	7.4	6.5	8.1	6.5	9	9		
	10		22	8	9.2	8	9.9	8	11.1	11		
	12		26	10	11.3	10	12.2	10	13.5	13		
	16		32	13	14.7	13	15.8	13	17.5	17		

NEW

U-Nuts® / Double Locking Nuts

-Hard Lock Nuts®-

Price Revision

: New Price

CAD Data

■U-Nuts®

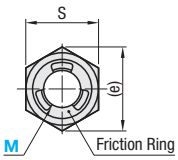


RoHS

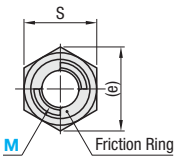
Not RoHS compliant

Type		(1) Main Material	(2) Friction Ring Material	Surface Treatment	Screw Accuracy
Single Item	Pack				
UNUTZ	PACK-UNUT	1.0038/S235JR	1.4319/X3CrNiN17-8	JIS STKM Bright Chromate Plating	JIS6H (Class 2)
UNUTKZ	PACK-UNUTK	1.0038/S235JR	1.4319/X3CrNiN17-8	Trivalent Chromate	JIS6H (Class 2)
UNUTSZ	PACK-UNUTS	1.4301/X5CrNi18-10	1.4319/X3CrNiN17-8	-	JIS6H (Class 2)

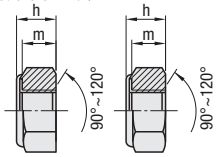
(M6 or less)



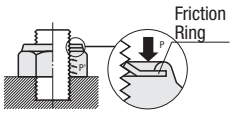
(M8 or more)



(UNUT / UNUTZ16 / UNUTK / UNUTKZ16 / UNUTS / UNUTSZ4~16) (UNUT / UNUTZ4~12 / UNUTK / UNUTKZ4~12)



When the friction ring makes a contact with the thread as shown in the figure below, spring action generates a reaction force P. A friction torque (prevailing torque) that prevents the nut from rotating is then generated by the nut due to another reaction force P'.



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Part Number Type	M	UNUTZ € Unit Price 1~9 pcs.	UNUTZ Volume Discount 10 pcs. or more	UNUTKZ € Unit Price 1~9 pcs.	UNUTKZ Volume Discount 10 pcs. or more	UNUTSZ € Unit Price 1~9 pcs.	UNUTSZ Volume Discount 10 pcs. or more
UNUTZ UNUTKZ UNUTSZ	4						
	5						
	6						
	8						
	10						
	12						
	16						

Part Number Type	M	Qty. /1 pkg.	PACK-UNUT € Unit Price 1~9 pkgs.	PACK-UNUT Volume Discount 10 pkgs. or more	PACK-UNUTK € Unit Price 1~9 pkgs.	PACK-UNUTK Volume Discount 10 pkgs. or more	PACK-UNUTS € Unit Price 1~9 pkgs.	PACK-UNUTS Volume Discount 10 pkgs. or more
PACK-UNUT PACK-UNUTK PACK-UNUTS	4	100						
	5	100						
	6	100						
	8	100						
	10	50						
	12	50						
	16	50						

*100 pcs./pack for M4~8; 50 pcs./pack for M10~16.

M	Pitch	S Reference Dim.	S Tolerance	h Reference Dim.	h Tolerance	m	(e)	Tightening Torque N·m (kg/cm) UNUT · UNUTK	Tightening Torque N·m (kg/cm) UNUTS
4	0.7	7	0 -0.2	3.8	±0.3	3	8.1	2.2 (22)	1.9 (19)
5	0.8	8		4.6		3.9	9.2	4.4 (45)	3.8 (39)
6	1.0	10		5.1		4.2	11.5	7.4 (75)	6.5 (66)
8	1.25	13	0 -0.25	7.3	±0.4	6.1	15	18 (180)	16 (160)
10	1.5	17		8.3		7.1	19.6	36 (370)	31 (320)
12	1.75	19	0 -0.35	10.5		9	21.9	62 (630)	55 (560)
16	2.0	24		14.5	±0.5	13	27.7	155 (1600)	135 (1400)

Part Number UNUTZ4 PACK-UNUT12

6 Days P.87

■Features of U-Nuts®

- Capable of stable anti-loosening effect. Prevents screws from falling off despite decline in axial tension.
- Being a solid metal product, the nuts are highly resistive to heat and cold.
- Simplified fastening task makes work management easier.
- Easy parts management prevents inappropriate installation.
- Reusable.

⚠Cautions

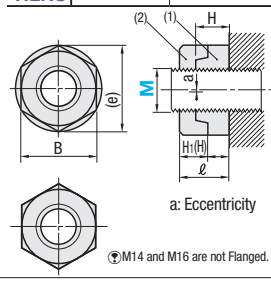
- Make 2 pitches or more of the thread protrude from the friction ring.
1. When tightening the nut refer to the Tightening Torque Chart.
2. Use chamfered tipped screws of JIS6g (Grade 2) in thread precision.
3. Use appropriate lubricant if seizure or scuffing occurs when screwing or unscrewing the nut onto threads.
4. Cannot be screwed in from the friction ring side.
5. Discontinue the use if abnormal deformation occurs in the friction ring or the clamp.

■Double Locking Nuts



RoHS

Type	M Material	S Surface Treatment
HLN	1.0038/S235JR	Trivalent Chromate
HLNS	1.4301/X5CrNi18-10	-



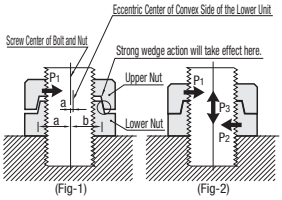
M14 and M16 are not Flanged.

Part Number Type	M	MxPitch	B	(e)	(1) Lower Nut H	(1) Lower Nut Tolerance	(2) Upper Nut H1	(2) Upper Nut Tolerance	Pair Height ℓ Tolerance	(h)	Weight per Set (g)	€ Unit Price HLN	€ Unit Price HLNS
HLN HLNS (Stainless Steel)	6	6x1.0	10	11.5	5	±0.3	5	$^{0}_{-0.3}$	8	3	4		
	8	8x1.25	13	15	6.5	0 -0.58	6.5	0 -0.58	10.6	4.1	8.9		
	10	10x1.5	17	19.6	8		8		13.2	5.2	18		
	12	12x1.75	19	21.9	10		9.3		16	7.0	26		
	14	14x2.0	22	25.4	11	0 -0.7	11	0 -0.7	18.5	7.5	39		
	16	16x2.0	24	27.7	13		13		22.5	9.5	52.8		

■Tightening Torque Chart (Reference Value)

M	(1) Lower Nut By Material: Tightening Torque Reference Value Chart (N.m) 1.0038/S235JR 4.8 (320N/mm²)	1.1191/C45E 8.8 (640N/mm²)	1.7220/34CrMo4 10.9 (900N/mm²)	1.4301/X5CrNi18-10 or 316 50 (210N/mm²)	1.4301/X5CrNi18-10 or 316 70 (450N/mm²)	(2) Upper Nut All Materials Tightening Torque (N.m)
6	2.3~6	-	-	1.5~4	3.3~9	4~5
8	5.6~15	11.2~30	15.8~42	3.7~10	7.9~21	9~13
10	11~30	22~59	31~84	7~20	16~42	18~24
12	19~52	39~104	55~146	13~34	27~73	27~39
14	31~82	62~165	87~232	20~54	44~116	40~58
16	48~129	97~257	136~362	32~84	68~181	70~100

■Structure and Function of Hard Lock Nut®



Hard Lock Nuts® is a registered trademark of Hard Lock Industry Co., Ltd.

⚠Cautions

Screws or shafts should be made to JIS6g (Grade 2) in thread precision, or Hard Lock Nuts may not fit well. Although outer diameter of the upper nut and the lower nut may become eccentric or clearance may occur during assembling caused by its structure, it does not affect the operation.

* Fig-1: When upper nut is tightened, stress is automatically applied in P1 arrow direction. Horizontal stress continues to increase with tightening until upper nut closely contacts lower nut as shown in Fig.-2. The nuts are fully locked by the wedge effect.

*Fig.-2: After nuts are tightened, internal stress remains distributed as composite stress of P1+P2+P3 to resist external impact.

Part Number HLN8

6 Days P.87

2 Days

Price

- HLN

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99
Applicable Price	€ Unit Price	Volume Discount
	Price List	5%

- HLNS

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Washers / Washers for Slotted Holes / Metal Washers

NEW

Price Reduction 27% on average

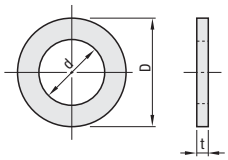
CAD Data

Flat washers and spring washers can be ordered by cost saving boxes. P.170

Flat Washers RoHS

PWF
SPWF





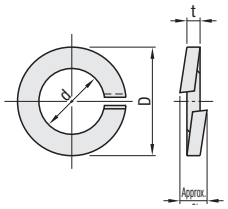
	PWF	SPWF
M Material:	1.0330/DC01	1.4301/X5CrNi18-10
S Surface Treatment:	Trivalent Chromate	—
		JIS B 1256

Part Number		PWF				SPWF			
Type	Nominal	€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
		1~24 pcs.	25~199 pcs.	200~499 pcs.	500 pcs. or more	1~24 pcs.	25~199 pcs.	200~499 pcs.	500 pcs. or more
PWF SPWF	2								
	2.5								
	2.6								
	3								
	4								
	5								
	6								
	8								
	10								
	12								
	16								
	20								
	24								

Spring Washers RoHS

SLW
SSLW





	SLW	SSLW
M Material:	JIS SWRH	1.4301/X5CrNi18-10-N1
S Surface Treatment:	Trivalent Chromate	—
		JIS B 1251

Part Number		SLW				SSLW			
Type	Nominal	€ Unit Price	Volume Discount			€ Unit Price	Volume Discount		
		1~24 pcs.	25~199 pcs.	200~499 pcs.	500 pcs. or more	1~24 pcs.	25~199 pcs.	200~499 pcs.	500 pcs. or more
SLW SSLW	2								
	2.5								
	2.6								
	3								
	4								
	5								
	6								
	8								
	10								
	12								
	16								
	20								
	24								

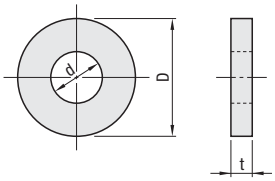
Order Example — Part Number: PWF3

Days to Ship: 6 Days / 2 Days P.87

Washers for Slotted Holes RoHS

Type	M Material	S Surface Treatment
PACK-PWFN	1.0330/DC01	Trivalent Chromate
PACK-SPWFN	1.4301/X5CrNi18-10	-





■Features
-Thicker flat washers than the standard type. Usable to prevent washers for Slotted Holes from falling.

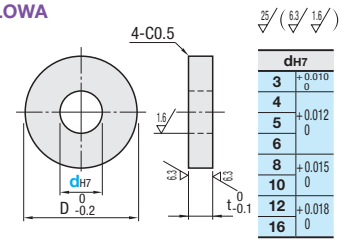
Part Number		PACK-PWFN			PACK-SPWFN			No. of pieces	PACK-PWFN		PACK-SPWFN	
Type	Nominal	d	D	T	d	D	T		€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
									1~2 Pack	3 packs or more	1~2 Pack	3 packs or more
PACK -PWFN PACK -SPWFN	3	3.4	8	1	3.3	8	1	50				
	4	4.5	10	1.6	4.5	10	1.5	50				
	5	5.5	16	2	5.5	12	2	20				
	6	6.5	16	3.2	6.5	13	3	20				
	8	8.5	20	3	8.5	22	3	20				

Metal Washers RoHS

LOWA



M Material: 1.0038/S235JR



dH7	
3	+0.010 0
4	
5	+0.012 0
6	
8	+0.015 0
10	
12	+0.018 0
16	

Part Number		D	t	€ Unit Price	Volume Discount		
Type	d			1~49 pcs.	50~99	100~200	201~300
LOWA	3	6	5				
	4	10					
	5						
	6	14	8				
	8	18					
	10	22					
	12	25	10				
	16	32					

Order Example — Part Number: PACK-PWFN3, LOWA5

Days to Ship: 6 Days / 2 Days P.87

Lock Washers (Nord-Lock) / Tab Washers / Disc Spring Washers

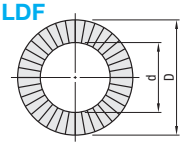
Spec.Change Printed in Purple

CAD Data

NLDF

RoHS





M Material: 1.4404/X2CrNiMo17-12-2 equivalent H Hardness 51HRC

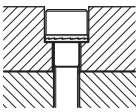
Part Number Type	No.	Applicable Screws	D	d	t	NLDF € Unit Price 1~9 pcs.	NLDF Volume Discount 10 pcs. or more
NLDF	3	M3	7	3.4	2.2		
	4	M4	7.6	4.4			
	5	M5	9	5.4			
	6	M6	10.8	6.5			
	8	M8	13.5	8.7	2.0		

This product is to be used in pairs.

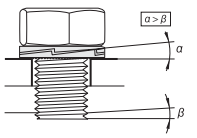
Order Example — Part Number: NLDF3

Days to Ship: 6 Days P.87

Example



Counterbore dia. does not need to be larger than the screw head.





Principle of Self-locking Washers

A pair of washers with wedge cams on one side and radial ribs on the other side each to compose a self-locking arrangement.
Cam angle (α) is set to be larger than the thread lead angle (β)
When the screw attempts to rotate loose, a force is generated by a cam member to push up and separate from the opposite cam member. The rotation is blocked by the wedge effect and the cams will not be separated by more than one thread pitch.

Proper Installation

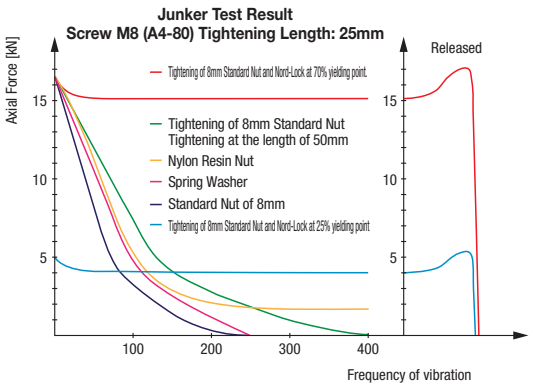
The washers come pre-assembled in pairs (glued).
Upon reusing, please confirm the cams are not worn or cracked, and follow the installation instruction on the right. Do not use together with other washers.

Cautions on Repeated Use

NLDF can be used repeatedly. Use lubricant for repeated use.

Allowable Temperature

Temperature limit for NLDF is 500°C.
Do not use in an environment when it exceeds the temperature limit.



About mating materials

On the surface of mating materials, there will be impression marks made by the radial teeth of the washers. The hardness of the mating surfaces should not exceed the hardness of the Nord-Lock washers.

Recommended Tightening Torque and Tightening Force

Please refer to the values listed below as guidelines when securing a screw with a Nord-Lock. There is no self-locking effect when the values are far below recommended values. If the tightened torque exceeds the recommended figures, loosening the screws may become impossible or Nord-Lock may be broken.

Screw tightening torque and recommended tightening force when Self-locking Washer is used.

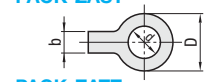
(Lubricant GTP600)

NLDF	Applicable Screws MxP	Screw Strength Class A2-70, A4-70 GF=0.65 μG=0.14, μW=0.14 Torque Nm	Tightening Force kN	Screw Strength Class A2-80, A4-80 GF=0.65 μG=0.14, μW=0.14 Torque Nm	Tightening Force kN
3	3x0.5	0.9	1.5	1.2	2
4	4x0.7	2	2.6	2.7	3.4
5	5x0.8	3.9	4.1	5.3	5.5
6	6x1.0	6.9	5.9	9.2	7.8
8	8x1.25	17	11	22	14

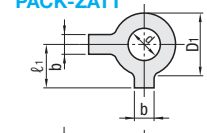
GF: Yield point coefficient, μG: Friction coefficient of screw thread, μW: Friction coefficient of washer

Tab Washers-One-Tabbed / Tab Washers-Two-Tabbed

PACK-ZAST



PACK-ZATT





RoHS

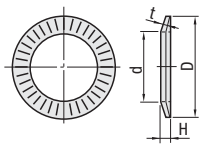
10 pcs. per Package

M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	d	D	D1	t	ℓ	ℓ1	b	€ Unit Price 1~9 pkgs.	Volume Discount 10 pkgs. or more
PACK-ZAST PACK-ZATT	3	3.2	12	7	0.29	13	5	4		
	4	4.3	14	9		14	7	5		
	5	5.3	17	10	0.5	15	8	6		
	6	6.5	18	13			9			
	8	8.5	22	16		20	13	7		
	10	10.5	26	20	0.8	22	14	9		
	12	12.5	30	24		27	19	10		
	16	17	38	30	1.2	32	24	12		
	20	21	45	38		36	28	15		
	24	25	52	44		44	35	17		

Serrated Conical Disc Spring Washers — GTS





RoHS

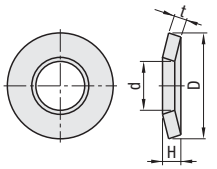
M Material: 1.1206/C50E~S70C
H Hardness: 40~48HRC
S Surface Treatment: Tempered Collar JIS G 3311

Part Number Type	No.	D	d	H	t	€ Unit Price less than *	Volume Discount * or more	*Quantity
GTS	3	5.5	3.2	0.6	0.45			15000
	4	7	4.25	0.7	0.5			10000
	5	8.5	5.25	0.85	0.6			5000
	6	10	6.4	1.25	1.0			6000
	8	13	8.4	1.55	1.2			3000
	10	16	10.6	1.90	1.5			2000
	12	18	12.6	2.20	1.8			1000
	16	24	16.9	2.80	2.3			500
	20	30	20.9	3.55	2.8			250
	24	36	25.4	4.25	3.5			150

No.3~5 Light Load, No.6~24 Heavy Load

Disc Spring Washers — SSRBW





RoHS

M Material: 1.4301/X5CrNi18-10 - CSP
H Hardness: 37~46HRC
JIS B 1251 class 2 equivalent

Part Number Type	No.	D	d	H	t	€ Unit Price 1~49 pcs.	Volume Discount 50~69	70~99	100~500
SSRBW	4	7.5	4.3	0.7	0.45				
	5	9.0	5.3	0.85	0.55				
	6	10.5	6.4	0.95	0.60				
	8	13.5	8.4	1.3	0.90				
	10	16.5	10.5	1.6	1.10				
	12	19.0	13.0	1.75	1.20				

Light Load

Order Example — Part Number: PACK-ZAST3, GTS10, SSRBW8

Days to Ship: 6 Days / 2 Days P.87

Square Washers · Nuts

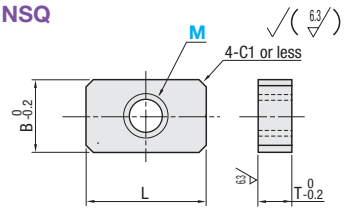
CAD Data

■Square Nuts

RoHS



NSQ



M Material: 1.0038/S235JR

S Surface Treatment: Trivalent JIS STKM Bright Chromate Plating

Part Number Type	M (Coarse)	L	B	T	€ Unit Price 1~49 pcs.	Volume Discount 50 pcs. or more
NSQ	4	7	7	3.2		
	5	8	8	4		
	6	16	10	4.5		
	8	42	15.5	6		

Order Example: Part Number NSQ8

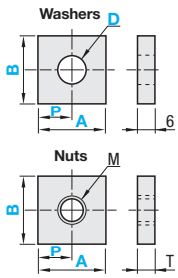
Days to Ship: 6 Days | 6 Days P.87

■Square Washers · Nuts –Dim. Configurable One-Hole Type–

RoHS



Type Washers	Nuts	M Material	S Surface Treatment
FKW	FKT	1.1191	-
FKWB	FKTB	1.1191	Black Oxide
FKWS	FKTS	1.4301	-

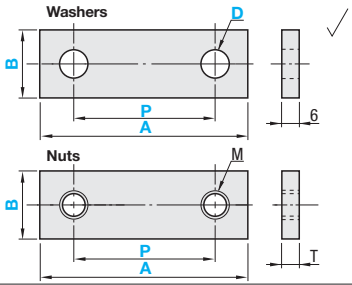


■Square Washers · Nuts –Dim. Configurable Two-Hole Type–

RoHS



Type Washers	Nuts	M Material	S Surface Treatment
FK2W	FK2T	1.1191	-
FK2WB	FK2TB	1.1191	Black Oxide
FK2WS	FK2TS	1.4301	-



Part Number Type	B	1mm Increment A	0.5mm Increment P	D Selection	€ Unit Price FKW	FKWB	FKWS
Washers FKW FKWB FKWS	16	16~50	D/2+2≤P≤A-D/2-2	7 9			
	22			7 9			
	25			7 9 11 14			
	38			7 9 11 14			

Part Number Type	B	1mm Increment A	P	D Selection
Washers FK2W FK2WB FK2WS	16	30~200	2D≤P≤A-2D	7 9
	22			7 9
	25			7 9 11 14
	38			7 9 11 14

Part Number Type	B	1mm Increment A	0.5mm Increment P	M (Coarse)	T	€ Unit Price FKT	FKTB	FKTS
Nuts FKT FKTB FKTS	16	16~50	M/2+2≤P≤A-M/2-2	6	6			
	22			8	6			
	25			10	9			
	38			12	10			

B		€ Unit Price A30~50	A51~100	A101~150	A151~200
16	FK2W				
	FK2WB				
	FK2WS				
22	FK2W				
	FK2WB				
	FK2WS				
25	FK2W				
	FK2WB				
	FK2WS				
38	FK2W				
	FK2WB				
	FK2WS				

Part Number Type	B	1mm Increment A	P	M (Coarse)	T
Nuts FK2T FK2TB FK2TS	16	30~200	2M≤P≤A-2M	6	6
	22			8	6
	25			10	9
	38			12	10

B		€ Unit Price A30~50	A51~100	A101~150	A151~200
16	FK2T				
	FK2TB				
	FK2TS				
22	FK2T				
	FK2TB				
	FK2TS				
25	FK2T				
	FK2TB				
	FK2TS				
38	FK2T				
	FK2TB				
	FK2TS				

Order Example: Part Number - A - P - D

FKW16 - A20 - P10 - D7

FK2T16 - A40 - P25

Days to Ship

-FKW · FKWS · FKT · FKTS · FK2W · FK2WS · FK2T · FK2TS

8 Days

Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

-FKWB / FKTB / FK2WB / FK2TB

10 Days

Express B | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Small Parts / Magnets

Small Parts/ Magnets


Addition


Price Reduction 10% on average







Product Name	Parallel Keys	-Configurable-	-With Counterbore-	-With Female Thread Counterbore Hole-	-With Counterbores and Female Thread Hole-
Page	237	238	239	239	240




NEW
Price Reduction 10% on average


NEW







-With Pull-Out Female Thread Hole-	Parallel Keys -Blank Type-	Tapered Machine Keys with Gib Head	Dowel Pins / General Purpose Pins	Dowel Removal Jigs	Dual-Fit Dowel Pins
240	241	242	243~248	248	249













-Hollow, Female Thread-	Stepped Dowel Pins	Insulating Dowel Pins	Resin Dowel Pins	Spring Pins	Screw Plugs
249	250	250	250	251	252


Price Reduction Up to 60%




Price Reduction 40% on average






Addition
Price Reduction Up to 40%

Retaining Rings -C Type (External)-	Retaining Rings -E Type	Retaining Rings -C Type (Internal)-	Split Pins	Split Pins	Thread Inserts
253	253	254	254	254	255





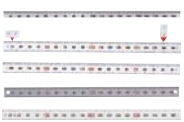






Tools for Thread Inserts	Tangless Inserts	Hand Taps for Tangless Inserts / Tools	Self-Tapping Inserts
255	256	256	256

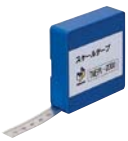











スチールテープ

Hand Tools for Self-Tapping Inserts	Scale Plates and Pointer Plates	Angle Scales -Plate Type-	Double -Adhesive Tape-	Scale Tapes
256	257- 258	259	259	259









Bubble Levels -Surface Mounting Type-	-Embedded Type-	Grease Fittings	Hardening Precision Balls	Loss-Proof Stainless Steel Chains
260	260	260	260	261



Loss-Proof Chains
261



Loss-Proof Wires
262



Metal Joints
262



Brackets
262



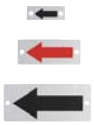
Connecting Parts -Double Ring-
262



Temperature Sensing Labels
263



Arrow Sign Stickers
264



Arrow Sign Plates
264



Open / Closed Sign Plates
264



Stickers
265- 266

Addition



Price Reduction
Up to 41%

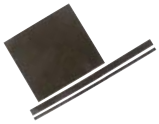
Magnets-Round-
268



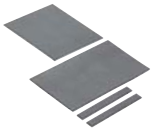
-Ring-
269



-Square-
269



Rubber Magnets -Super Strong Type-
270



Rubber Magnets -Strong Type-
270



Rubber Magnets -Standard Type-
270



-With Countersink-
271



-Countersunk with Holder-
272



-Oval Holder-
272

NEW



Price Reduction
Up to 7%

Urethane Coated Magnets
273

NEW



Male Thread Magnets with Holders
273

Addition



Price Reduction
Up to 27%

Magnets with Holders
274~276



Magnets with Holder -Tolerance h7 Type-
275



Hex Head Bolts with Magnets (Regular)
277



Hex Head Bolts with Magnets - Low Small Head Type-
277

NEW



Magnet Blocks with Three-Side Attraction
278



Screw Stoppers with Magnet
278



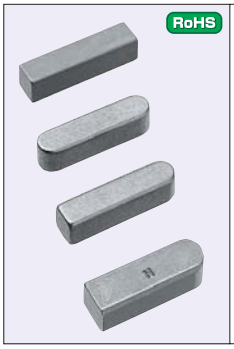
Electromagnetic Holders -Standard Type / Thin Type / Female Thread Through Hole Type / Rectangular Type / Axial Cable Type-
279



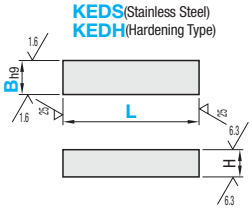
Rectifiers for Electromagnetic Holders
280

Add. Spec. Parallel Keys

CAD Data



RoHS



Type	Material	Tensile Strength
KED KES KEG	1.1191/C45E	600N/mm² or more
KEDS KESS KEGS	1.4401/X5CrNiMo17-12-2	600N/mm² or more
KEDH KESH KEGH	1.1191/C45E 25~30HRC	700N/mm² or more

JISB1301-1996 (New JIS Standard)

Hardening Type has an engraved mark for identification.

Part Number Type	Bh9	L	H Tolerance	C
KED KES KEG (Stainless Steel) KEDS KESS KEGS	2	0 -0.025	6 8 10 15 20	2	0 -0.025	0.16 ~ 0.25
	3		6 8 10 12 15 16 18 20 25 30	3		
	4	0 -0.030	8 10 12 15 16 18 20 25 30 35 40 45 50	4	0 -0.030	0.25 ~ 0.40
	5		10 12 15 16 18 20 22 25 28 30 32 35 40 45 50 55 60	5		
	6		10 12 15 16 18 20 22 25 28 30 32 35 40 45 50 55 60	6		
	7	0 -0.036	15 20 22 25 28 30 32 35 40 45 50 60 70	7	0 -0.036	
	8		10 12 15 16 18 20 22 25 28 30 32 35 40 45 50 55 60 70 80 65 90			
	10		15 16 18 20 25 30 35 40 45 50 55 60 70 80 65 90	8	0 -0.090	0.40 ~ 0.60
	12	0 -0.043	20 25 30 35 40 45 50 55 60 70 80 65 90			
	14		30 35 40 45 50 55 60 70 80 65 90	9		
	15		30 35 40 45 50 55 60 70 80 90	10		
	16		40 45 50 55 60 70 80 90 100			
	18		40 45 50 55 60 70 80 90 100 110	11	0 -0.110	

Order Example: Part Number - L → KED6 - 30

Days to Ship

B2~12: 6 Days P.88

2 Days

B14~18: 8 Days

Express A 2,00 EUR / piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Part Number Type	Bh9	L	H Tolerance	C
(Hardening Type) KEDH KESH KEGH	4	0 -0.030	8 10 12 15 16 20 25 30	4	0 -0.030	0.16 ~ 0.25
	5		10 12 15 16 20 25 26 28 30 32 35 40 45 50	5		
	6		10 15 16 20 25 26 28 30 32 35 40 45 50	6		0.25 ~ 0.40
	7	0 -0.036	15 20 25 26 28 30 32 35 40 45 50	7	0 -0.036	
	8		15 20 25 26 28 30 32 35 40 45 50			
	10		15 20 25 30 35 40 45 50	8	0 -0.090	0.40 ~ 0.60
	12	0 -0.043	20 25 30 35 40 45 50			

Order Example: Part Number - L → KESH6 - 30

Days to Ship

KESH B4~12
KEDH · KEGH B4~6, 8, 10
6 Days P.87

KEDH · KEGH B7, 12
8 Days

Express A 2,00 EUR / piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

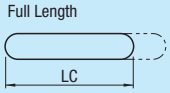
B	KED · KES · KEG € Unit Price	Volume Discount 4~19	20~100	101~400	KEDS · KESS · KEGS € Unit Price	Volume Discount 4~19	20~100	101~400	KEDH · KESH · KEGH € Unit Price	Volume Discount 4~19	20~100	101~400
	Qty. 1~3				Qty. 1~3				Qty. 1~3			
2												
3												
4												
5												
6												
7												
8												
10												
12												
14												
15												
16												
18												

L	Tolerance	L	Tolerance
Min.~10	0 -0.15	81~120	0 -0.35
11~18	0 -0.18	121~180	0 -0.40
19~30	0 -0.21	181~250	0 -0.46
31~50	0 -0.25	251~300	0 -0.52
51~80	0 -0.30		

Days to Ship

2 Days

Alterations

Alteration	Code	Spec.	Price Adder
Full Length 	LC	Specifies L dimension in 1mm increment.	2,00

B	LC Range	B	LC Range
2	5~20	10	15~ 80
3	6~30	12	20~ 80
4	8~50	14	25~ 90
5	8~50	15	25~ 90
6	10~60	16	35~100
7	15~60	18	35~110
8	15~80		

Part Number - L(LC) → KED6 - LC28

8 Days

Express A 2,00 EUR / piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Parallel Keys
-Configurable-

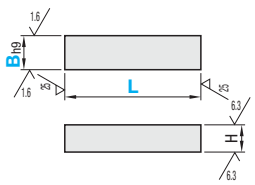
Price Reduction
10% on average

CAD Data

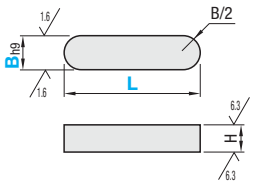
■Parallel Keys Configurable RoHS



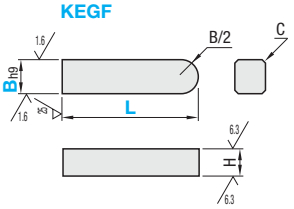
KEDF



KESF



KEGF



JISB1301-1996 (New JIS Standard)

Type	Material	Tensile Strength
KEDF KESF KEGF	1.1191/C45E	600N/mm² or more

Part Number Type	B h9	L 1mm Increment	H Tolerance	C	KEDF € Unit Price	KEDF Volume Discount Qty. 1~19	20~29	30~49	50~100	101~400	KESF € Unit Price	KESF Volume Discount Qty. 1~19	20~29	30~49	50~100	101~400	KEGF € Unit Price	KEGF Volume Discount Qty. 1~19	20~29	30~49	50~100	101~400
KEDF KESF KEGF	2	5~20	2	0.16~0.25																		
		21~30																				
	3	6~30	3																			
		31~50																				
	4	6~50	4																			
		51~60																				
	5	8~50	5	0.25~0.40																		
		51~60																				
	6	8~60	6																			
		61~80																				
	7	10~60	7																			
		61~100																				
	8	10~80																				
		81~100																				
	10	15~80	8	0.40~0.60																		
		81~100																				
	12	15~80																				
		81~150																				
	14	16~90	9																			
		91~150																				
	15	18~90	10																			
		91~150																				
	16	20~100	10	0.40~0.60																		
		101~150																				
	18	30~110	11																			
		111~150																				

Order Example: Part Number KEGF2 - L 12

Days to Ship: B2~18 — 8 Days — Express A — 2,00 EUR / piece

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Part Number Type	B h9	L 1mm Increment	H Tolerance	C	KEDF € Unit Price	KEDF Volume Discount Qty. 1~4	5~9	10~19	20~29	30~100	KESF € Unit Price	KESF Volume Discount Qty. 1~4	5~9	10~19	20~29	30~100	KEGF € Unit Price	KEGF Volume Discount Qty. 1~4	5~9	10~19	20~29	30~100
KEDF KESF KEGF	20	40~100	12	0.60~0.80																		
		101~150																				
		151~200																				
	22	40~100	14																			
		101~150																				
		151~200																				
	25	40~100																				
		101~150																				
		151~200																				
		201~250																				
	28	40~100	16																			
		101~150																				
		151~200																				
		201~250																				
		251~300																				
	32	40~100	18																			
		101~150																				
		151~200																				
		201~250																				
		251~300																				

Order Example: Part Number KEGF28 - L 120

Days to Ship: B20~32 — 10 Days — Express B — 2,00 EUR / piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Parallel Keys

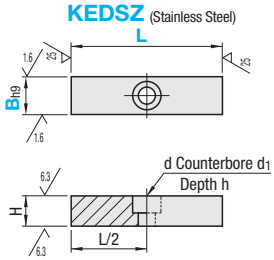
-With Counterbore · With Female Thread Counterbore Hole-

CAD Data

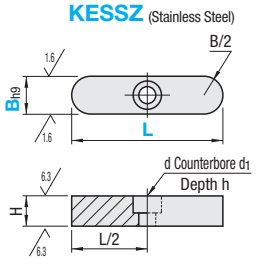
■Parallel Keys With Counterbore RoHS



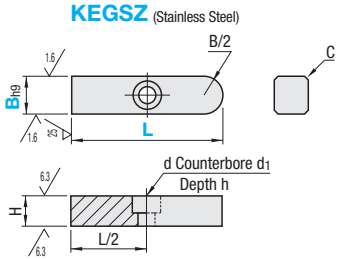
KEDZ
KEDSZ (Stainless Steel)



KESZ
KESSZ (Stainless Steel)



KEGZ
KEGSZ (Stainless Steel)



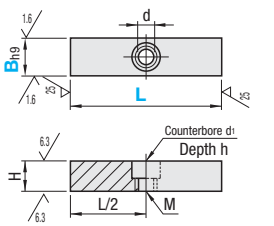
Type	Material	Tensile Strength
KEDZ KESZ KEGZ	1.1191/C45E	600N/mm²
KEDSZ KESSZ KEGSZ	1.4401/X5CrNiMo17-12-2	or more

Part Number Type	Bh9		L 5mm Increment	H Tolerance		d	d1	h	C	€ Unit Price KEDZ	KEDSZ	KESZ	KESSZ	KEGZ	KEGSZ
KEDZ KEDSZ (Stainless Steel) KESZ KESSZ (Stainless Steel) KEGZ KEGSZ (Stainless Steel)	8	0 -0.036	15~80	7	0 -0.090	3.4	6	3.5	0.25~0.40						
	10		15~80	8		4.5	7.5	4.5	0.40~0.60						
	12	0 -0.043	20~80			5.5	9.5	5.5							
	14		30~90	9											
	15		30~90	10											
	16		40~100												
	18		40~110	11	0 -0.110	6.6	11	6.5							

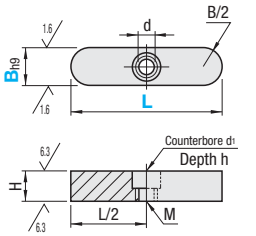
■Parallel Keys With Female Thread Counterbore Hole RoHS



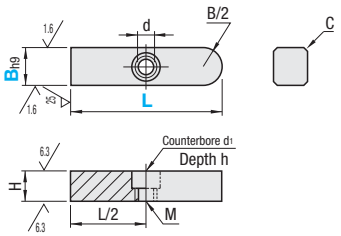
KEDY
KEDSY (Stainless Steel)



KESY
KESSY (Stainless Steel)



KEGY
KEGSY (Stainless Steel)



The hole can be used as a mounting hole as well as a tapped hole.

Type	Material	Tensile Strength
KEDY KESY KEGY	1.1191/C45E	600N/mm² or
KEDSY KESSY KEGSY	1.4401/X5CrNiMo17-12-2	more

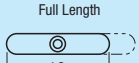
Part Number Type	Bh9		L 5mm Increment	H Tolerance		Female Thread M (d)	Mounting Screw	d1	h	C	€ Unit Price KEDY	KEDSY	KESY	KESSY	KEGY	KEGSY
KEDY KEDSY (Stainless Steel) KESY KESSY (Stainless Steel) KEGY KEGSY (Stainless Steel)	8	0 -0.036	15~80	7	0 -0.090	M4 (3.5)	M3	6	3.5	0.25~0.40						
	10		15~80	8		M5 (4.3)	M4	7.5	4.5	0.40~0.60						
	12	0 -0.043	20~80													
	14		30~90	9		M6 (5.3)	M5	9.5	5.5							
	15		30~90	10												
	16		40~100													
	18		40~110	11	0 -0.110											

Order Example

Part Number	-	L
KEDZ8	-	30
KEDY10	-	40

Alterations

Part Number - L(LC)
KEDZ8 - LC28

Alteration	Code	Spec.	Price Adder
Full Length 	LC	Cuts L dimension within the standard L dimension range. LC=1 mm Increment	2,00

L	Tolerance
Min.~15	0 -0.18
16~30	0 -0.21
31~50	0 -0.25
51~80	0 -0.30
81~110	0 -0.35

8 Days — Express A — 2,00 EUR / piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~14	15~19	20~49
Discount Rate	€ Unit Price	5%	15%

For orders of 101 or more identical pieces, please request a quotation.

Parallel Keys

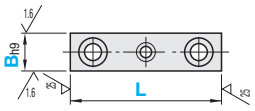
-With Counterbores and Female Thread Hole · With Female Thread Hole-

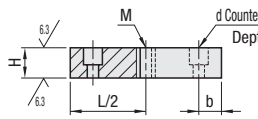
CAD Data

■Parallel Keys With Counterbores and Female Thread Hole RoHS

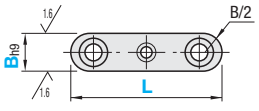


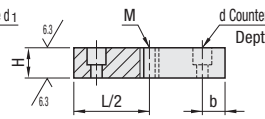
KEDW
KEDSW (Stainless Steel)



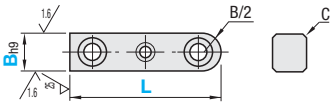


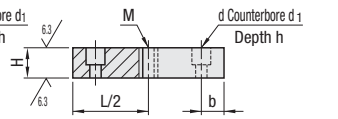
KESW
KESSW (Stainless Steel)





KEGW
KEGSW (Stainless Steel)





Type	Material	Tensile Strength
KEDW KESW KEGW	1.1191/C45E	600N/mm² or more
KEDSW KESSW KEGSW	1.4401/X5CrNiMo17-12-2	

Counterbored Hole Pitch=L-(bx2)

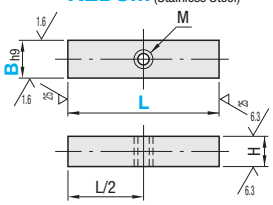
Part Number Type	Bh9	L 5mm Increment	H Tolerance	d	d1	h	b	M (Coarse)	C	€ Unit Price KEDW	KEDSW	KESW	KESSW	KEGW	KEGSW
KEDW KEDSW (Stainless Steel)	8 (0 -0.036)	35~80	7 (0 -0.090)	3.4	6	3.5	8	M3	0.25~0.40						
	10 (0 -0.036)	45~80	8 (0 -0.090)	4.5	7.5	4.5	10	M4							
KESW KESSW (Stainless Steel)	12 (0 -0.043)	50~80		5.5	9.5	5.5	12	M5	0.40~0.60						
	14 (0 -0.043)	50~90	9 (0 -0.090)				14								
	15 (0 -0.043)	50~90	10 (0 -0.090)				15								
KEGW KEGSW (Stainless Steel)	16 (0 -0.043)	60~100					16								
	18 (0 -0.043)	60~110	11 (0 -0.110)	6.6	11	6.5	18	M6							

L	Tolerance
Min.~50	0 -0.25
51~80	0 -0.30
81~110	0 -0.35

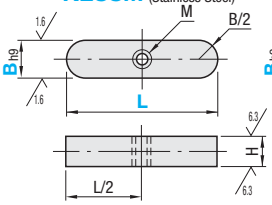
■Parallel Keys With Female Thread Hole RoHS



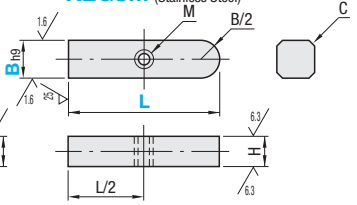
KEDM
KEDSM (Stainless Steel)



KESM
KESSM (Stainless Steel)



KEGM
KEGSM (Stainless Steel)



Type	Material	Tensile Strength
KEDM KESM KEGM	1.1191/C45E	600N/mm² or more
KEDSM KESSM KEGSM	1.4401/X5CrNiMo17-12-2	

Part Number Type	Bh9	L 5mm Increment	H Tolerance	M (Coarse)	C	€ Unit Price KEDM	KEDSM	KESM	KESSM	KEGM	KEGSM
KEDM KEDSM (Stainless Steel)	5 (0 -0.030)	10~50	5 (0 -0.030)	M3	0.25~0.40						
	6 (0 -0.030)	10~60	6 (0 -0.030)								
	7 (0 -0.036)	15~60	7 (0 -0.036)								
	8 (0 -0.036)	15~80									
KESM KESSM (Stainless Steel)	10 (0 -0.036)	15~80	8 (0 -0.090)	M4	0.40~0.60						
	12 (0 -0.036)	20~80									
KEGM KEGSM (Stainless Steel)	14 (0 -0.043)	30~90	9 (0 -0.090)	M5							
	15 (0 -0.043)	30~90	10 (0 -0.090)								
	16 (0 -0.043)	40~100									
	18 (0 -0.043)	40~110	11 (0 -0.110)	M6							

L	Tolerance
Min.~10	0 -0.15
11~15	0 -0.18
16~30	0 -0.21
31~50	0 -0.25
51~80	0 -0.30
81~110	0 -0.35

Order Example

Part Number	-	L
KEDM5	-	30
KEDW12	-	80

Days to Ship

8 Days

Express A | 2,00 EUR / piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

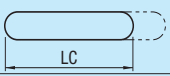
■Volume Diwunt (Round down to one Cent.) P.87

Quantity	1~14	15~19	20~49
Discount Rate	€ Unit Price	5%	15%

For orders of 101 or more identical pieces, please request a quotation.

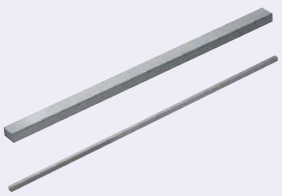
Alterations

Part Number	-	L(LC)	-	(MPC)
KEDW8	-	LC28		
KEDM5	-	30	-	MPC8

Alterations	Code	Spec.	Price Adder
Full Length 	LC	Cuts L dimension within the standard L dimension range. LC=1 mm Increment	2,00
Tap Position Change 	MPC	Changes the tapped hole position. MPC=1 mm Increment With Counterbores and Female Thread Hole b+M≤MPC≤L-6-M With Female Thread Hole M≤MPC≤L-M	2,00

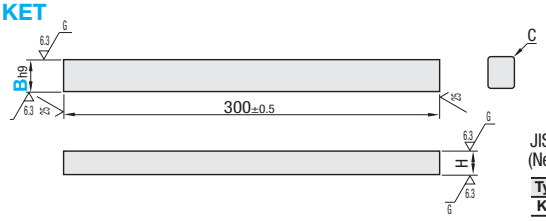
Parallel Keys
-Blank Type-

Price Reduction
10% on average



RoHS

KET



JIS B 1301-1996
(New JIS Standard)

Type	Material	Tensile Strength
KET	1.1191/C45E	600N/mm² or more

Part Number Type	B	Tolerance (h9)	h	H Tolerance	C	€ Unit Price Qty. 1~3	Volume Discount 4~19	20~49	50~100
KET	3	0 -0.025	3	0 -0.025	0.16~0.25				
	4	0 -0.030	4	0 -0.030					
	5		5		0.25~0.40				
	6		6						
	7	0 -0.036	7	0 -0.036					
	8								
	10		8	0 -0.090	0.40~0.60				
	12	0 -0.043							
	14		9						
	15		10						
	16								
	18		11	0 -0.110					

Order Example

Part Number
KET10

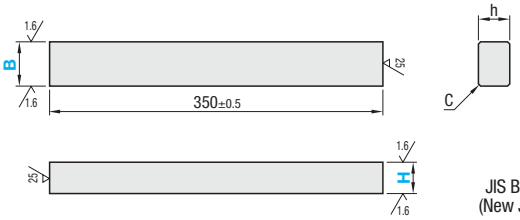
Days to Ship
6 Days P.87

■Stainless Steel

RoHS

KETS





JIS B 1301-1996
(New JIS Standard)

Type	Material	Tensile Strength
KETS	1.4401/X5CrNiMo17-12-2	600N/mm² or more

Part Number Type	B		h		C	€ Unit Price Qty. 1~3	Volume Discount 4~19	20~49	50~100
KETS	2	+0.015 -0.025	2	+0.015 -0.025	0.2				
	3		3		0.3				
	4		4						
	5		5						
	6		6						
	7		7						
	8								
	10		8		0.5				
	12								
	14		9						

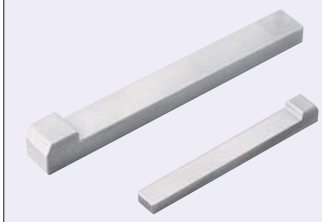
Order Example

Part Number - h
KETS8 - 7

Days to Ship
6 Days P.87

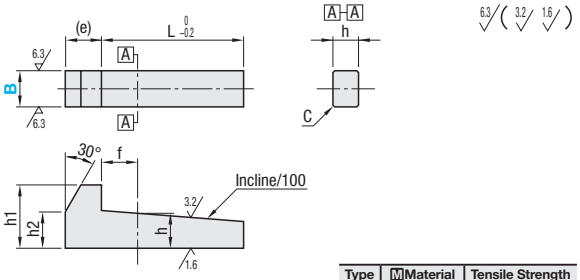
Tapered Machine Keys with Gib Head

CAD Data



RoHS

KTH



JIS B 1301 - 1996 (New JIS Standard)

Type	Material	Tensile Strength
KTH	1.1191/C45E	600N/mm² or more

Part Number Type	Bh9	h	L	h1	h2 / f	(e)	C	€ Unit Price Qty. 1~4	Volume Discount 5~9	10~29	30~49
KTH	4	0 -0.030	4 0 -0.030	30	7	4	4	0.16~0.25				
	5		5	40	8	5	5	0.25~0.40				
	6		6	45	10	6	6					
	7	0 -0.036	7.2 0 -0.036	50		7	7					
	8		7	60	11	7	8					
	10		8	75	12	8	10	0.40~0.60				
	12	0 -0.043	8	90		8	12					
	14		9	110	14	9	14					
	15		10.2 0 -0.090	110	15	10	15					
	16		10	120	16	10	16					
	18		11	135	18	11	18					
	20	0 -0.052	12 0 -0.110	150	20	12	20	0.60~0.80				
	22		14	170	22	14	22					
	24		16.2 0 -0.070	180	24	16	24					
	25		14 0 -0.110	200	22	14	25					
	28		16	210	25	16	28					
	32	0 -0.062	18	240	28	18	32					
	35		22.3 0 -0.084	260	32	22	35	1.00~1.20				
	36		20 0 -0.130	280		20	36					
	38		24.3 0 -0.084	285	36	24	38					

Order Example

Part Number
KTH12

Days to Ship

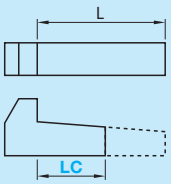
8 Days

Express A | 2,00 EUR / piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations

Part Number - (LC)
KTH10 - LC60

Alteration	Code	Spec.	Price Adder
L Dimension Change 	LC	LC=1 mm Increment LC(Min.)≤LC≤L For LC(Min.), see below.	2,00

B	LC (Min.)
4 · 5	10
6 · 7 · 8	15
10 · 12	20
14 · 15 · 16	22
18 · 20	25
22 · 24 · 25	30
28	35
32 · 35 · 36	40
38	45

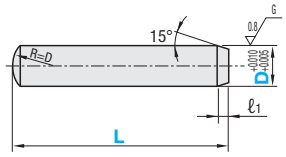
Dowel Pins
-Oversized-



■Straight

Type	Material	Hardness
MS	1.3505/100Cr6	58HRC~
MSC	1.4125/X105CrMo17	58HRC~
MSCSS	1.4301/X5CrNi18-10	-

MS MSC MSCSS



※ℓ1 dimension may become larger than the value shown in the catalog due to polishing process.

ℓ1	Part Number Type	d	L	€ Unit Price 1~499	Volume Discount 500~1999	2000~4000
0.4	MS	1	6 8 10			
0.6		1.5	6 8 10			
1.0		2	6 8 10 15 20			
		2.5	6 8 10 15 20 25 30			
		3	6 8 10 15 20 25 30 35 40			
1.5		4	8 10 15 20 25 30 35 40 45 50			
		5	8 10 15 20 25 30 35 40 45 50			
2.0		6	8 10 15 20 25 30 35 40 45 50 55 60			
2.5		8	10 15 20 25 30 35 40 45 50 55 60 65 70 80			
3.0		10	15 20 25 30 35 40 45 50 55 60 65 70 80			
3.5		12	20 25 30 35 40 45 50 55 60 70 80			
		13	30 40 50 60 70 80			

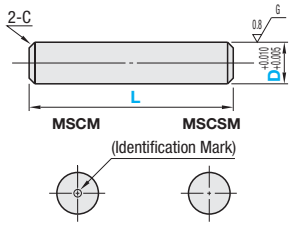
ℓ1	Part Number Type	d	L	€ Unit Price 10~19	Volume Discount 20~49	50~2000
0.4	MSC	1	6 8 10			
0.6		1.5	6 8 10			
1.0		2	6 8 10 15 20			
		3	10 15 20 25 30 6 8 12 35 40			
1.5		4	10 15 20 25 30 8 12 35 40 50			
		5	10 15 20 25 30 8 12 35 40 50			
2.0		6	10 15 20 25 30 8 12 35 40 50 60			
2.5		8	20 30 40 10 15 25 35 50 60			
3.0		10	10 15 20 30 40 50 60 25 35			
3.5		12	30 35 40 50 60			

ℓ1	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.0	MSCSS	2	6 8 10 12 15				
		3	10 12 15 20				
1.5		4	10 12 15 20				
		5	10 12 15 20				
2.0		6	10 12 15 20 25				

■Straight Chamfered

Type	Material	Hardness
MSCM	1.4125/X105CrMo17	58HRC~
MSCSM	1.4301/X5CrNi18-10	-

MSCM MSCSM



C	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
0.3 or Less	MSCM	2	6 8 10 12 15				
		3	10 12 15 20				
		4	10 12 15 20				
0.5		5	10 12 15 20				
		6	10 12 15 20 25				

C	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
0.3 or Less	MSCSM	2	6 8 10 12 15				
		3	10 12 15 20				
		4	10 12 15 20				
0.5		5	10 12 15 20				
		6	10 12 15 20 25				

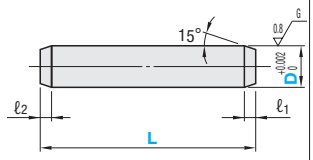
CAD Data

ℓ1 and ℓ2 dimension may become larger than the value shown in the catalog due to polishing process.

Straight – High Precision

Type	Material	Hardness
MSV	1.3505/100Cr6	58HRC~
MSVC	1.4125/X105CrMo17	58HRC~

MSV MSVC



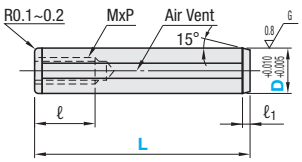
Measurement is taken place in constant temperature room.

ℓ1	ℓ2	Part Number Type	d	L	€ Unit Price Qty. 1~299	Volume Discount 300~499	500~1999	2000~4000
1.0	0.2	MSV	2	6 8 10				
	0.5		3	8 10 15 20 25 30				
1.5			4	10 15 20 25 30				
			5	10 15 20 25 30				
2.0			6	10 15 20 25 30				
2.5			8	20 30 40				
3.0			10	30 40 50 60				
1.0	0.2	MSVC	2	6 8 10				
	0.5		3	8 10 15 20 25 30				
1.5			4	10 15 20 25 30				
			5	10 15 20 25 30				
2.0			6	10 15 20 25 30				
2.5			8	20 30 40				
3.0			10	30 40 50 60				

One End Female Thread

Type	Material	Hardness
MSTP	1.3505/100Cr6	58HRC~
MSTPC	1.4125/X105CrMo17	58HRC~
MSTPCS	1.4301/X5CrNi18-10	-

MSTP MSTPC MSTPCS



When D=5 or 6 and L=10, the pilot hole for tapping may go through.

* ℓ=6 only when D=6 and L=10

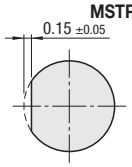
ℓ1	MxP	ℓ	Part Number Type	d	L	€ Unit Price 1~299	Volume Discount 300~500
1.5	3x0.5	6	MSTP	5	10 15 20 25 30		
2.0	4x0.7	*8		6	10 15 20 25 30 35 40 50		
	5x0.8			8	15 20 25 30 35 40 45 50 60 70 80		
2.5	6x1.0	10		10	15 20 25 30 35 40 45 50 60 70 80		
				12	20 30 40 50 60 70 80		
	8x1.25	15		13	40 50 60 70 80		
3.0				16	40 50 60 70		

ℓ1	MxP	ℓ	Part Number Type	d	L	€ Unit Price 1~19	Volume Discount 20~99	100~500
1.5	3x0.5	6	MSTPC	5	10 15 20			
2.0	4x0.7	8		6	15 20 25 30			
	5x0.8			8	15 20 25 30 35 40			
2.5	6x1.0	10		10	20 25 30 35 40 45 50 60			
	8x1.25	15		12	30 40 50 60			
				13	30 40 50 60			

Depth of Air Vent

For the products below, all air vents applied on D dimensions are identical in depth ;

Applicable Products: **MSTP · MSTPC · MSTPCS**



ℓ1	MxP	ℓ	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.5	3x0.5	6	MSTPCS	5	10 15 20 25 30				
2.0	4x0.7	8		6	10 15 20 25 30 35 40				
	5x0.8			8	15 20 25 30 35 40 45 50				

Order Example

Part Number	-	L
MS2	-	10
MSTPC6	-	20

Days to Ship: 6 Days P.88 / 2 Days

Price

For orders larger than indicated quantity, please request a quotation P.88

Dowel Pins
-Oversized-

CAD Data

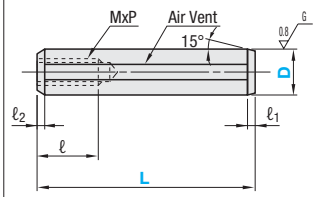
ℓ1 and ℓ2 dimension may become larger than the value shown in the catalog due to polishing process.



■One End Female Thread

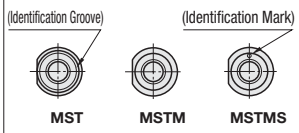
Type	D Tolerance	Material	Hardness
MST	p6	1.3505/100Cr6	45~50HRC
MSTM	m6		
MSTMS		1.4125/X105CrMo17	

MST MSTM MSTMS



When D=5 or 6 and L=10, the pilot hole for tapping may go through.

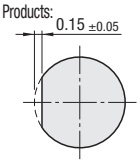
* ℓ=6 only when D=6 and L=10



Depth of Air Vent

For the products below, all air vents applied on D dimensions are identical in depth ;

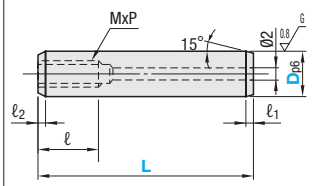
Applicable Products: **MST · MSTM · MSTMS**



■One End Female Thread (Hollow)

Type	Material	Hardness
THS	1.3505/100Cr6	45~50HRC
THSS	1.4125/X105CrMo17	

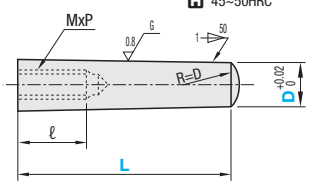
THS THSS



■Tapered, Female Thread

MTT

M ISO TC90
H 45~50HRC



ℓ1	ℓ2	M x P	ℓ	Dp6	Part Number Type	Part Number d	L	€ Unit Price 1~299	Volume Discount 300~500
1.5	0.5	3 x 0.5	6	+0.020 +0.012	MST p6 (Type)	5	10 15 20 25 30		
2.0		4 x 0.7	*8			6	10 15 20 25 30 35 40 50		
		5 x 0.8		+0.024 +0.015		8	15 20 25 30 35 40 45 50 60 70 80		
2.5		6 x 1.0	10			10	15 20 25 30 35 40 45 50 60 70 80		
	1.0			+0.029 +0.018		12	20 30 40 50 60 70 80		
		8 x 1.25	15			13	40 50 60 70 80		
3.0						16	40 50 60 70 80		
		10 x 1.5	18	+0.035 +0.022		20	50 60 70 80		

ℓ1	ℓ2	M x P	ℓ	Dm6	Part Number Type	Part Number d	L	€ Unit Price 1~299	Volume Discount 300~500
1.5	0.3	3 x 0.5	6	+0.012 +0.004	MSTM m6 (Type)	5	10 15 20 25 30		
2.0		4 x 0.7	*8			6	10 15 20 25 30 35 40 50		
	0.5	5 x 0.8		+0.015 +0.006		8	15 20 25 30 35 40 45 50 60 70 80		
2.5		6 x 1.0	10			10	15 20 25 30 35 40 45 50 60 70 80		
	1.0			+0.018 +0.007		12	20 30 40 50 60 70 80		
		8 x 1.25	15			13	40 50 60 70 80		
3.0	1.5					16	40 50 60 70 80		
		10 x 1.5	18	+0.021 +0.008		20	50 60 70 80		

ℓ1	ℓ2	M x P	ℓ	Dm6	Part Number Type	Part Number d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.5	0.3	3 x 0.5	6	+0.012 +0.004	MSTMS m6 (Type)	5	10 15 20				
2.0		4 x 0.7	*8			6	10 15 20 25 30				
	0.5	5 x 0.8		+0.015 +0.006		8	15 20 25 30 35 40				
		6 x 1.0				10	20 25 30 35				

ℓ1	ℓ2	ℓ	M x P	Dp6	Part Number Type	Part Number d	L	€ Unit Price Qty. 1~499	Volume Discount 500~999	1000~1999	2000~4000
2	0.3	8	4 x 0.7	+0.020 +0.012	THS	6	15 20 25 30 35				
	0.5		5 x 0.8	+0.024 +0.015		8	15 20 25 30 35				
2.5		10	6 x 1.0			10	20 25 30 35 40				
	1.0		6 x 1.0	+0.029 +0.018		12	20 25 30 35 40 45				

ℓ1	ℓ2	ℓ	M x P	Dp6	Part Number Type	Part Number d	L	€ Unit Price Qty. 1~499	Volume Discount 500~999	1000~1999	2000~4000
2	0.3	8	4 x 0.7	+0.020 +0.012	THSS	6	15 20 25 30 35				
	0.5		5 x 0.8	+0.024 +0.015		8	15 20 25 30 35				
2.5		10	6 x 1.0			10	20 25 30 35 40				
	1.0		6 x 1.0	+0.029 +0.018		12	20 25 30 35 40 45				

MxP	ℓ	Part Number Type	Part Number d	L	€ Unit Price Qty. 1~499	Volume Discount 500~999	1000~1999	2000~4000
5x0.8	9	MTT	8	30 40				
6x1.0	10		10	40 50				
			12	40 50				
8x1.25	14		13	50 60				
10x1.5	16		16	60 70				

Dowel Pins / General Purpose Pins
-Undersized-

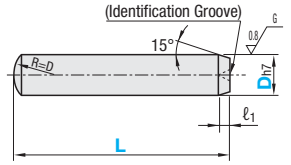
CAD Data

ℓ1 dimension may become larger than the value shown in the catalog due to polishing process.

■Dowel Pin Straight (h7)

Type	Material	Hardness
MSH	1.4125/X105CrMo17	45~50HRC
MSHS	1.4301/X5CrNi18-10	-

MSH MSHS



The identification groove is available for MSH only.

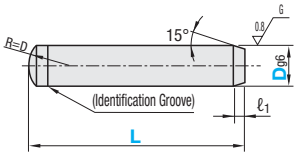
ℓ1	Dh7	Part Number Type	d	L	€ Unit Price 1~19	Volume Discount 20~199	200~2000
1.0	0 -0.01	MSH	2	6 8 10 15 20			
			2.5	6 8 10 15 20 25 30			
			3	6 8 10 12 15 20 25 30 35 40			
1.5	0 -0.012		4	8 10 12 15 20 25 30 35 40 45 50			
			5	8 10 12 15 20 25 30 35 40 45 50			
2.0			6	8 10 12 15 20 25 30 35 40 45 50 55 60			
	0 -0.015		8	10 15 20 25 30 35 40 50 60			
2.5			10	15 20 25 30 35 40 50 60			

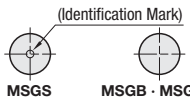
ℓ1	Dh7	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.0	0 -0.01	MSHS	2	6 8 10 12 15 18 20				
			3	6 8 10 12 15 18 20				
1.5	0 -0.012		4	8 10 12 15 18 20				
			5	8 10 12 15 18 20				
2.0			6	10 12 15 18 20				
	0 -0.015		8	15 18 20				

■General Purpose Pin – Straight (g6)

Type	Material	Hardness
MSGB	1.3505/100Cr6	58HRC~
MSGS	1.4125/X105CrMo17	58HRC~
MSGSS	1.4301/X5CrNi18-10	-

MSGB MSGS MSGSS





ℓ1	Dg6	Part Number Type	d	L
1.0	-0.002 -0.008	MSGB MSGS MSGSS	2	6 8 10 12 15
			3	6 8 10 12 15 20
1.5	-0.004 -0.012		4	8 10 12 15 20
			5	8 10 12 15 20
2.0			6	10 12 15 20
	-0.005 -0.014		8	15 20

d	MSGB € Unit Price	MSGB Volume Discount Qty.1~19	20~29	30~49	50~100	MSGS € Unit Price	MSGS Volume Discount Qty.1~19	20~29	30~49	50~100	MSGSS € Unit Price	MSGSS Volume Discount Qty.1~19	20~29	30~49	50~100
2															
3															
4															
5															
6															
8															

Order Example

Part Number	-	L
MST6	-	20
MSH3	-	10

Price

For orders larger than indicated quantity, please request a quotation. P.87

Days to Ship

6 Days P.87

2 Days

Dowel Pins / General Purpose Pins / Dowel Removal Jigs

-Undersized-

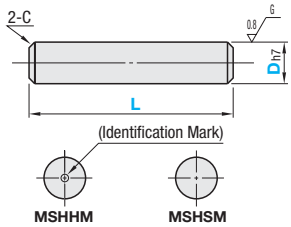


RoHS

■Dowel Pin Chamfered

Type	Material	Hardness
MSHHM	1.4125/X105CrMo17	58HRC~
MSHSM	1.4301/X5CrNi18-10	-

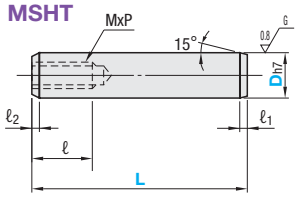
MSHHM MSHSM



■Dowel Pin One End Female Thread (h7)

Type	Material	Hardness
MSHT	1.4125/X105CrMo17	40~50HRC

MSHT

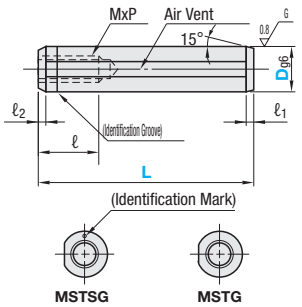


When D=5 or 6 and L=10, the pilot hole for tapping may go through.
* ℓ=6 only when D=6 and L=10
No air vent.

■General Purpose Pin One End Female Thread (g6)

Type	Material	Hardness
MSTG	1.3505/100Cr6	45~50HRC
MSTSG	1.4125/X105CrMo17	45~50HRC

MSTG MSTSG



ℓ1 and ℓ2 dimension may become larger than the value shown in the catalog due to polishing process.

C	Dh7	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
0.3 or Less	0 -0.01	MSHHM	2	6 8 10 12 15				
			3	6 8 10 12 15 20				
	0 -0.012		4	8 10 12 15 20				
0.5			5	8 10 12 15 20				
			6	10 12 15 20				
	0 -0.015		8	15 20				

C	Dh7	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
0.3 or Less	0 -0.01	MSHSM	2	6 8 10 12 15				
			3	6 8 10 12 15 20				
	0 -0.012		4	8 10 12 15 20				
0.5			5	8 10 12 15 20				
			6	10 12 15 20				
	0 -0.015		8	15 20				

ℓ1	ℓ2	MxP	ℓ	Dh7	Part Number Type	d	L	€ Unit Price Qty. 1~499	Volume Discount 500~999	1000~1999	2000~4000
1.5	0.3	3x0.5	6	0 -0.012	MSHT	5	10 15 20 25 30				
2.0	0.5	4x0.7	*8			6	10 15 20 25 30 35 40 45 50				
		5x0.8		0 -0.015		8	15 20 25 30 35 40 45 50				
2.5	1.0	6x1.0	10			10	15 20 25 30 35 40 45 50				
				0 -0.018		12	30 35 40 45 50				

ℓ1	ℓ2	MxP	ℓ	Dg6	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.5	0.3	3x0.5	6	-0.004 -0.012	MSTG	5	10 15 20				
2.0	0.3	4x0.7	8			6	10 15 20 25 30				
2.0	0.5	5x0.8	8	-0.005 -0.014		8	15 20 25 30 35 40				
2.5	0.5	6x1.0	10			10	20 25 30 35 40				
2.5	1	6x1.0	10	-0.006 -0.017		12	30 35 40 45				

ℓ1	ℓ2	MxP	ℓ	Dg6	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.5	0.3	3x0.5	6	-0.004 -0.012	MSTSG	5	10 15 20				
2.0	0.3	4x0.7	8			6	10 15 20 25 30				
2.0	0.5	5x0.8	8	-0.005 -0.014		8	15 20 25 30 40				
2.5	0.5	6x1.0	10			10	20 25 30 40				

Order Example

Part Number	-	L
MSHT6	-	30
MSTH12	-	100

Days to Ship

6 Days

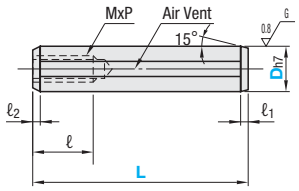
P.88

2 Days

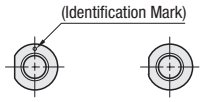
Dowel Pin One End Female Thread (h7)

Type	Material	Hardness
MSTH	1.3505/100Cr6	45~50HRC
MSTHS	1.4125/X105CrMo17	45~50HRC
MSTSS	1.4301/X5CrNi18-10	-

MSTH MSTHS MSTSS



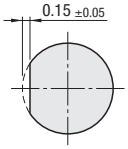
When D=5 or 6 and L=10, the pilot hole for tapping may go through.
* ℓ=6 only when D=6 and L=10
With an air vent.



Depth of Air Vent

For the products below, all air vents applied on D dimensions are identical in depth ;
Applicable Products:

MSTG · MSTSG
MSTH · MSTHS · MSTSS



ℓ1 and ℓ2 dimension may become larger than the value shown in the catalog due to polishing process.

ℓ1	ℓ2	MxP	ℓ	Dh7	Part Number Type	d	L	€ Unit Price Qty 1~299	Volume Discount Qty 300~500
1.5	0.3	3x0.5	6	0 -0.012	MSTH	5	10 15 20 25 30		
		4x0.7	*8			6	10 15 20 25 30 35 40 50		
2.0		5x0.8		0 -0.015		8	15 20 25 30 35 40 45 50 60 70 80		
	0.5					10	15 20 25 30 35 40 45 50 60 70 80 100 120		
2.5		6x1.0	10			12	20 30 40 50 60 70 80 100 120		
	1.0			0 -0.018		13	40 50 60 70 80 100 120		
3.0	1.5	8x1.25	15			16	40 50 60 70 80 100 120 150		

ℓ1	ℓ2	MxP	ℓ	Dh7	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.5	0.3	3x0.5	6	0 -0.012	MSTHS	5	10 15 20				
2.0		4x0.7	8			6	10 15 20 25 30				
	0.5	5x0.8		0 -0.015		8	15 20 25 30 35 40				
2.5		6x1.0	10			10	30 35 40 45				

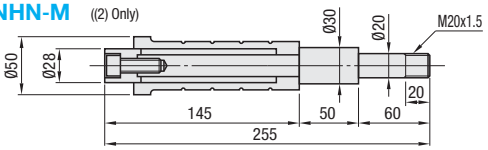
ℓ1	ℓ2	MxP	ℓ	Dh7	Part Number Type	d	L	€ Unit Price Qty.1~19	Volume Discount 20~29	30~49	50~100
1.5	0.3	3x0.5	6	0 -0.012	MSTSS	5	10 15 20				
2.0		4x0.7	8			6	10 15 20 25 30				
	0.5	5x0.8		0 -0.015		8	15 20 25 30 35 40				
2.5		6x1.0	10			10	30 35 40 45				

Dowel Removal Jigs

RoHS



KNHN ((1) Main Body + (2) Holder Cap 1pc. for each)
KNHN-M ((2) Only)



(1) Body
M Material: 1.1191/C45E
38~42HRC
(2)Holder Cap
For M4 · M5 · M6 · M8 · M10

Part Number	€ Unit Price Qty.1~9	Volume Discount 10~20
KNHN ((1)+(2))		

d	Part Number Type	No.	€ Unit Price Qty.1~9	Volume Discount 10~20
4.2	KNHN-M ((2) Only)	4		
5.2		5		
6.3		6		
8.5		8		
10.5		10		

Order Example

Part Number
KNHN
KNHN - M5

Days to Ship

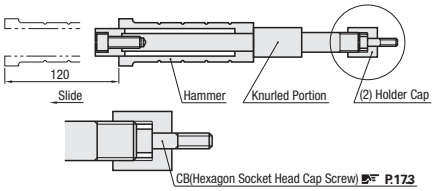
8 Days

Express A 3,00 EUR / Piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

How to Use

1.Insert the hexagon socket head cap screw (CB) into the holder cap.
2.Attach (2) holder cap to the tip of main body.
3. Attach screw tip onto the dowel pin by turning the knurled portion of shaft.
4. Slide the hammer to remove dowel pin.



Dual-Fit Dowel Pins

-p6-h7, p6-g6 · Hollow, Female Thread-

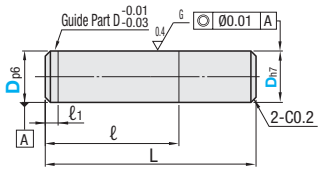
CAD Data

■Dual-Fit Dowel Pins

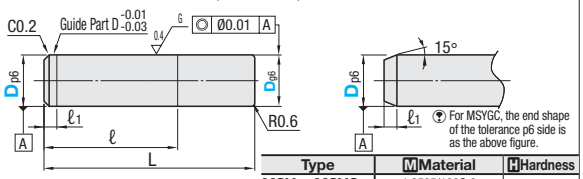


RoHS

p6-h7 Type **MSY** **MSYC** (Stainless Steel)



p6-g6 Type **MSYG** **MSYGC** (Stainless Steel)



For MSYGC, the end shape of the tolerance p6 side is as the above figure.

Type		Material	Hardness
MSY	MSYG	1.3505/100Cr6	58HRC~
MSYC	MSYGC	1.4125/X105CrMo17	

Part Number Type	d	D Tolerance p6	h7	No.	L	ℓ	ℓ1	MSY € Unit Price Qty.1~99	MSY Volume Discount Qty.100 or More	MSYC € Unit Price Qty.1~99	MSYC Volume Discount Qty.100 or More
MSY MSYC (Stainless Steel)	3	+0.012 +0.006	0 -0.010	803	8	3	1				
				8		4					
				805		5					
				1003	10	3					
				1005		5					
				10		7					
				12	12	6					
				15	15	10					
				20	20	13					
	4	+0.020 +0.012	0 -0.012	803	8	3	1.5				
				8		4					
				805		5					
				1005	10	5					
				10		7					
				1008		8					
				1205	12	5					
				12		6					
				1208		8					
				1508	15	8					
				15		10					
				1512		12					
				20	20	13					
	5			1003	10	3					
				1005		5					
				10		7					
				1205	12	5					
				12		6					
				1208		8					
				1508	15	8					
				15		10					
				1512		12					
				18	18	12					
				20	20	13					
	6			1005	10	5					
				10		7					
				1008		8					
				1205	12	5					
				12		6					
				1208		8					
				1508	15	8					
				15		10					
				1512		12					
				18	18	12					
				20	20	13					
	8	+0.024 +0.015	0 -0.015	18	18	12	2				
				20	20	13					
				25	25	16					
				30	30	19					
	10			18	18	12					
				25	25	16					
				30	30	19					
	12	+0.028 +0.018	0 -0.018	40	40	25					

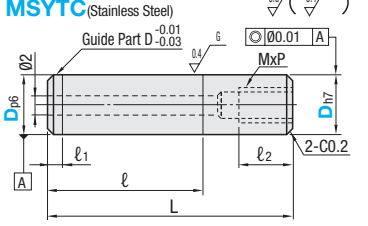
Part Number Type	d	D Tolerance p6	g6	No.	L	ℓ	ℓ1	MSYG € Unit Price Qty.1~99	MSYG Volume Discount Qty.100 or More	MSYGC € Unit Price Qty.1~99	MSYGC Volume Discount Qty.100 or More
MSYG MSYGC (Stainless Steel)	3	+0.012 +0.006	-0.002 -0.008	803	8	3	1				
				8		4					
				805		5					
				1003	10	3					
				1005		5					
				10		7					
				12	12	6					
				15	15	10					
				20	20	13					
	4	+0.020 +0.012	-0.004 -0.012	803	8	3	1.5				
				8		4					
				805		5					
				1005	10	5					
				10		7					
				1008		8					
				1205	12	5					
				12		6					
				1208		8					
				1508	15	8					
				15		10					
				1512		12					
				20	20	13					
	5			1003	10	3					
				1005		5					
				10		7					
				1205	12	5					
				12		6					
				1208		8					
				1508	15	8					
				15		10					
				1512		12					
				18	18	12					
				20	20	13					
	6			1005	10	5					
				10		7					
				1008		8					
				1205	12	5					
				12		6					
				1208		8					
				1508	15	8					
				15		10					
				1512		12					
				18	18	12					
				20	20	13					
	8	+0.024 +0.015	-0.005 -0.014	18	18	12	2				
				20	20	13					
				25	25	16					
				30	30	19					
	10			18	18	12					
				25	25	16					
				30	30	19					
	12	+0.028 +0.018	-0.006 -0.017	40	40	25					

■Dual-Fit Dowel Pins -Hollow, Female Thread-



RoHS

MSYT **MSYTC** (Stainless Steel)



The end shape of the tolerance p6 side for MSYTC is same as that of MSYGC.

	MSYT	MSYTC
M Material:	1.3505/100Cr6	1.4125/X105CrMo17
H Hardness:	58HRC~	58HRC~

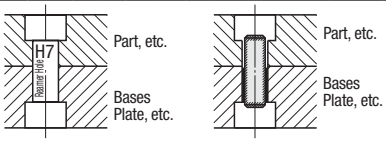
Part Number Type	d	D Tolerance p6	h7	No.	MxP	L	ℓ	ℓ1	ℓ2	MSYT € Unit Price Qty.1~99	MSYT Volume Discount Qty.100 or More	MSYTC € Unit Price Qty.1~99	MSYTC Volume Discount Qty.100 or More
MSYT MSYTC (Stainless Steel)	6	+0.020 +0.012	0 -0.012	1205	4x0.7	12	5	1.5	5				
				12			6						
				1208			8		8				
				1508		15	8						
				15			10						
				1512			12						
				18		18	12						
				20		20	13						
	8	+0.024 +0.015	0 -0.015	18	5x0.8	18	12	2					
				20		20	13						
				25		25	16						
				30		30	19						
	10			18	6x1.0	18	12						
				25		25	16						
				30		30	19		10				
	12	+0.028 +0.018	0 -0.018	40		40	25						

Order Example

Part Number	-	No.
MSY3	-	10
MSYG6	-	1208
MSYT8	-	18

Days to Ship 6 Days P.88

Example



Stepped Dowel Pins / Insulating Dowel Pins / Resin Dowel Pins

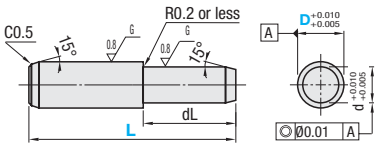
CAD Data

■Stepped Dowel Pins -Standard · With Female Thread Hole-

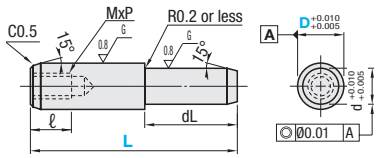


RoHS

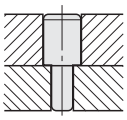
MSFW
MSFWC (Stainless Steel)



MSFWM (With Tap)
MSFWCM (Stainless Steel with Female Thread Hole)



Example



Convenient for fall off prevention and modification.

Type		Material	Hardness
MSFW	MSFWM	1.3505/100Cr6	58HRC~
MSFWC	MSFWCM	1.4125/X105CrMo17	

Part Number Type	d	L	MxP	ℓ	d	dL	€ Unit Price MSFW	MSFWC	MSFWM	MSFWCM
MSFW MSFWC (Stainless Steel) MSFWM (With Tap) MSFWCM (Stainless Steel with Female Thread Hole)	5	15	-	-	4	5				
		25				10				
	6	20	-	-	5	10				
		30	3x0.5	6		15				
	8	25	4x0.7	8	6	10				
		35				15				
	10	35	5x0.8		8	15				
		40				15				
	13	45	6x1.0	10	10	20				
		55				25				
		70				30				

Order Example: Part Number - L → MSFW10 - 35

Days to Ship: 6 Days P.88

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~99	100~299	300~500
Discount Rate	€ Unit Price	5%	10%	15%

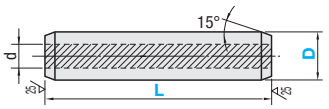
For orders larger than indicated quantity, please request a quotation.

■Insulating Dowel Pins



RoHS

MSIP



Material: Body: Fabric Base Bakelite Core Rods: 1.4301/X5CrNi18-10
Properties of Bakelite P.858
The D dimension tolerance is the result of measurement at room temperature (20°C).

Order Example: Part Number - L → MSIP6 - 30

Days to Ship: 8 Days

Express A 2,00 EUR / piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

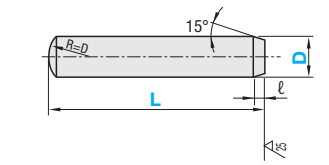
Part Number Type	d	D Tolerance	d	L	€ Unit Price L8 / 10	L15	L20	L25	L30	L35	L40	L45	L50
MSIP	6	+0.03 0	3	8 10 15 20 25 30 35 40									
	8		4	10 15 20 25 30 35 40									
	9			15 20 25 30 35 40 45 50									
	10		5	15 20 25 30 35 40 45 50									
	12		6	20 25 30 35 40 45 50									

■Resin Dowel Pins



RoHS

MSIPJ



Material: Body: Polycarbonate
Properties of Polycarbonate P.863
The D dimension tolerance is the result of measurement at room temperature (20°C).

Order Example: Part Number - L → MSIPJ6 - 25

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

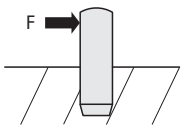
Quantity	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	d	D Tolerance	ℓ	L	€ Unit Price L10	L15	L20	L25
MSIPJ	3	+0.03 0	1.0	10 15 20				
	4		1.5	10 15 20				
	5			10 15 20				
	6		2.0	10 15 20 25				
	8			15 20 25				

Material	d	Static Yield Load (kN)
Polycarbonate	3	0.4
	4	0.6
	5	1.1
	6	1.4
	8	2.1

■Static Shear Failure Data



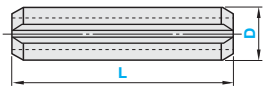
Spring Pins

CAD Data

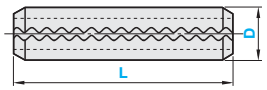
Spring Pins RoHS

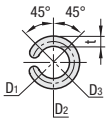


SSPR



SSPSR (Stainless Steel)





L	L Tolerance
5~ 10	$^{+0.5}_{0}$
12~ 50	$^{+1.0}_{0}$
56~100	$^{+1.5}_{0}$

Type	Material	Hardness
JIS SSPR	Spring Steel	45~50HRC
JIS SSPSR	Spring Stainless Steel Alloy	42~48HRC

Part Number			*kN		t (Reference)		D	
Type	D - L		JIS SSPR	JIS SSPSR	JIS SSPR	JIS SSPSR	min	max
SSPR (D2~10) SSPSR (D2~6)	2	(Price Table below)	2.76	2.76	0.4	0.4	2.15	2.25
	3		6.2	6.2	0.6	0.6	3.15	3.25
	4		10.8	10.8	0.8	0.8	4.2	4.4
	5		17.25	17.25	1	1	5.2	5.4
	6		24.83	24.83	1.2	1.2	6.2	6.4
	8		44.13	-	1.6	-	8.3	8.6
	10		68.94	-	2	-	10.3	10.6

Order Example **Part Number** SSPR5 - 40

Days to Ship **6 Days** P.87

Maximum value of D is the maximum value on the pin's circumference and the minimum value for D is the average of D_1, D_2 and D_3.
Reference: t conforms to JSMA No.6 (Japan Spring Manufactures Association Standard)
* kN = Minimum Double Shearing Load

Part Number		SSPR		SSPSR	
		€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	D - L	Qty 1~99	Qty.100 or More	Qty 1~99	Qty.100 or More
SSPR SSPSR (Stainless Steel)	2- 5				
	6				
	8				
	10				
	12				
	14				
	16				
	18				
	20				
SSPR SSPSR (Stainless Steel)	3- 6				
	8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	25				
	28				
	32				
SSPR SSPSR (Stainless Steel)	4- 8				
	10				
	12				
	14				
	16				
	18				
	20				
	22				
	25				
	28				
	32				
	36				
	40				
SSPR SSPSR (Stainless Steel)	5- 10				
	12				
	14				
	16				
	18				
	20				
	22				
	25				
	28				
	32				
	36				
	40				
	45				
	50				

Part Number		SSPR		SSPSR	
		€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	D - L	Qty 1~99	Qty.100 or More	Qty 1~99	Qty.100 or More
SSPR SSPSR (Stainless Steel)	6- 12				
	14				
	16				
	18				
	20				
	22				
	25				
	28				
	32				
	36				
	40				
	45				
	50				
	56				
SSPR	8- 16				
	18				
	20				
	22				
	25				
	28				
	32				
	36				
	40				
	45				
	50				
	56				
	63				
	70				
	80				
SSPR	10- 18				
	20				
	22				
	25				
	28				
	32				
	36				
	40				
	45				
	50				
	56				
	63				
	70				
	80				
	90				
	100				

Dimensions not listed are not standardized.

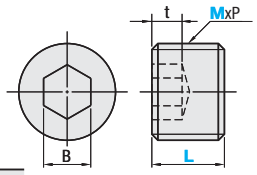
Screw Plugs

CAD Data

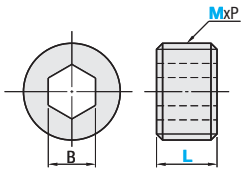


RoHS

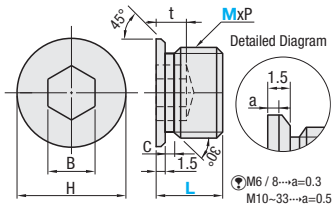
MSW (Short Type)
MSWS (Short Type)



MSWA (Through Hole Type)
MSWAS (Through Hole / Short Type)

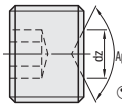


MSWZ (With Washer Type)
MSWZS (With Washer / Short Type)



M6 / 8···a=0.3
M10~33···a=0.5

MSW: Dimple Shape and Dimension



Part Number	dz max.
MSW3	1.4
MSW4	2.0
MSW5	2.5

Please note the tip of MSW3, 4, 5 is a cup point.

MSW / **MSWS**
Material: **MSW** 1.7220/34CrMo4 (M2.5~10) 1.1191/C45E (M12~45)
MSWS 1.1191/C45E
Hardness: 34~43HRC
Surface Treatment: Black Anodize (JIS B 0207 Class 2)

MSWA / **MSWAS**
Material: 1.1191/C45E
Hardness: 34~43HRC
Surface Treatment: Black Anodize (JIS B 0207 Class 2)

MSWZ / **MSWZS**
Material: 1.1191/C45E
Hardness: 33~38HRC
Surface Treatment: Black Anodize (JIS B 0207 Class 2)

Standard Type

MxP		L	B	t	Part Number Type	Part Number M	€ Unit Price 50~299	Volume Discount 300~500
2.5	0.45	3	1.3	1.2	MSW	2.5		
3	0.5	3	1.5			3*		
4	0.7	4	2	1.5		4*		
5	0.8	5	2.5	2		5*		
6	1.0	6	3	3.5		6		
8	1.25	8	4	5		8		
10	1.5	10	5	6		10		
12	1.5 (Fine Thread)		6	5		12		
14						14		
16			8			16		
18			10			18		
20		12		6		20		
22			12			22		
24			14			24		
25						25		
26						26		
27						27		
28						28		
30			17			30		
33						33		
36		18		10		36		
38						38		
40						40		
42						42		
45						45		

*The tip of MSW3 / 4 / 5 is a cup point.

MxP		L	B	Part Number Type	Part Number M	€ Unit Price Qty. 1~299	Volume Discount 300~499	500~999	1000~2000
8	1.25	8	4	MSWA (Through Hole)	8				
10	1.5	10	5		10				
12	1.5 (Fine Thread)		6		12				
14					14				
16			8		16				
18			10		18				
20					20				
22		12	12		22				
24			14		24				
25					25				
26					26				
27					27				
28					28				
30			17		30				
33					33				

MxP		L	B	h	t	C	Part Number Type	Part Number M	€ Unit Price Qty.1~99	Volume Discount 100~199	200~299	300~500
6	1.0	8	3	9	5	2.5	MSWZ (With Washer)	6				
8	1.25	10	4	11				8				
10	1.5	12	5	13				10				
12	1.5 (Fine Thread)		6	15				12				
14				17				14				
16			8	19				16				
18			10	21				18				
20		15		23				20				
22			12	25				22				
24			14	27				24				
25				28				25				
26				29				26				
27				30				27				
28				31				28				
30			17	33				30				
33				36				33				

Short Type

MxP		L	B	t	Part Number Type	Part Number M-L	€ Unit Price 1~299	Volume Discount 300~499	500~1000
8	1.25	6	4	3	MSWS (Short)	8-6			
10	1.5		5			10-6			
12	1.5 (Fine Thread)		6			12-6			
14						14-6			
16			8			16-6			
18			10			18-6			
20		8		4		20-8			
22			12			22-8			
24			14			24-8			
25						25-8			
26						26-8			
27						27-8			
28						28-8			
30			17			30-8			
33						33-8			

MxP		L	B	Part Number Type	Part Number M-L	€ Unit Price Qty. 1~299	Volume Discount 300~499	500~999	1000~2000
8	1.25	6	4	MSWAS (Through Hole Short)	8-6				
10	1.5		5		10-6				
12	1.5 (Fine Thread)		6		12-6				
14					14-6				
16			8		16-6				
18			10		18-6				
20		8			20-8				
22			12		22-8				
24			14		24-8				
25					25-8				
26					26-8				
27					27-8				
28					28-8				
30			17		30-8				
33					33-8				

MxP		L	B	h	t	C	Part Number Type	Part Number M-L	€ Unit Price Qty.1~99	Volume Discount 100~199	200~299	300~500
10	1.5	10	5	13	4	2.0	MSWZS With Washer Short	10-10				
12	1.5 (Fine Thread)		6	15				12-10				
14				17				14-10				
16			8	19				16-10				
18			10	21				18-10				
20				23				20-10				
22			12	25				22-10				
24			14	27				24-10				
25				28				25-10				
26				29				26-10				
27				30				27-10				
28				31				28-10				
30		12	17	33	5			30-12				
33				36				33-12				

Short Type has shorter L dimention and fewer threads, compared with the standard type (MSW, MSWA, MSWZ). Before use, check the load applied to the screw plug and the material of the plate to be tapped.

Order Example — Part Number: MSW18, MSWS18 - 6

Price — For orders larger than indicated quantity, please request a quotation. P.87

Days to Ship — 6 Days P.87

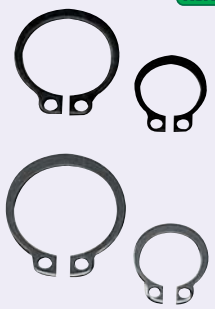
Retaining Rings -C Type (External) / Retaining Rings -E Type

Price Reduction
Up to 60%

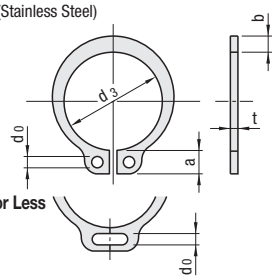
CAD Data

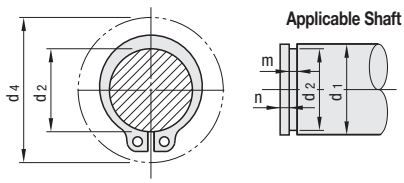
Cost-saving box package is available when large quantity is required. ☞P.171

■Retaining Rings -C Type (External) RoHS



STWN
STWS(Stainless Steel)





d4: Maximum outer diameter when retaining ring is fitted on d1 (Clearance outer diameter)

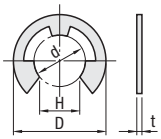
Type	Material	Hardness
STWN	Spring Steel	44~53HRC
STWS	1.4301/X5CrNi18-10	36~44HRC

Part Number		Retaining Ring							Reference	Applicable Shaft (Reference)						STWN € Unit Price	STWN Volume Discount Qty. 1~49	STWN Volume Discount Qty. 50~199	STWN Volume Discount 200 or More	STWS € Unit Price	STWS Volume Discount Qty. 50~199	STWS Volume Discount 200 or More
Type	No.	d3	Tolerance	t	Tolerance	b (Approx.)	a (Approx.)	d0 (Min.)	d4	d1	d2	Tolerance	m	Tolerance	n (Min.)							
STWN	3	2.7	+0.04 -0.15	0.25	±0.025	0.5	1.7	0.7	7	3	2.85	0 -0.04	0.35	+0.10 0	0.3							
	4	3.7		0.4	±0.03	0.9	2.2	0.8	9	4	3.8		0.5									
	5	4.7		0.6	±0.04	1.1	2.4		10.5	5	4.8		0.7									
	6	5.6	+0.06 -0.2	0.7		1.3	2.8	1	12	6	5.7		0.8		0.5							
	7	6.5		0.8		1.4	3		14	7	6.7	0 -0.06	0.9									
	8	7.4		0.8		1.6	3		15	8	7.6				0.6							
STWS (Stainless Steel)	4	3.6	±0.1	0.25	±0.03	0.7	1.4	0.7	9	4	3.7	±0.06	0.3	+0.10 0	1.0							
	5	4.5		0.4	±0.04	0.7	1.4		10.5	5	4.7		0.45		1.5							
	6	5.5				0.8	2.0		12	6	5.7											
	7	6.3		0.65		0.9	2.0	1	14	7	6.5		0.7									
	8	7.1				1.0	2.2		15	8	7.4											
STWN STWS (Stainless Steel)	10	9.3	±0.15	1	±0.05	1.8	3	1.2	17	10	9.6	0 -0.09	1.15	+0.14 0	1.5							
	11	10.2				2	3.1		18	11	10.5											
	12	11.1	±0.18			2.1	3.2	1.5	19	12	11.5											
	13	12					3.3		20	13	12.4											
	14	12.9				2.2	3.4	1.7	22	14	13.4	0 -0.11										
	15	13.8					3.5		23	15	14.3											
	16	14.7					3.6		24	16	15.2											
	17	15.7					3.7		25	17	16.2											
	18	16.5		1.2		2.6	3.8	2	26	18	17	0 -0.21	1.35									
	19	17.5				2.7	3.8		27	19	18											
	20	18.5	±0.2				3.9		28	20	19											
	21	19.5					4		30	21	20											
	22	20.5					4.1		31	22	21											
	23	21.4				2.9	4.5		32.5	23	22											
	24	22.2				3.1	4.2		33	24	22.9											
	25	23.2					4.3		34	25	23.9											
	26	24.2					4.4		35	26	24.9											
	28	25.9		1.5			4.6		38	28	26.6		1.65									
	29	26.9				3.5	4.7		39	29	27.6											
	30	27.9					4.8		40	30	28.6											
	32	29.6					5	2.5	43	32	30.3											
	35	32.2	±0.25			4	5.4		46	35	33											
	40	37	±0.4	1.75	±0.07	4.5	5.8		53	40	38	0 -0.25	1.9		2							
	45	41.5				4.8	6.3		58	45	42.5											
	50	45.8		2		5	6.7		64	50	47		2.2									
	52	47.8					6.8		66	52	49											
	60	55.8	±0.45	2.5	±0.08	5.5	7.2		75	60	57	0 -0.3	2.7		2.5							
	80	74.5				7.4	8.2		97	80	76.5											

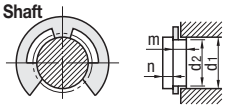
■Retaining Rings -E Type RoHS



NETW
NETWS(Stainless Steel)



Applicable Shaft



Type	Material	Hardness	Surface Treatment
NETW	Spring Steel	44~53HRC	Trivalent Chromate Plating
NETWS	1.4301/X5CrNi18-10	37~46HRC	-

Part Number		Retaining Ring								Applicable Shaft (Reference)						NETW	NETWS	NETW NETWS
Type	No.	d	Tolerance	D	Tolerance	H	Tolerance	t	Tolerance	d1 Class More than	d1 Class or Less	d2	Tolerance	m	Tolerance	n (Min.)	€ Unit Price Qty. 1~199	€ Unit Price Qty. 1~199	Volume Discount 200 or More
NETW	1.2	1.2	0 -0.09	3	±0.1	1	0 -0.25	0.3	±0.025	1.4	2	1.2	+0.06 0	0.4	+0.05 0	0.6			
	1.5	1.5		4	±0.2	1.3		0.4	±0.03	2	2.5	1.5		0.5		0.8			
	2	2		5		1.7				2.5	3.2	2				1			
	2.5	2.5		6		2.1				3.2	4	2.5							
	3	3		7		2.6		0.6	±0.04	4	5	3		0.7	+0.1 0				
NETWS (Stainless Steel)	4	4	0 -0.12	9		3.5	0 -0.30			5	7	4	+0.075 0			1.2			
	5	5		11		4.3				6	8	5							
	6	6		12		5.2				7	9	6							
	7	7	0 -0.15	14		6.1	0 -0.35	0.8		8	11	7	+0.09 0	0.9		1.5			
	8	8		16		6.9				9	12	8				1.8			
	9	9		18		7.8				10	14	9				2			

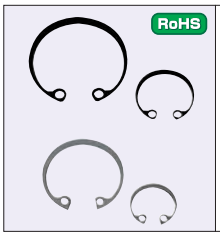
Order Example

Part Number	Days to Ship	
STWS6	6 Days	☞P.87
NETW9	2 Days	

Retaining Rings -C Type (Internal) / Hair Pins / Split Pins

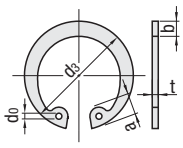
Price Reduction
40% on average

CAD Data

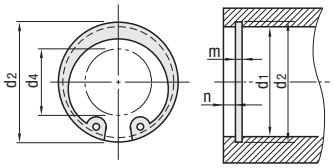


RoHS

RTWN
RTWS (Stainless Steel)



Applicable Holes



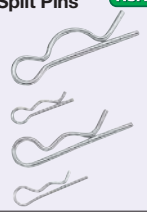
d4: Minimum circumferential diameter when retaining ring fits inside d1 (Clearance inner diameter)

Type	Material	Hardness
RTWN	Spring Steel	44~53HRC
RTWS	1.4301/X5CrNi18-10	36~44HRC

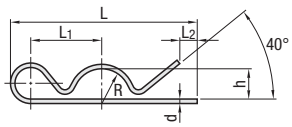
Part Number		Retaining Ring							Reference	Applicable Bore (Reference)							RTWN			RTWS		
Type	No.	d3	Tolerance	t	Tolerance	b (Approx.)	a (Approx.)	do (Min.)	d4	d1	d2	Tolerance	m	Tolerance	n (Min.)	€ Unit Price Qty. 1~49	Volume Discount Qty. 50~199	Volume Discount 200 or More	€ Unit Price Qty. 1~49	Volume Discount Qty. 50~199	Volume Discount 200 or More
RTWN / RTWS (Stainless Steel)	10	10.7	±0.18	1	±0.05	1.5	2.8	1.2	4	10	10.4	+0.11 0	1.15	+0.14 0	1.5						
	11	11.8					3		4	11	11.4										
	12	13				1.7	3.1	1.5	5	12	12.5										
	13	14.1					3.1		6	13	13.6										
	14	15.1				1.9	3.6		7	14	14.6										
	15	16.2					3.6	1.7	8	15	15.7										
	16	17.3					3.7		8	16	16.8										
	17	18.3	±0.2				3.8		9	17	17.8										
	19	20.5				2.5	4	2	11	19	20	+0.21 0									
	20	21.5					4		12	20	21										
	21	22.5					4.1		12	21	22										
	22	23.5					4.1		13	22	23										
	24	25.9		1.2	±0.06		4.3		15	24	25.2		1.35								
	25	26.9				3	4.4		16	25	26.2										
	26	27.9					4.6		16	26	27.2										
	28	30.1	±0.25				4.6		18	28	29.4										
	30	32.1					4.7		20	30	31.4										
	32	34.4				3.5	5.2	2.5	21	32	33.7		1.65								
	35	37.8		1.5			5.2		24	35	37	+0.25 0									
	37	39.8					5.2		26	37	39										
	40	43.5	±0.4	1.75	±0.07	4	5.7		28	40	42.5		1.9		2						
	42	45.5					5.8		30	42	44.5										
	45	48.5				4.5	5.9		33	45	47.5										
	47	50.5	±0.45				6.1		34	47	49.5										
	52	56.2		2		5.1	6.5		39	52	55	+0.3 0	2.2								
	55	59.2					6.5		41	55	58										
	60	64.2				5.5	6.8		46	60	63										
	62	66.2					6.9		48	62	65										
	68	72.5		2.5	±0.08	6	7.4		53	68	71	+0.35 0	2.7		2.5						
	72	76.5				6.6	7.4		57	72	75										
	80	85.5	±0.55			7	8		64	80	83.5										

Split Pins

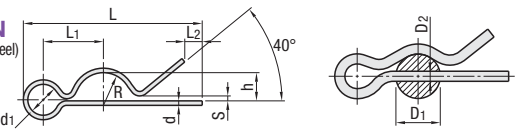
RoHS



RNPN



JNPN
JNSPN (Stainless Steel)



Type	Material	Surface Treatment
RNPN	JISSWRH6 ~C43	Trivalent Chromate Plating
JNPN	JISSWRH6 ~C43	Trivalent Chromate Plating
JNSPN	1.4301/X5CrNi18-10	-

Part Number Type	No.	d (Wire Dia.)	L	L1	L2	R	h	D1 (Applicable Shaft Dia.)	D2 (Shaft Bore Dia.)	€ Unit Price Qty. 1~199	Volume Discount 200 or More
RNPN	6	1.2	25.2	9.7	3.9	3	1.4	6	1.5		
	8	1.6	33.8	13.1	5.3	4	2.1	8	1.9		
	10	1.8	40.2	15.7	5.7	5	3	10	2.2		
	12	2	46	17.5	6	6	4	12	2.4		

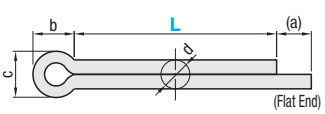
Part Number Type	No.	d (Wire Dia.)	d1	L	L1	L2	R	h	S	D1 (Applicable Shaft Dia.)	D2 (Shaft Bore Dia.)	JNPN € Unit Price Qty. 1~199	JNPN Volume Discount 200 or More	JNSPN € Unit Price Qty. 1~199	JNSPN Volume Discount 200 or More
JNPN / JNSPN (Stainless Steel)	4	1	3	16.3	6	1.5	2	1	0.5	4	1.2				
	5			17.9	6.5		2.5	1.5		5					
	6	1.2	3.6	21.2	7.8		3	1.8	0.6	6	1.5				
	8	1.6	4.8	27.7	10.4		4	2.4	0.8	8	1.9				
	10	1.8	5.4	32.6	12.2		5	3.2	0.9	10	2.2				
	12			35.8	13.2		6	4.2		12					

Split Pins

RoHS



NPN
NSPN (Stainless Steel)



NPN M Material: 1.0330/DC01 SWRM SPC
NSPN M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	L	d	a (Approx.)	b	c	NPN € Unit Price Qty. 1~199	NPN Volume Discount 200 or More	NSPN € Unit Price Qty. 1~199	NSPN Volume Discount 200 or More
NPN / NSPN (Stainless Steel)	0.8	8 10 12	0.7	1.6	2.4	1.4				
	1	10 12 15	0.9		3	1.8				
	1.2	10 12 15	1	2.5	3	2				
	1.6	10 12 15	1.4		3.2	2.8				
	2	12 15	1.8		4	3.6				
	2.5	15 20	2.3		5	4.6				
	3.2	20	2.9	3.2	6.4	5.8				
	4	20 25	3.7	4	8	7.4				
	5	35	4.6		10	9.2				

Order Example
Part Number - L
RTWS47
RNPN6
NSPN3.2 - 20

Days to Ship: 6 Days / 2 Days

P87

Thread Inserts / Tools for Inserts

Price Reduction
Up to 40%

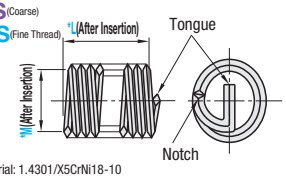
Cost-saving box package is available when large quantity is required. ☞P.172

Thread Inserts



RoHS

HLTS (Coarse)
HLSS (Fine Thread)



M Material: 1.4301/X5CrNi18-10

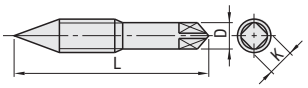
Taps for Inserts



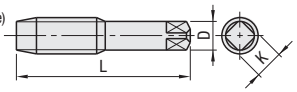
RoHS

Coarse	Fine Thread	Finish
HLTX	HLSX	Coarse Tapping
HLTY	HLSY	Medium Tapping
HLTZ	HLSZ	Finish Tapping

(M3~5)



(M6 or More)



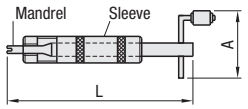
M Material: JIS-SKH H Hardness: 61~64HRC

Installation Tools



RoHS

HLTP



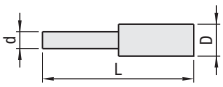
No.	M Material		S Surface Treatment
	Sleeve	Mandrel	
3~6	PPS	1.7220/34CrMo4	Black Anodize (1.7220/34CrMo4)
8~16	1.7220/34CrMo4		

Tang Break-off Tools



RoHS

HLTB



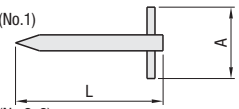
M Material: 1.7220/34CrMo4
S Surface Treatment: Black Oxide

Insert Removal Tools

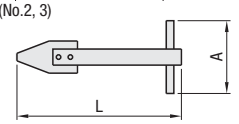


RoHS

HLTN (No.1)



HLTN (No.2, 3)



M Material: 1.1191/C45E S Surface Treatment: Black Oxide

Thread Inserts

Part Number Type	*M	*L	Pitch	Tap Pilot Hole Diameter (Reference)	€ Unit Price Qty. 1~9.	Volume Discount 10~19	20~49	50~99
HLTS (Coarse)	3	3 4.5 6	0.5	3.11~3.20				
	4	4 6 8	0.7	4.16~4.29				
	5	5 7.5 10	0.8	5.18~5.33				
	6	6 9 12	1.0	6.22~6.40				
	8	8 12 16	1.25	8.28~8.48				
	10	10 15 20	1.5	10.33~10.56				
	12	12 18 24	1.75	12.38~12.64				
	16	16 24 32	2.0	16.44~16.73				

Part Number Type	*M	*L	Pitch	Tap Pilot Hole Diameter (Reference)	€ Unit Price Qty. 1~9.	Volume Discount 10~19	20~49	50~99
HLSS (Fine Thread)	8	8 16 24	1.0	8.28~8.48				
	10	10 15	1.0	10.33~10.56				
		10 15 20	1.25					
	12	12 18	1.25	12.38~12.64				
		12 24	1.5					

* M and L are sizes after inserting into tapped holes. L dimension after insertion is shorter than that before the insertion.

Taps for Inserts

Part Number Type	No.	Applicable Inserts M	L	D	K	€ Unit Price Qty. 1~9.	Volume Discount 10~20
HLTX HLTY HLTZ (Coarse)	3	3	55	5	4		
	4	4	61	5.5	4.5		
	5	5	67	6			
	6	6	65	6.2	5		
	8	8	75	7	5.5		
	10	10	82	8.5	6.5		
	12	12	88	10.5	8		
	16	16	105	14	11		

Part Number Type	No.	Pitch	L	D	K	€ Unit Price 1~9 pcs.	Volume Discount 10~20
HLSX HLSY HLSZ (Fine Thread)	8	1.0	75	7	5.5		
	10	1.0 1.25	82	8.5	6.5		
	12	1.25 1.5	88	10.5	8		

Installation Tools

Part Number Type	No.	Applicable Inserts M	L	A	€ Unit Price Qty. 1~9.	Volume Discount 10~20
HLTP	3	3	150	80		
	4	4				
	5	5				
	6	6	165	103		
	8	8	175			
	10	10	180	124		
	12	12	200			
	16	16	210			

Tang Break-off Tools

Part Number Type	No.	Applicable Inserts M	L	D	d	€ Unit Price Qty. 1~9.	Volume Discount 10~20
HLTB	3	3	100	6	1.8		
	4	4			2.6		
	5	5		9	3.5		
	6	6		10	4.2		
	8	8		12	5.5		
	10	10	110	14	7.5		
	12	12	115	16	8.5		
	16	16	114	20	12		

Insert Removal Tools

Part Number Type	No.	Applicable Inserts M	L	A	€ Unit Price Qty. 1~9.	Volume Discount 10~20
HLTN	1	3 · 4 · 5	92	60		
	2	6 · 8 · 10	109	75		
	3	12 · 16	117	100		

Order Example

Part Number		L		Pitch
HLTS3	-	4.5		
HLTX5				
HLSS10	-	15	-	1.25
HLSX	-	8	-	1.0

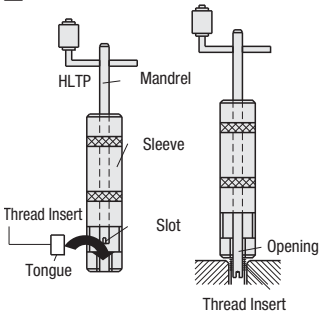
Days to Ship

6 Days ☞P.87

2 Days

Price For orders larger than indicated quantity, please request a quotation. ☞P.87

How to Handle Thread Inserts



(Fig. 1) (Fig. 2) (Fig. 3) (Fig. 4)

1. Drill a pilot hole in the work within the appropriate limit of tap pilot hole diameters shown in the above table.
   (Hole Depth > Length after Insertion+2.5xP)
2. Tap with "Taps for Inserts" (Coarse, Medium, Finish Tapping in that order), and completely remove metal chips.
3. Insert Thread Inserts to tip of sleeve of the Insert Tool (with tang on the tip side), and clip on the tang at the mandrel slot (Fig. 1). Turn the handle and insert Thread Insert into the guide of thread part on the tool tip. Set it so that the insert does not protrude more than the sleeve tip (leaving 1 or 2 pitches).
4. Turn the handle to install Thread Inserts by positioning the insert tool perpendicular to the work (Fig. 2). Check the insertion condition from the opening of the sleeve tip. Remove the tool from the work when insertion is complete.
   * Inserting while pressing the handle hard in the insertion direction causes damages such as skipped threads. Always turn the handle lightly in the horizontal direction. Do not reverse the rotation during the insertion as that will cause damages.
5. After the insertion is complete, insert the tang break-off tool, and break off the tang from the notch by striking the head sharply with a hammer (Fig. 3).
6. When removing Thread Inserts, press an Insert Removal Tool onto the insert, and slowly turn counterclockwise to remove it (Fig. 4). When reinserting the Insert into the removed hole, use special tap again before inserting.

Tangless Inserts / Self-Tapping Inserts
-Slotted-

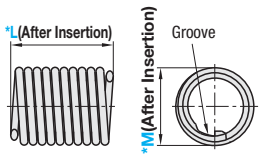
Cost-saving box package is available when large quantity is required. ☞P.172

■Tangless Inserts



RoHS

TLTS(1.4301/X5CrNi18-10)

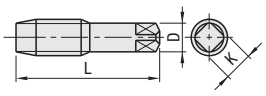


■Hand Taps for Tangless Inserts
Hand Taps



RoHS

TLTK(Set of a plug tap and a bottom tap)



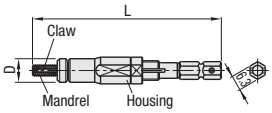
M Material: JIS-HSSV
H Hardness: 63~68HRC

■Insertions · Removal Tools



Caps are removable.

TLTP TLTN



	M Material	H Hardness
Claw	HAP-10	64~65HRC
Mandrel	DC-53	57~60HRC
Housing	1.4305/X10CrNiS18-9	-

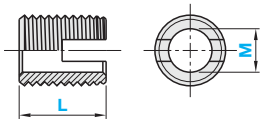
■Self-Tapping Inserts
-Slotted-



RoHS

Part Number ☐ Not Compliant
The hexavalent chrome content for surface treatment is within threshold value.

Type	M Material	S Surface Treatment
ENT	JIS STKM	Chromate
ENTS	1.4305/X10CrNiS18-9	-

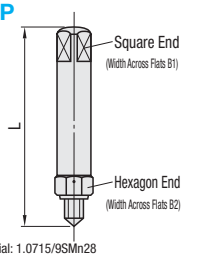


■Hand Tools for Self-Tapping Inserts



RoHS

ENTP



M Material: 1.0715/9SMn28

■Tangless Inserts

Part Number Type	*M	*L			Tap Pilot Hole Diameter (Reference)	€ Unit Price Qty. 1~49	Volume Discount 50~
TLTS	2.5	2.5	3.8	5	2.60~2.65		
	3	3	4.5	6	3.12~3.20		
	4	4	6	8	4.17~4.30		
	5	5	7.5	10	5.16~5.33		
	6	6	9	12	6.25~6.42		
	8	8	12	16	8.31~8.52		
	10	10	15	20	10.37~10.62		

* M (Coarse Thread) and L are the sizes after inserting to the tapped hole.
Before insertion, L Dimension is shorter.
These specialized tools allow insertion and removal of tangless inserts, reducing working human hours.

■Hand Taps for Tangless Inserts

Part Number Type	No.	Applicable Inserts M	L	D	K	€ Unit Price Qty. 1~3	Volume Discount 4~
TLTK	2.5	2.5	46	4	3.2		
	3	3	52	4	3.2		
	4	4	60	5.5	4.5		
	5	5	62	6	4.5		
	6	6	70	6.2	5		
	8	8	75	7	5.5		
	10	10	82	8.5	6.5		

■Insertions · Removal Tools

Part Number Type	No.	D	L	€ Unit Price Qty. 1~3	Volume Discount 4~
TLTP (Insert Tool) TLTN (Removal Tool)	2.5	6.0	69.0		
	3	6.8	68.5		
	4	9.0	75.8		
	5	9.7	78.6		
	6	11.0	78.1		
	8	13.0	98.4		
	10	15.5	104.4		

TLTP and TLTN are not RoHS compliant, but the content of hexavalent chrome for surface treatment is within threshold value.
- No damages on the threads · bodies at removal.
- No need for breaking tangs off and looking for broken tangs, or checking gauge positions.

Part Number Type	M	L	Tap Pilot Hole Diameter (Reference) Softer ← Mating material → Harder: Soft Plastic Hardwood	Hard Plastic Cast Iron ~HB200: Light Metal such as Aluminum Alloy Tensile Strength ~350N/mm²	Cast Iron HB200~: Aluminum Alloy etc. Light Metals Tensile Strength (350N/mm² ~) Brass, other Nonferrous metals		Outer Screw: Outer Dia.	Pitch	ENT € Unit Price Qty. 1~9.	ENT Volume Discount 100~	ENTS € Unit Price Qty. 1~9.	ENTS Volume Discount 100~
ENT ENTS	3	6	4.5	4.6	4.7	4.8	5	0.5				
	4	8	5.9	6.0	6.1	6.2	6.5	0.75				
	5	10	7.2	7.3	7.5	7.6	8	1.0				
	6	14	8.8	9.0	9.2	9.4	10	1.5				
	8	15	10.8	11.0	11.2	11.4	12	1.5				
	10	18	12.8	13.0	13.2	13.4	14	1.5				
	12	22	14.8	15.0	15.2	15.4	16	1.5				

Do not use this for difficult-to-cut high strength Aluminum (Duralumin etc.)
When the tapped material has high hardness, drill a pilot hole of slightly larger diameter within the range.

Part Number Type	No.	Applicable Inserts M	L	B_1	B_2	€ Unit Price Qty. 1~9.	Volume Discount 10~20
ENTP	3	3	55	5	7		
	4	4	60	5	7		
	5	5	75	8	13		
	6	6	75	8	13		
	8	8	75	8	13		
	10	10	95	12.5	19		
	12	12	95	12.5	19		

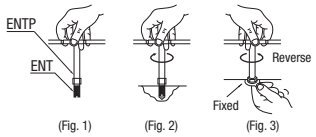
Order Example

Part Number	-	L
TLTS2.5	-	5
ENT3		6
ENTP5		
TLTP10		

Days to Ship: 6 Days / 2 Days ☞P.87

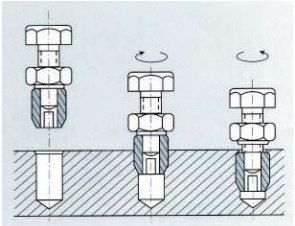
■Features of Self-Tapping Inserts
- Slotted tap inserts with both external and internal threads
This fastener components reinforce relatively-low mechanical thread strength and allow skipping of the pre-tapping.

■Machining Procedure and Precautions for Use
1. Drill a pilot hole in the work within the appropriate limit of tap pilot hole diameters shown in the above table. When the tapped material has high hardness, drill a pilot hole of slightly larger diameter within the range.
2. With the slot facing down, fit the self-tapping insert all the way onto the tip of the hand tool (Fig. 1). Put the insert vertically into the pilot hole by turning the tool handle. (Fig 2)
   * If the pilot hole diameter is too small, it may cause a lag in pitch or looseness, and can damage tools.
   * At the start of tapping (1 to 2 pitches), check to see if the tools are aligned straight with the pilot hole.
   If the insert is going in slanted,, stop turning the tool and re-align. Realignment after inserting almost halfway (1/3 to 1/2) is too late. Do not turn the handle in reverse during the insertion as that will cause defects
3. When the insert has arrived at a predetermined depth, tighten the hexagon part of the tool with a wrench, and then turn the handle counterclockwise to separate the tool from the work. (Fig. 3)
   * Further turning a tool when already in contact with the work can damage the self-tapping part of the insert and result in a loose fit.
4. Before the first use, please select a proper pilot hole dia. through trials.



(Fig. 1) (Fig. 2) (Fig. 3)

■How to use a bolt and a nut
Use a hexagon nut and a Self-Tapping Insert in a double-nut arrangement as shown below. Do not obstruct the first thread or the 3-holes with the bolt. After the insertion is complete, loosen the hex nut while holding the bolt head.

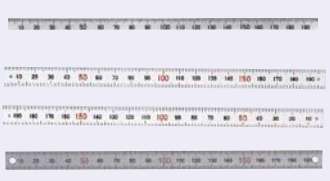


Scale Plates and Pointer Plates

* Use as measuring tools for slide adjustment of machines and equipment.

■Scale Plates and Pointer Plates

RoHS



■Horizontal Scale Type

Width	Type			Material
	Zero at Left	Zero at Right	Center Divided	
8mm	MEPLH	MEPRH	MEPCH	EN AW-1050A/Al99,5 (Clear Anodized)
12mm	MEPL	MEPR	MEPC MES	
8mm	MEPLSH	MEPRSH	MEPCSH	1.4301/X5CrNi18-10
12mm	MEPLS	MEPRS	MEPCS	
12mm	MEPLP	MEPRP	MEPCP	PET Plastic

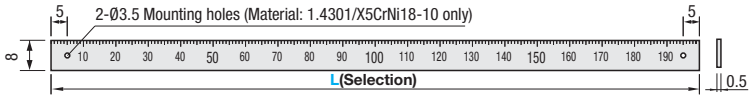
■Vertical Scale Type

Width	Type		Material
	Zero at the bottom	Center Divided	
15mm	MEPCTT	MEPCT	EN AW-1050A/Al99,5 (Clear Anodized)
	-	MEPCTP	PET Plastic

■8mm Width

(EN AW-1050A/Al99,5 are all printed in black. (For 1.4301/X5CrNi18-10, 0.5mm increment are printed in red.)

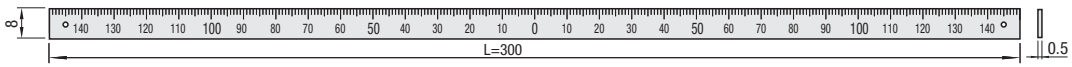
MEPLH (EN AW-1050A/Al99,5 · Clear Anodize) with adhesive tape
MEPLSH (1.4301/X5CrNi18-10) Ø3.5x2 positions with mounting holes



MEPRH (EN AW-1050A/Al99,5 · Clear Anodize) with adhesive tape
MEPRSH (1.4301/X5CrNi18-10) Ø3.5x2 positions with mounting holes

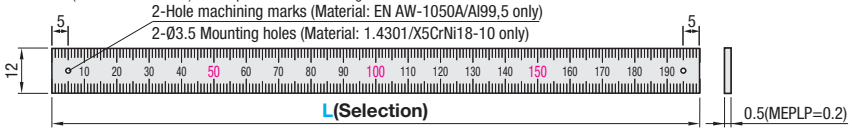


MEPCH(EN AW-1050A/Al99,5 · Clear Anodize) with adhesive tape
MEPCSH(1.4301/X5CrNi18-10) Ø3.5x2 positions with mounting holes

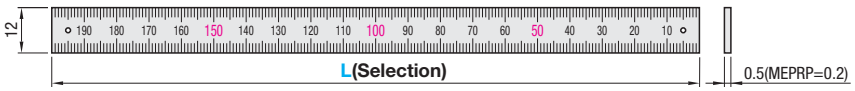


■12mm Width

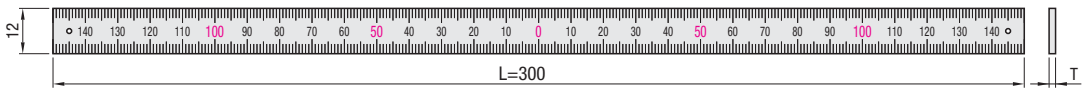
MEPL(EN AW-1050A/Al99,5 · Clear Anodize) with adhesive tape
MEPLP(PET Plastic) with adhesive tape
MEPLS(1.4301/X5CrNi18-10) Ø3.5x2 positions with mounting holes



MEPR(EN AW-1050A/Al99,5 · Clear Anodize) with adhesive tape
MEPRP(PET Plastic) with adhesive tape
MEPRS(1.4301/X5CrNi18-10) Ø3.5x2 positions with mounting holes

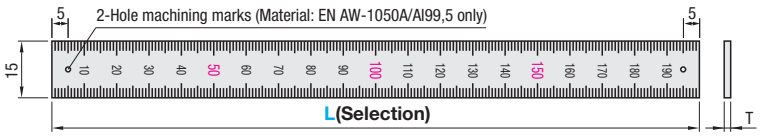


MEPC(EN AW-1050A/Al99,5 · Clear Anodize T0.5) with adhesive tape
MEPCP(PET Plastic T0.2) with adhesive tape
MEPCS(1.4301/X5CrNi18-10 T0.5) Ø3.5x2 positions with mounting holes
MES(EN AW-1050A/Al99,5 · Clear Anodize · Slim T0.15) with adhesive tape

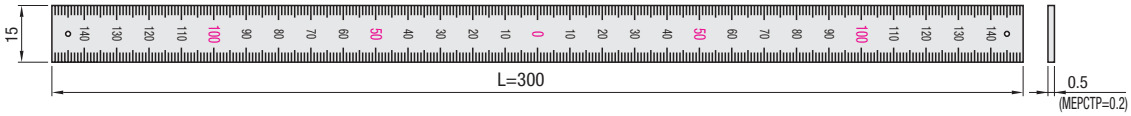


■Vertical Scale Type

MEPCTT(EN AW-1050A/Al99,5 · Clear Anodize · Vertical) with adhesive tape



MEPCT(EN AW-1050A/Al99,5 · Clear Anodize · Vertical) with adhesive tape
MEPCTP(PET Plastic · Vertical) with adhesive tape



MES and PET plastic types can be used on curved surfaces. Hole drilling marks are not printed on PET plastic type of width 8mm.
Double-sided adhesive tape is not attached to stainless steel type. Use the two Ø3.5x2 screw mounting holes.
LC alteration on stainless steel type results in removal of the mounting holes on the ends. Combination with HC machining is recommended.

Price Revision

: New Price

CAD Data

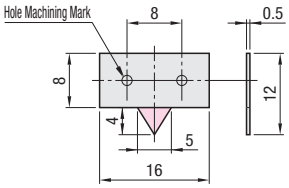
Pointer Plates

RoHS

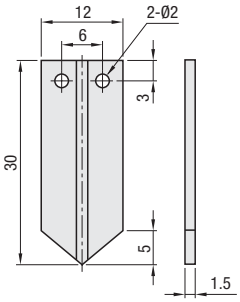


Type	Material
PPL	EN AW-1050A/Al99,5 (White)
PPSP PPLP	PET Plastic
PPPS PPPL	Polycarbonate

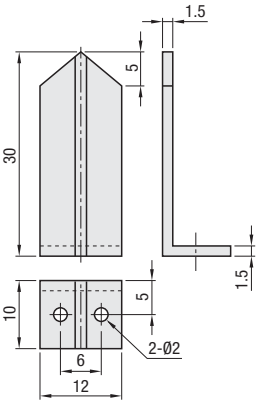
PPS12 PPSP12



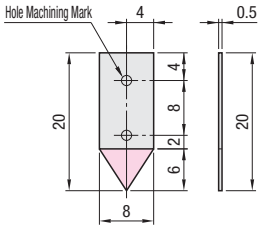
PPPS



PPPL



PPL20 PPLP20



Scale Plates Width 12mm Zero at Left · Right

Zero Point Position	Part Number Type	L	€ Unit Price Qty. 1~19	Volume Discount 20~29	30~49	50~100
Left End	MEPL	100				
		200				
		300				
		600				
Right End	MEPLS	100				
		200				
Left End	MEPLP	200				
Right End	MEPR	100				
		200				
		300				
		600				
Right End	MEPRS	100				
		200				
Left End	MEPRP	200				

Scale Plates Width 12mm Center Divided Type

Zero Point Position	Part Number Type	L	€ Unit Price Qty. 1~19	Volume Discount 20~29	30~49	50~100
Center	MEPC	300				
	MEPCS					
	MEPCP					
	MES					

Scale Plates Width 15mm Vertical Type

Zero Point Position	Part Number Type	L	€ Unit Price Qty. 1~19	Volume Discount 20~29	30~49	50~100
Bottom	MEPCTT	100				
		200				
		300				
Center	MEPCT	300				
	MEPCTP					

L600 comes as a set of 2 pcs. of 0~300 and 301~600.

Order Example — Part Number: PPS12, MEPL-200

Days to Ship: 6 Days P.87

Alterations — Part Number - (LC · HC) — Days to Ship: 8 Days

MEPL - LC55

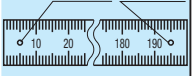
MEPLS - LC155-HC

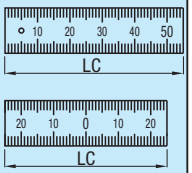
Scale Plates Width 8mm Type

Zero Point Position	Part Number Type	L	€ Unit Price Qty. 1~19	Volume Discount 20~29	30~49	50~100
Left End	MEPLH	100				
	MEPLSH					
Right End	MEPRH	200				
	MEPRSH					
Center	MEPCH	300				
	MEPCSH					

Pointer Plates

Part Number Type	No.	€ Unit Price Qty. 1~4	Volume Discount 5~9	10~29	30~100
PPSP	12				
PPL PPLP	20				
PPPS	30				
PPPL	30				

Alterations	Code	Spec.	Price Adder
Hole Machining 	HC	Adds mounting holes at hole machining marks. PPS12 · PPL20 ···Ø2.5x2 Positions MEPL_ · MEPR_ MEPC_ · MES · MEPCT ···Ø3.5x2 Positions Adds mounting holes for above types. ⊗Not applicable to PET plastic type of 8mm width (EN AW-1050A/Al99,5) Ⓨ For over L300, adds mounting holes at 2 positions for 0~300, at 2 positions for 301~. Ⓨ For using combination with LC over L300, hole machining is only applicable to LC≥ 310.	2,00

Alterations	Code	Spec.	Price Adder
Length Cut 	LC	Cuts the length in 1mm increment. Specify LC after checking the desired scale range. Cuts at the specified length from the zero point. Zero Point / Applicable Part Number / Point of Origin: Left End — MEPL_Type — From Zero Point Right End — MEPR_Type — From Zero Point Bottom — MEPCTT — From Zero Point Center — MEPC_Type MES — From Zero Point Center Divided ⊗Not available for PET plastic type. Ⓨ There will be two pieces for sizes over 301mm. Ⓨ Mounting hole marks will remain on Stainless Type when cut 5mm from overall length.	2,00

Angle Scales / Scale Tapes

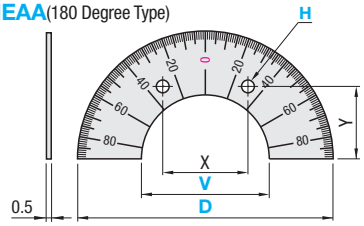
CAD Data

* Use as measuring tools for slide adjustment of machines and equipment.

■Angle Scales Plate Type RoHS

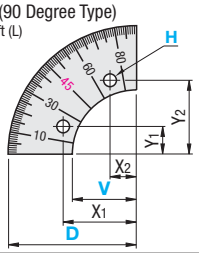


MEAA (180 Degree Type)

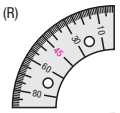


MEAB (90 Degree Type)

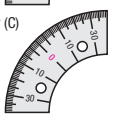
* Zero at Left (L)



* Zero at Right (R)



* Zero at Center (C)



M Material: 1.4301/X5CrNi18-10

Part Number Type	Graduation direction	d	V	H	X	Y	€ Unit Price
MEAA 180 Degree Type	C (Zero at Center)	40	20	3	13.5	11.5	
		60	30		20	17	
		100	50		36	26	
		140	80		48	40	

Part Number Type	Graduation direction	D	V	H	X_1	Y_1	X_2	Y_2	€ Unit Price
MEAB 90 Degree Type	L (Zero at Left) R (Zero at Right) C (Zero at Center)	20	10	3	12	5	5	12	
		30	15		17	7	7	17	
		50	25		29	12	12	29	
		70	40		43	18	18	43	

Order Example: Part Number MEABC50 - V 25 - H 3

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

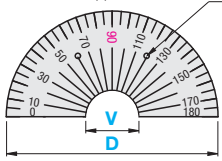
For orders larger than indicated quantity, please request a quotation.

■Angle Scales Double-sided Adhesive Tape RoHS

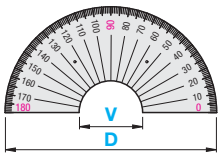


MEAN

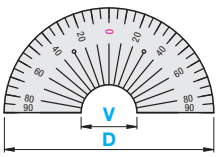
* Zero at Left (L)



* Zero at Right (R)



* Zero at Center (C)



For D40 and D60, angle graduations are marked in 5 degree increment.
For D100 and D140, angle graduations are marked in 1 degree increment.

M Material: EN AW-1050A/Al99,5

Part Number Type	Graduation direction	D	V Selection	€ Unit Price
MEAN	L (Zero at Left) C (Zero at Center) R (Zero at Right)	40	10 12 16 20	
		60	16 20 25 30	
		100	30 35 40 50	
		140	40 50 60 80	

Zero position varies depending on graduation direction.
Similar products are available. Adjusting Collars P.1015

Alterations: Part Number MEANC140 - V 60 - (HC) HC — 8 Days

Order Example: Part Number MEANC60 - V 25

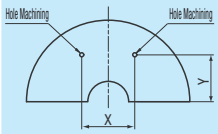
Days to Ship: 8 Days

Price

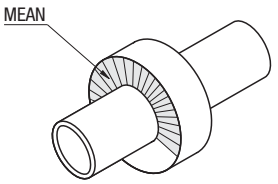
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29	30~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

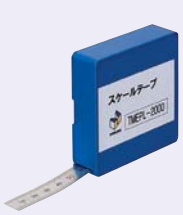
For orders larger than indicated quantity, please request a quotation.

Alterations	Code	Spec.	Price Adder
Hole Machining 	HC	Adds mounting holes at hole machining marks. MEAN…Ø3.5 x 2 locations Adhesive tape is affixed to the back. (Mounting Hole Dimension Diagram) D / X / Y: 40 / 13.5 / 11.5; 60 / 20 / 17; 100 / 36 / 26; 140 / 51 / 36 Available for MEAN only.	2,00

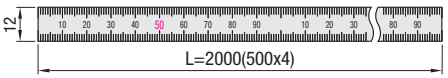
Example



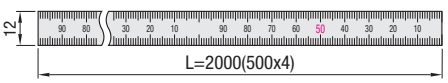
■Scale Tapes RoHS



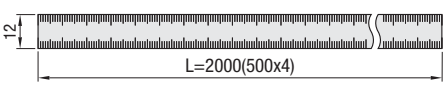
TMEPL (Zero Left End)



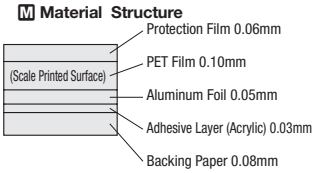
TMEPR (Zero Right End)



TMEPN (No Number)



M Material Structure



TMEPL and TMEPR repeat 100mm graduations. The values of 0, 100 are not displayed.
Please cut with scissors etc. at convenient length.

Zero Point Position	Part Number Type	L	Thickness	Scale Increment	€ Unit Price L2000
Left End	TMEPL	2000	0.18	1mm Increment	
Right End	TMEPR				
-	TMEPN				

Four pieces of 500mm tape are connected.
Peel off the surface protection film before use.
Wipe off the dirt on the surface.

Order Example: Part Number TMEPL-2000

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

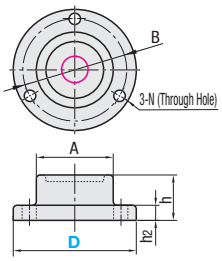
Bubble Levels / Grease Nipples / Hardening Precision Balls

CAD Data

Bubble Levels RoHS (Mounting Type)



SMTP



M Material:
EN AW-5052/AlMg2,5
Glass

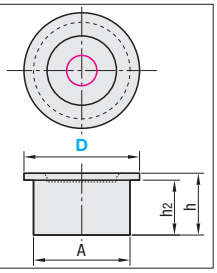
S Surface Treatment:
Black Anodize
Max. Operation
Temperature 55°C

Part Number Type	D	A	B	h	h2	M Holes (N)	Sensitivity	€ Unit Price
SMTP	28	16	22	10.5	3.5	2	38'12"(R-180)	
	32	20	27	12.0	4.0	3	38'12"(R-180)	

Bubble Levels RoHS (Embedded Type)



SMH



M Material:
ABS Plastic
Glass

S Surface Treatment:
Black Anodize
Max. Operation
Temperature 55°C

Part Number Type	D	A	h	h2	Sensitivity	€ Unit Price
SMH	20	16.7	11	9.5	38'12"(R-180)	

Bubble Levels
- Level the surface to be mounted prior to placing the bubble level, then mount while adjusting the bubble level so the air bubble stays within the red circle in the center.
- When the bubble moves 2mm away from the center, the mounting surface is inclined approximate 0.6 degrees.

Mounting interface of these bubble levels have no accuracies built-in.

Part Number: SMTP28

6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Grease Fittings RoHS



GPA GPAS

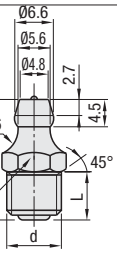


Fig.1

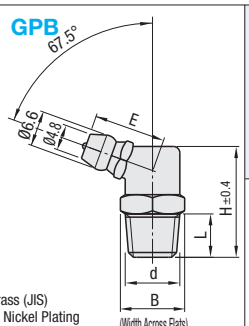


Type	M Material	S Surface Treatment
GPA	360BD Brass (JIS)	Nickel Plating
GPAS	1.4305/X10CrNiS18-9	-



RoHS

GPB

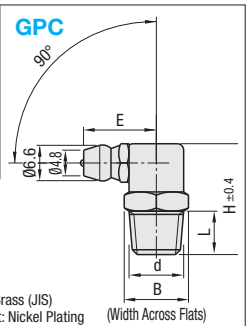


M Material: 360BD Brass (JIS)
S Surface Treatment: Nickel Plating



RoHS

GPC



M Material: 360BD Brass (JIS)
S Surface Treatment: Nickel Plating

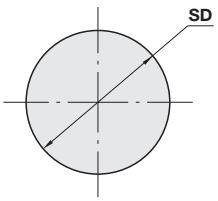
Part Number Type	No.	d	H	L	E	B	GPA · GPB · GPC € Unit Price Qty. 1~99	GPA · GPB · GPC Volume Discount 100 pcs. or More	GPAS € Unit Price Qty. 1~99	GPAS Volume Discount 100 pcs. or More
GPA GPAS	6	M6xP0.75	13.5	5	-	7				
	6A	M6xP1.0	13.5	5	-	7				
	1	R (PT) 1/8	20 (20.5)	9 (9.5)	-	10				
	2	R (PT) 1/4	25	12	-	14				
GPB	1	R (PT) 1/8	21.5	8	12.5	10				
	2	R (PT) 1/4	25	11	13.5	14				
GPC	1	R (PT) 1/8	21.5	8	12.5	10				
	2	R (PT) 1/4	25	11	14.2	14				

* Dimensions in ( ) are for GPAS1. Fig.1 shows thread shapes of GPA1, 2 and GPAS1, 2.

Hardening Precision Balls RoHS



BLIJ (Inch)
BLIS (Inch)
BLMJ (mm)
BLMS (mm)



* Class 28 Standards (JIS-B1501) µm

Diameter Deviation	max.	0.7
Sphericity	max.	0.7
Surface Roughness	max.	0.05
Diameter Size Variation of the Lot	max.	1.4

Type	Dimension	M Material	Class	H Hardness	Standards
BLIJ	Inch	1.3505/100Cr6	28	61~67HRC	JIS B1501
BLIS	Inch	1.4125/X105CrMo17		59~66HRC	In accordance with JIS-B1501
BLMJ	mm	1.3505/100Cr6		61~67HRC	JIS B1501
BLMS	mm	1.4125/X105CrMo17		59~66HRC	In accordance with JIS-B1501

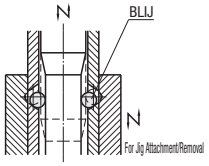
Inch Standards Type

Part Number Type	No.	SD (Inch)	BLIJ € Unit Price Qty. 1~49	BLIJ Volume Discount 50~99	BLIJ Volume Discount 100 pcs. or More	BLIS € Unit Price Qty. 1~49	BLIS Volume Discount 50~99	BLIS Volume Discount 100 pcs. or More
BLIJ BLIS	8	1/8						
	10	5/32						
	12	3/16						
	14	7/32						
	15	15/64						
	16	1/4						
	17	17/64						
	18	9/32						
	20	5/16						
	22	11/32						
	24	3/8						
	26	13/32						

Metric Standards Type

Part Number Type	No.	SD (mm)	BLMJ € Unit Price Qty. 1~49	BLMJ Volume Discount 50~99	BLMJ Volume Discount 100 pcs. or More	BLMS € Unit Price Qty. 1~49	BLMS Volume Discount 50~99	BLMS Volume Discount 100 pcs. or More
BLMJ BLMS	3	3						
	3.5	3.5						
	4	4						
	4.5	4.5						
	5	5						
	6	6						
	8	8						

Example



Order Example: Part Number GPA6A, BLIJ16, BLMS3

Days to Ship: 6 Days P.87 / 2 Days

Loss-Proof Chains

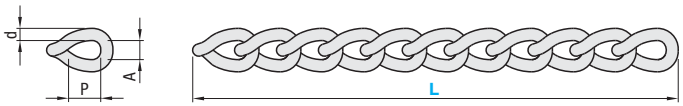
CAD Data

■Loss-Proof Stainless Steel Chains



RoHS

SCHSP



Material: 1.4301/X5CrNi18-10

Part Number	L 50mm Increment	P	A	d	Reference Applied Load	€ Unit Price
SCHSP	100~500	5.5	2.5	1.6	9kg	
	550~1000					

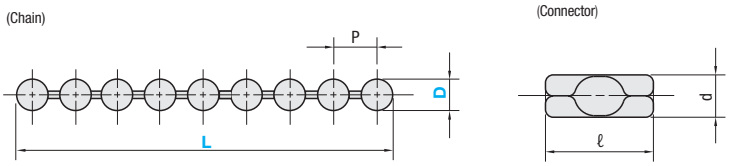
The reference applied load is only a guideline.

■Loss-Proof Ball Chains



RoHS

BALLC



Material: 1.4301/X5CrNi18-10

Part Number		L 50mm Increment	P	Reference Applied Load	Accessory (Connector)		€ Unit Price
Type	D				d	ℓ	
BALLC	2.3	100~500	3.3	4kg	3.0	8	
		550~1000					
	3.2	100~500	4.4	6kg	4.3	11	
		550~1000					

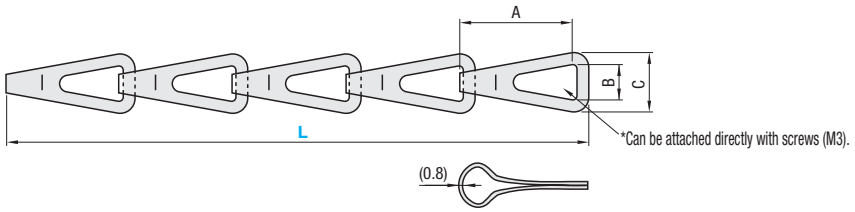
* Depending on the number of links, the actual L dimension may be slightly longer than the specified dimension. (Connecting Parts: A connecter is attached.)
The reference applied load is only a guideline. Dimensions of chains and connecting parts are for reference only.

■Chains



RoHS

CHSP



Material: 1.4301/X5CrNi18-10

Part Number		L 50mm Increment	A	B	C	Plate Thickness	Reference Applied Load	€ Unit Price
Type	No.							
CHSP	4	100~500	15.5	4.2	8	0.8	70kg	
		550~1000						

* Depending on the number of links, the actual L dimension may be slightly longer than the specified dimension. (Please refer to http://jp.misumi-ec.com/mech/. Connecting parts are not included.) UH: ERL. IN EN/CS/de
The reference applied load is only a guideline.

Order Example

Part Number	-	L
SCHSP	-	600
BALLC2.3	-	150
CHSP4	-	100

Days to Ship: 8 Days | Express A | 2,00 EUR / piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

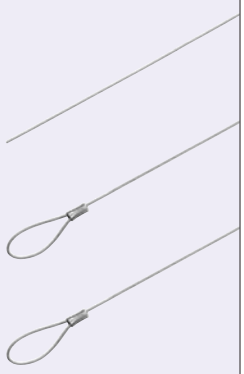
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

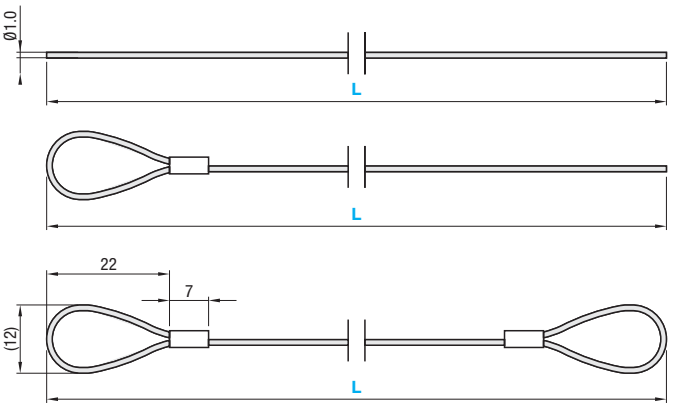
For orders larger than indicated quantity, please request a quotation.

CAD Data

Loss-Proof Wires RoHS



LPWW



Dimension in ( ) is for reference only.

Material: 1.4301/X5CrNi18-10

Part Number		L	Reference	€ Unit Price		
Type	Shape	50mm Increment	Applied Load	A	B	C
LPWW	A B C	100~500	9kg			
		550~1000				

The reference applied load is only a guideline.

Order Example: Part Number — Type: LPWW, Shape: C, L: 850

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P87

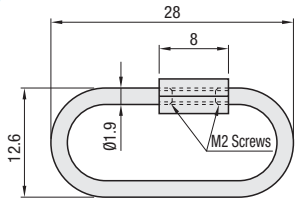
Quantity	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Metal Joints RoHS



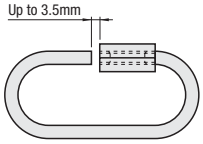
SKC



Material: 1.4301/X5CrNi18-10

Part Number	Reference Applied Load	€ Unit Price
SKC	20kg	

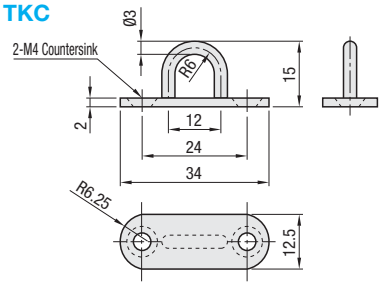
The reference applied load is only a guideline.



Brackets RoHS



TKC



Material: 1.4301/X5CrNi18-10 Accessory: M4-5 Flat Head Screw 2pcs (1.4301/X5CrNi18-10)

Part Number	Reference Applied Load	€ Unit Price
TKC	20kg	

The reference applied load is only a guideline.

Order Example: Part Number — SKC, TKC

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

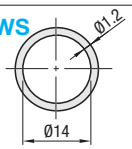
For orders larger than indicated quantity, please request a quotation.

Connecting Parts UH: ERL. IN EN/CS/de

Double Rings RoHS



RWS



Material: 1.4401/X5CrNiMo17-12-2

Double Rings

Part Number		Reference Applied Load	€ Unit Price	Volume Discount		
Type	No.		Qty. 1	2~3	4~19	20~99
RWS	14	1kg				

The reference applied load is only a guideline.

Order Example: Part Number — RWS14

Days to Ship: 8 Days

Express A 2,00 EUR / piece P88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Temperature Sensing Labels

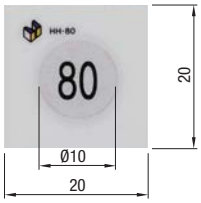
RoHS



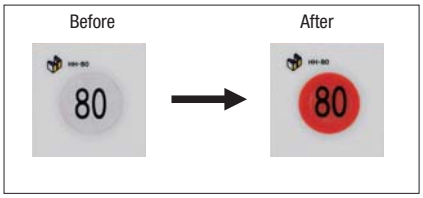
Order unit: Pack

■Single Temperature Labels

HH(Irreversible)

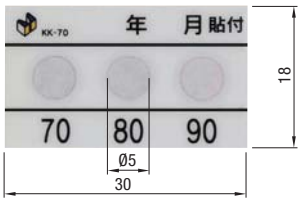


The color change is irreversible and registers the temperature history.

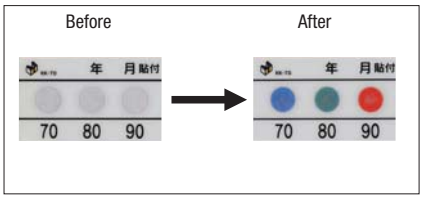


■3 Increment Temperature Labels

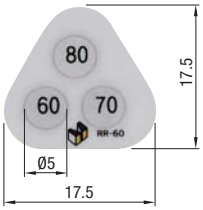
KK(Irreversible)



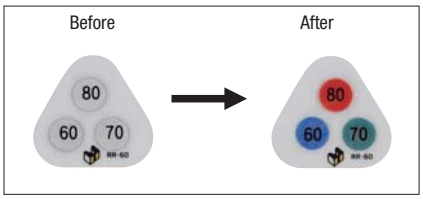
The color change is irreversible and registers the temperature history.

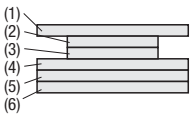


RR(Irreversible)



The color change is irreversible and registers the temperature history.





(1) Surface Film : Polyester Film
(2) Colored Paper : Wood pulp high quality paper
(3) Wax Paper : Pulp Japanese paper + carbon hydride
(4) Adhesive : Acrylic pressure sensitive adhesive
(5) White Film : Polyester Film
(6) Adhesive : Acrylic pressure sensitive adhesive

* Temperature precision: ±2°C
* Product developed using physical property change of wax. Free of environmentally hazardous substances such as lead, mercury and chrome.
* Features of petroleum natural wax
(1) Chemically stable material made of saturated hydrocarbon.
(2) Highly safe material certified as non-carcinogenic.
(3) Environmentally friendly biodegradable material.

Part Number Type	Part Number No.	Pcs. per package	Coloring Temperature (°C)	Color Alteration	€ Unit Price 1~4 Pkgs.	Volume Discount 5 Pkgs.or More
HH	40	20 pcs.	40	White → Red		
	50		50			
	60		60			
	70		70			
	80		80			
	90		90			
	100		100			
	110		110			

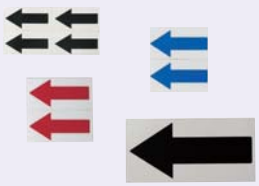
-Example of Use-
- For temperature management of manufacturing process
- For temperature management during transportation
- For maintenance of electric and electronic equipment

Part Number Type	Part Number No.	Pcs. per package	Coloring Temperature (°C) Blue, Green, Red	Color Alteration	KK € Unit Price 1~4 Pkgs.	KK Volume Discount 5 Pkgs.or More	RR € Unit Price 1~4 Pkgs.	RR Volume Discount 5 Pkgs.or More
KK RR	40	20 pcs.	40 / 50 / 60	White → Blue, Green, Red				
	50		50 / 60 / 70					
	60		60 / 70 / 80					
	70		70 / 80 / 90					
	80		80 / 90 / 100					
	90		90 / 100 / 110					

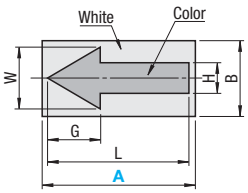
Order Example | Part Number RR-40 | Days to Ship 6 Days P.87

Arrow Sign Stickers / Arrow Sign Plates / Open-Closed Plate Signs
-Straight / R Type-

■Straight Sticker Type RoHS



ARWS(Black)
ARWSR(Red)
ARWSB(Blue)

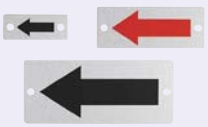


Part Number Type	A	No. of Panels per Label	No. of Labels per package
ARWS ARWSR ARWSB	15	4	10 Pcs.
	20	2	
	40	1	

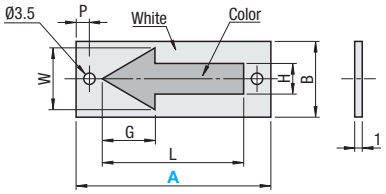
Material: PET Films

Part Number Type	A	B	L	W	H	G	€ Unit Price 1~9 Pkgs.	Volume Discount 10 Pkgs.or More
ARWS ARWSR ARWSB	15	7.5	13	6	3	5		
	20	10	18	8.5	4	6.5		
	40	20	37	17	8	13		

■Straight Plate Type RoHS



APWS(Black)
APWSR(Red)



Order unit: Pack 5 pcs. per package

Peel off the surface protection film before use.

Material: EN AW-1050A/Al99,5

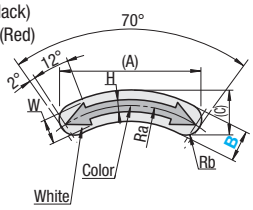
Part Number Type	A	B	L	W	H	G	P	€ Unit Price 1~2 Pkgs.	Volume Discount 3 Pkgs.or More
APWS APWSR	30	12	17	8	4	6	3.5		
	50	20	36	16	8	12			
	70	30	55	24	12	19			

■R Type RoHS

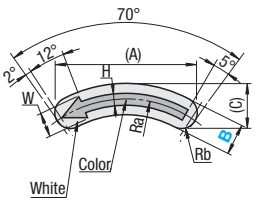


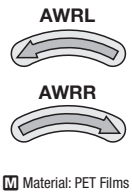
10 Pcs. per package

AWRB(Black)
AWRBR(Red)



AWRL(Black)
AWRLR(Red)
AWRR(Black)
AWRRR(Red)





Material: PET Films

Part Number Type	B	Ra	W	H	Rb	(A)	(C)	€ Unit Price 1~9 Pkgs.	Volume Discount 10 Pkgs.or More
AWRB AWRBR	13	50	10	5	6.5	59.2	18.7		
AWRL AWRLR	20	75	15	8	10	88.9	28.4		
AWRR AWRRR	25	100	20	10	12.5	118.3	36.6		

Instruction of Use

(1) Choose a flat surface.
(2) Wipe dirt off the surface.
(3) When wish to put a sticker on an exact position, moisten a large surface with a cloth beforehand.
(4) Separate a release paper and put the sticker, then press firmly.

Material Characteristics (Features of PET Film)

Heat Resistance: 100°Cx7 days——No change
Oil Resistance: 72 hours in gear oil——No change
Weather Resistance: 400 hours in weather meter——No change
Durability may vary under irregular conditions.

Material Structure

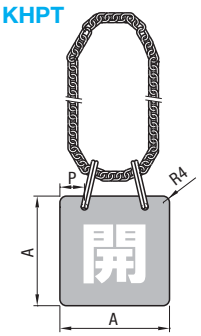


■Open / Closed Sign Plates RoHS



Chains are removable.
1 "Open" and 1 "Close" plates make a set.

KHPT



Material: Polyethylene Synthetic Paper
Chain: 1.4301/X5CrNi18-10

Part Number Type	No.	A	P	Ring Wire Dia.	Ring Inner Dia.	Chains Length	€ Unit Price Qty. 1~2	Volume Discount 3 pcs. or More
KHPT	70	67	15	1.4	22	600		

Order Example

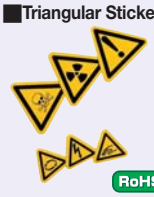
Part Number
AWRB-20
KHPT-70

Days to Ship

6 Days P.87

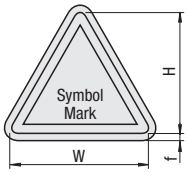
Triangular Stickers / Mark Stickers / Caution & Warning Stickers

■Triangular Stickers



RoHS

LRS
LRM



10 Pcs. per package

Material: PET Films

Part Number Type	Nominal	W	H	f	€ Unit Price 1~9 Pkgs.	Volume Discount 10 Pkgs. or More
LRS	01~	25	23	2		
LRM		45	40	3		

ISO: International Organization for Standardization
IEC: International Electrotechnical Commission
B S: British Standards
E N: European Standards (Web Page)

LRS
LRM

Nominal

ISO	ISO	ISO	ISO	ISO	ISO	IEC
						
Electric Shock	Cautions	Rotating Objects	Caution Pinching	Flammable	High Temperature	
01	02	03	04	05	06	
BS	BS	ISO	ISO	ISO	ISO	
						
Laser Caution	Radioactive	Explosive	Irritant / Harmful	Corrosive	Toxic	
07	08	09	10	11	12	

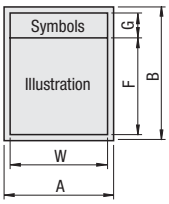
Standards shown on the left decree graphic patterns only.

■Mark Stickers

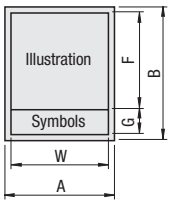


RoHS

LRUS
LRUM



LRDS
LRDM



10 Pcs. per package

Material: PET Films

Part Number Type	Nominal	A	B	W	F	G	€ Unit Price 1~9 Pkgs.	Volume Discount 10 Pkgs. or More
LRUS LRDS	01~	40	50	36	36	10		
LRUM LRDM		80	100	72	72	20		

LRUS
LRUM



Nominal 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09

LRDS
LRDM



Nominal 01 | 02 | 03 | 04 | 05 | 06

Order Example — Part Number: LRDS-01, LRM-05

Days to Ship: 6 Days P.88

RoHS

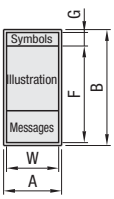


Type: Portrait Type	Type: Landscape Type	Type: English	Symbols: Japanese	Symbols: English
LHWS LHWM LHWL	LWWS LWWM LWWL	PEW	警告	WARNING
LHCS LHCM LHCL	LWCS LWCM LWCL	PEC	注意	CAUTION
LHDS LHDM -	LWDS LWDM LWDL	PED	危険	DANGER

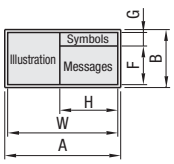
For stickers in Japanese, the portrait and landscape type are available.
For stickers in English, please visit our website.

Material: PET Films

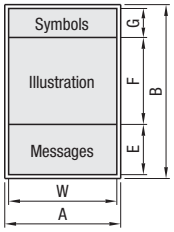
Portrait Type
LH_S
LH_M
LH_L



Landscape Type
LW_S
LW_M
LW_L



English
PE_



Part Number Type	Warning	Caution	Danger	Nominal	A	B	W	E	F	G	H	€ Unit Price Qty. 1~9.	Volume Discount 10~19	20~49	50~99
Portrait Type	LHWS	LHCS	LHDS	01~	32	61.5	28	-	50.5	7	-				
	LHWM	LHCM	LHDM		60	120	55	-	101	14	-				
	LHWL	LHCL	-		80	160	74	-	134	20	-				
Landscape Type	LWWS	LWCS	LWDS		61.5	32	57.5	-	21	7	30.5				
	LWWM	LWCM	LWDM		120	60	115	-	40	15	60				
	LWWL	LWCL	LWDL		160	80	154	-	55	19	81				
English	PEW	PEC	PED		60	90	56	26	45	15	-				

For Warning and Caution Stickers, please select from the right page.

Price Revision

: New Price

Portrait Type 警告 **LHWS LHWM LHWL**



Nominal 01 02 03 04 05 06 07 08 09 10 11 12

Portrait Type 注意 **LHCS LHCM LHCL**



Nominal 01 02 03 04 05 06 07 08 09 10 11 12



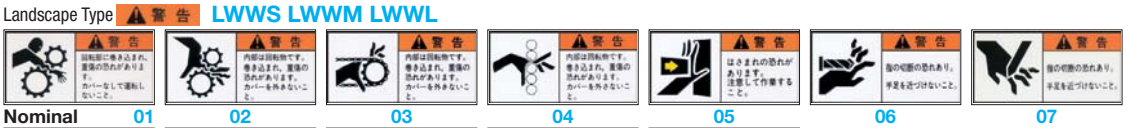
13 14 15 16 17 18

Portrait Type 危険 **LHDS LHDM**

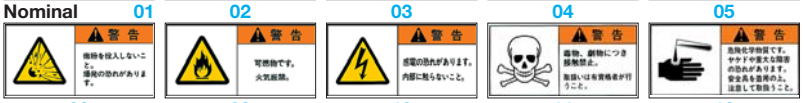


Nominal 01 02 03 04 05 06 07 08 09 10 11 12

Landscape Type 警告 **LWWS LWWM LWWL**

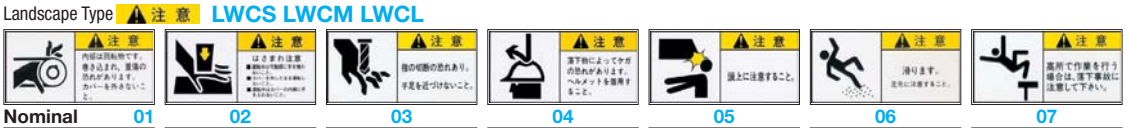


Nominal 01 02 03 04 05 06 07



08 09 10 11 12

Landscape Type 注意 **LWCS LWCM LWCL**



Nominal 01 02 03 04 05 06 07

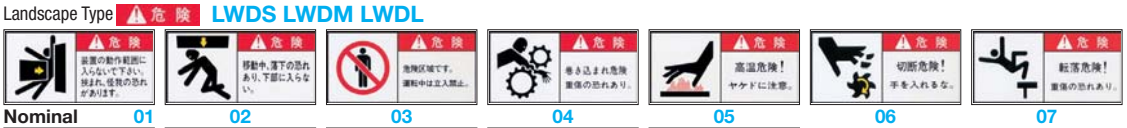


08 09 10 11 12 13 14



15 16 17 18

Landscape Type 危険 **LWDS LWDM LWDL**



Nominal 01 02 03 04 05 06 07



08 09 10 11 12

Order Example — Part Number: LHWS-03 PEC-02 — Days to Ship: 6 Days P.87

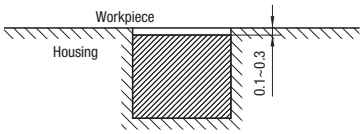
Properties of Magnets

Features

Neodymium Magnet	Capable of highest magnetic force of all materials currently available. High forces can be obtained from small volume. One of the disadvantages is tendency to rust easily. Called "Rare Earth Magnets" along with the cobalt magnets.
Samarium-Cobalt Magnet	Full name is Samarium-Cobalt Magnet, and is second in strength following the Neodymium Iron Boron magnets. Advantages are: resistance to rusting and high temperatures. Brittle and mechanically low in strength, requiring careful handling.
Ferrite Magnet	This material has low magnetic force but has relatively high coercive force, thus suffers little demagnetization. Mechanical strength is low and brittle, and caution is required for handling.
Alnico Magnet	It has superior property against temperature and mechanical strength. Disadvantage is its likeliness to demagnetize.

Cautions

- Since these materials are very fragile, no alteration is available.
- Magnet is susceptible to impact. Be careful during installation.
- Magnetic fields may cause negative effects on items listed below.
  Electronic devices such as cellular phones, PCs and watches
  Medical electronics such as pacemakers
- The magnetic force may deteriorate when used at above maximum operating temperature.
- Strong impact or alteration on magnets may cause magnetic force losses.
- To prevent direct impacts on magnets, keep 0.1~0.3mm distance from the body.



Characteristic Values

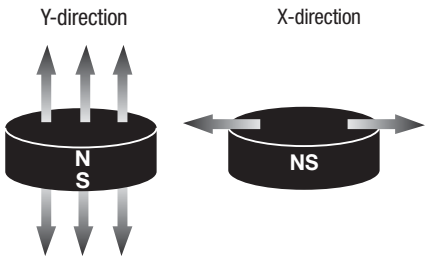
Item	Increment	Neodymium Magnet	Heat-resistant Neodymium Magnets	Samarium-Cobalt Magnet	Ferrite Magnet	Alnico Magnet
Residual Flux Density	T	1.26 or More	1.23 or More	1.03 or More	0.385 or More	1.25 or More
Coercive Force bHC	KA/m	859 or More	923 or More	640 or More	230 or More	47.7 or More
Coercive Force iHC	KA/m	955 or More	1592 or More	1190 or More	235 or More	47.7 or More
Max. Energy Product	kJ/m³	260 or More	287 or More	140 or More	27.9 or More	38.2 or More
Density	g/cm³	7.3~7.5	7.3~7.5	8.3	4.8~5.0	7.3~7.4
Curie Temperature	°C	310	340~400	710	450~460	850
Vickers Hardness	HV	500~600	500~600	600	480~580	650
* Max. Operating Temp.	°C	80	150	200	300	400

Listed values are for reference, not guaranteed.



* When L/D=0.7

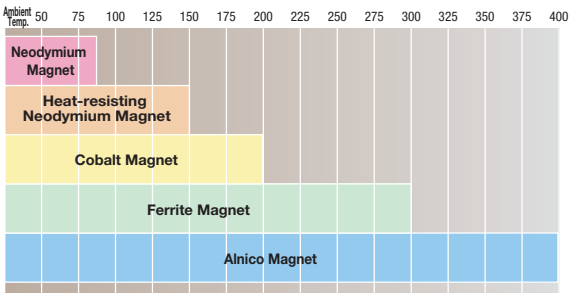
Magnetization Direction:



Property Order

Item	Reference Characteristic Values	Weak ← → Strong			
Magnetic force	Residual Flux Density, Maximum Energy Product	Ferrite	Alnico	Cobalt	Neodymium Heat-resisting Neodymium
Repeat Absorption	Coercive Force	Alnico	Ferrite	Cobalt	Neodymium Heat-resisting Neodymium
Mechanical Strength	-	Cobalt	Ferrite	Neodymium Heat-resisting Neodymium	Alnico
Corrosion Resistance	-	Neodymium Heat-resisting Neodymium	Alnico	Cobalt	Ferrite
High Temperature Stability	Curie Temperature Max. Operating Temperature	Neodymium Heat-resisting Neodymium	Cobalt	Ferrite	Alnico

Comparison of Heat Resistance Temperature

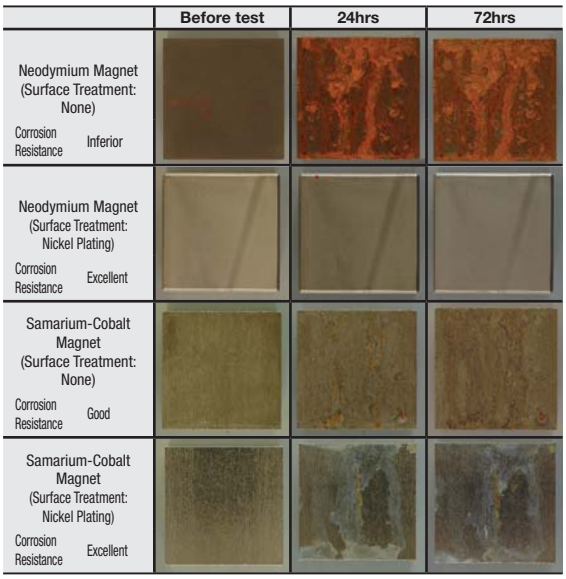




* When L/D=0.7

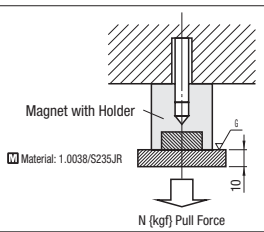
* Maximum operating temperature for magnets alone.

Comparison on Corrosion Resistance



In compliance with humidity cabinet test JIS K 5400 9.2.2. Experiment temperature is 70°C, while standard temperature is 50°C.
The spot pattern seen on cobalt magnets is of water drops.

Features of Magnets
Load {kgf} = Load Nx0.101972
Don't apply alteration on magnets to avoid possible damage.
Strong impact on magnets may cause damages.
Magnets with Holders have 0.1~0.3mm steps to protect the magnet surface from impacts.
The magnet and holder are fixed by adhesive.
* "Attraction Force" indicates the power of lifting the material 1.0038/S235JR (polished surface of 10mm thick plate).



Magnets
-Round-

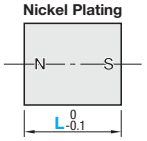
Price Reduction
Up to 41%

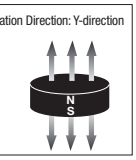
CAD Data

Nickel Plating RoHS



Type	Material	Surface Treatment	Heat-resistant Temperature
HXN	Neodymium Magnet	Nickel Plating	80°C
HXNH	Heat-resistant Neodymium Magnets		150°C
HXMS	Samarium-Cobalt Magnet		200°C





Neodymium Magnets and Samarium-Cobalt Magnets have very powerful magnetic force. May crack when pulled and struck by other magnetic substances. Please handle with care on unpacking.

Part Number Type	D	L	Attraction Force N{kgf} HXN HXNH	Attraction Force N{kgf} HXMS	Surface Magnetic Flux Density Gauss [G] HXN HXNH	Surface Magnetic Flux Density Gauss [G] HXMS	€ Unit Price HXN	HXNH	HXMS
(Neodymium) HXN (Heat-resistant Neodymium) HXNH (Samarium-Cobalt) HXMS	1	2	0.06{0.006}	0.04{0.004}	1100~1300	900~1100			
		3	0.07{0.007}	0.05{0.005}	1200~1400	1000~1200			
		5	0.08{0.008}	0.06{0.006}	1300~1500	1100~1300			
	2	2	0.59{0.06}	0.39{0.04}	2400~2600	2000~2200			
		3	0.69{0.07}	0.49{0.05}	3100~3300	2600~2800			
		5	0.78{0.08}	0.49{0.05}	3100~3300	2600~2800			
	3	1	1.07{0.11}	-	2000~2400	-			
		2	1.57{0.16}	1.08{0.11}	3100~3300	2600~2800			
		3	1.96{0.20}	1.37{0.14}	3300~3500	2800~3000			
		4	2.25{0.23}	1.47{0.15}	3400~3600	2900~3100			
		5	2.35{0.24}	1.57{0.16}	3500~3700	2900~3100			
	4	1	1.47{0.15}	-	2000~2200	-			
		2	2.84{0.29}	1.86{0.19}	3100~3300	2600~2800			
		3	3.82{0.39}	2.55{0.26}	3600~3800	3100~3300			
		4	4.31{0.44}	2.94{0.30}	3800~4000	3200~3400			
		5	4.70{0.48}	3.14{0.32}	4000~4200	3400~3600			
	5	1	1.45{0.16}	-	1800~2000	-			
		2	3.92{0.40}	2.65{0.27}	3000~3200	2500~2700			
		3	5.78{0.59}	3.82{0.39}	3800~4000	3200~3400			
		4	6.86{0.70}	4.61{0.47}	4000~4200	3400~3600			
		5	7.64{0.78}	5.10{0.52}	4300~4500	3600~3800			
		6	8.13{0.83}	5.39{0.55}	4300~4500	3600~3800			
		10	9.80{1.00}	-	4800~5000	-			
	6	2	5.00{0.51}	3.33{0.34}	2900~3100	2400~2600			
		3	7.64{0.78}	5.10{0.52}	3700~3900	3100~3300			
		4	9.60{0.98}	6.47{0.66}	3900~4100	3300~3500			
		5	10.88{1.11}	7.25{0.74}	4300~4500	3600~3800			
		6	11.76{1.20}	7.84{0.80}	4400~4600	3700~3900			
		10	11.84{1.30}	-	4800~5000	-			

Part Number Type	D	L	Attraction Force N{kgf} HXN HXNH	Attraction Force N{kgf} HXMS	Surface Magnetic Flux Density Gauss [G] HXN HXNH	Surface Magnetic Flux Density Gauss [G] HXMS	€ Unit Price HXN	HXNH	HXMS
(Neodymium) HXN (Heat-resistant Neodymium) HXNH (Samarium-Cobalt) HXMS	8	2	6.66{0.68}	4.41{0.45}	2400~2600	2000~2200			
		3	10.78{1.10}	7.45{0.76}	3200~3400	2700~2900			
		5	17.93{1.83}	11.96{1.22}	4200~4400	3500~3700			
		8	23.03{2.35}	15.39{1.57}	4600~4800	3900~4100			
		10	24.02{2.45}	-	5000~5200	-			
	10	2	7.84{0.80}	5.29{0.54}	2000~2200	1700~1900			
		3	14.11{1.44}	9.41{0.96}	2800~3000	2400~2600			
		5	24.79{2.53}	16.56{1.69}	3800~4000	3200~3400			
		8	34.30{3.50}	23.03{2.35}	4700~4900	4000~4200			
		10	38.02{3.88}	25.48{2.60}	4900~5100	4100~4300			
	12	2	9.02{0.92}	5.98{0.61}	1600~1800	1300~1500			
		3	16.46{1.68}	11.07{1.13}	2500~2700	2100~2300			
		5	31.16{3.18}	20.87{2.13}	3600~3800	3000~3200			
		8	46.55{4.75}	31.07{3.17}	4500~4700	3800~4000			
		10	52.72{5.38}	35.28{3.60}	4800~5000	4000~4200			
	15	2	10.58{1.08}	7.06{0.72}	1400~1600	1100~1300			
		3	19.60{2.00}	13.13{1.34}	2300~2500	1900~2100			
		5	39.59{4.04}	26.46{2.70}	3100~3300	2600~2800			
		8	64.39{6.57}	43.02{4.39}	4200~4400	3500~3700			
		10	75.85{7.74}	50.67{5.17}	4600~4800	3800~4000			
	20	3	34.32{3.50}	-	1700~1900	-			
		10	98.06{10.00}	-	4200~4400	-			

Attraction Force and Surface Flux Density are reference values for magnets alone.
N pole side is colored. (HXN: Red, HXNH: Black, HXMS: Blue)

Price HXN

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~99	100~400
Discount Rate	€ Unit Price	5%	10%	50%

For orders larger than indicated quantity, please request a quotation.

HXNH HXMS

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~99	100~199	200~400
Discount Rate	€ Unit Price	5%	10%	50%

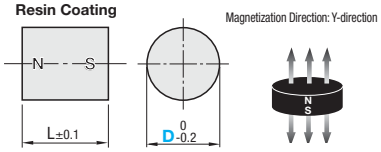
For orders larger than indicated quantity, please request a quotation.

Epoxy Resin Coating RoHS



Type	Material	Surface Treatment	Heat-resistant Temperature
HXNJ	Neodymium Magnet	Epoxy Resin Coating	80°C

Resin Coating



Part Number Type	D	L	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	€ Unit Price
(Neodymium) HXNJ	3	5	2.3{0.24}	4000~4200	
	4		4.4{0.45}	4200~4400	
	5	6	6.8{0.7}	4400~4600	
	6		9.8{1.0}	4400~4600	
	8	8	18.6{1.9}	4600~4800	
	10	10	33.3{3.4}	4800~5000	

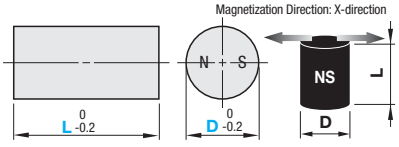
Resin coating enhances water resistant and antirust properties.
Attraction Force and Surface Flux Density are reference values for magnets alone.
N pole side is colored in white.

Nickel Plating RoHS



Type	Material	Surface Treatment	Heat-resistant Temperature
RHXN	Neodymium Magnet	Nickel Plating	80°C

Magnetization Direction: X-direction



Part Number Type	D	L	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	€ Unit Price
(Neodymium) RHXN	5	5	4.9{0.5}	4300~4500	
		10	11.8{1.2}	4300~4500	
		15	12.7{1.3}	4300~4500	
	10	15	23.5{2.4}	5600~5800	
		20	35.3{3.6}	5600~5800	

Attraction Force and Surface Flux Density are reference values for magnets alone. N pole side is colored in red.

Price HXNJ

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~99	100~199	200~400
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

RHXN

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	L
HXN8	-	5
HXNJ3		
RHXN5	-	10

Days to Ship

6	Days	P.87
2	Days	

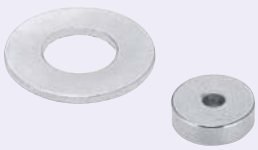
For High Power Bar Magnets, Bar Magnets Cleaning Cover and Viewer, visit our website http://jp.misumi-ec.com/mech.

Magnets
-Ring / Square-

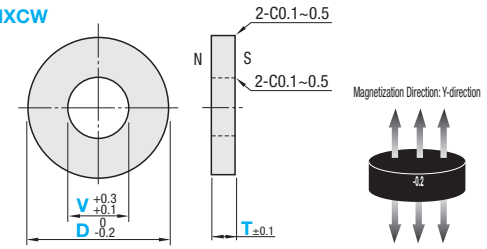
Very powerful magnets. May crack when pulled and struck by other magnetic substances. Please handle with care on unpacking.

■Ring

RoHS



HXCW



M Material: Neodymium Magnet S Surface Treatment: Nickel Plating
Heat Resistant Temperature 80°C

Part Number	-	V	-	T
HXCW25	-	6	-	1

Order Example

Days to Ship: **6 Days** P.87

Part Number Type	d	V Selection	T	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	€ Unit Price
HXCW	6	2	2	6.2{0.6}	2600~2800	
			3	8.0{0.8}	3200~3400	
	8	3 4	1	4.9{0.5}	1600~1800	
			2	7.8{0.8}	2600~2800	
			3	9.8{1.0}	3200~3400	
			5	14.3{1.5}	3200~3800	
	10	3 4 5 6	1	6.9{0.7}	1700~1900	
			2	10.8{1.1}	2600~2800	
			3	11.8{1.2}	3200~3400	
		4 5 6	5	18.8{1.9}	3600~3800	
	12	4 5 6 8	1	7.8{0.8}	1500~1700	
			2	13.7{1.4}	2500~2700	
			3	15.7{1.6}	2900~3100	
		4 6 8	5	23.3{2.4}	3600~3800	
	14	6 8	1	8.8{0.9}	1600~1800	
			2	19.6{2.0}	2600~2800	
			3	23.5{2.4}	2900~3100	
			5	36.0{3.7}	3600~3800	
	18	6 8 12	3	48.6{5.0}	2900~3100	
	20	6 8 10 12	1	10.8{1.1}	1300~1500	
			2	21.6{2.2}	2200~2400	
			3	33.3{3.4}	2600~2800	
		6 12	5	62.3{6.3}	3600~3800	
	25	6 8 10 12	1	12.7{1.3}	1300~1500	
			2	34.3{3.5}	2100~2300	
			3	58.8{6.0}	2600~2800	
		6 12	5	73.8{7.5}	3400~3600	
	30	12	5	98.5{10.0}	3000~3200	

Attraction Force and Surface Flux Density are reference values for magnets alone.
N pole side is colored in red.

■Square

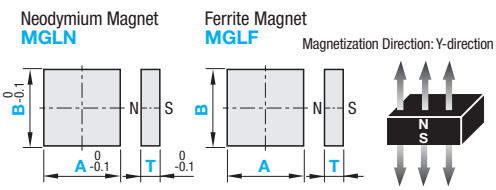
RoHS



Type	M Material	Heat-resistant Temperature	S Surface Treatment
MGLN	Neodymium Magnet	80°C	Nickel Plating
MGLF	Ferrite Magnet	300°C	-

Neodymium Magnet **MGLN**

Ferrite Magnet **MGLF**



Type	A and B Tolerance		T Tolerance	
MGLN	0 -0.1			
MGLF	5~20 ±0.1 20~40 ±0.8	30 ±0.15 50 / 60 ±1.2	5 ±0.1	10 ±0.2

Part Number	-	B	-	T
MGLN10	-	5	-	1

Part Number	-	A	-	B
MGLF5	-	10	-	5

Order Example

Days to Ship: **6 Days** P.87

Part Number Type	A	B	T	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	€ Unit Price
MGLN (Neodymium Magnet)	3	3	5	2.8{0.29}	4100~4300	
	4	4	5	5.6{0.57}	4300~4500	
	5	5	5	8.9{0.91}	4400~4600	
	6	6	6	13.7{1.4}	4500~4700	
	8	8	6	23.2{2.37}	4400~4600	
	10	5	1	2.7{0.28}	1700~1900	
			2	8.5{0.87}	3000~3200	
			5	16.8{1.71}	4200~4400	
		10	1	6.5{0.66}	1800~2000	
			2	11.8{1.2}	2500~2700	
			8	39.3{4.01}	4500~4700	
	15	5	3	13.9{1.42}	3100~3300	
			5	23.7{2.42}	4100~4300	
			10	31.4{3.2}	4700~4900	
		10	3	23.9{2.44}	2900~3100	
			5	34.3{3.5}	3300~3700	
			10	61.4{6.27}	4600~4800	
	20	5	10	40.8{4.16}	4600~4800	
		10	5	47.7{4.87}	3500~3700	
			10	77.8{7.94}	4700~4900	
		15	5	69.7{7.11}	3300~3700	
	30	20	5	84.8{8.65}	3100~3300	
		30	5	110.8{11.31}	3300~3700	

Attraction Force and Surface Flux Density are reference values for magnets alone.
N pole side of MGLN is colored in red.

Part Number Type	T	A	B	Attraction Force N{kgf}	Surface Flux Density Gauss [G]	A Tolerance	B Tolerance	T Tolerance	€ Unit Price
MGLF (Ferrite Magnet)	5	10	5	1.6{0.16}	900~1100	±0.1	±0.1	±0.1	
		20	10	4.9{0.50}	1000~1200	±0.1	±0.1		
		30	20	9.8{1.00}		±0.15	±0.15		
		50	20	12.7{1.30}		±1.2	±0.4		
	10	30	30	21.6{2.20}	1100~1400	±0.15	±0.15		
		30	60	29.4{3.00}		±0.6	±1.2		
		40	20	17.7{1.80}		±0.8	±0.4		
			40	31.4{3.20}		±0.8	±0.8		

Attraction Force and Surface Flux Density are reference values for magnets alone.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

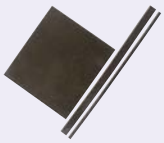
Rubber Magnets
-Super Strong / Strong / Standard-

CAD Data

Can be cut and used with scissors or knife. The surface is coated with urethane film. There may be slight unevenness in bonding but does not affect performances.

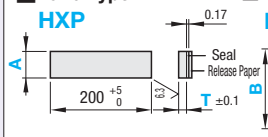
Strong Type

RoHS



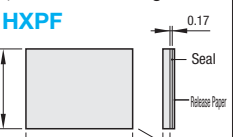
Band Type

HXP



A, B Dimension Configurable

HXPF



- Dimension Tolerance of A and B

200mm or less	201~400
+1.5 0	+2.0 0

A≥B

M Material: Neodymium-group rare earth magnet powder compounded magnet

Temperature limit for seals is 80°C.

Physical and Mechanical Characteristics of Rubber Magnets

Measurement Item	Testing Method	Isotropic Ferrite Rubber	Anisotropic Ferrite Rubber	Samarium Iron-Nitrogen Rubber	Neodymium Magnets Rare Earth Magnetic Particle Compounded Rubber
Tensile strength {Mpa}	JIS K6301	3.9	6.9	≥3.9	3.8
Elongation rate {%}	JIS K6301	80	50	20	55
Hardness {shore D}	ASTM D2240	48	49	55	30
Volume resistivity {Ω / m}	JIS K7194	$4.0x10^{12}$	$4.0x10^{12}$	$5.7x10^{3}$	$4.75x10^{16}$
Heat-resistant Temperature	-	-10~50°C	-10~50°C	-40~120°C	-20~120°C

Band Type

Part Number Type	T	€ Unit Price A 10	20	30	40	50	80	100
HXP	1.0							
	2.0							

Magnetic Properties

Type	T	Attraction Force {g/cm²}	Surface Flux Density [G]
HXP HXPF	1.0	140	1300
	2.0	250	1550

Attraction force and surface magnetic flux density are for reference only.

A · B Dimension Configurable

Part Number Type	T	A 1mm Increment	€ Unit Price B 1mm Increment 10~100	101~200
HXPF	1.0	10~100		
		101~200		
		201~300		
		301~400		
	2.0	10~100		
		101~200		
		201~300		
		301~400		

Order Example

Band Type: Part Number HXP1.0 - A 100

A, B Dimension Configurable: Part Number HXPF2.0 - A 305 - B 150

Days to Ship: 8 Days

Price

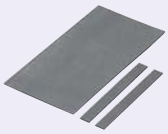
Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

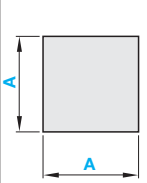
High Strength Type

RoHS

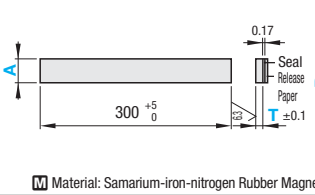


A Dimension Selectable Type

HXRS(Square Type)

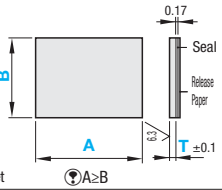


HXRSL(Band Type)



A, B Dimension Configurable

HXRSF



- Dimension Tolerance of A and B

200mm or less	201~300
+1.5 0	+2.0 0

M Material: Samarium-iron-nitrogen Rubber Magnet

A≥B

A Dimension Selectable Type -Square Type -

Part Number Type	T	€ Unit Price A 100	200
HXRS	0.5		
	1.0		
	1.5		

Magnetic Properties

Type	T	Attraction Force {g/cm2}	Surface Flux Density [G]
HXRS HXRSL HXRSF	0.5	27	610
	1	98	860
	1.5	142	1030

Attraction force and surface magnetic flux density are for reference only.

Usable as simplified magnet catches if mounted on door frame.

A Dimension Selectable Type - Band Type -

Part Number Type	T	€ Unit Price A 10	20	30	40	50	80	100
HXRSL	0.5							
	1.0							
	1.5							

Order Example

A Dimension Selectable Type: Part Number HXRS1.0 - A 100, HXRSL1.5 - 50

A, B Dimension Configurable: Part Number HXRSF0.5 - A 110 - B 65

Days to Ship

- Sizes marked with * for HXRS and HXRSL are available in stock.
- part: 6 Days P.87
- Others: 8 Days

Price

A, B Dimension Configurable

Part Number Type	T	A 1mm Increment	€ Unit Price B 1mm Increment 10~100	101~200
HXRSF	0.5	10~100		
		101~200		
		201~300		
	1.0	10~100		
		101~200		
		201~300		
	1.5	10~100		
		101~200		
		201~300		

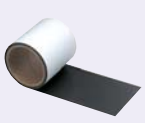
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

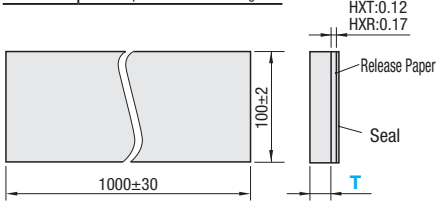
For orders larger than indicated quantity, please request a quotation.

Standard Type

RoHS



Type	M Material
HXR	Isotropic Ferrite Rubber Magnet
HXT	Anisotropic Ferrite Rubber Magnet



Part Number Type	T	Length	Attraction Force HXR	HXT	€ Unit Price HXR	HXT
HXR HXT	0.4	1m	16	25		
	0.6		25	60		
	1.0		38	80		
	2.0		54	100		
	3.0		56	110		

Order Example: Part Number HXR0.6, HXT3.0

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Magnets
-With Countersink / Square-

CAD Data

Very powerful magnets. May crack when pulled and struck by other magnetic substances. Please handle with care on unpacking.

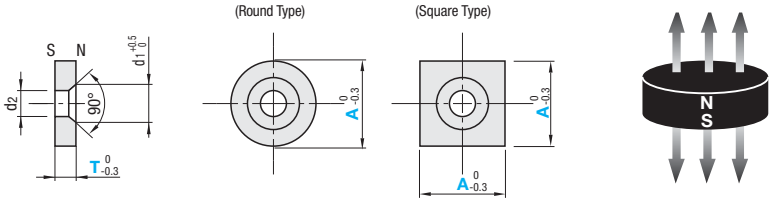
■Countersunk Type

RoHS



Type		M Material	Heat-resistant Temperature	S Surface Treatment
Round	Square			
NHXCC	NHXCS	Neodymium Magnet	80°C	Nickel Plating
NHXCCH	NHXCSH	Heat-resistant Neodymium Magnets	150°C	

Magnetization Direction : Y-direction



A Accessory: Stainless Steel Flat Head Screw 1pc.

Part Number		T	d1	d2	Accessory	Attraction Force N {kgf}		Surface Flux Density Gauss [G]		€ Unit Price			
Type	A					NHXCC NHXCCH	NHXCS NHXCSH	NHXCC NHXCCH	NHXCS NHXCSH	NHXCC	NHXCCH	NHXCS	NHXCSH
(Round Type) NHXCC NHXCCH (Square Type) NHXCS NHXCSH	8	2	5.5	3.0	M2.5-6	7.8{0.8}	10.8{1.1}	2000~2500	-				
		3				10.8{1.1}	16.6{1.7}	2400~2800	-				
	10	3	6.5	3.5	M3-8	14.7{1.5}	22.5{2.3}	3500~4000	-				
		4				18.6{1.9}	24.5{2.5}	4000~4200	3800~4000				
	12	3	6.5	3.5	M3-8	18.6{1.9}	-	3600~4000	-				
		4.5				23.5{2.4}	27.4{2.8}	4100~4300	3900~4100				
	15	3	9	4.8	M4-10	23.5{2.4}	-	3800~4200	-				
		5				41.1{4.2}	31.3{3.2}	4200~4500	4000~4300				
	20	4	11	5.8	M5-12	49{5.0}	-	3800~4100	-				
		5.5				54.8{5.6}	44.1{4.5}	4200~4400	4000~4200				
	25	4	13	7.0	M6-15	58.8{6.0}	-	3700~4100	-				
		6				78.4{8.0}	98.0{10.0}	4100~4400	3900~4300				

Attraction Force and Surface Flux Density are reference values for magnets alone.

Order Example: Part Number - T → NHXCC8 - 3

Days to Ship: 6 Days / 2 Days P.87

Price

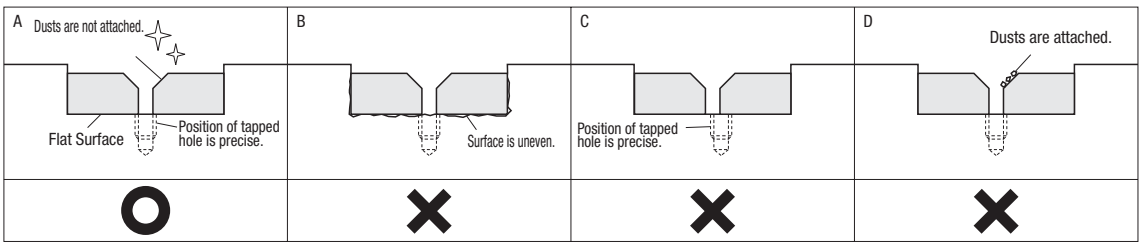
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■About installation

- Place magnet on flat surface. (illustration B)
- Please make sure that there is no misalignment between magnet holes and tapped holes. (illustration C)
- Please make sure that there is no dust before installing flat-head screw. (illustration D)



■Tightening Torque (Value for Reference)

Flat Head Screw Mounting Type

Tightening Torque (Value for Reference)		
Magnet A Dimension	Included Flat Head Screw	N·m
8	M2.5-6	0.8
10	M3-8	1.5
12	M3-8	1.5
15	M4-10	3.6
20	M5-12	7.6
25	M6-15	13.0

Tightening beyond the specified torques may cause magnet breakage.

Magnets
-Countersunk with Holder / Oval Holder-

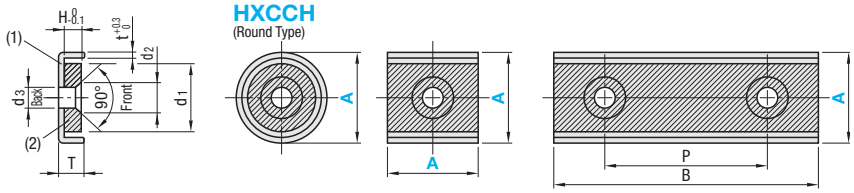
CAD Data

Combination use of magnets and holders helps to protect the magnets.

Countersunk Screw Hole with Holder Type RoHS



Type			(1)		(2)		Heat-resistant Temperature	Temperature	
Round	Square	Rectangle	M Material	S Surface Treatment	M Material	S Surface Treatment		Front	Back
HXCC	HXCS	HXCR	1.0330/DC01	Nickel Plating	Neodymium Magnet	Nickel Plating	80°C	N	S
HXCC-S	-	-						S	N
HXCCH	-	-			Heat-resistant Neodymium Magnets		150°C	N	S



Handle with care since these materials are very brittle.For Tightening Torque (Value for Reference), refer to P.271

Part Number Type	A	B	P	d1	H	d2	d3	T	t	Accessory: Stainless Steel Flat Head Screw HXCC / HXCC-S HXCCH / HXCS	Accessory: Stainless Steel Flat Head Screw HXCR	Attraction Force HXCC HXCC-S HXCCH	Attraction Force HXCS	Attraction Force HXCR	Surface Magnetic Flux Density Gauss [G]	€ Unit Price HXCC	HXCC-S	HXCCH	HXCS	HXCR
(Round Type) HXCC HXCC-S HXCCH	8	15	8	6.4	3.2	5.5	3	4	0.6	M2.5-8x1 pc.	M2.5-8x2 pcs.	3.9{0.4}	7.8{0.8}	17.6{1.8}	1200~3900					
	10	20	10	8	4	6.5	3.5	5	0.8	M3-10x1 pc.	M3-10x2 pcs.	5.8{0.6}	19.6{2.0}	39.2{4.0}	1500~4000					
	12	25	12	9.6	4.8	6.5	3.5	6	1.0	M3-10x1 pc.	M3-10x2 pcs.	15.7{1.6}	29.4{3.0}	68.6{7.0}	3200~4000					
(Square Type) HXCS	15	30	15	12.6	4.8	9	4.8	6	1.0	M4-12x1 pc.	M4-12x2 pcs.	24.5{2.5}	49.0{5.0}	98.1{10.0}	3800~4000					
(Rectangle Type) HXCR	20	40	20	17.2	5.6	11	5.8	7	1.2	M5-15x1 pc.	M5-15x2 pcs.	58.8{6.0}	127.5{13.0}	230.5{23.5}	3800~4000					
	25	50	30	21.2	6.2	13	7.0	8	1.6	M6-16x1 pc.	M6-16x2 pcs.	152.0{15.5}	181.4{18.5}	294.2{30.0}	3700~4000					

Order Example Part Number HXCC10

Days to Ship 6 Days / 2 Days P.87

Attraction force and surface magnetic flux density are for reference only.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

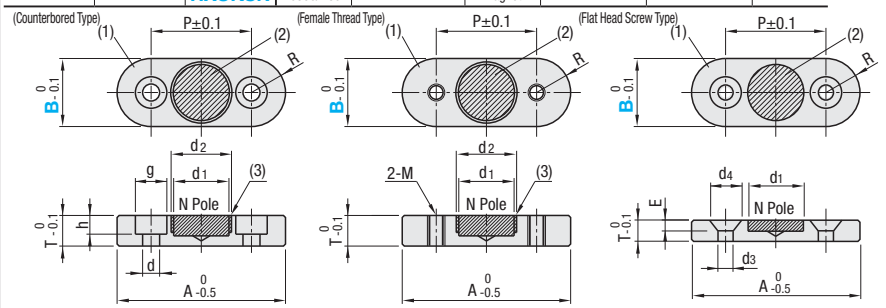
For orders larger than indicated quantity, please request a quotation.

Oval Holder RoHS



Type			(1)		(2)		(3)	Heat Resistant Temperature
Counterbored Type	Female Thread Type	Flat Head Screw	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material	
HXUKZ	HXUKM	-	1.1158/C25E or equivalent	Electroless Nickel Plating	Samarium-Cobalt Magnet	-	Brass (CW614N/CuZn39Pb3 BD Brass (JIS))	80°C
HXUKZN	HXUKMN	-			Neodymium Magnet	Nickel Plating		
-	-	HXUKSN	1.0330/DC01				-	

No brass contents in Flat Head Screw Mounting Type



Part Number Type	B	A	P	T	R	Counterbored Type g	Counterbored Type d	Counterbored Type h	Female Thread Type M (Coarse)	Attraction Force HXUKZ / HXUKM	Attraction Force HXUKZN / HXUKMN	d1	d2	Surface Flux Density Gauss [G] HXUKZ · HXUKM	Surface Flux Density Gauss [G] HXUKZN · HXUKMN	€ Unit Price HXUKZ · HXUKM	€ Unit Price HXUKZN	€ Unit Price HXUKMN
(Counterbored Type) HXUKZ HXUKZN	10	27	17	7	5	8	4.5	4.5	M4	8.8{0.9}	13.7{1.4}	7	8	2700~2900	3600~3900			
	13	33	20		6.5					19.6{2.0}	30.4{3.1}	9.5	11	2800~3100	3800~4200			
(Female Thread Type) HXUKM HXUKMN	16	41	25	9	8	9.5	5.5	5.5	M5	38.2{3.9}	63.7{6.5}	12.5	14	2900~3300				
	20	50	30		10					60.8{6.2}	114.7{11.7}	16.5	18	2900~3400	4000~4400			

Part Number Type	B	A	P	T	R	E	d1	d3	d4	Accessory (Stainless Steel Flat Head Screw)	Attraction Force N {kgf}	Surface Magnetic Flux Density Gauss [G]	€ Unit Price
(Flat Head Screw Type) HXUKSN	10	25	15	3	5	1.5	7	3.5	6.5	M3-6x2 pcs.	13.7{1.4}	2700~2900	
	13	30	20		6.5		9.5				29.4{3.0}	2800~3100	

Order Example Part Number HXUKZ10

Days to Ship 6 Days / 2 Days P.87

Attraction force and surface magnetic flux density are for reference only.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Urethane Coated Magnets / Male Thread Magnets with Holders

NEW

Price Reduction
Up to 7%

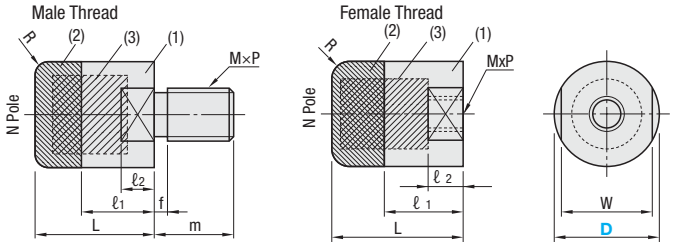
CAD Data

Urethane Coated Magnets

RoHS



Type		(1) Holder	(2) Urethane		(3) Magnet	Heat-resistant Temperature
Male Thread	Female Thread	M Material	M Material	H Hardness	M Material	
HXX	HXXH	1.4301/ X5CrNi18-10	Ether Type Polyurethane	Shore A90	Heat-resistant Neodymium Magnets	80°C
HXXA	-			Shore A70		



Male Thread

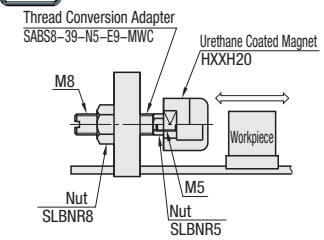
Part Number Type	D	MxP (Coarse)	L	ℓ1	ℓ2	f	m	W	R	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	HXX · HXXA € Unit Price Qty 1~4	HXX · HXXA Volume Discount 5~49
HXX HXXA	10	M5x0.8	16	10	4	1	7	8	1	4.0{0.40}	3000~3200		
	12	M6x1.0				2	10	10	2	6.5{0.66}	2900~3100		
	16	M8x1.25	18	11	5		12	14		8.0{0.81}	2700~2900		
	20	M10x1.5	20	13	6		14	17	3	17.7{1.8}	2600~2800		
	25	M10x1.5	22	15	8		14	22		35.0{3.56}	2900~3100		

Attraction force and surface magnetic flux density are for reference only.

Features

- Effective in preventing work from being damaged, and help dampening noise.

Example



Female Thread

Part Number Type	D	MxP (Coarse)	L	ℓ1	ℓ2	W	R	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	HXXH € Unit Price Qty 1~4	HXXH Volume Discount 5~49
HXXH	10	M4x0.7	15	9	4	8	1	4.0{0.40}	3000~3200		
	12	M4x0.7				10	2	6.5{0.66}	2900~3100		
	16	M5x0.8	17	10	5	14		8.0{0.81}	2700~2900		
	20	M5x0.8				17	3	17.7{1.8}	2600~2800		
	25	M6x1.0	18	11	6	22		35.0{3.56}	2900~3100		

Attraction force and surface magnetic flux density are for reference only.

Order Example | Part Number: HXX10 | Days to Ship: 6 Days P.87

Male Thread Magnets with Holders

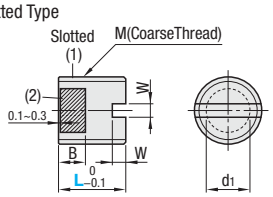
RoHS



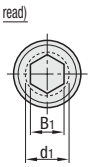
Part Number	(1) M Material	(1) S Surface Treatment	(2) M Material	(2) S Surface Treatment	Heat-resistant Temperature	Temperature Front	Temperature Back
HXB	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C	N	S

L dimensions with * in the specification table are Slotted Type.

Slotted Type



Hexagon Socket Head Type



Part Number Type	L	d1	B	M (Coarse)	Attraction Force N{kgf}	Slotted W	Hexagonal Hole B1	Hexagonal Hole t1	€ Unit Price
HXB	6 8	4	5	M6x1.0	3.9{0.4}	1.5	-		
	6 15					-	3.0	3.0	
	8 8	5		M8x1.25	7.8{0.8}	1.5	-		
	8 15					-	4.0	3.0	
	10 8	6		M10x1.5	16.7{1.7}	2.0	-		
	10 15					-	5.0	3.0	
	12 12	7	8	M12x1.75	32.3{3.3}	2.5	-		
	12 20					-	6.0	3.0	
	16 14	10		M16x2	60.8{6.2}	-	8.0	3.0	
	16 20								
	20 16	13		M20x2.5	123.5{12.6}	-	10.0	4.0	
	20 25								

Attraction force and surface magnetic flux density are for reference only.

Order Example | Part Number: HXB10 - L 8 | Days to Ship: 6 Days P.87 | Price

Volume Discount (Round down to one Cent.) P.87

HXB

Quantity	1~9	10~19	20~29	30~49
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Magnets with Holders

NEW

Price Reduction
Up to 27%

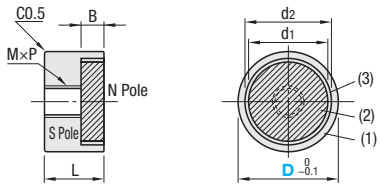
CAD Data

High Strength Flat Type

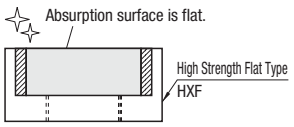
RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature	(3) Material	Temperature Front	Temperature Back
HXF	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C	Brass (JIS C3603BD)	N	S



Features
- Highest attraction force compared with others of the same size.
- No grooves or bumps on surfaces to collect dust.



Part Number Type	D	L	MxP (Coarse)	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d1	d2	B	€ Unit Price Qty. 1~3	Volume Discount 4~9	10~49	50~199
HXF	6	8	M3x0.5	5.9{0.6}	2100~3000	4	5	3				
	8			9.8{1.0}	2300~3300	6	7					
	10		M4x0.7	20.6{2.1}	2500~3600	8	9					
	13	10		45.1{4.6}	2500~3600	10	11	4				
	16		M5x0.8	89.2{9.1}	3000~4400	12	14	5				
	20			128.5{13.1}	3200~4600	15	18					
	25	13	M6x1.0	225.5{23.0}	3200~4600	18	23					

Attraction force and surface magnetic flux density are for reference only.

Order Example — Part Number: HXF10

Days to Ship — 6 Days P.87

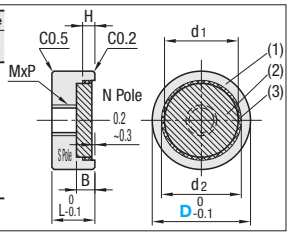
High Strength Type

RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature	(3) Material	Temperature Front	Temperature Back
HXU	1.0718/9SMnPb28	-	Samarium-Cobalt Magnet	-	80°C	Brass (JIS C3603BD)	N	S
HXUM		Electroless Nickel Plating						
HXUS	1.4005/X12CrS13	-						
HXUMN	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating				
HXUSN	1.4005/X12CrS13	-						
HXUMNH	1.0715/9SMn28	Electroless Nickel Plating	Heat-resistant Neodymium Magnets		150°C			

For HXUMNH, heat-resistant adhesive is applied.



Part Number Type	D	L	MxP (Coarse)	HXU · HXUM · HXUS Attraction Force N{kgf}	HXU · HXUM · HXUS Surface Magnetic Flux Density Gauss [G]	HXUMN · HXUSN · HXUMNH Attraction Force N{kgf}	HXUMN · HXUSN · HXUMNH Surface Magnetic Flux Density Gauss [G]	d1	d2	B	H	€ Unit Price HXU	HXUM	HXUS	HXUMN	HXUSN	HXUMNH
(Samarium-Cobalt Magnet) HXU HXUM HXUS (Neodymium Magnet) HXUMN HXUSN (Heat-resistant Neodymium Magnet) HXUMNH	4	5	M2x0.4	-	-	0.784{0.08}	3100~3300	2.5	3	1	0.5						
	5			-	-	1.37{0.14}	3100~3300	3.5	4								
	6	8	M3x0.5	3.9{0.4}	2100~2600	4.9{0.5}	3100~3300	4	5	2	1.6						
	8			5.9{0.6}	2400~2600	8.8{0.9}	3300~3600	5	6								
	10		M4x0.7	14.7{1.5}	2700~2900	19.6{2.0}	3800~4100	7	8	3	2.1						
	13	10		34.3{3.5}	2800~3100	44.1{4.5}	4000~4300	9.5	11	4	3.1						
	16		M5x0.8	58.8{6.0}	2900~3300	63.7{6.5}	4000~4300	12.5	14								
	20	13		98.1{10.0}	2900~3400	107.9{11.0}	4100~4400	16.5	18	6	5.1						
	25	15	M6x1.0	137.3{14.0}		176.5{18.0}	4500~4800	21.5	23								

Attraction force and surface magnetic flux density are for reference only.

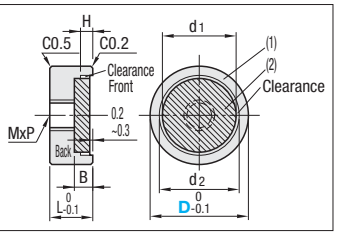
Thin Type

RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature	Temperature Front	Temperature Back
HX	1.0718/9SMnPb28	-	Samarium-Cobalt Magnet	-	80°C	N	S
HXM		Electroless Nickel Plating	Neodymium Magnet	Nickel Plating			
HXMN							
HXMN-S						S	N
HXSNS	1.4005/X12CrS13	-				N	S
HXMNH	1.0715/9SMn28	Electroless Nickel Plating	Heat-resistant Neodymium Magnets		150°C		

For HXMNH, heat-resistant adhesive is applied.



Part Number Type	D	L	MxP (Coarse)	HX · HXM Attraction Force N{kgf}	HX · HXM Surface Magnetic Flux Density Gauss [G]	HXMN · HXMN-S · HXSNS · HXMNH Attraction Force N{kgf}	HXMN · HXMN-S · HXSNS · HXMNH Surface Magnetic Flux Density Gauss [G]	d1	d2	B	H	€ Unit Price HX	HXM	HXMN	HXMN-S	HXSNS	HXMNH
(Samarium-Cobalt Magnet) HX HXM (Neodymium Magnet) HXMN HXMN-S HXSNS (Heat-resistant Neodymium Magnet) HXMNH	4	4	M2x0.4	-	-	0.62{0.06}	2700~3000	2.5	3	1	0.5						
	5			-	-	1.27{0.13}	2700~3000	3.5	4								
	6	6	M3x0.5	2.9{0.3}	2100~2600	3.9{0.4}	2700~3000	4	5	2	1.5						
	8			3.9{0.4}	2200~2600	6.9{0.7}	2700~3000	5	6								
	10		M4x0.7	9.8{1.0}	2100~2300	19.6{2.0}	2700~3000	7	8	1.5	1						
	13	8		29.4{3.0}	2200~2400	44.1{4.5}	3000~3400	9.5	11	2	1.5						
	16		M5x0.8	49.0{5.0}	2200~2500	88.3{9.0}	3000~3400	12.5	14								
	20	10		88.3{9.0}	2300~2600	127.5{13.0}	3300~3500	16.5	18	3	2.5						
	25	13	M6x1.0	127.5{13.0}	2300~2600	196.1{20.0}	3000~3400	21.5	23								

Attraction force and surface magnetic flux density are for reference only.

Order Example — Part Number: HXUMN10, HXMN20, HXMN-S20

Days to Ship — 6 Days P.87 2 Days

Price

Volume Discount (Round down to one Cent.) P.87

HXUMN · HXMN

Quantity	1~9	10~19	20~49	50~199
Discount Rate	€ Unit Price	5%	10%	20%

HXU · HX

Quantity	1~19	20~49	50~199	200~400
Discount Rate	€ Unit Price	5%	10%	15%

HXUM · HXUS · HXUSN · HXUMNH
HXM · HXMN-S · HXSNS · HXMNH

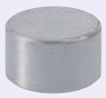
Quantity	1~49	50~99	100~199	200~400
Discount Rate	€ Unit Price	5%	10%	18%

Magnets with Holders

■Magnets with Holders -Tolerance h7 Type- RoHS

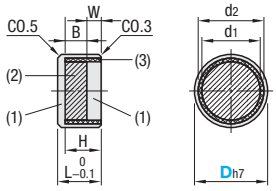
Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment
HXG HXGS	1.0718/ 9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating

Part Number	(3) Material	Heat-resistant Temperature	Temperature Front	Temperature Back
HXG HXGS	Brass (CW614N/CuZn39Pb3)	80°C	N	S

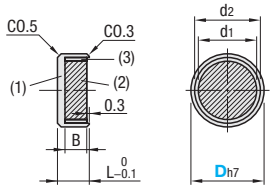




HXG



HXGS



Part Number Type	D	Dh7	L	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d1	d2	B	H	W	€ Unit Price
HXG	6	0 -0.012	6	2.9{0.3}	680~750	4	5	3	5	2	
	8	0 -0.015		8.8{0.9}	750~820	5	6				
	10			9.8{1.0}	1000~1500	8	9				
	13	0 -0.018	8	44.1{4.5}	1000~1500	10	11	4	6		
	16			68.6{7.0}	1200~1800	12	13				
HXGS	6	0 -0.012	5	2.9{0.3}	2500~3000	4	5	3	-	-	
	8	0 -0.015		9.8{1.0}	3000~3400	5	6				
	10			15.6{1.6}	3500~4000	8	9				
	13	0 -0.018	6	58.8{6.0}	3500~4000	10	11				
	16			88.2{9.0}	3600~4100	12	13				

Attraction force and surface magnetic flux density are for reference only.

Order Example: Part Number HXG10

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29	30~49
Discount Rate	€ Unit Price	5%	10%	15%

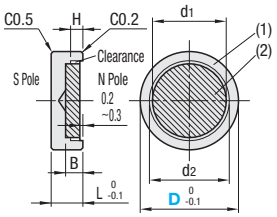
For orders larger than indicated quantity, please request a quotation.

Days to Ship: 6 Days P.87

■Super Thin Type RoHS

Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature
HXD	1.4005/X12CrS13	-	Neodymium Magnet	Nickel Plating	80°C

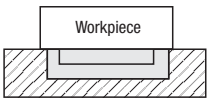




Part Number Type	D	L	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d1	d2	B	H	€ Unit Price
HXD	6	3	3.9{0.4}	2700~3000	4	5	1.5	1.0	
	8		6.9{0.7}	2700~3000	5	6			
	10		19.6{2.0}	2700~3000	7	8			
	13	4	44.1{4.5}	3000~3400	9.5	11	2.0	1.5	

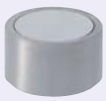
Attraction force and surface magnetic flux density are for reference only.

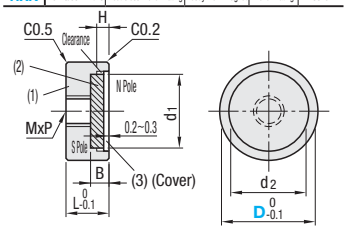
Example: Best suited for use in limited spaces. (Fixing with adhesives recommended.)



■Cap Type RoHS

Part Number	(1)(3) Material	(1)(3) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature
HXK	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C





Part Number Type	D	L	MxP	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d1	d2	B	H	€ Unit Price
HXK	8	6	3x0.5	4.1{0.42}	1300~1500	5	6	2.0	1.5	
	10		4x0.7	11.8{1.2}	1900~2100	7	8	1.5	1.0	
	13	8		26.5{2.7}	2300~2500	9.5	11	2.0	1.5	
	16		5x0.8	52.6{5.4}	2300~2500	12.5	14			

The cap may come off if strong impacts are applied, or magnets directly come incontact with each other.

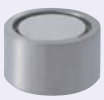
Attraction force and surface magnetic flux density are for reference only.

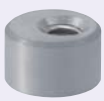
Example: No direct contact with work piece.

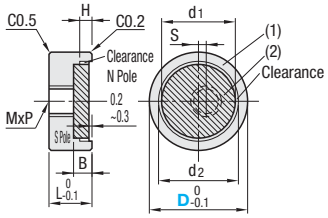


■Eccentric Mount Type RoHS

Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature
HXE	1.0715/9SMn28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C



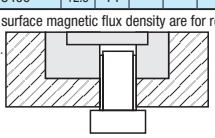




Part Number Type	D	L	MxP	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d1	d2	B	H	S	€ Unit Price
HXE	8	6	3x0.5	6.9{0.7}	2700~3000	5	6	2.0	1.5	0.5	
	10		4x0.7	19.6{2.0}	2700~3000	7	8	1.5	1.0	1.0	
	13	8		44.1{4.5}	3000~3400	9.5	11	2.0	1.5		
	16		5x0.8	88.3{9.0}	3000~3400	12.5	14				

Attraction force and surface magnetic flux density are for reference only.

Example: The magnet with holder doesn't rotate when tightening.



Order Example: Part Number HXD10

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~99	100~199	200~400
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

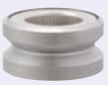
Days to Ship: 6 Days P.87

NEW

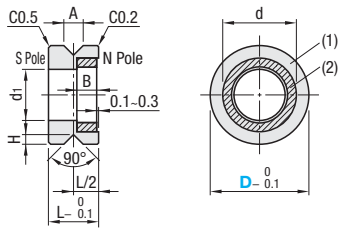
CAD Data

■V-grooved Through Hole Type

RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature
HXY	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C

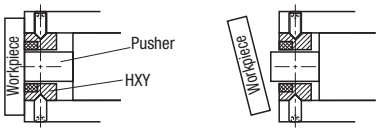


Part Number Type	D	L	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d	d1	A	B	H	€ Unit Price
HXY	10	6	8.8{0.9}	1000~1500	8	4	3	2	1.5	
	13	8	18.6{1.9}	1800~2600	11	6		2.5		
	16		39.2{4.0}	2100~3100	14	8		3		
	20	10	78.4{8.0}	2100~3100	18	10	4		2.0	

※Attraction force and surface magnetic flux density are for reference only.

Example

Can remove the adsorbed work piece by pushing.



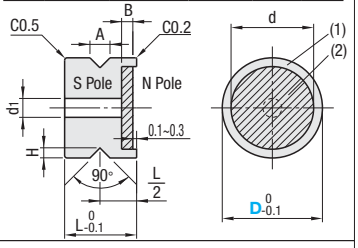
When absorbed　　When removed

■V Grooved Type

RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature
HYM	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C

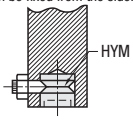


Part Number Type	D	L	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d	A	B	H	d1	€ Unit Price
HYM	8	6	3.9{0.4}	3200~3500	4.0	3	2	1.5	2	
	10		9.8{1.0}	3200~3500	6.0				2	
	13	8	14.7{1.5}	3200~3500	7.0		1.5		2	
	16		29.4{3.0}	3300~3700	9.5	4	2	2.0	3	
	20	10	49.0{5.0}	3400~3700	12.5		2		3	
	25	13	98.0{10.0}	3400~3800	16.5	5	3	2.5	3	

※Attraction force and surface magnetic flux density are for reference only.

Example

Can be fixed from the side.

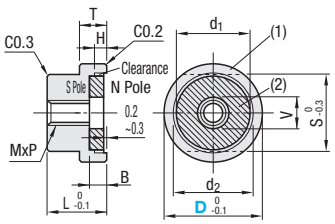


■For Adjustment Screws

RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature
HXAJ	1.0715/9SMn28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C

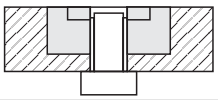


Part Number Type	D	L	MxP	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d1	d2	B	H	T	S	V	€ Unit Price
HXAJ	8	6	3x0.5	5.9{0.6}	2000~2200	6.0	6.5	1.5	0.7	2.5	6.0	3.5	
	10			17.6{1.8}	2000~2400	8.0	8.5				8.0	4.5	
	13	8	4x0.7	29.4{3}	2200~2600	10.0	10.5	2.0	1.0	3.0	10.0	5.0	
	16		5x0.8	78.4{8}	3000~3300	13.0	13.5				13.0	6.0	

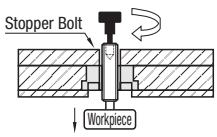
※Attraction force and surface magnetic flux density are for reference only.

Example

Magnets will not be pushed out by screw.



Break of magnetic attraction



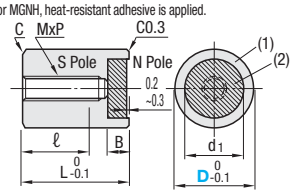
■Standard Type

RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature	Temperature Front	Temperature Back
MGN	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C	n	S
MGNH	1.4005/X12CrS13	-	Heat-resistant Neodymium Magnets		150°C		

※For MGNH, heat-resistant adhesive is applied.



Part Number Type	D	L	MxP	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d1	B	C	ℓ	€ Unit Price MGN	€ Unit Price MGNH
(Neodymium Magnet) MGN	6	10	3x0.5	2.9{0.3}	3000~3200	4.0	2.0	0.3	6		
	8			5.8{0.6}	3500~3700	5.0					
	10	15	5x0.8	9.8{1.0}	3400~3600	6.0		0.5	10		
	13			15.6{1.6}	3200~3400	7.0	1.5				
(Heat-resistant Neodymium Magnet) MGNH	16	20	6x1.0	36.2{3.7}	3500~3700	9.5	2.0	1.0	12		
	20	25	8x1.25	58.8{6.0}	3100~3300	12.5			16		
	25	30		112.7{11.5}	3500~3700	16.5	3.0	1.5	18		
	28			196.1{20.0}	3300~3500	18.5					

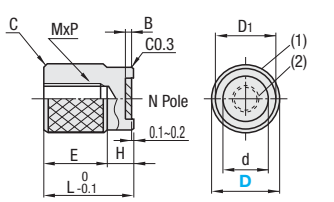
※Attraction force and surface magnetic flux density are for reference only.

■Knurled Type

RoHS



Part Number	(1) Material	(1) Surface Treatment	(2) Material	(2) Surface Treatment	Heat Resistant Temperature
MGR	1.0718/9SMnPb28	Electroless Nickel Plating	Neodymium Magnet	Nickel Plating	80°C



Part Number Type	D	L	MxP	Attraction Force N{kgf}	Surface Magnetic Flux Density Gauss [G]	d	D1	B	C	H	E	€ Unit Price
MGR	10	15	5x0.8	9.8{1.0}	3400~3600	6.0	9	2.0	0.5	5	10	
	13			15.7{1.6}	3500~3700	7.0	11	1.5				
	16	20	6x1.0	36.3{3.7}		9.5	14	2.0	1.0	6	14	
	20	25	8x1.25	58.8{6.0}	3400~3700	12.5	18			7	18	
	25	30		117.7{12.0}	3500~3900	16.5	23	3.0	1.5	8	22	
	28			196.1{20.0}		18.5	26					

※Attraction force and surface magnetic flux density are for reference only.

Order Example Part Number HXY10

Price

Volume wcount (※Round down to one Cent.) P87

Quantity	1~49	50~99	100~199	200~400
Discount Rate	€ Unit Price	5%	10%	18%

※For orders larger than indicated quantity, please request a quotation.

Days to Ship 6 Days P87

Hex Head Bolts with Magnets (Regular)

CAD Data

■Standard Type RoHS



■Cap Type



■Hardening Type



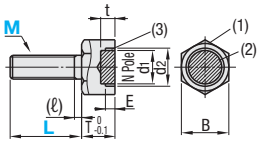
■Low Head / Low Small Head
Low Head / Low Small Head Hexagon Socket



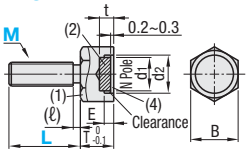
Type							(1)(4)		(2)		(3)	Heat Resistant Temperature
Standard	Cap	Hardening	Low Head	Low Head Hexagon Socket	Low Small Head	Low Small Head Hexagon Socket	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material	
HXUB	-	-	-	-	-	-	1.0718/ 9SMnPb28	Electroless Nickel Plating	Samarium-Cobalt Magnet	-	* Brass (CW614N/ CuZn39Pb3 BD Brass)	80°C
HXUBN	HXUBNK	-	HXSUBN	RHXSUBN	KHUBN	RKHUBN			Neodymium Magnet	Nickel Plating		
HXUBNH	-	-	-	-	-	-			Heat-resistant Neodymium Magnets			150°C
-	-	HXBY	-	-	-	-	1.1191/C45E		Neodymium Magnet			80°C

* Brass is not included in Cap, Low Head and Low Small Head Type. Included in Standard and Hardening Type.

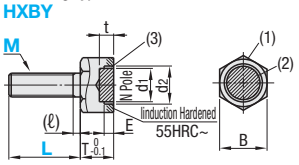
Standard Type
HXUB HXUBN HXUBNH



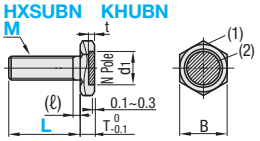
Cap Type
HXUBNK



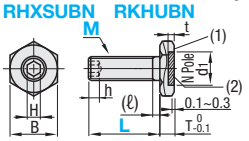
Hardening Type
HXBY



Low Head / Low Small Head
HXSUBN KHUBN



Low Head / Low Small Head Hexagon Socket
RHXSUBN RKHUBN



Hardening provided on the head portion increases abrasion resistance.

Part Number Type	M (Coarse)	L	B	T	(ℓ)	d1	d2	t	E	H	h	Attraction Force: Samarium-Cobalt Magnet	Attraction Force: Neodymium Magnet Heat-resistant Neodymium Magnets	Surface Flux Density Gauss [G]: Samarium-Cobalt Magnet	Surface Flux Density Gauss [G]: Neodymium Magnet Heat-resistant Neodymium Magnets
HXUB HXUBN	3	10	7	5	1.2	4	5	2	2	-	-	2.9{0.3}	3.9{0.4}	2100~2600	2700~3000
	4	10 15	8	6	1.5	5	6					3.9{0.4}	6.8{0.7}	2500~2900	3000~3500
	5	10 15 20	10	7	2	7	8	3				10.8{1.1}	16.7{1.7}	2700~2900	3600~3900
	6	15 20 25	13			9.5	11	4	3			27.5{2.8}	39.2{4.0}	2800~3100	3800~4200
	8	15 20 25	17	9	3	12.5	14					47.1{4.8}	83.4{8.5}	2900~3300	
	10	20 25	21			16.5	18	6	5			88.3{9.0}	140.2{14.3}	2900~3400	4000~4400
HXUBNH	4	10	8	6	1.5	5	6	2	2	-	-	-	6.8{0.7}	-	3000~3500
	5	10	10	7	2	7	8	3	2				16.7{1.7}		3600~3900
	6	20	13			9.5	11	4	3				39.2{4.0}		3800~4200
(Cap Type) HXUBNK	4	10	8	6	1.5	5	6	2	2	-	-	-	4.0{0.4}	-	3000~3200
	5	10	10	7	2	7	8	3					10.0{1.0}		3100~3300
	6	20	13			9.5	11	4	3				23.5{2.4}		3100~3300
	8	20	17	9	3	12.5	14						50.1{5.1}		3500~3700
(Hardening Type) HXBY	4	10	8	6	1.5	5	6	2	2	-	-	-	6.8{0.7}	-	3000~3500
	5	10 15	10	7	2	7	8	3					16.7{1.7}		3600~3900
	6	15 20	13			9.5	11	4	3				39.2{4.0}		3800~4200
	8	20	17	9	3	12.5	14						83.4{8.5}		
(Low Head Type) HXSUBN (Hexagon Socket Low Head Type) RHXSUBN	4	10	14	3	1	10	-	1	-	2	2.2	-	32.1{3.3}	-	1700~1900
	5	10 15 20	17	3	2	12.5		1		2.5	2.8		49.0{5.0}		2400~2600
	6	15 20 25	19	3.5		14.5		1.5		3	3		78.4{8.0}		2600~2800
	8	(15) (20) (25) 30	21	4	3	16.5		1.5		4	4		117.7{12.0}		
	10	20 (25) (30) (35)	24	5		18.5		2		5	5		176.5{18.0}		2800~3100
(Low Small Head Type) KHUBN (Hexagon Socket Low Small Head Type) RKHUBN	4	10	8	3	1	5	-	1	-	2	2.2	-	3.6{0.4}	-	2000~2200
	5	10 15	10	3	1.5	7		1.5		2.5	2.8		10.2{1.1}		2500~2700
	6	15 20	13	3.5	2	9.5		1.5		3	3		25.6{2.6}		2300~2500

Sizes in ( ) are not applicable for HXSUBN.

Attraction force and surface magnetic flux density are for reference only.

M	€ Unit Price: Standard HXUB	Standard HXUBN	Standard HXUBNH	Cap HXUBNK	Hardening HXBY	Low Head HXSUBN	Low Head Hexagon Socket RHXSUBN	Low Small Head KHUBN	Low Small Head Hexagon Socket RKHUBN
3									
4									
5									
6									
8									
10									

Order Example: Part Number - L → HXUB5 - 15

Days to Ship: 6 Days P.87 2 Days

Price

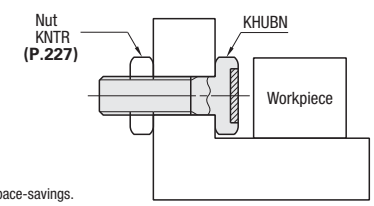
■Volume Discount (Round down to one Cent.) P.87

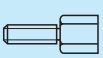
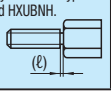
Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations: Part Number - L - (NC) → HXUB5 - 15 - NC; 8 Days

Example



Alteration	Code	Spec.	Price Adder
Relief 	NC	Adds a relief to under head portion. Applicable for only Standard Type HXUB, HXUBN and HXUBNH. Ordering Code NC 	2,00

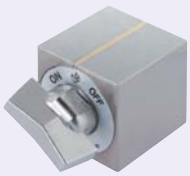
Best for use in space-savings.

On-off switchable
Magnet Blocks with Three-Side Attraction / Adjustment Screws with Magnets

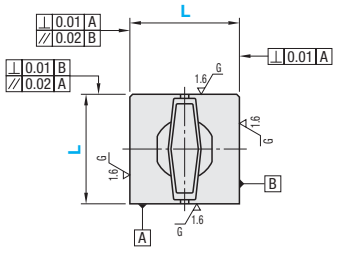
CAD Data

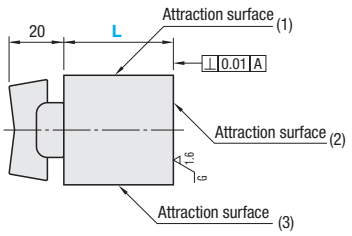
On-off switchable Magnet Blocks with Three-Side Attraction

RoHS



Component Details	Material	Surface Treatment
Main Body	1.0038/S235JR	Electroless Nickel Plating
Magnets	Neodymium Magnet	-
Knob	1.4301/X5CrNi18-10	-





There is a Brass Separator located in the center.

Part Number		Attraction Force (1) (3) N{kgf}	Attraction Force (2) N{kgf}	Mass (g)	€ Unit Price	Volume Discount	
Type	L				Qty. 1	2~3	4~10
HXBK	40	235{24}	78{8}	528			
	60	490{50}	147{15}	1683			

Attraction force is for reference only.
For orders larger than indicated quantity, please request a quotation.

Features

- Attraction surfaces (1)~(3) can be turned ON and OFF by turning the knob.
- Knob is made of sturdy stainless steel.
- Enhances the assembly and machining efficiency.

Order Example: Part Number HXBK40

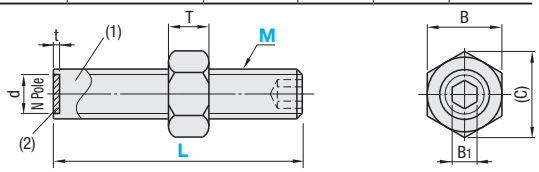
Days to Ship: 6 Days P.87

Screw Stoppers with Magnet

RoHS



Type		(1)		(2)		Nut	Heat-resistant Temperature
Standard Type	High Strength Type	Material	Surface Treatment	Material	Surface Treatment	Material	
HXBB	-	1.7220/ 34CrMo4	Black Anodize	Neodymium Magnet	Nickel Plating	SGD3	80°C
HXBN	PHXBN		Electroless Nickel Plating				



Part Number		L	Attraction Force N{kgf}		Surface Flux Density Gauss [G]		B	B1	(C)	T	t		d	€ Unit Price		
Type	M		Standard Type	High Strength Type	Standard Type	High Strength Type					Standard	High Strength		HXBB	HXBN	PHXBN
PHXBN	4	15	-	0.5{0.05}	-	1800~2100	7	2	8.1	3.2	-	3	2			
	5	15	-	1{0.1}	-	2700~3000	8	2.5	9.2	4	-	4	2.5			
Standard Type HXBB HXBN	6	*15 *20 30 40	1.4{0.15}	2{0.2}	2800~2900	2700~3000	10	3	11.5	5	2	6	3			
	8	*15 *20 30 40 50	4.9{0.5}	6.9{0.7}	3000~3300	3000~3300	13	4	15	6.5	2	6	5			
	10	30 40 50 60	7.8{0.8}	-	3000~3300	-	17	5	19.6	8	2	-	6			
High Strength Type *PHXBN	12	30 40 50 60	10.7{1.1}	-	2600~2900	-	19	6	21.9	10	1.5	-	7			
	16	40 50 60 80	24.5{2.5}	-	3200~3400	-	24	8	27.7	13	2	-	9.5			

High Strength Type (PHXBN) is available with * marked sizes.
Attraction force and surface magnetic flux density are for reference only.

Order Example: Part Number HXBB6 - L 30

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- PHXBN: 6 Days P.87
- Except PHXBN: 8 Days | Express A | 2,00 EUR / piece P.87

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Electromagnet Holders · Rectifiers for Electromagnet Holders

■Standard Type
■Low Profile Type
■Super Low Profile Type
RoHS



■Female Thread Through Hole Type
RoHS

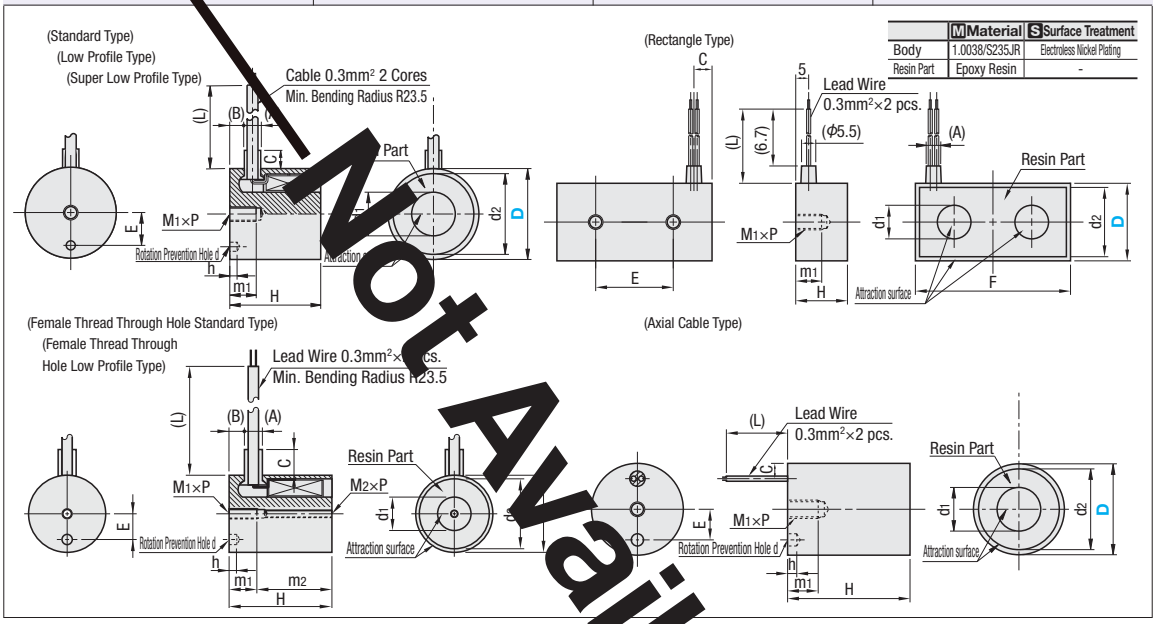


■Rectangle
RoHS



■Axial Cable Type
RoHS





	Material	Surface Treatment
Body	1.0038/S235JR	Electroless Nickel Plating
Resin Part	Epoxy Resin	-

Not Available

Part Number Type	D	H	d1	d2	(A)	(B)	C*	M1×P	M2×P	Effective Screw Depth m1	Effective Screw Depth m2	Attraction Prevention Hole d	E	(L)	F	Voltage (V)	Current (A)	Max. Attraction Force N{kgf}	Mass (g)	€ Unit Price
	*20	28	8	17.4	5.5	3.5	4 (4.5)	4x0.7	-	8	-	-	-		-	24	0.06	28{2.8}	70	
	*30	40	13	27.2	7.2	6	10	6x1.0	-	12	-	4	3		-	24	0.17	180{18}	200	
	40	40	16	35.5	7.2		(5)		-	12	-			15	-		0.24	300{30}	350	
(* only)	50	50	24	44.4	7.2	4.5		8x1.25	-	15	-	5	4	18		90	0.11	600{60}	700	
	60	60	31	52.7	7.2	3	15	10x1.5	-	20	-						0.20	1,200{120}	1200	
	20	20	6	17	5	1.5	12	4x0.7	-	5	-	-	-	-	-	24	0.06	10{1}	40	
	30	20	13	27	5.5	2	15	6x1.0	-	10	-	3	2	15	-		0.08	100{10}	80	
	40	20	17	34	5				-	10	-						0.09	220{22}	150	
	50	25	24	42	5			8x1.25	-	12	-	4	3	18		90	0.10	500{50}	300	
	60	30	32	50	5	3	18	10x1.5	-	16	-			20			0.21	1,000{100}	500	
	20	28	8	17.4	5.5	3.5	4 (4.5)	4x0.7	3x0.5	8	16.3	-	-	-	-	24	0.06	16{1.6}	52.5	
	30	40	13	27.2	7.2	6	10 (5)	6x1.0	4x0.7	12	22.6	4	3	10	-		0.17	108{10.8}	154	
	20	20	6	17	5	1.5	12	4x0.7	3x0.5	5	11.3	-	-	-	-	24	0.06	6{0.6}	30	
	30	20	13	27	5	2	15	6x1.0	4x0.7	10	4.6	3	2	10	-		0.08	60{6}	60	
	30	15	11.5	27.5	5	1.3	15	6x1.0	-	8	-	3	2	10	200	-	24	0.06	50{5}	60	
	20	20	6	17.6	5.5	-	5	4x0.7	-	5	-	-	-	20	700	40	24	0.1	40{4}	100	
	30	20	13	26.8	5.5	-	7	6x1.0	-	10	-	-	-	30	700	60	24	0.16	150{15}	200	

Maximum attraction force is for subect material of 1.0038/S235JR (polished surface, 50mm thick plate). *Dimensions in ( ) are for MGET.

Order Part Number Example

Days to Ship 6 Days P.88

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

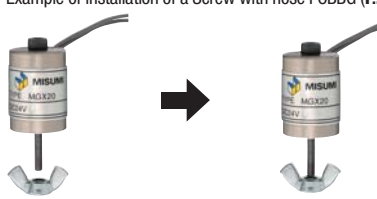
For orders larger than indicated quantity, please request a quotation.

Example ■Countermeasure for residual magnetism
Spring Plungers NPJS (P.-1477 1).



Spring force separates objects from the magnet stuck by residual magnetism.

■More Options
Example of installation of a Screw with nose FCBBG (P.2[illegible]7)



Can magnetize Screw with nose and pickup objects with the end.

See the page on the right for features, use conditions and cautions on Electromagnet Holders.

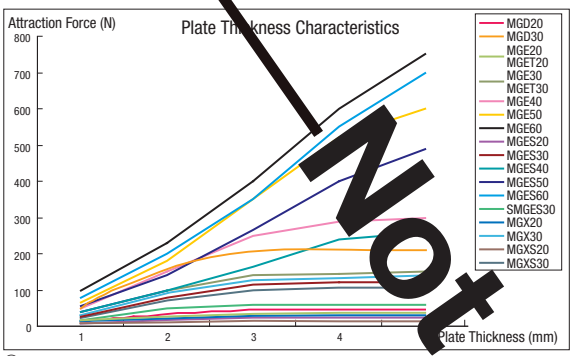
Not Available

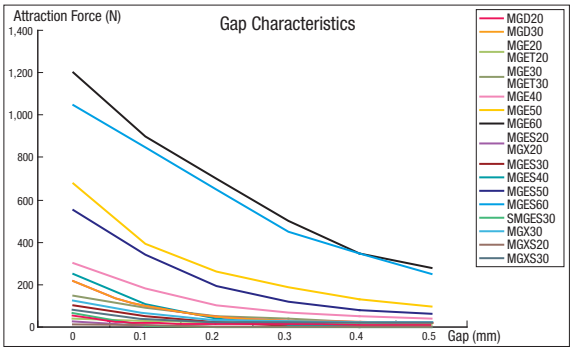
Features, Operating Conditions and Precautions for Use for Electromagnet Holders

■Features
- Electromagnet holder with a coil wound around the attraction body (polarity revrsible).
- Can be used on end effectors of robos to carry small work pieces.
- Electrical control can be utilized for turning ON / OFF and remote controlling of the magnet.
- For power supply, a rectifier is necessary. Select a rectifier for relevant voltage.
  (Applicable rectifier: MGEC)

■Condition of Use
- Installation Location: Indoor (Ambient temperature: -10~40°C)
- Applicable metal subect surface: Flat (No protrusions, holes, etc.)
  * Use entire holder surface for attraction.
- Duty Ratio: Continuous (100%ED)

■Precautions for Use
- Attraction force of electromagnetic holder may decrease considerably depending on condition of use.
  (1) Plate Thickness : Attraction force decreases as plate thickness decreases.
  (2) Gap : Attraction force decreases as gap increases between the attraction side of magnet and the object.
  (3) Material : Attraction force shown is based on 1.0038/S235JR.
  (4) Surface of attracted object: Attraction force decreases if the object surface is rough.
  (5) Coil Heating : Attraction force decreases as the excited electromagnet coil temperature rises. Decrease rate is 10 to 20% (approx.).
- Maximum attraction force shown is for subject material of 1.0038/S235JR (1018) STKM (polished surface, 50mm thick plate).
- There will be some residual magnetism after the power is turned OFF.



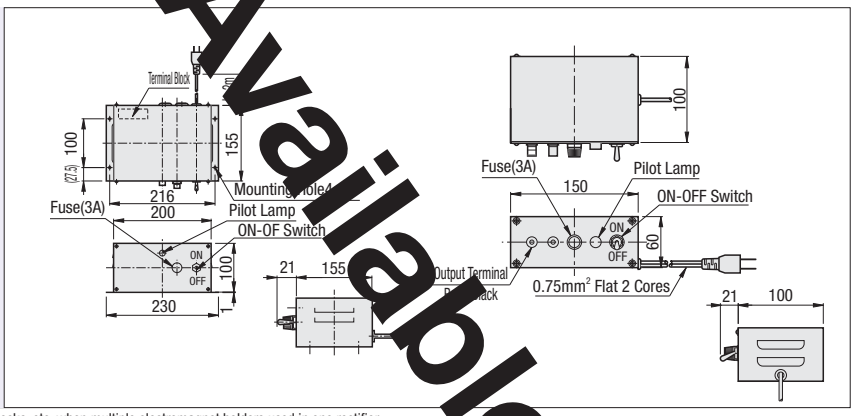


Reference graph indicating attraction force saturation. Usable up to "Maximum Attraction Force (N)".
"Plate Thickness Characteristics" graph shows the relationship of attraction force vs. subject metal thickness (polished 1.0038/S235JR), and "Gap Characteristics" graph shows the gap distance of attraction surface vs. subject metal.

■Rectifiers for Electromagnetic Holders

RoHS





Work in parallel connections using with terminal blocks, etc. when multiple electromagnet holders used in one rectifier.
Max. allowable electromagnet holders for one rectifier = Max. allowable current of the rectifier (3A) / Operating current of electromagnet holders
(Electromagnet holders operating current may vary with models and sizes. Refer to "Current (A)" in the table on the left page.)

Part Number Type	Part Number No.	Input Voltage	Output Voltage DC (V)	Max. Allowable Current (A)	Weight (kg)	€ Unit Price
	1	Single Phase AC100V	24	3	3.5	
	2		90		1	

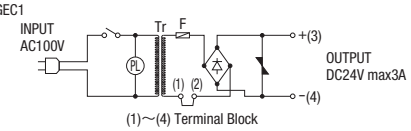
Order Example — Part Number

Days to Ship — 10 Days

■Features
- Rectifies input AC source into DC. Used as a power supply for the electromagnet holder.

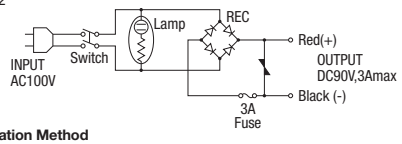
■Circuit

●MGEC1



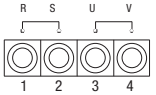
(1)~(4) Terminal Block

•MGEC2



■Interconnection

•MGEC1



Single phase 24V
R, S — Jumper Wire (Removed for external control)
U, V — Electromagnet Holder Connection

1: Before wiring, remove the rear cover.
2: Connect leads from electromagnet holder to terminals 3 and 4 of the rectifier unit.
For remote ON/OFF operations, remove the jumper wire from terminals 1 and 2 and replace with signal input leads.
3: Pull out each wire from filmed grommet, and tighten the cover with screws.

●MGEC2



Single phase 90V
U, V — Electromagnet Holder Connection

1: Connect leads of electromagnetic holder to red and black terminals located on the front terminal block.

Provide proper GFCI devices to avoid fire and smoke that may be caused by short circuited electromagnet holders.
Electromagnet will not operate properly unless correctly wired.

■Operation Method
1: ON/OFF operated with the switch on the front side of the rectifier unit.
- Pilot lamp turns on-off
- Electromagnet holder will be excited, and the work will be attracted / released.

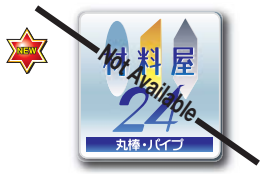
2-1: Turn the ON/OFF switch to ON when operating it remotely.
(Pilot lamp is always on.)

2-2: ON/OFF is operated remotely.
[ON Operation]
- Terminal 1 and 2 on terminal block are closed. (Electromagnet holder will be excited, and the work will be attracted.)

[OFF Operation]
- Terminal 1 and 2 on terminal block are opened. (Excitation of an electromagnetic holder stops, and the work will be released.)

Round Bars / Rods / Hollows / Resin Rods

Round Bars / Rods Hollow Resin Rods







Product Name	Material Shop 24 Round Bars and Hollows Website	Rods-1.1191/C45E / 1.0038/S235JR / 1.7220/34CrMo4-	Rods-Stainless Steel / Aluminum / Brass / 3.7035/Ti99.5 (Ti2)-
Page	282	283	285









Precision Rods - 1.1191/C45E / 1.4305/X10CrNiS18-9 / 1.4301/X5CrNi18-10 -	Mini Rods	-Selectable Tips-	-Outer Dia. Tolerance Selectable-
287	288	289	290









Hexagonal Rods	Inner Diameter Selectable Steel Hollows	Wall Thickness Selectable Stainless Steel Hollows	Welded Thin-walled Hollows
291	292	292	293





Price Reduced
Approx. 4%



Price Reduced
Approx. 4%



Price Reduced
Approx. 4%

Drawn Hollows	Thick-Walled Stainless Steel Hollows -Straight-	-Female Thread / Male Thread-	Thin-walled Stainless Steel Hollows
293	294	295	296









-Precision Inner / Outer Diameter-	Stainless Steel Hollows with Bending Alteration	Resin Rods	Resin Rod Exterior Surface Finished
296	297	298	299







Precision Resin Rods	Ceramics Rods	Transparent Resin Rod	Transparent Resin Hollow
301	302	302	303





Resin Hollows	Resin Hollows -Bore and Exterior Surface Finished Type-
303	304

"Material Shop 24 Round Bars and Hollows Website" Information

■"Material Shop 24 Round Bars and Hollows Website" Overview

[Website Details]

MISUMI part numbers, lead times and prices are automatically generated after selecting the specifications, and the order can be placed directly from the web site.

(?)Products with the symbol shown on the left are available on the "Material Shop 24 Round Bars and Hollows Website".



"Material Shop 24 Round Bars and Hollows Website"

(?)"Material Shop 24 Round Bars and Hollows Website" is scheduled to open in June of 2010.

MISUMI part numbers, lead time and prices are all displayed only in 6 sec.

[Details of Material Shop 24 Round Bars and Hollows]

Metallic: 43 different material round bars, hex rods and pipes are all lined up!

Resin: Selectable from 17 different material round bars and pipes!

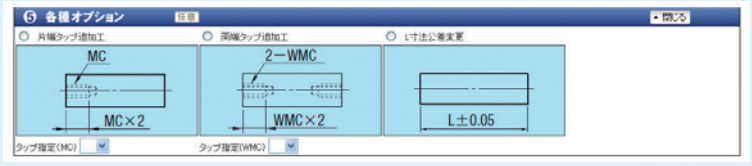
Urethane: Selectable from 15 different varieties (material and hardness) of round bars and pipes!

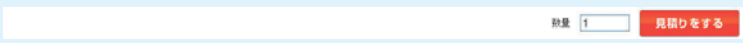
Not Available

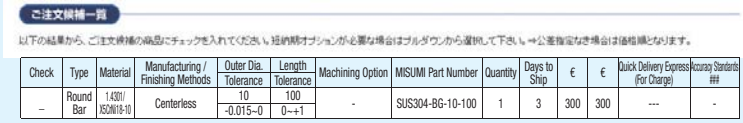
Material Shop 24 Round Bars and Hollows Website Screenshots

Ex.)Metal Round Bars and Hollows Screenshots
Website images are subject to change.

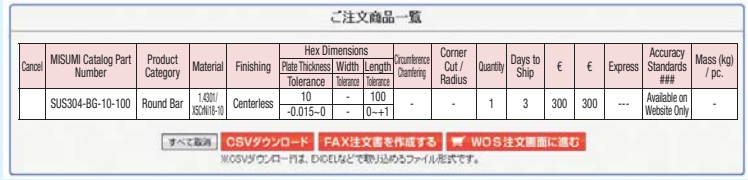








Check	Type	Material	Manufacturing / Finishing Methods	Outer Dia. Tolerance	Length Tolerance	Machining Option	MISUMI Part Number	Quantity	Days to Ship	€	€	Quick Delivery Express (For Charge)	Accuracy Standards ###
_	Round Bar	1.4301/ XSCrNi18-10	Centerless	10 -0.015~0	100 0~+1	-	SUS304-BG-10-100	1	3	300	300	---	-



Cancel	MISUMI Catalog Part Number	Product Category	Material	Finishing	Hex Dimensions Plate Thickness Tolerance	Hex Dimensions Width Tolerance	Hex Dimensions Length Tolerance	Circumference Chamfering	Corner Cut / Radius	Quantity	Days to Ship	€	€	Express	Accuracy Standards ###	Mass (kg) / pc.
	SUS304-BG-10-100	Round Bar	1.4301/ XSCrNi18-10	Centerless	10 -0.015~0	-	100 0~+1	-	-	1	3	300	300	---	Available on Website Only	-

Some of the materials, shapes, dimensions and finishings are only available on the website.
###

[Selection Steps]

1 Select type.
Selectable from five shapes of round bars and pipes.

2 Select material.
43 material types in all!
A wide variety of product lineup meets various purposes.

3 Select manufacturing and finishing methods.

4 Input Dimensions
Length (L) is configurable up to 2000mm in 1mm increment.
Reducing stocks and saving time for cutting work pieces.

5 Various Options
Various options such as One End Female Thread and Both Ends Female Thread can be selected.
###
*Applicable only to products with selectable options.

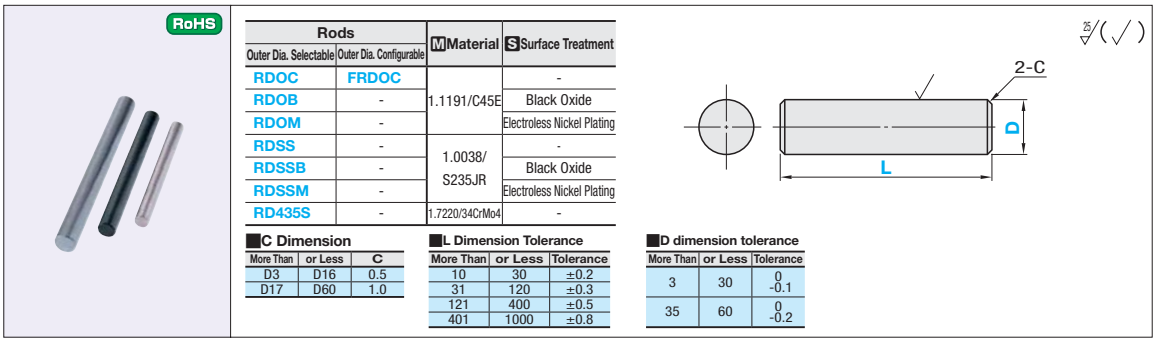
6 Input Quantity / Estimate

7 Auto Product Extraction
MISUMI part numbers, lead times and prices are all automatically generated.

8 How To Order
(There are following three ordering methods to choose from.)
-Ordering Through WOS
(For WOS, please see**P.95###**
-Print FAX Ordering Sheet
-Download CSV data
(The file format can be read in EXCEL.)

Rods

- 1.1191·C45E · 1.0038·S235JR · 1.7220·34CrMo4-



RoHS

Rods		M Material	S Surface Treatment
Outer Dia. Selectable	Outer Dia. Configurable		
RDOC	FRDOC	1.1191/C45E	-
RDOB	-		Black Oxide
RDOM	-		Electroless Nickel Plating
RDSS	-	1.0038/ S235JR	-
RDSSB	-		Black Oxide
RDSSM	-		Electroless Nickel Plating
RD435S	-	1.7220/34CrMo4	-

■C Dimension

More Than	or Less	C
D3	D16	0.5
D17	D60	1.0

■L Dimension Tolerance

More Than	or Less	Tolerance
10	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8

■D dimension tolerance

More Than	or Less	Tolerance
3	30	0 -0.1
35	60	0 -0.2

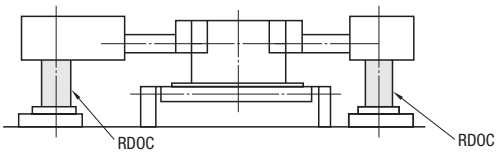
■Rods (Outer Diameter Selectable)

Part Number		L
Type	D	Specify in 1mm increment.
RDOC RDOB RDOM RDSS RDSSB RDSSM RD435S(D4~20)	3	10~250
	4	
	5	
	6	10~500
	8	
	10	
	12	10~750
	13	
	15	
	16	10~900
	18	20~1000
	20	
	25	
	30	
RDOC RDOB	35	30~1000
	40	
	50	
RDOC	60	30~1000

■Rods (Outer Diameter Configurable)

Part Number	D Specify in 1mm increment.	L Specify in 1mm increment.
FRDOC	6~10	10~500
	11~15	10~750
	16~17	10~900
	18~30	20~1000

Example It can also be used as a post.



Order Example

■Rods (Outer Diameter Selectable)

Part Number - L

RDOC15 - 700

■Rods (Outer Diameter Configurable)

Part Number - D - L

FRDOC - D11 - L113

Days to Ship

• RDOC· RDOB· RDSS· RDSSB· RD435S

8 Days | Express A | 3,00 EUR/ piece | P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

• RDOM, RDSSM

10 Days

• FRDOC

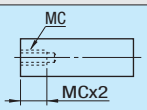
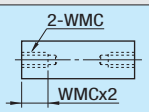
10 Days | Express B | 3,00 EUR/ piece | P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Alterations

Part Number - L - (MC · WMC)

RDOC20 - 535 - MC8

Alterations	One End Female Thread	Both Ends Female Thread
		
Code	MC	WMC
Spec.	Adds a tap on one end. Ordering Code MC8 6≤D≤30 When L≤Mx2, the tap goes through.	Adds taps on both ends. Ordering Code WMC12 6≤D≤30 When L≤Mx4, the tap goes through.

D	MC (Selection Range)
6·7	3
8·9	3·4
10·11	3·4·5
12~14	3·4·5·6
15~19	3·4·5·6·8
20~24	3·4·5·6·8·10·12
25~30	3·4·5·6·8·10·12·16

When L≤Mx4, the pilot hole for tapping may go through.

D	WMC (Selection Range)
6·7	3
8·9	3·4
10·11	3·4·5
12~14	3·4·5·6
15~19	3·4·5·6·8
20~24	3·4·5·6·8·10·12
25~30	3·4·5·6·8·10·12·16

Price Adder	2,00	4,00

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Rods (Outer Diameter Selectable)

For maximum L dimension in each D dimension, refer to the specification table shown on the left page.

Part Number Type	D	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RDOC (1.1191/C45E)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
	35						
	40						
	50						
	60						
RDOB (1.1191/C45E)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
	35						
	40						
	50						
RDOM (1.1191/C45E)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
RD435S (1.7220/ 34CrMo4)	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						

Part Number Type	D	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RDSS (1.0038/S235JR)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
RDSSB (1.0038/S235JR)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
RDSSM (1.0038/S235JR)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						

Rods (Outer Diameter Configurable)

Part Number	D Specify in 1mm increment.	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
FRDOC (1.1191/ C45E)	6~10						
	11~15						
	16~19						
	20~24						
	25~27						
	28~30						

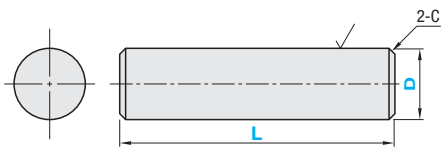
Rods

-Stainless Steel, Aluminum, Brass, 3.7035/Ti99.5 (Ti2)-



RoHS
Part Number
Not RoHS Compliant

Rods		Material
Outer Dia. Selectable	Outer Dia. Configurable	
RDOF	-	1.4305/X10CrNiS18-9
RDOS	FRDOS	1.4301/X5CrNi18-10
RDOH	-	1.4401/X5CrNiMo17-12-2
RDOA	-	EN AW-2017/AlCu4MgSi
RDOK	-	EN AW-5056/AlMg5
RD52A	-	EN AW-5052/AlMg2,5
RDOG	-	CW614N/CuZn39Pb3 Brass (JIS) (Brass)
RDOGR	-	CW614N/CuZn39Pb3 (Brass with low cadmium)
RDOT	-	Titanium Class 2



■C Dimension

More Than	or Less	C
D3	D16	0.5
D17	D80	1.0

■L Dimension Tolerance

More Than	or Less	Tolerance
10	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8

*1.4031/X38Cr13 Type has been discontinued.

■Rods (Outer Diameter Selectable)

Part Number Type	D	L Specify in 1mm increment.
RDOF RDOS RDOH RDOA RDOK RD52A(D5~12 · 15~20) RDOG RDOGR RDOT(D3~6)	3	10~250
	4	
	5	
	6	10~500
	8	
	10	
	12	10~750
	13	
	15	
	16	10~900
	18	20~1000
	20	
	25	
	30	
RDOF RDOS	50	30~1000
	60	
	80	30~200

■Rods (Outer Diameter Configurable)

Part Number	D Specify in 1mm increment.	L Specify in 1mm increment.
FRDOS	6~10	10~500
	11~15	10~750
	16~17	10~900
	18~30	20~1000

■Outer Diameter Tolerance

Part Number / D	RDOF RDOS	FRDOS RDOH RDOT	RDOA	RDOK RD52A RDOG RDOGR
3	0 -0.1	0 -0.1	±0.1	±0.1
4				
5				
6				
8				
10				
12			±0.3	
13				
15				
16				
18				
20			±0.4	
25				
30				
50	0 -0.2	-	-	-
60				
80				

Order Example

■Rods (Outer Diameter Selectable)

Part Number	-	L
RDOA15	-	700

■Rods (Outer Diameter Configurable)

Part Number	-	D	-	L
FRDOS	-	D11	-	L113

Days to Ship

• Except Those Shown Below

8 Days

Express A | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

• RDOT · FRDOS

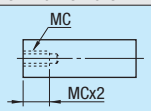
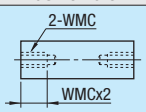
10 Days

Express B | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Alterations

Part Number	-	L	-	(MC · WMC)
RDOF20	-	535	-	MC8

Alterations	One End Female Thread	Both Ends Female Thread
		
Code	MC	WMC
Spec.	Adds a tap on one end. Ordering Code MC8 6≤D≤30 When L≤Mx2, the tap goes through. D / MC (Selection Range) 6·7 / 3 8·9 / 3·4 10·11 / 3·4·5 12~14 / 3·4·5·6 15~19 / 3·4·5·6·8 20~24 / 3·4·5·6·8·10·12 25~30 / 3·4·5·6·8·10·12·16 When L≤Mx4, the pilot hole for tapping may go through.	Adds taps on both ends. Ordering Code WMC12 6≤D≤30 When L≤Mx4, the tap goes through. D / WMC (Selection Range) 6·7 / 3 8·9 / 3·4 10·11 / 3·4·5 12~14 / 3·4·5·6 15~19 / 3·4·5·6·8 20~24 / 3·4·5·6·8·10·12 25~30 / 3·4·5·6·8·10·12·16
Price Adder	2,00 (6,00 for RDOT only)	4,00 (12,00 for RDOT only)

CAD Data

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Rods (Outer Diameter Selectable)

For maximum L dimension in each D dimension, refer to the specification table shown on the left page.

Part Number Type	D	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RDOF (1.4305/ X10CrNiS18-9)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
	50						
	60						
	80						
RDOS (1.4301/ X5CrNi18-10)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
	50						
	60						
	80						
RDOH (1.4401/ X5CrNiMo17-12-2)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
RDOA EN AW-2017/ AlCu4MgSi	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						

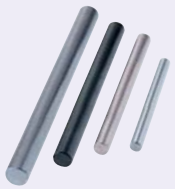
Part Number Type	D	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RDOK (EN AW-5056/ AlMg5)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
RD52A (EN AW-5052/ AlMg2,5)	5						
	6						
	8						
	10						
	12						
	15						
	16						
	18						
	20						
RDOG (CW614N/ CuZn39Pb3) RDOGR (CW614N/ CuZn39Pb3)	3						
	4						
	5						
	6						
	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
RDOT (Titanium Class 2)	3						
	4						
	5						
	6						

Rods (Outer Diameter Configurable)

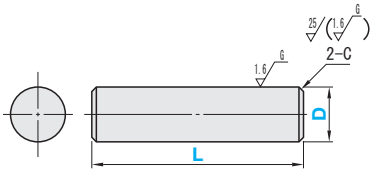
Part Number	D Specify in 1mm increment.	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
FRDOS (1.4301/ X5CrNi18-10)	6~10						
	11~15						
	16~19						
	20~24						
	25~27						
	28~30						

Precision Rods (Tolerance h7/g6)

-1.1191/C45E · 1.4305/X10CrNiS18-9 · 1.4301/X5CrNi18-10-



Type	D Tolerance	Material	Surface Treatment
RGOC	h7	1.1191/C45E	-
RGOB			Black Oxide
RGOM			Electroless Nickel Plating
RGOF		1.4305/X10CrNiS18-9	-
RGOS		1.4301/X5CrNi18-10	-
RGOCG	g6	1.1191/C45E	-
RGOFG		1.4305/X10CrNiS18-9	-



C Dimension

More Than	or Less	C
D 3	D16	0.5
D17	D30	1.0

L Dimension Tolerance

More Than	or Less	Tolerance
10	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8

Precision Rod

Part Number Type	D	L Specify in 1mm increment.
RGOC RGOB RGOM RGOF RGOS RGOCG RGOFG	3	10~250
	4	
	5	
	6	10~500
	7	
	8	
	9	
	10	
	11	10~750
	12	
	13	
	14	
	15	
	16	10~900
	17	20~1000
	18	
	19	
	20	
	25	
	30	

Order Example: Part Number - L → RGOC15 - 700

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: **8 Days** — Express A — 3,00 EUR/piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

For the maximum L dimension in each D dimension, refer to the specification table shown above right.

Part Number Type	D	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RGOC (h7 - 1.1191/C45E)	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	25						
	30						
RGOB (h7 - 1.1191/C45E)	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	25						
	30						
RGOM (h7 - 1.1191/C45E)	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	25						
	30						

Part Number Type	D	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RGOF (h7 - 1.4305/X10CrNiS18-9)	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	25						
	30						
RGOS (h7 - 1.4301/X5CrNi18-10)	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	25						
	30						

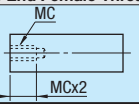
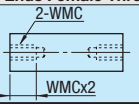
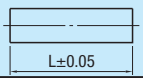
Part Number Type	D	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RGOCG (g6 - 1.1191/C45E)	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	25						
	30						
RGOFG (g6 - 1.4305/X10CrNiS18-9)	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	25						
	30						

For the Tolerance g6 1.4301/X5CrNi18-10 and 1.1191/C45E materials (black oxide and electroless nickel plating) refer to the Rotary Shaft Straight Type on 1 P. 735

Alterations

Part Number - L - (MC · WMC · LKC)

RGOC20 - 535 - MC8
RGOM18 _ 200 _ LKC

Alterations	One End Female Thread	Both Ends Female Thread	L Dimension Tolerance
			
Code	**MC**	**WMC**	**LKC**
Spec.	Adds a tap on one end. Ordering Code MC8 6≤D≤30 When L≤Mx2, the tap goes through. D: 6 / 7·8 / 9·10 / 11·12·13 / 14~18 / 19·20 / 25·30 MC (Selection Range): 3 / 3·4 / 3·4·5 / 3·4·5·6 / 3·4·5·6·8 / 3·4·5·6·8·10·12 / 3·4·5·6·8·10·12·16 When L≤Mx4, the pilot hole for tapping may go through.	Adds taps on both ends. Ordering Code WMC12 6≤D≤30 When L≤Mx4, the tap goes through. D: 6 / 7·8 / 9·10 / 11·12·13 / 14~18 / 19·20 / 25·30 WMC (Selection Range): 3 / 3·4 / 3·4·5 / 3·4·5·6 / 3·4·5·6·8 / 3·4·5·6·8·10·12 / 3·4·5·6·8·10·12·16	Changes L Dimension Tolerance within ±0.05 Ordering Code LKC
Price Adder	2,00	4,00	4,00

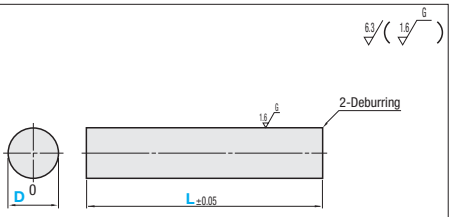
Mini Rods

CAD Data



RoHS

Type	D Tolerance	M Material	H Hardness	S Surface Treatment
MRS	0 -0.005	1.3343/S6-5-2	60HRC~	-
MRSB				Black Oxide
MRSM				Electroless Nickel Plating
MRSK		ISO TC90		-
MRSD		1.2379/X155CrVMo12-1	58HRC~	-
MRSS		1.4125/X105CrMo17	56HRC~	-
MRSG		1.4301/X5CrNi18-10	-	-
MRSF		P / M High-Speed Steel	65~68HRC	-
MRSC		CW614N/CuZn39Pb3 (Brass with low cadmium)	-	-



Discoloration may occur on rod ends.

Part Number Type	D	L Specify in 0.1mm increment.	€ Unit Price MRS	MRSB	MRSM	MRSK	MRSD	MRSS	MRSG	MRSF	MRSC
MRS MRSB MRSM MRSK MRSD MRSS MRSG MRSF MRSC	0.5	5.0~50.0									
	0.6										
	0.7										
	0.8										
	0.9										
	1.0										
	1.1										
	1.2	5.0~60.0									
	1.3										
	1.4	5.0~70.0									
	1.5	5.0~75.0									
	1.6	5.0~80.0									
	1.7										
	1.8	5.0~90.0									
	1.9										
	2.0	5.0~100.0									
	2.1										
	2.2										
	2.3										
	2.4										
	2.5										
	2.6										
	2.7										
	2.8										
	2.9										
	3.0	5.0~150.0									
	3.1										
	3.2										
	3.3										
	3.4										
	3.5										
	3.6										
	3.7										
	3.8										
	3.9										
	4.0										
	4.1										
	4.2										
	4.3										
	4.4										
	4.5										
	4.6										
	4.7										
	4.8										
	4.9										
	5.0										

Order Example

Part Number	-	L
MRS1.2	-	60.0

Price

Volume Discount (Round down to one Cent.) P.87

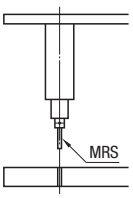
Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders of 100 or more pieces of MRSK · MRSD · MRSF and MRSC, please request a quotation.

Days to Ship

- MRSK: 8 Days — Express A — 3,00 EUR/ piece — P.88
  - A Express Charge of 8,10 EUR for 3 or more identical pieces.
- Other Than Those Above: 8 Days — Express A — 3,00 EUR/ piece — P.88
  - A Express Charge of 8,10 EUR for 3 or more identical pieces.

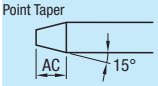
Example



Alterations

Part Number	-	L	-	(AC)
MRS1.2	-	60.0	-	AC1.0

8 Days — Express A

Alteration	Code	Spec.	Price Adder
Point Taper 	AC	Adds a 15° taper on the point. AC = Specify in 0.1mm increment. 0.5≤AC≤10 D-2(AC tan15°)≥0.2	4,00

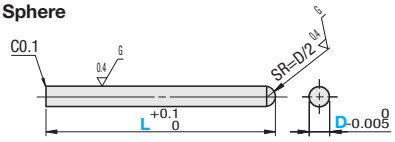
Mini Rods
-Selectable Tips-

CAD Data

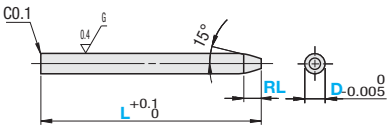


End Shape			Material	Hardness
Sphere	Tapered	Taper SR		
MRSHQ	MRSHT	MRSHR	1.3343/S6-5-2	58HRC~
MRSSQ	MRSST	MRSSR	1.4125/X105CrMo17	56HRC~
MRSGQ	MRSGT	-	1.4301/X5CrNi18-10	-

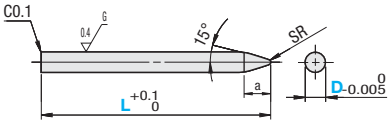
Sphere



Tapered



Taper SR



Stepped Type is available on our website.

Sphere Type

Part Number	Specify in 0.1mm increment.		€ Unit Price		
	D	L	1.3343/ S6-5-2 MRSHQ	1.4125/ X105CrMo17 MRSSQ	1.4301/ X5CrNi18-10 MRSGQ
MRSHQ MRSSQ MRSGQ	2.0~2.9	5.0~20.0			
		20.1~50.0			
		50.1~100.0			
	3.0~3.9	5.0~20.0			
		20.1~50.0			
		50.1~100.0			
	4.0~5.0	8.0~20.0			
		20.1~50.0			
		50.1~100.0			

Tapered Type

Part Number	Specify in 0.1mm increment.			€ Unit Price		
	D	L	RL D-2(RLtan15°)≥0.2	1.3343/ S6-5-2 MRSHT	1.4125/ X105CrMo17 MRSST	1.4301/ X5CrNi18-10 MRSGT
MRSHT MRSST MRSGT	2.0~2.9	5.0~20.0	0.5~10			
		20.1~50.0				
		50.1~100.0				
	3.0~3.9	5.0~20.0				
		20.1~50.0				
		50.1~100.0				
	4.0~5.0	5.0~20.0				
		20.1~50.0				
		50.1~100.0				

Taper SR Type

Part Number	Specify in 0.1mm increment.		SR	a (Reference)	€ Unit Price	
	D	L			1.3343/ S6-5-2 MRSHR	1.4125/ X105CrMo17 MRSSR
MRSHR MRSSR	2.0~2.9	8.0~20.0	0.5	2.4~4.1		
		20.1~50.0				
		50.1~100.0				
	3.0~3.9	8.0~20.0		4.2~6.0		
		20.1~50.0				
		50.1~100.0				
	4.0~5.0	8.0~20.0	1	4.7~6.6		
		20.1~50.0				
		50.1~100.0				

a dimensions vary within values listed above according to D dimensions.

Order Example

Part Number	-	D	-	L	-	RL
MRSHT	-	D3.5	-	L100.0	-	RL10

Days to Ship

8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Mini Rods

-Outer Diameter Tolerance Selectable-

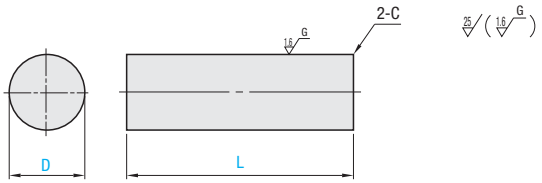
CAD Data



RoHS

Outer Dia. Selectable	Outer Dia. Configurable	Material	Hardness
KRSH	KRBSH	1.3343/S6-5-2	58HRC~
KRSK	KRBSK	ISO TC90	
KRSD	KRBSD	1.2379/X155CrVMo12-1	60HRC~
KRSS	KRBSS	1.4125/X105CrMo17	56HRC~
KRSG	KRBSG	1.4301/X5CrNi18-10	-

D	Tolerance Selection				
	M	P	G	H	S
	m6	p6	g6	h7	-
0.30 ~ 3.00	+0.008 +0.002	+0.012 +0.006	-0.002 -0.008	0 -0.010	0 -0.01
3.01 ~ 5.00	+0.012 +0.004	+0.020 +0.012	-0.004 -0.012	0 -0.012	



■C Dimension

More Than	or Less	C
D0.3	D0.59	Deburring
D0.6	D5	0.1

■L Dimension Tolerance

More Than	or Less	Tolerance
5.0	6.0	±0.1
6.1	30.0	±0.2
30.1	120.0	±0.3
120.1	150.0	±0.5

■Outer Dia. Selectable

Part Number: Type	Tolerance Selection	D	L: Specify in 0.1mm increment.	€ Unit Price: KRSH	KRSK	KRSD	KRSS	KRSG
KRSH (D0.3~5) KRSK (D0.5~5) KRSD (D1~5) KRSS (D0.3~5) KRSG (D1~5)	M G H	0.3	5.0~50.0					
		0.4						
		0.5						
		0.6						
		0.7						
		0.8						
		0.9						
		1						
		1.1						
		1.2	5.0~60.0					
		1.3						
		1.4	5.0~70.0					
		1.5	5.0~75.0					
		1.6	5.0~80.0					
		1.7						
		1.8	5.0~90.0					
		1.9						
		2	5.0~100.0					
		2.5						
		3	5.0~150.0					
		3.5						
		4						
		4.5						
		5						

Order Example

■Outer Dia. Selectable

Part Number	-	L
Type	D Tolerance	D
KRSH	M	0.5 - 50.0

■Outer Dia. Configurable

Part Number	-	L	-	D
Type	D Tolerance	No.		
KRBSH	H	0.6 - 30.0 - D0.55		

Days to Ship

8 Days

Express A | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

■Outer Diameter Configurable (Specify in 0.01m increment.)

Part Number: Type	Tolerance Selection	No.	L: Specify in 0.1mm increment.	D: Specify in 0.01 mm increment.	€ Unit Price: KRBSH	KRBSK	KRBSD	KRBSS	KRBSG
KRBSH (No. 0.5~5) KRBSK (No. 0.6~5) KRBSD (No. 1.5~5) KRBSS (No. 0.5~5) KRBSG (No. 1.5~5)	M P G H S	0.5	5.0~50.0	0.30~0.49					
		0.6		0.50~0.59					
		1	5.0~100.0	0.60~0.99					
		1.5		1.00~1.49					
		2		1.50~1.99					
		2.5		2.00~2.49					
		3		2.50~2.99					
		3.5		3.00~3.49					
		4		3.50~3.99					
		4.5		4.00~4.49					
		5		4.50~4.99					

Price

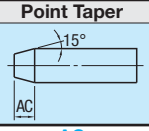
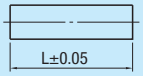
■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	L	-	(AC / LKC)
KRSHM0.5	-	50.0	-	LKC

Alterations	Point Taper	L Dimension Tolerance
		
Code	AC	LKC
Spec.	AC: Specify in 0.1mm increment. 0.5≤AC≤10.0 D-2(AC tan15°)≥0.2 Ordering Code AC 5.5	Changes L Dimension Tolerance within ±0.05 Ordering Code LKC
Price Adder	4,00	4,00

Hexagonal Rods

-1.1191C45E · 1.4305/X10CrNiS18-9 / 1.4301/X5CrNi18-10 · Brass · EN AW-2011/AlCu6BiPb Aluminum Alloy-

CAD Data

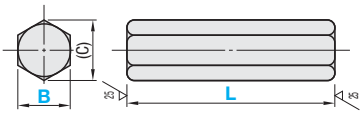


RoHS

Part Number

Not RoHS Compliant

Type	Material
RDRC	1.1191/C45E
RDRF	1.4305/X10CrNiS18-9
RDRS	1.4301/X5CrNi18-10
RDRG	CW614N/CuZn39Pb3 Brass (JIS) (Brass)
RDRA	EN AW-2011/AlCu6BiPb



L Dimension Tolerance

More Than	or Less	Tolerance
15	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8

Part Number Type	B	L Specify in 1mm increment.	(C)
RDRC (1.1191/C45E)	6	15~400	6.9
	7		8.1
	8		9.2
	10	25~600	11.5
RDRF (1.4305/X10CrNiS18-9)	12		13.9
	13		15.0
RDRS (1.4301/X5CrNi18-10)	14	35~800	16.2
	17		19.6
RDRG (CW614N/CuZn39Pb3)	19		21.9
	24	65~1000	27.7
RDRA (EN AW-2011/AlCu6BiPb)	27		31.2
	30		34.6
	32		36.9

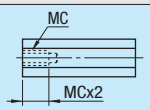
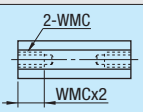
Order Example

Part Number	-	L
RDRC10	-	300

Alterations

Part Number - L - (MC · WMC)

RDRC19 - 535 - MC8

Alterations	One End Female Thread	Both Ends Female Thread
		
Code	MC	WMC
Spec.	Adds a tap on one end. Ordering Code MC8 ※6≤B≤32 ※When L≤Mx2, the tap goes through.	Adds taps on both ends. Ordering Code WMC12 ※6≤B≤32 ※When L≤Mx4, the tap goes through.
Price Adder	2,00	4,00

B	MC (Selection Range)
6 · 7	3
8	3, 4
10	3, 4, 5
12~14	3, 4, 5, 6
17 · 19	3, 4, 5, 6, 8
24	3, 4, 5, 6, 8, 10, 12
27~32	3, 4, 5, 6, 8, 10, 12, 16

※When L≤Mx4, the pilot hole for tapping may go through.

B	WMC (Selection Range)
6 · 7	3
8	3, 4
10	3, 4, 5
12~14	3, 4, 5, 6
17 · 19	3, 4, 5, 6, 8
24	3, 4, 5, 6, 8, 10, 12
27~32	3, 4, 5, 6, 8, 10, 12, 16

Days to Ship

8 Days

Express**A** 3,00 EUR/ piece P.88

※A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount (※Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

※For orders larger than indicated quantity, please request a quotation.

Part Number Type	B	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RDRC	6						
	7						
	8						
	10						
	12						
	13						
	14						
	17						
	19						
	24						
	27						
	30						
	32						
RDRF	6						
	7						
	8						
	10						
	12						
	13						
	14						
	17						
	19						
	24						
	27						
	30						
	32						
RDRS	6						
	7						
	8						
	10						
	12						
	13						
	14						
	17						
	19						
	24						
	27						
	30						
	32						

Part Number Type	B	€ Unit Price Min.L~100	101~200	201~400	401~600	601~800	801~1000
RDRG	6						
	7						
	8						
	10						
	12						
	13						
	14						
	17						
	19						
	24						
	27						
	30						
	32						
RDRA	6						
	7						
	8						
	10						
	12						
	13						
	14						
	17						
	19						
	24						
	27						
	30						
	32						

Inner Diameter Selectable Steel Hollows / Wall Thickness Selectable Stainless Steel Hollows

CAD Data

Inner Diameter Selectable Steel Hollows

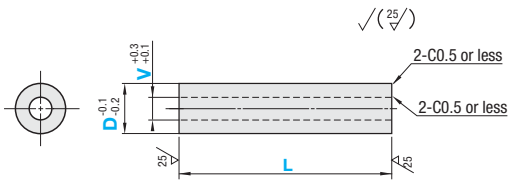


RoHS

Type	Material	Surface Treatment
PISS	JIS STKM17C ~C50E	-
PISK		Black Oxide
PISN		Electroless Nickel Plating

L Dimension Tolerance

More Than	or Less	Tolerance
100	120	±0.3
121	400	±0.5
401	1000	±0.8



End faces of PISK and PISN are not surface-treated.

Part Number Type	D	V	L Specify in 1mm increment.	€ Unit Price L100~200	L201~400	L401~600	L601~800	L801~1000
PISS (No treatment)	6	3 4	100~1000					
	8	3 4 5 6						
	10	3 4 5 6 8						
	12	3 4 5 6 8 10						
	13	5 6 8 10						
	14	4 5 6 8 10						
	15	4 5 6 8 10 12						
	16	4 5 6 8 10 12						
	20	5 6 8 10 12 15 16						
	25	6 8 10 12 15 16 20						
	30	10						
		20 25						
PISK (Black Oxide)	6	3 4	100~1000					
	8	3 4 5 6						
	10	3 4 5 6 8						
	12	3 4 5 6 8 10						
	13	5 6 8 10						
	14	4 5 6 8 10						
	15	4 5 6 8 10 12						
	16	4 5 6 8 10 12						
	20	5 6 8 10 12 15 16						
	25	6 8 10 12 15 16 20						
	30	10						
		20 25						
PISN (Electroless Nickel Plating)	6	3 4	100~1000					
	8	3 4 5 6						
	10	3 4 5 6 8						
	12	3 4 5 6 8 10						
	13	5 6 8 10						
	14	4 5 6 8 10						
	15	4 5 6 8 10 12						
	16	4 5 6 8 10 12						
	20	5 6 8 10 12 15 16						
	25	6 8 10 12 15 16 20						
	30	10						
		20 25						

Order Example: Part Number - V - L → PISS20 - 10 - 400

Days to Ship: 8 Days

ExpressA 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

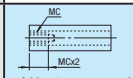
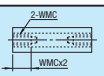
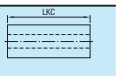
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations: Part Number - V - L - (MC · WMC · LKC) → PISS20 - 8 - 400 - MC

Alterations	One End Female Thread	Both Ends Female Thread	L Dimension Tolerance
Code	MC	WMC	LKC
Spec.	 Adds a tap on one end. Ordering Code MC	 Adds taps on both ends. Ordering Code WMC	 Changes L Dimension Tolerance Ordering Code LKC
Price Adder	2,00	4,00	4,00

D \ V	3	4	5	6	8	10	12	15	16	20	25
6	M4	-									
8	M4	M5									
10	M4	M5									
12	M4	M5	M8	M8	-						
13			M8	M8	M10	-					
14		M6	M8	M8	M10	-					
15		M6	M8	M8	M10	-	-				
16		M8	M8	M8	M10	M12	-				
20			M10	M10	M10	M12	-	-	-		
25				M10	M10	M12	M16	M18	M20	-	
30						M12				-	-

Not applicable to "-"

L	L Tolerance
100~300	±0.05
301~500	±0.10

Not applicable to L>500

Wall Thickness Selectable Stainless Steel Hollows



RoHS

PIPS



C Dimension

More Than	or Less	C
D3	D16	0.5
D20	D30	1.0

L Dimension Tolerance

More Than	or Less	Tolerance
10	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8

Material: 1.4301/X5CrNi18-10 (Drawn Hollow)

For maximum L dimension in each D dimension, refer to the specification table.

Part Number Type	D	t Selection	L Specify in 1mm increment.	€ Unit Price L10~100	L101~200	L201~400	L401~600	L601~800	L801~1000
PIPS	3	0.5 1	10~250						
	4	0.5 1							
	5	0.5 1 1.5							
	6	0.5 1 1.5 2	10~500						
	8	0.5 1 1.5 2							
	10	0.5 1 1.5 2 2.5 3							
	13	0.5 1 1.5 2 2.5 3	10~900						
	15	1 1.5 2 2.5 3 4							
	16	1.5 2 2.5 3 4 5							
	20	2 2.5 3 4 5	10~1000						
	25	2.5 3 4 5 6							
	30	4 5 6							

Order Example: Part Number - t - L → PIPS4 - 1 - 125

Days to Ship: 8 Days

ExpressA 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Welded Thin-Walled Hollows / Drawn Hollows

-1.4301/X5CrNi18-10 · 1.0480/H240LA · CW508L/CuZn37 · EN AW6063/AlMg0,7Si-

CAD Data

■Welded Thin-walled Hollows



RoHS

■Drawn Hollows



RoHS

Type	Hollow Type	Material
PIPD	Welded Hollow	1.4301/X5CrNi18-10
PIPC	Drawn Hollow	1.0480/H240LA
PIPG		CW508L/CuZn37 Brass (JIS) (Brass)
PIPA		EN AW-6063/AlMg0,7Si

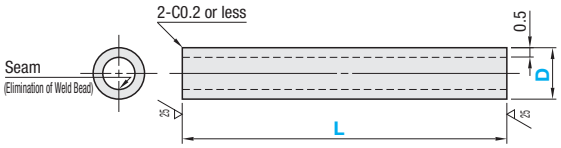
■D Tolerance

D	PIPC PIPG PIPD	PIPA
2~6	±0.1	±0.1
8~30	±0.2	±0.4

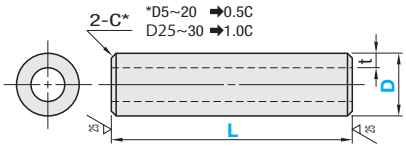
■L Tolerance

More Than	or Less	Tolerance
10	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8

PIPD



PIPC · PIPG · PIPA



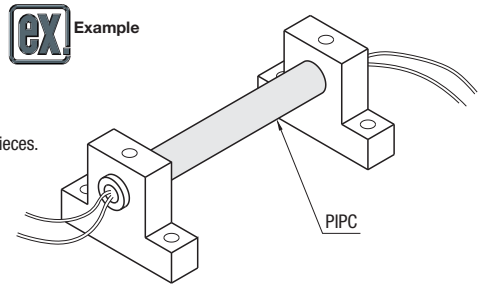
For maximum L dimension in each D dimension, refer to the specification table.

Part Number Type	D	L Specify in 1mm increment	t	€ Unit Price L10~100	L101~200	L201~400	L401~600	L601~800	L801~1000
PIPD (1.4301/X5CrNi18-10)	2	10~1000	0.5						
	3								
	4								
	5								
	6								
	8								
	10								
	12								
	15								
	16								
	20								
	25								
	30								
PIPC (1.0480/H240LA)	5	10~250	1						
	6	10~500							
	8								
	10								
	12	10~900	1						
	13		1.5						
	15		1.5						
	16		1						
	20	10~1000	1						
	25		2						
	30		2						
PIPG (CW508L/CuZn37)	5	10~250	1						
	6	10~500							
	8								
	10								
	12	10~900	1						
	13		1.5						
	15		1.5						
	20	10~1000	1						
	25		2						
	30		2						
PIPA (EN AW-6063/AlMg0,7Si)	5	10~250	1						
	6	10~500							
	8								
	10								
	12	10~900	1						
	13		1.5						
	15		1.5						
	16		2						
	20	10~1000	1						
	25		2						
	30		2						

Order Example

Part Number	-	L
PIPC8	-	450

Example



Days to Ship

8 Days | ExpressA 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount(Round down to one Cent.)P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Thick-walled Stainless Steel Hollow
-Straight-

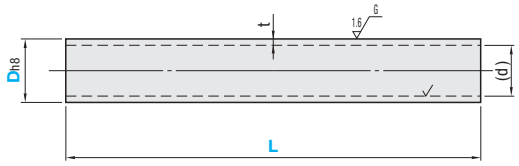
Price Reduction
Approx. 4%

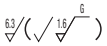
CAD Data



RoHS

PSTS





■L Dimension Tolerance

More Than	or Less	Tolerance
10	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8
1001	1200	±1.2

Ⓜ Material: 1.4301/X5CrNi18-10

Part Number Type	D	h8	L Specify in 1mm increment	t	$(d^{+0.5}_{0})$	€ Unit Price L10~200	L201~400	L401~600	L601~800	L801~1000	L1001~1200
PSTS	6	0 -0.018	10~600	1.5	3						
	8A	0 -0.022		1.5	5						
	8			2	4						
	10A			1.5	7						
	10			2	6						
	12A	0 -0.027	10~800	2	8						
	12			3	6						
	12B			4	4						
	15B		10~1000	1.5	12						
	15A			2	11						
	15			3	9						
	16			3	10						
	20A	0 -0.033		2.5	15						
	20			4	12						
	20B			6	8						
	25A			3	19						
	25			5	15						
	30A			3	24						
	30			5	20						
	35	0 -0.039	10~1200	5	25						
	40			5	30						
	45			5	35						
	50			8	34						

Order Example

Part Number	-	L
PSTS15	-	173

Days to Ship: 8 Days

Express**A** 5,00 EUR/ piece

P.88

Ⓐ A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■**Volume Discount** (Ⓡ Round down to one Cent.) P.87

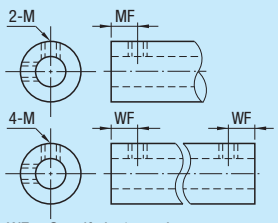
Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

Ⓡ For orders larger than indicated quantity, please request a quotation.

Alterations

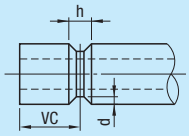
Part Number	-	L	-	(MF · WF · VC · LKC)
PSTS15	-	173	-	WF17

Alterations	Side Female Thread		V Groove	L Dimension Tolerance
Code	MF	WF	VC	LKC
Spec.				
Price Adder	3,00		4,00	5,00



MF · WF = Specify in 1 mm increment.
Ordering Code MF12
⊗Not applicable to D6 · 8A · 10A and 15B

D	Side Tap Diameter
8 · 10 · 12 · 12A · 12B 15 · 15A · 16	M3
20 · 20A · 20B · 25 · 25A 30 · 30A	M4
35 · 40 · 45 · 50	M5



VC = Specify in 1 mm increment.
Ordering Code VC15
⊗Not applicable to D6 · 8A · 10A and 15B

D	h	d
8	4	0.75
10		
12 · 12A		
15 · 15A · 16 20 · 20A · 20B	5	1.0
25 · 25A · 30 · 30A	6	1.5
35 · 40	8	
45 · 50	12	2.0



L Dimension Tolerance
Ordering Code LKC

L	L Tolerance
10~ 200	+0.05 0
201~ 500	+0.2 0
501~ 800	+0.5 0
801~1200	+0.8 0

Thick-walled Stainless Steel Hollow

-Female Thread · Male Thread-

Price Reduction Approx. 4%

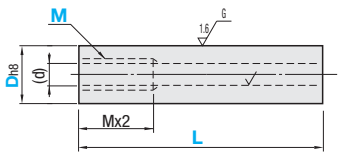
CAD Data

■Female Thread

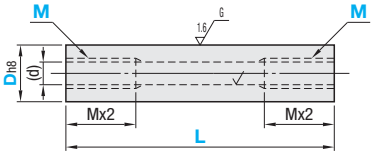


RoHS

PSTT (One End Female Thread)



PSWT (Both Ends Female Thread)



Dimension L tolerance conforms to the PSTS.**P.294**

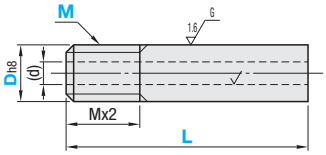
Material: 1.4301/X5CrNi18-10

■Male Thread

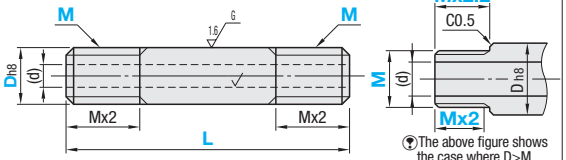


RoHS

PSTN (One End Male Thread)



PSWN (Both Ends Male Thread)



The above figure shows the case where D>M.

Dimension L tolerance conforms to the PSTS.**P.294**

Material: 1.4301/X5CrNi18-10

Part Number Type	D	h8	L Specify in 1mm increment.	M (Coarse Thread)	(d +0.5 0)
PSTT PSWT	6	0 -0.018	30~600	4	3
	8	0 -0.022		5 6	4
	10			8	6
	12	0 -0.027	30~800	8	6
	15		30~1000	10 12	8
	20	0 -0.033		12 16	10
	25			16 20	13
	30			20 24	16

L≥Mx3 for PSTT, L≥Mx6 for PSWT

Part Number Type	D	h8	L Specify in 1mm increment.	M (Coarse Thread)	(d +0.5 0)
PSTN PSWN	8	0 -0.022	50~600	8	4
	10			10	6
	12	0 -0.027	60~800	10 12	6
	15		70~1000	12	8
	20	0 -0.033		16 20	10
	25			20 24	13
	30			24 30	16

L≥Mx3 for PSTN, L≥Mx6 for PSWN

Order Example

Part Number	-	L	-	M
PSTT20	-	184	-	12
PSWN20	-	320	-	16

Days to Ship

8 Days

ExpressA 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	L	-	M	-	(LKC)
PSTT15	-	173	-	10	-	LKC

Alteration Code	L Dimension Tolerance LKC
Spec.	LKC  Ordering Code LKC L Dimension Tolerance: L 30~200 +0.05 0; 201~500 +0.2 0; 501~800 +0.5 0; 801~1000 +0.8 0
Price Adder	5,00

■PSTT · PSWT

D	PSTT € Unit Price L30~200	L201~400	L401~600	L601~800	L801~1000	PSWT € Unit Price L30~200	L201~400	L401~600	L601~800	L801~1000
6										
8										
10										
12										
15										
20										
25										
30										

■PSTN · PSWN

D	PSTN € Unit Price Min. L~200	L201~400	L401~600	L601~800	L801~1000	PSWN € Unit Price Min. L~200	L201~400	L401~600	L601~800	L801~1000
8										
10										
12										
15										
20										
25										
30										

Thin-walled Stainless Steel Hollow / Thin-walled Stainless Steel Hollow
-Precision Inner / Outer Diameter-

Price Reduction
Approx. 4%

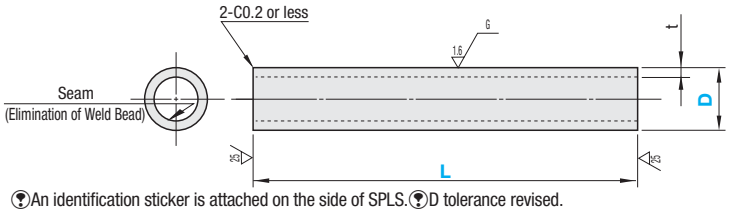
CAD Data



RoHS

Type	Material
SPLS	1.4301/X5CrNi18-10
SPLT	1.4301/X5CrNi18-10 (Annealed)

SPLS:t=0.3, 0.5, 1.0 Selection
SPLT:t=0.5



(?)An identification sticker is attached on the side of SPLS.(?)D tolerance revised.

L Dimension Tolerance

More Than	or Less	Tolerance
10	30	±0.2
31	120	±0.3
121	400	±0.5
401	1000	±0.8

D Dimension Tolerance

More Than	or Less	Tolerance
2	12	0 -0.05
15	30	0 -0.1

Part Number Type	D t=0.5	D t=0.3	D t=1.0	L Specify in 1mm increment.	€ Unit Price L10~50	L51~100	L101~200	L201~400	L401~600	L601~800	L801~1000
SPLS SPLT	2	2A	-	10~1000							
	3	3A									
	4	4A	4B								
	5	5A	5B								
	6	6A	6B								
	8	8A	8B								
	10		10B								
	12										
	15										
	16	-	-								
	20										
	25										
(?)For SPLT, t=0.5 only.)	30										

Order Example

Part Number	-	L
SPLS2A	-	500
SPLT4	-	500

Days to Ship: 8 Days

ExpressA 2,00 EUR/ piece P.88

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

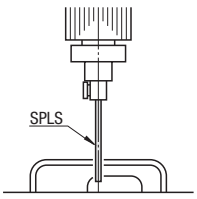
Price

Volume Discount(?)Round down to one Cent.)P.88

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

Example



[Product Usage Examples]
Roll Shafts for Photocopiers
Antenna
Heater Hollow
Tubing Hollow
Injection Nozzle
Ornamental Piping, etc.

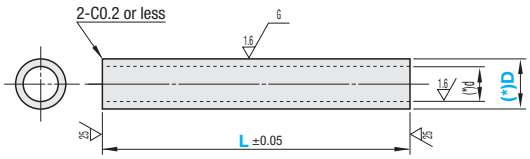
(?)SPLS is the straight type, and it can be used for infusion or other purposes. Annealed material (180 to 220HV) is adopted so that SPLT can be bent to fit the above applications.

Precision Inner / Outer Diameter Type



RoHS

SPLN



D	D - d Dimension Tolerance
0.5~2.0	±0.01
2.5~5.0	±0.02

Material: 1.4301/X5CrNi18-10

Part Number Type	D	L Specify in 1mm increment.	d	€ Unit Price L10~50	L51~100	L101~200
SPLN	0.5	10~200	0.34			
	1		0.7			
	1.5		1.1			
	2		1.6			
	2.5		2.1			
	3		2.6			
	3.5		3.1			
	4		3.6			
	4.5		4.1			
	5		4.6			

(?)Can be used as a guide for mini rods.

Order Example

Part Number	-	L
SPLN2	-	100

Days to Ship: 10 Days

ExpressB 2,00 EUR/ piece P.88

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount(?)Round down to one Cent.)P.88

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

Stainless Steel Hollows with Bending Alteration



SPLM (Semi-Seamless)

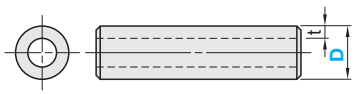
‹Base Material Specification›



Ends are deburred only (Both SPLM and PIPM).

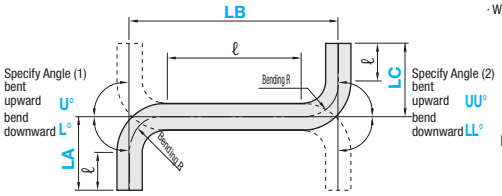
Material: 1.4301/X5CrNi18-10 (Annealed)

PIPM (Seamless Ornamental Hollows #400)



Material: 1.4301/X5CrNi18-10 t=1.0 (D=10 · 15)
t=2.0 (D=22 · 25 · 32)
t=3.0 (D=38 · 45 · 50)

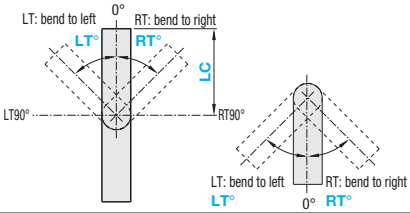
Specifying Angle 1 · Angle 2



Bending process may cause scratches on the surface.

Specifying Angle 3

Bend the Angle (2) portion as specified for Angle (3).
· When Angle (2) begins with UU upward
· When Angle (2) begins with LL downward



RoHS

Part Number Type	D	Bending Type B	Bending R Tolerance ±3	Hollow Length LA	LB	LC	Straight Section Min. Value ℓ	Bending Angle (1) U L	(2) UU LL	(3) RT LT	Obtain the sum of the material price (LA+LB+LC) and the bending charge (B1+B2+B3). LA · LB · LC 80~100	101~200	201~300	301~400	401~500	501~600	601~800	801~1000	Bending Charge (B) B1 (1st Bending)	B2 (2nd Bending) B3 (3rd Bending)
SPLM (Semi-Seamless)	2	1(1st Bending) 2(2nd Bending) 3(2nd Bending + 3rd Bending)	40	80~600 (Specify in 1 mm increment.) LA LC≥R+ℓ LB≥2R+ℓ			40	30~90 (Specify in 1° increment. ±0.5°)											+	
	3																			
	4																			
	5																			
	6																			
	8																			
	10		50				50													
	12																			
	15		100				80													
	16																			
	20		130				100													
	25		150																	
	30		180																	
PIPM (Ornamental Hollow)	10		30	80~1000 (Specify in 1 mm increment.) LA, LC≥R+ℓ LB≥2R+ℓ			50													
	15		40																	
	22		40				60													
	25		50																	
	32		80				100													
	38		80																	
	45		120				130													
	50		100																	

Order Example

Part Nr.	B	LA	LB	LC	U/L	UU/LL	RT/LT
SPLM10	B1	100	100		L50		
PIPM25	B3	200	253	220	L90	UU75	LT45

Days to Ship 10 Days

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~4	5~19
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Price Calculation Method: Obtain the sum of the material price (LA+LB+LC) and the bending charge (B1+B2+B3).

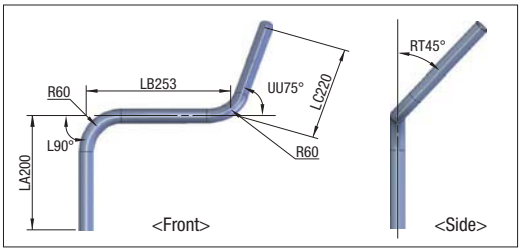
(Ex.) PIPM25-B3-200-253-220-L90-UU75-RT45

Base Material Price (LA+LB+LC)	+	Bending Charge (B1, B2, B3)	=	Price
(24,00+25,00+25,00)	+	42,00	=	116,00

Alterations

Part Number	B	LA	LB	LC	U/L	UU/LL	RT/LT	(AUT · CUT · CUA · CUC)
PIPM22	B3	100	240	320	U50	UU35	LT49	AUT70
PIPM22	B3	200	253	361	U60	UU35	LT49	CUA

■Ex. 3rd-Bending
· For PIPM25-B3-200-253-220-L90-UU75-RT45



Alterations	LA · LC Cut	Parallel Cutting
	AUT (Cut)	
Code	AUT (LA Cut) CUT (LC Cut)	CUA (LA Side) CUC (LC Side)
Spec.	Cuts LA and LC. Ordering Code AUT100 AUT(CUT)≥R+D	Cuts LB parallel. Ordering Code CUA
Price Adder	6,00	6,00

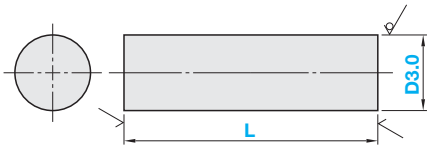
Resin Rod Exterior Surface Unfinished

■ These Polyacetal and MC Nylon rod materials are used for various industrial purposes. Available from Ø10 to Ø200.

RoHS



Part Number	Material	Color
RDJJS	Polyacetal - Standard	White
RDJMS	MC Nylon, Standard	Blue



■L Dimension Tolerance

D	L Dimension Tolerance
10~50	0~+3.0
60~200	0~+10.0

Outer diameter is unfinished.
For Outer Diameter Finished Type, refer to P.**299**
Characteristic Values Refer to **P.858-859**

Order Example: Part Number - L → RDJJS15 - 500

Days to Ship: 8 Days

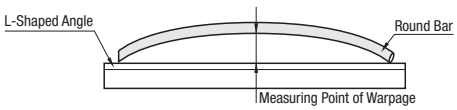
Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~15	16~20	21~34	35~50
Discount Rate	€ Unit Price	2%	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Warpage Inspection Method



·Outer Dia.
Maximum and minimum diameters will be measured with a caliper.
·Warpage
Rod is placed along an L-shaped Angle as shown in the diagram below and turned 360° about the outer diameter. Maximum clearance is measured with a ruler.

Part Number Type	D	L Specify in 1mm increment.	D dimension tolerance	Warpage	€ Unit Price 100~200	201~300	301~400	401~500	501~600	601~700	701~800
RDJJS	10	20~800	0~+1.5	5.0 or Less							
	15			3.0 or Less							
	20										
	25										
	30										
	40		0~+3.0								
	50										
	60										
	70										
	80		0~+5.0								
	90										
	100										
	120										
	150	20~500									
	180		0~+7.0								
	200										

Part Number Type	D	L Specify in 1mm increment.	D dimension tolerance	Warpage	€ Unit Price 100~200	201~300	301~400	401~500	501~600	601~700	701~800
RDJMS	20	20~800	0~+1.5	4.0 or Less							
	25										
	30										
	40		0~+3.0								
	50										
	60		0~+4.0								
	70										
	80										
	90										
	100										
	120										
	150	20~500	0~+5.0								
	180										
	200										

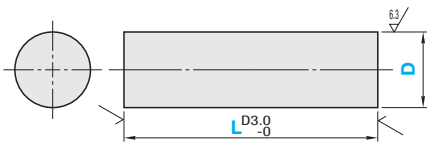
Resin Rod Exterior Surface Finished

-Standard · Outer Diameter Configurable-

■ 14 types of exterior surface finished engineered plastics are added to our lineup. Outer diameter is configurable in 1mm increment.



Selectable / Large Dia.	Outer Dia. Configurable	Material	Grade	Color
RDJJ	FRDJJ	Polyacetal	Standard	White
RDJK	-		Standard	Black
RDJM	FRDJM	MC Nylon	Standard	Blue
RDJW	-		Standard	Ivory
RDJG	-		Conductive CDR2	Black
RDJT	-		Conductive CDR2	Black
RDJB	-	Bakelite	Paper Base	Brown
RDJN	-		Cloth Base	Light Brown
RDJF	-	Fluororesin	Standard	White
RDJP	-	PEEK	Standard	Gray
RDJS	-		Standard	Brown
RDJX	-	ABS	Standard	Beige
RDJE	-	Epoxy Glass	Standard	Green
RDJU	-	Ultra High-Molecular-Weight Polyethylene	Standard	Milky White



Characteristic Values P.858-859 Refer to

For Large Diameter Type (D60~200), refer to **P.298**

Use alteration LKC for L dimension tolerance precision.

■Standard Type

Part Number Type	D	L Specify in 1mm increment.
RDJJ (Polyacetal, Standard, White)	3	10~250
RDJK (Polyacetal, Standard, Black)	4	
RDJM (MC Nylon, Standard, Blue)	5	
RDJW (MC Nylon, Standard, Ivory)	6	10~500
RDJG (MC Nylon, Conductive CDR2)	8	
RDJT (MC Nylon, Conductive CDR6)	10	
RDJB (Bakelite / Paper Base)	12	10~750
RDJN (Bakelite / Cloth Base)	13	
RDJF (Fluororesin, Standard)	15	
RDJP (PEEK, Standard)	16	10~800
RDJE (Epoxy Glass, Standard)	18	20~800
RDJU (PPS, Standard)	20	
RDJS (PPS, Standard)	25	
RDJX (ABS, Standard)	30	
RDJJ (Polyacetal, Standard, White) RDJM (MC Nylon, Standard, Blue) RDJF (Fluororesin, Standard)	40	
	50	

RDJS (PPS) generates an oxide film on the surface and the color turns brown when exposed to light and heat (direct sunlight, fluorescent light, mercury lamp and high-temperature atmosphere) for extended duration, however its mechanical and physical properties change little.

For D60~D200, refer to **P.298**

■Outer Dia. Configurable

Part Number	D Specify in 1mm increment.	L Specify in 1mm increment.
FRDJJ (Polyacetal / White) FRDJM (MC Nylon, Standard, Blue)	6~10	10~500
	11~15	10~750
	16~18	10~800
	19~30	20~800

Order Example

■Standard Type

Part Number - L

RDJJ15 - 500

■Outer Dia. Configurable

Part Number - D - L

FRDJJ - D14 - L530

Days to Ship

■Standard Type

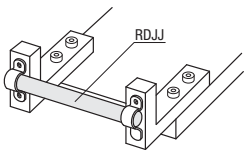
6 Days P.88

■Outer Dia. Configurable

8 Days | ExpressA | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Example



Alterations

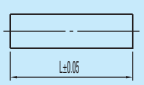
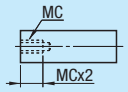
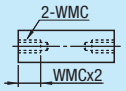
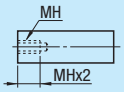
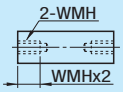
Part Number - L - (LKC · MC · WMC · MH · WMH)

RDJJ20 - 535 - MC8

8 Days

L Dimension Tolerance after alterations: ±0.3 for 400 mm or less; ±0.8 for greater than 400 to 800 mm.

No alteration is applicable to RDJB · RDJN · RDJF and RDJE.

Alterations	L Dimension Tolerance	One End Female Thread	Both Ends Female Thread	One End Female Thread with a Thread Insert	Both Ends Female Thread with a Thread Insert
					
Code	LKC	MC	WMC	MH	WMH
Spec.	Changes L dimension tolerance as follows. 10~400mm ±0.3 401~800mm ±0.8 Ordering Code LKC 8≤D≤30	Adds a tap on one end. Ordering Code MC10 8≤D≤50 When L MCx2, the tap goes through. D / MC (Selection Range) 8· 9 / 4 10· 11 / 4· 5 12~14 / 4· 5· 6 15~19 / 4· 5· 6· 8 20~24 / 4· 5· 6· 8· 10· 12 25~30· 40· 50 / 4· 5· 6· 8· 10· 12· 16 When L-MCx4, the pilot hole for tapping may go through.	Adds taps on both ends. Ordering Code WMC12 8≤D≤50 When L≤WMCx4, the tap goes through. D / WMC (Selection Range) 8· 9 / 4 10· 11 / 4· 5 12~14 / 4· 5· 6 15~19 / 4· 5· 6· 8 20~24 / 4· 5· 6· 8· 10· 12 25~30· 40· 50 / 4· 5· 6· 8· 10· 12· 16	Adds a tap on one end. Ordering Code MH12 8≤D≤50 When L-MHx2, the tap goes through. D / MH (Selection Range) 8· 9 / 4 10· 11 / 4· 5 12~14 / 4· 5· 6 15~19 / 4· 5· 6· 8 20~24 / 4· 5· 6· 8· 10· 12 25~30· 40· 50 / 4· 5· 6· 8· 10· 12· 16	Adds taps on both ends (with thread inserts). Ordering Code WMH10 8≤D≤50 When L-WMHx4, the tap goes through. D / WMH (Selection Range) 8· 9 / 4 10· 11 / 4· 5 12~14 / 4· 5· 6 15~19 / 4· 5· 6· 8 20~24 / 4· 5· 6· 8· 10· 12 25~30· 40· 50 / 4· 5· 6· 8· 10· 12· 16
Price Adder	1,80	2,00	4,00	4,00	8,00

CAD Data

Price

Standard Type

■Volume Discount(Ⓟ Round down to one Cent.)P.87

Quantity	1~10	11~15	16~20
Discount Rate	€ Unit Price	5%	10%

Ⓟ For orders larger than indicated quantity, please request a quotation.

Outer Dia. Configurable

■Volume Discount(Ⓟ Round down to one Cent.)P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

Ⓟ For orders larger than indicated quantity, please request a quotation.

■Standard Type Ⓟ For maximum L dimension in each D dimension, refer to the specification table shown on the left page.

Part Number Type	D	€ Unit Price Min.L~100	L101~200	L201~400	L401~600	L601~800
RDJJ RDJK	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJJ	40					
	50					
RDJM RDJW	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJM	40					
	50					
RDJG	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJT	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	€ Unit Price Min.L~100	L101~200	L201~400	L401~600	L601~800
RDJB	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJN	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJF	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
	40					
	50					
RDJP	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	€ Unit Price Min.L~100	L101~200	L201~400	L401~600	L601~800
RDJS	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJX	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJE	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
RDJU	3					
	4					
	5					
	6					
	8					
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

■Outer Dia. Configurable

Part Number	D	€ Unit Price Min.L~100	L101~200	L201~400	L401~600	L601~800
FRDJJ	6~10					
	11~15					
	16~19					
	20~24					
	25~27					
	28~30					

Part Number	D	€ Unit Price Min.L~100	L101~200	L201~400	L401~600	L601~800
FRDJM	6~10					
	11~15					
	16~19					
	20~24					
	25~27					
	28~30					

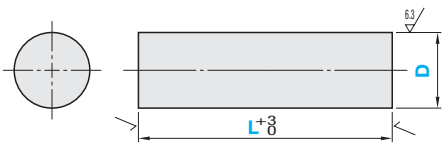
Precision Resin Rods

CAD Data

■ Tolerance is highly precise since the outer diameter is finished with centerless grinding.



Type	Material	Color
RDPJ	Polyacetal, Standard	White
RDPK	Polyacetal, Standard	Black
RDPP	PEEK, Standard	Gray
RDPE	Epoxy Glass, Standard	Green



RoHS

Use alteration LKC for L dimension tolerance accuracies.

Characteristic Values Refer to P.858-859

Part Number Type	D	L Specify in 1mm increment.
RDPJ (Polyacetal, Standard, White) / RDPK (Polyacetal, Standard, Black)	3	10~250
	4	
	5	
	6	10~500
	8	
	10	
	12	10~750
	15	
	16	10~800
	20	20~800

Part Number Type	D	L Specify in 1mm increment.
RDPP (PEEK, Standard) / RDPE (Epoxy Glass, Standard)	3	10~250
	4	
	5	
	6	10~500
	8	
	10	
	12	10~750

Order Example

Part Number	-	L
RDPJ10	-	300

Days to Ship

8 Days

Express A | 3,00 EUR/piece P.88

A flat charge of 8,10 EUR for 3 or more identical pieces.

Price

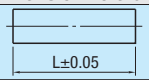
■ Volume Discount Rate (Round down to the one Cent.)

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	L	-	(LKC)
RDPJ10	-	100	-	LKC

Alteration	L Dimension Tolerance
	 L±0.05
Code	LKC
Spec.	Changes L dimension tolerance as follows. 10~400mm ±0.3 401~800mm ±0.8 Ordering Code LKC 8≤D≤20 Not applicable to RDPE.
Price Adder	1,80

Part Number Type	D	€ Unit Price Min.L~100	L101~200	L201~400	L401~600	L601~800
RDPJ (Polyacetal, Standard, White)	3					
	4					
	5					
	6					
	8					
	10					
	12					
	15					
	16					
	20					
RDPK (Polyacetal, Standard, Black)	3					
	4					
	5					
	6					
	8					
	10					
	12					
	15					
	16					
	20					

Part Number Type	D	€ Unit Price Min.L~100	L101~200	L201~400	L401~600	L601~750
RDPP (PEEK, Standard)	3					
	4					
	5					
	6					
	8					
	10					
	12					
RDPE (Epoxy Glass, Standard)	3					
	4					
	5					
	6					
	8					
	10					
	12					

Ceramic Rod · Transparent Resin Rod

CAD Data

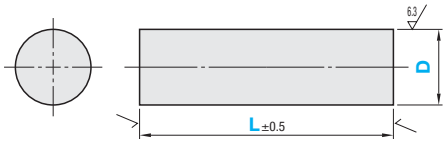
■ Ceramic Rods excel in insulation, abrasion resistance and heat resistance; Transparent Resin Rods excel in transparency and insulation.

■Ceramics Rods



RoHS

CERAR



Ⓜ Material:Alumina 99.5

Part Number Type	D	L Specify in 1mm increment.	€ Unit Price L30~100	L101~200	L201~300
CERAR	3	30~300			
	4				
	5				
	6				
	8				
	10				

Order Example: Part Number CERAR6 - L 200

Days to Ship: 10 Days

Price

■Volume Discount Rate (Round down to the one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Physical Properties of Alumina 99.5

Properties	Unit	Alumina 99.5
Water Absorption Ratio	%	0
Bulk Density	g/cm³	3.9
Heat Resistance	°C	1000~1200
Compression Strength	KN/cm²	363
Bending Strength	KN/cm²	49
Linear Thermal Expansion Coefficient	-	8.0x10-6 (25~700°C)
Thermal Conductivity	W/(m · °C)	31.4 (20°C) 16.0 (300°C)
Specific Volume Resistivity	Ω · cm	1014< (20°C) 1014<(300°C)
Dielectric Constant	1MHz	9.8
Insulation Resistance	KV/mm	10

Physical property values are representative values (reference values).

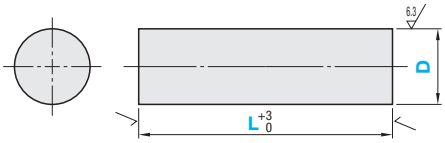
■Transparent Resin Rod



RoHS

Type	Ⓜ Material	Color
RDJA	Acrylic, Standard	Transparent
RDJC	Polycarbonate, Standard	

The acrylic rod is made by machining the cast plate into a round rod and finished by centerless grinding.



Characteristic Values Refer to P.863

Part Number Type	D	L Specify in 1mm increment.	€ Unit Price RDJA L10~100	RDJA L101~200	RDJA L201~400	RDJA L401~600	RDJC L10~100	RDJC L101~200	RDJC L201~400	RDJC L401~600
RDJA (Acrylic, Standard) RDJC (Polycarbonate, Standard)	3	10~250								
	4									
	5									
	6	10~500								
	8									
	10									
	12	10~600								
	13									
	15									
	16									
	18									
	20									
	25									
	30									

The end face is not transparent because tooling marks remain on the surface.

Order Example: Part Number RDJA3 - L 250

Days to Ship: 6 Days

Price

■Volume Discount Rate (Round down to the one Cent.) P.87

Quantity	1~10	11~15	16~20
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Transparent Resin Hollow · Resin Hollow

-Polycarbonate · Acrylic · Polyacetal · MC Nylon-

■ Polycarbonate Hollow and Acrylic Hollow excel in impact resistance and transparency.
■ These Polyacetal and MC Nylon pipes are used for various industrial purposes.

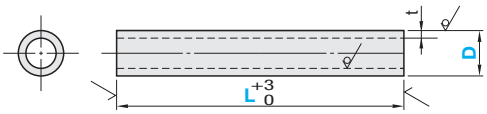
CAD Data

■Polycarbonate Hollows



RoHS

PIJC



Refer to **P.863**
M Material: Polycarbonate, Standard (Transparent)

Part Number / Type	D Selection	D Tolerance	L Specify in 1mm increment.	t	t Tolerance	€ Unit Price L50~100	L101~200	L201~400	L401~600	L601~800	L801~1000
PIJC	13	±0.2	50~1000	2.0	±0.2						
	18										
	22										
	26	±0.3		2.5	±0.3						
	32										
	34			3.0							
	38										
	42										
	48	±0.4		3.5	±0.4						
	60			4.0							
	76			5.5							
	89			6.0							

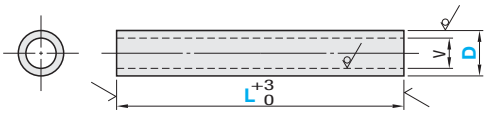
■Features
- Ranks the highest in impact resistance among the transparent resin materials.
(Approx. 30 times higher than that of acrylic plates)
- It excels in high and low temperature resistances, and has the widest applicability.

■Acrylic Hollows



RoHS

PIJA



Refer to **P.863**
M Material: Acrylic, Standard (Transparent)

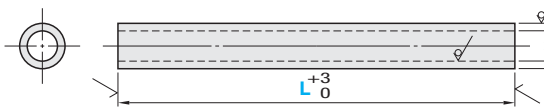
Part Number / Type	D Selection	D Tolerance	L Specify in 1mm increment.	V	V Tolerance	€ Unit Price L50~100	L101~200	L201~400	L401~600	L601~800	L801~1000
PIJA	15	±0.3	50~1000	9	±0.8						
	20			14							
	25			19							
	30			24							
	35	±0.5		29	±1.0						
	40			34							
	50			40							
	55			45							
	60			50							
	70			60							
	80	±1.0		70							
	90			80							
	100			90							

■Resin Hollows -Bore and Exterior Surface Unfinished Type-



RoHS

Part Number	M Material	Color
FPIJJ	Polyacetal, Standard	White
FPIJM	MC Nylon, Standard	Blue



Bore and exterior surfaces are unfinished. For Bore and Exterior Surface Finished Type, refer to **P.304**

Refer to **P.859**

Part Number / Type	D Selection	D Tolerance	L Specify in 1mm increment.	V	V Tolerance	€ Unit Price L100~200	L201~400	L401~600	L601~800	L801~1000
FPIJJ (Polyacetal, Standard)	30	+2.0 0	100~1000	20	0 -2.5					
	40			30						
	50			40						
	60	+3.0 0		50	-3.0 0					
	70	+3.5 0		50	0 -4.0					
	80			60						
	90	+4.0 0		70	0 -5.0					
	100			80						

Order Example

Part Number	-	D	-	L
PIJC22			-	200
PIJA20			-	100
FPIJJ	-	D50	-	L550

Part Number / Type	D Selection	D Tolerance	L Specify in 1mm increment.	V	V Tolerance	€ Unit Price L100~200	L201~350
FPIJM (MC Nylon, Standard)	30	+2.0 +0.1	100~350	15	-1.0 -6.0		
	40	+3.0		20			
	50	+0.1		25			
	60	+5.0 +0.1		25			
	70			45			
	80			55			
	90			65			
	100			75			

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Resin Hollows

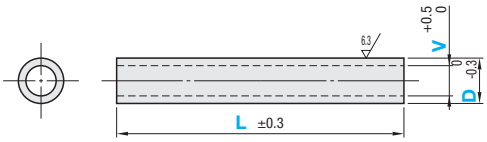
-Bore and Exterior Surface Finished Type-

CAD Data

■ 13 types of bore and exterior surface finished engineered plastics are added to our lineup. Small diameters are available.



Type	Material	Grade	Color
PIJJ	Polyacetal	Standard	White
PIJK		Standard	Black
PIJM	MC Nylon	Standard	Blue
PIJW		Standard	Ivory
PIJG		Conductive CDR2	Black
PIJT		Conductive CDR2	Black
PIJB	Bakelite	Paper Base	Brown
PIJN		Cloth Base	Light Brown
PIJF	Fluororesin	Standard	White
PIJP	PEEK	Standard	Gray
PIJS		Standard	Brown
PIJX	ABS	Standard	Beige
PIJU	Ultra High-Molecular-Weight Polyethylene	Standard	Milky White



(PIJS (PPS) generates an oxide film on the surface and the color turns brown when exposed to light and heat (direct sunlight, fluorescent light, mercury lamp and high-temperature atmosphere) for extended duration, however its mechanical and physical properties change little.

Refer to P.858~860

Part Number Type	D	V Selection	L Specify in 1mm increment.
PIJJ PIJN PIJK PIJF PIJM PIJP PIJW PIJS PIJG PIJX PIJT PIJU PIJB	5	3	20~100
	6	3 4	
	8	3 4 5 6	20~120
	10	3 4 5 6	20~150
	12	5 6 8	
	13	5 6 8	20~200
	14	5 6 8 10	
	15	5 6 8 10	
	16	5 6 8 10	
	20	8 10 12 15	
	25	15 16 20	
	30	16 20 25	

Order Example: Part Number - V - L → PIJJ15 - 8 - 150

Days to Ship: 8 Days

Express A 3,00 EUR/ piece P.88

(A Express Charge of 8,10 EUR for 3 or more identical pieces.

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

(For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	€ Unit Price L20~100	101~120	121~150	151~200
PIJJ PIJK	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJM PIJW	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJG	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJT	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				

Part Number Type	D	€ Unit Price L20~100	101~120	121~150	151~200
PIJB	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJN	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJF	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJP	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				

Part Number Type	D	€ Unit Price L20~100	101~120	121~150	151~200
PIJS	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJX	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				
PIJU	5				
	6				
	8				
	10				
	12				
	13				
	14				
	15				
	16				
	20				
	25				
	30				

Springs · Shock Absorbers · Gas Springs

Springs · Shock Absorbers · Gas Springs






Product Name	Tension Springs -Extra Light Load-	-Light Load-	-Light to Medium Load-	-Medium Load-
Page	309	309	310	310







-Medium to Heavy Load-	-Heavy Load-	-Configurable-	Tension Springs -Hook Free-	Tension Springs -Long Medium Load-
311	311	312	313	314






Hooks	Tension Springs -Hook Insertion-	Posts for Tension Springs -Hole-	-Notched Hole-
314	314	315	315






-L-Shaped Hole-	-L-Shaped Groove-	-Hexagon Socket Head-	-Hexagon-
316	316	316	316









-Groove-	-Roller Type-	Disk Springs	Flat Springs -Straight-	-One-Point-Bend-
317	317	318	319	319






-Two-Point-Bend-	Torsion Springs	Constant Force Springs	Brackets for Constant Force Springs
319	320	322	322

Newly Added Newly Added Newly Added






Round Wire Coil Springs -Outer Ø Referenced-	-Inner Ø Referenced-	-L Dim. Configurable – Outer Ø Referenced - Stainless Steel Round Wire-	-Stainless Steel Round Wire-
323~330	331	332	333~339



Washers for Compression Springs -Standard-
340



Washers for Compression Springs -Female Thread-
340



Washers for Coil Springs
340

Newly Added



Price Reduction 14% on Average

Shock Absorbers -Adjustable-
343



Price Reduction 14% on Average

-Set-
344

Newly Added



Eccentric Angle Adapters
345



Stopper Nuts for Shock Absorbers
345

Newly Added



Shock Absorbers -Compact Adjustable-
346

Newly Added



-Compact Fixed-
346



-Water Resistant / Coolant Resistant-
347



-Economy Type-
348



Gas Springs -Free Attachable-
350



Dust Boots
352



Gas Springs -Mounting Orientation Limited Type-
351 · 353



Gas Springs -Gas Reaction Force Configurable-
354



Stainless Steel Gas Springs
354

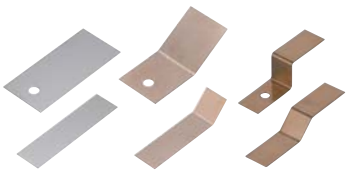
Springs
-Overview-

* The heat resistance temperatures shown in the tables are for the spring wire material.
The data are obtained in room temperature. Allowable load and durability may decrease depending on the various conditions under higher temperature.

* The load range shown is for material JIS SWP-A.
* Values for the Tension Springs Configurable Types are for coil length = 50.

Type	Features	Type	Part Number (JIS SWP-A)		Part Number (1.4301/X5CrNi18-10-WPB)		Load* N{kgf} min.	Load* N{kgf} max.
Tension Springs	 * Heat Resistant Temperature: JIS SWP-A 120°C 1.4301/X5CrNi18-10-WPB 180°C	Ultra Light Load	P.309	AWA	P.309	AUA	0.69{0.07}	19.6{2.0}
		Light Load	P.309	AWY BWY	P.309	AUY BUY	1.86{0.19}	78.45{8.0}
		Light to Medium Load	P.310	AWU BWU	P.310	AUU BUU	2.45{0.25}	98.07{10.0}
		Medium Load	P.310	AWS BWS	P.310	AUS BUSS	3.53{0.36}	225.55{23.01}
		Medium to Heavy Load	P.311	AWF	-	-	6.47{0.66}	83.36{8.5}
		Heavy Load	P.311	AWT BWT	P.311	AUT BUT	8.8{0.9}	430.51{43.91}
		Configurable	P.312	WFSP BWFSP	P.312	UFSP BUFSP	2.37{0.2}	156{15.9}
		Hook Free	P.313	AWFM	P.313	AUFM	39.2{4.0}	101.29{10.3}
		Long No Hook	P.314	LWS	P.314	LUS	-	-

Type	Features	Type	Part Number (JIS SWP-A)		Part Number (1.4301-WPB)		Max. Allowable Deflection % (Standard Operation Frequency)	Load* N{kgf} min.	Load* N{kgf} max.
Round Wire Springs	 (Stainless Steel) * Heat Resistant Temperature: JIS SWP-A 120°C 1.4301/X5CrNi18-10-WPB 180°C	Outer Diameter Referenced	P.323	WY	P.333	UV UY	75 (1,000,000 times)	0.02{0.0018}	10.3{1.05}
			P.324	WR	P.333	UR	60 (1,000,000 times)	0.9{0.09}	23.5{2.4}
			P.325	WF	P.334	UF	45 (1,000,000 times)	1.1{0.11}	35.3{3.6}
			P.326	WL	P.335	UL	40 (1,000,000 times)	0.98{0.1}	117.7{12}
			P.327	WT	P.336	UTT	40 (1,000,000 times)	2.9{0.3}	125.5{12.8}
			P.328	WM	P.337	UM	28~35 (1,000,000 times)	3.4{0.35}	171.6{17.5}
			P.329	WH	P.338	UH	20~30 (1,000,000 times)	4.4{0.45}	441.3{45}
			P.330	WB	P.339	UBB	25 (1,000,000 times)	5.9{0.6}	735.5{75}
		Inner Diameter Referenced	P.331	NWL	P.331	VUR	40 (1,000,000 times)	0.03{0.27}	27.5{2.8}
			P.331	NWM	-	-	32 (1,000,000 times)	20.6{2.1}	34.3{3.5}
		Outer Diameter Referenced L Dimension Configurable	P.332	FWR	P.332	FUR	60 (1,000,000 times)	2.5{0.25}	55.2{5.63}
			P.332	FWF	P.332	FUF	50 (1,000,000 times)	4.5{0.46}	100.0{10.2}
			P.332	FWT	P.332	FUT	40 (1,000,000 times)	7.1{0.73}	128.0{13.1}

Type	Flat Springs			Torsion Springs			Constant Force Springs	
Features								
Type	Straight	One-Point-Bend	Two-Point-Bend	Arm Angle 90°	Arm Angle 135°	Arm Angle 180°	Main Body	Brackets
Material	1.4301/X5CrNi18-10-CSP			1.4301/X5CrNi18-10-WPB			1.4319/X3CrNiN17-8	1.4016/X6(8)Cr17
Part Number	IBN	IBNS	IBNW	UA90_	UA135_	UA180_	CFS	CFSB
Page	P.319			P.320			P.322	

■Tension Springs

Load P[N] = Initial Tension Pi[N]+(Spring Constant k[N/mm]x Deflection F[mm])

- MISUMI tension springs (except for Specified Types) are standardized to maintain the maximum load constantly to the same diameter. Produced based on the maximum load value, the initial tension and spring constant are reference values.
- Use the springs within the range of the allowable deflection F max.(mm). Using at more than the allowable deflection may cause deformation or failure after a few uses. Also, do not extend tension springs more than its allowable deflection during the installation.
- It is recommended to use the tension springs (AW_ · BW_ · AWFM · WFSP · LWS · LWSH) under ambient temperature (at 40° C or less). Load value attenuates when tension springs are used in temperature higher than 40°C, although it depends on other conditions.

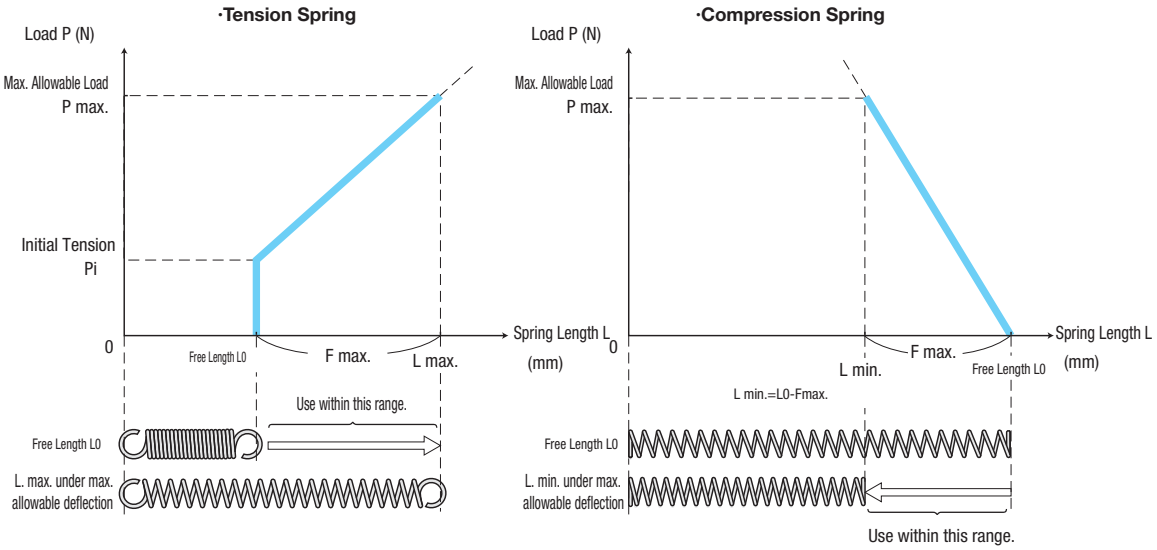
■Round Wire Coil Springs / Irregular Shaped Wire Coil Springs *

Load P[N] = (Spring Constant k[N/mm]x Deflection F[mm])

- MISUMI round wire compression springs are standardized to maintain the spring constant constantly to the same diameter. The tolerance of spring constant is ±10%.
- Use the springs within the range of the allowable deflection F max.(mm). Using at higher than the allowable deflection values may cause deformation or failure.
- The values of solid length are for reference only. Using it compressed to the solid length may cause deformation or break after a few uses.
- The round coil springs are manufactured based on the following diametral tolerance priorities given. Inner Diameter Referenced Type: Inner diametral tolerance prioritized, Outer Diameter Referenced Type: Outer diametral tolerance prioritized.
- Round wire coil springs (W_, NW_, FW_, U_ and FU_) are recommended to be used under room temperature (40°C or less). When used under higher temperature than 40°C, the load values may decrease depending on the conditions. (Heat Resistant springs are listed on "Standard Components for Plastic Mold".)

* Irregular shaped wire coil springs are listed on "Standard Components for Press Dies" and "Standard Components for Plastic Mold".

■Relationship Between Spring Length L and Load P



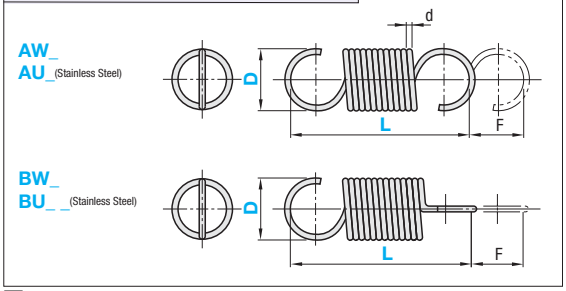
Tension Springs

-Extra Light Load · Light Load · Light to Medium Load · Medium Load-



RoHS

Type	Material
AW_ BW_	JIS SWP-A
AU_ BU_ _	1.4301/ X5CrNi18-10-WPB



Ultra Light Load Type

Part Number Type	D-L	Wire Dia. dmm	Dynamic Load Max. Deflection Fmax. mm	Dynamic Load Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price AWA	€ Unit Price AUA
AWA AUA	2-10	0.2	6.7	0.69	0.13	0.083		
	15		11.8			0.047		
	20		17.2			0.032		
	25		22.8			0.025		
	30		28.5			0.020		
AWA AUA	3-10	0.25	10.4	1.27	0.15	0.11		
	15		23.0			0.049		
	20		35.9			0.031		
	25		47.9			0.024		
	30		57.5			0.020		
AWA AUA	4-15	0.35	14.6	2.26	0.25	0.14		
	20		24.1			0.083		
	25		32.5			0.062		
	30		42.7			0.047		
	35		51.2			0.039		
	40		60.3			0.033		
AWA AUA	5-15	0.45	8.2	3.24	0.49	0.33		
	20		15.5			0.18		
	25		21.5			0.13		
	30		29.4			0.093		
	35		35.0			0.078		
	40		43.0			0.064		
	45		50.9			0.054		
	50		56.0			0.049		
AWA AUA	6-20	0.55	16.2	6.08	0.64	0.34		
	25		25.2			0.22		
	30		34.7			0.16		
	35		42.7			0.13		
	40		50.4			0.11		
	45		61.6			0.088		
	50		69.3			0.079		
	55		79.3			0.069		
	60		85.3			0.064		
AWA AUA	8-25	0.7	18.1	8.53	1.08	0.41		
	30		27.1			0.28		
	35		36.2			0.21		
	40		44.7			0.17		
	45		54.2			0.14		
	50		63.3			0.12		
	55		69.0			0.11		
	60		80.0			0.093		
	65		89.4			0.083		
	70		95.0			0.078		
AWA AUA	10-30	0.9	13.4	10.8	2.06	0.65		
	35		18.5			0.47		
	40		24.0			0.36		
	45		29.6			0.29		
	50		35.6			0.25		
	55		42.3			0.21		
	60		46.8			0.19		
	70		59.3			0.15		
	80		68.4			0.13		
	90		80.9			0.11		
	100		93.6			0.093		
AWA AUA	12-35	1.1	17.8	19.6	2.94	0.94		
	40		25.0			0.67		
	45		31.0			0.54		
	50		37.7			0.44		
	55		44.7			0.37		
	60		51.5			0.32		
	70		65.3			0.26		
	80		77.2			0.22		
	90		94.4			0.18		
	100		106.2			0.16		

Order Example Part Number: AWY10-50

Days to Ship 6 Days P.88

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~34	35~49	50~500
Discount Rate	€ Unit Price	20%	40%	65%

Prices are significantly discounted for larger orders.
For orders larger than indicated quantity, please request a quotation.

Light Load * marked dimensions are for AWY · AUY only.

Part Number Type	D-L	Wire Dia. dmm	Dynamic Load Max. Deflection Fmax. mm	Dynamic Load Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price AWY BWY	€ Unit Price AUY BUY
AWY AUY	2-10	0.25	5.7	1.86	0.34	0.27		
	15		10.3			0.15		
	20		14.0			0.11		
	25		18.2			0.08		
	30		22.1			0.07		
AWY BWY AUY BUY	3-10	0.3	8.7	2.25	0.29	0.23		
	15		16.6			0.12		
	20		25.0			0.08		
	25		33.3			0.06		
	30		40.0			0.05		
AWY BWY AUY BUY	4-15	0.4	10.0	3.24	0.59	0.26		
	20		16.8			0.16		
	25		22.5			0.12		
	30		28.4			0.09		
	35		33.7			0.08		
	40		38.5			0.07		
AWY BWY AUY BUY	5-15	0.5	6.8	4.22	0.88	0.49		
	20		11.7			0.28		
	25		17.0			0.20		
	30		21.2			0.16		
	35		26.1			0.13		
	40		34.0			0.10		
	45		37.7			0.09		
	50		42.5			0.08		
AWY BWY AUY BUY	6-20	0.6	14.0	8.14	1.27	0.49		
	25		21.2			0.32		
	30		28.0			0.25		
	35		35.0			0.20		
	40		41.1			0.17		
	45		50.0			0.14		
	50		53.8			0.13		
	55		63.6			0.11		
	60		70.0			0.10		
AWY BWY AUY BUY	8-25	0.8	15.1	12.75	2.35	0.69		
	30		21.2			0.49		
	35		26.5			0.39		
	40		33.1			0.31		
	45		39.2			0.26		
	50		46.0			0.23		
	55		48.1			0.22		
	60		53.0			0.20		
	65		58.8			0.18		
	70		66.2			0.16		
AWY BWY AUY BUY	10-30	1.0	11.5	15.00	3.73	0.98		
	35		15.3			0.74		
	40		19.8			0.57		
	45		23.9			0.47		
	50		28.7			0.39		
	55		32.8			0.34		
	60		37.0			0.30		
	65		39.6			0.29		
	70		44.2			0.26		
	75		47.9			0.24		
	80		52.2			0.22		
	*90		60.5			0.19		
	*100		71.8			0.16		
AWY BWY AUY BUY	12-35	1.2	22.0	31.37	5.39	1.18		
	40		27.8			0.93		
	45		35.3			0.74		
	50		42.0			0.62		
	55		50.0			0.52		
	60		55.2			0.47		
	65		63.0			0.41		
	70		69.7			0.37		
	75		77.9			0.33		
	80		82.8			0.31		
	90		91.3			0.29		
	100		106.0			0.25		
AWY AUY	14-40	1.5	15.4	38.24	8.43	1.94		
	45		21.0			1.42		
	50		25.4			1.17		
	55		30.8			0.97		
	60		37.0			0.8		
	65		43.2			0.69		
	70		46.2			0.64		
	75		52.8			0.56		
	80		58.3			0.51		
	90		68.1			0.43		
	100		76.4			0.39		
	125		91.0			0.33		
AWY AUY	16-45	1.6 (AWY) 1.7 (AUY)	15.8	43.15	9.12	2.16		
	50		21.0			1.62		
	55		25.7			1.32		
	60		31.5			1.08		
	65		35.8			0.95		
	70		40.8			0.83		
	75		46.3			0.74		
	80		49.6			0.69		
	90		60.9			0.56		
	100		69.4			0.49		
	125		91.3			0.37		
	150		115.6			0.29		
AWY	18-50	1.8	21.0	52.96	9.81	2.05		
	55		26.0			1.66		
	60		31.0			1.39		
	65		36.0			1.20		
	70		42.0			1.03		
	75		46.0			0.94		
	80		54.0			0.80		
	90		66.0			0.65		
	100		75.0			0.58		
	125		104.5			0.41		
	150		132.0			0.33		
AWY	20-60	2.0	29.1	78.45	12.75	2.26		
	70		41.8			1.57		
	80		53.6			1.23		
	90		67.0			0.98		
	100		78.8			0.83		
	125		111.6			0.59		
	150		139.5			0.47		
	175		167.5			0.39		

* marked dimensions are for AWY / AUY only.

Initial tension and spring constant are for reference only. Load {kgf} = Load Nx0.101972

Light to Medium Load Type * marked dimensions are for AWU · AUU only.

Part Number Type	D-L	Wire Dia. dmm	Dynamic Load Max. Deflection Fmax. m m	Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price AWU BWU	AUU BUU
AWU AUU	2-10	0.28	4.0	2.45	0.49	0.49		
	15		6.7			0.29		
	20		10.0			0.20		
	25		13.3			0.15		
AWU BWU AUU BUU	3-10	0.35	4.6	3.33	0.66	0.59		
	15		9.1			0.29		
	20		14.3			0.19		
	25		19.5			0.14		
	30		24.8			0.11		
AWU BWU AUU BUU	4-15	0.45	7.5	4.81	0.98	0.51		
	20		12.2			0.31		
	25		16.9			0.23		
	30		21.7			0.18		
	35		26.0			0.15		
	40		30.0			0.13		
AWU BWU AUU BUU	5-15	0.55	5.7	6.37	1.37	0.89		
	20		9.8			0.51		
	25		14.2			0.35		
	30		18.9			0.26		
	35		24.3			0.21		
	40		28.3			0.18		
	45		31.9			0.16		
	50		36.4			0.14		
AWU BWU AUU BUU	6-20	0.7	9.6	12.94	1.67	1.18		
	25		14.4			0.78		
	30		20.2			0.56		
	35		28.8			0.39		
	40		30.3			0.37		
	45		34.8			0.32		
	50		41.1			0.27		
	55		44.2			0.25		
	60		50.0			0.23		
AWU BWU AUU BUU	8-25	0.9	10.0	18.63	3.92	1.47		
	30		14.3			1.03		
	35		18.8			0.78		
	40		23.8			0.62		
	45		28.3			0.52		
	50		32.6			0.45		
	55		37.5			0.39		
	60		41.7			0.35		
	65		46.9			0.31		
	70		50.0			0.29		
AWU BWU AUU BUU	10-*30	1.1	9.9	23.24	4.71	1.87		
	35		14.0			1.32		
	40		18.0			1.03		
	45		22.2			0.83		
	50		26.3			0.71		
	55		31.5			0.59		
	60		35.7			0.52		
	65		38.6			0.48		
	70		43.0			0.43		
	75		47.3			0.39		
	80		51.0			0.36		
* marked dimensions are for AWU / AUU only.	*90		59.0			0.31		
	*100		67.5			0.27		
AWU BWU AUU BUU	12-35	1.4	11.7	47.7	10.49	3.14		
	40		15.5			2.35		
	45		19.6			1.86		
	50		23.3			1.57		
	55		28.7			1.27		
	60		32.4			1.13		
	65		37.3			0.98		
	70		41.4			0.88		
	75		44.9			0.81		
	80		49.7			0.74		
	90		57.4			0.64		
	100		65.4			0.56		
AWU AUU	14-40	1.6	12.8	58.84	13.73	3.53		
	45		16.7			2.7		
	50		21.0			2.16		
	55		25.5			1.77		
	60		28.7			1.57		
	65		32.8			1.37		
	70		38.3			1.18		
	75		41.8			1.08		
	80		46.0			0.98		
	90		54.1			0.83		
	100		61.3			0.74		
	125		83.6			0.54		
AWU AUU	16-45	1.8 (AWU) 1.9 (AUU)	13.7	70.61	16.67	3.92		
	50		17.7			3.04		
	55		22.0			2.45		
	60		26.0			2.06		
	65		30.5			1.77		
	70		34.3			1.57		
	75		39.2			1.37		
	80		42.3			1.27		
	90		50.0			1.08		
	100		57.8			0.93		
	125		78.7			0.69		
	150		100.0			0.54		
AWU	18-55	2.0	19.1	81.39	17.65	3.34		
	60		23.2			2.75		
	65		27.0			2.36		
	70		30.9			2.06		
	75		36.1			1.77		
	80		40.6			1.57		
	90		48.1			1.33		
	100		56.5			1.13		
	125		76.4			0.83		
	150		100.0			0.64		
AWU	20-60	2.3	16.0	98.07	22.56	4.72		
	70		22.6			3.34		
	80		28.5			2.65		
	90		36.6			2.06		
	100		42.7			1.77		
	125		59.2			1.28		
	150		77.0			0.98		
	175		90.5			0.83		

Initial tension and spring constant are for reference only. Load {kgf} = Load Nx0.101972

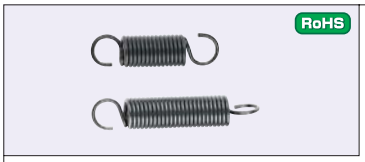
Medium Load Type * marked dimensions are for AWS · AUS only.

Part Number Type	D-L	Wire Dia. dmm	Dynamic Load Max. Deflection Fmax. mm	Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price AWS BWS	AUS BUSS
AWS AUS	2-10	0.3	3.8	3.53	0.69	0.75		
	15		6.7			0.42		
	20		9.6			0.30		
	25		12.6			0.23		
AWS AUS BWS BUSS	3-10	0.4	3.5	4.41	0.88	0.98		
	15		6.0			0.59		
	20		9.0			0.39		
	25		12.0			0.29		
	30		15.6			0.23		
AWS BWS AUS BUSS	4-15	0.5	6.5	6.37	1.18	0.78		
	20		10.2			0.49		
	25		13.9			0.39		
	30		17.5			0.29		
	35		20.3			0.26		
	40		24.0			0.22		
AWS BWS AUS BUSS	5-15	0.6	5.6	8.53	1.57	1.27		
	20		8.9			0.78		
	25		13.7			0.49		
	30		17.3			0.39		
	35		23.7			0.29		
	40		24.5			0.28		
	45		28.4			0.25		
	50		32.2			0.22		
AWS BWS AUS BUSS	6-20	0.8	6.7	17.26	3.53	2.06		
	25		9.3			1.47		
	30		12.7			1.08		
	35		15.6			0.88		
	40		18.7			0.69		
	45		20.6			0.68		
	50		24.5			0.57		
	55		28.0			0.50		
	60		29.7			0.47		
AWS BWS AUS BUSS	8-25	1.0	9.1	24.52	4.9	2.16		
	30		12.5			1.57		
	35		15.4			1.27		
	40		19.2			0.98		
	45		22.2			0.88		
	50		25.0			0.78		
	55		28.6			0.70		
	60		33.3			0.60		
	65		36.3			0.55		
	70		40.0			0.50		
AWS BWS AUS BUSS	10-30	1.2	10.4	30.99	5.49	2.45		
	35		13.7			1.86		
	40		17.3			1.47		
	45		20.0			1.27		
	50		24.8			0.98		
	55		28.2			0.88		
	60		31.6			0.78		
	65		34.2			0.76		
	70		38.8			0.67		
	75		43.3			0.60		
	80		47.2			0.55		
* marked dimensions are for AWS / AUS only.	*90		52.0			0.49		
	*100		59.0			0.43		
AWS BWS AUS BUSS	12-35	1.6	8.5	62.76	14.71	5.69		
	40		11.8			4.12		
	45		14.3			3.33		
	50		16.8			2.84		
	55		19.3			2.45		
	60		22.3			2.16		
	65		24.5			1.96		
	70		27.2			1.77		
	75		28.8			1.67		
	80		32.7			1.47		
	90		36.3			1.35		
	100		41.0			1.20		
AWS AUS	14-40	1.8	10.2	74.53	16.67	5.69		
	45		13.1			4.41		
	50		16.4			3.53		
	55		19.7			2.94		
	60		21.1			2.75		
	65		24.6			2.35		
	70		27.6			2.06		
	75		31.1			1.86		
	80		32.8			1.77		
	90		37.5			1.60		
	100		42.8			1.40		
	125		60.0			1.00		
AWS AUS	16-45	2.0 (AWS) 2.1 (AUS)	11.7	86.3	19.61	5.69		
	50		15.1			4.41		
	55		17.4			3.82		
	60		21.3			3.14		
	65		23.4			2.84		
	70		26.8			2.45		
	75		29.6			2.26		
	80		32.7			2.10		
	90		37.8			1.77		
	100		45.3			1.47		
	125		56.7			1.20		
	150		71.5			0.95		
AWS	18-50	2.3	12.5	115.72	27.46	7.06		
	55		15.0			5.88		
	60		17.3			5.10		
	65		20.0			4.41		
	70		22.5			3.92		
	75		25.0			3.53		
	80		29.0			3.04		
	90		33.6			2.65		
	100		39.1			2.26		
	125		53.0			1.70		
	150		64.2			1.40		
AWS	20-60	2.6	14.7	150.04	36.28	7.75		
	70		20.0			5.69		
	80		25.2			4.51		
	90		30.8			3.73		
	100		36.1			3.14		
	125		48.3			2.35		
	150		59.5			1.95		
	175		72.5			1.60		
AWS	24-70	3.2	14.7	225.55	56.88	11.47		
	80		20.7			8.14		
	90		24.9			6.77		
	100		29.7			5.69		
	125		41.0			4.12		
	150		50.6			3.4		
	175		61.4			2.8		
	200		74.7			2.3		

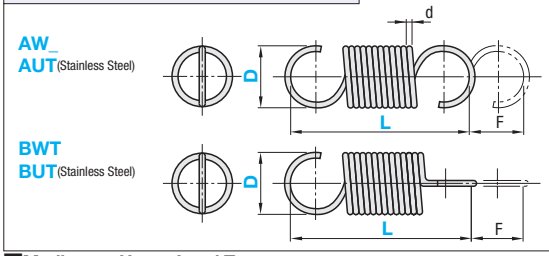
Tension Springs

-Medium to Heavy Load Type · Heavy Load Type-

CAD Data



Type	Material
AW_ BWT	JIS SWP-A
AUT BUT	1.4301/X5CrNi18-10-WPB



Medium to Heavy Load Type

Part Number Type	D-L	Wire Ødmm	Dynamic Load Max. Deflection Fmax. mm	Dynamic Load Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price
AWF	3-10	0.45	2.2	6.47	1.57	2.26	
	15		4.5			1.08	
	20		6.7			0.74	
	25		9.1			0.54	
	30		11.4			0.43	
AWF	4-15	0.55	4.5	8.43	1.86	1.47	
	20		7.1			0.93	
	25		10.0			0.66	
	30		12.6			0.52	
	35		15.2			0.43	
	40		18.1			0.36	
AWF	5-15	0.7	3.9	14.71	2.45	3.14	
	20		6.9			1.77	
	25		9.6			1.28	
	30		12.5			0.98	
	35		15.6			0.78	
	40		19.2			0.64	
	45		21.9			0.56	
	50		25.0			0.49	
AWF	6-20	0.9	3.9	23.54	5.88	4.51	
	25		6.0			2.94	
	30		7.8			2.26	
	35		10.0			1.77	
	40		12.0			1.47	
	45		13.8			1.28	
	50		16.4			1.08	
	55		18.0			0.98	
	60		20.0			0.88	
AWF	8-25	1.1	5.8	31.38	6.86	4.23	
	30		8.3			2.94	
	35		10.9			2.26	
	40		13.2			1.86	
	45		15.6			1.57	
	50		18.5			1.32	
	55		21.7			1.13	
	60		23.8			1.03	
	65		26.3			0.93	
	70		27.8			0.88	
AWF	10-30	1.4	6.5	49.03	12.75	5.58	
	35		8.7			4.17	
	40		10.7			3.39	
	45		12.9			2.81	
	50		15.2			2.39	
	55		17.2			2.11	
	60		19.5			1.86	
	70		23.1			1.57	
	80		27.4			1.32	
	90		32.1			1.13	
	100		46.2			0.79	
AWF	12-35	1.8	5.0	83.36	23.54	12.0	
	40		7.0			8.55	
	45		9.0			6.65	
	50		11.0			5.44	
	55		13.0			4.60	
	60		14.5			4.13	
	70		17.8			3.36	
	80		21.3			2.81	
	90		24.5			2.44	
	100		27.5			2.18	

Order Example — Part Number: AWT10-50

Days to Ship — 6 Days P87

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~34	35~49	50~500
Discount Rate	€ Unit Price	20%	40%	65%

Prices are significantly discounted for larger orders.
For orders larger than indicated quantity, please request a quotation.

Heavy Load * marked dimensions are for AWT · AUT only.

Part Number Type	D-L	Wire Ø dmm	Dynamic Load Max. Deflection Fmax. mm	Dynamic Load Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price AWT BWT	€ Unit Price AUT BUT
AWT AUT BWT BUT	3-10	0.5	2.0	8.8	2.16	3.24		
	15		3.7			1.77		
	20		5.2			1.27		
	25		6.8			0.98		
	*30		8.5			0.78		
AWT AUT BWT BUT	4-15	0.6	4.0	11.1	2.55	2.16		
	20		6.4			1.37		
	25		8.4			0.98		
	30		10.9			0.78		
	*35		12.4			0.69		
	*40		15.0			0.57		
AWT AUT BWT BUT	5-15	0.8	2.9	20.79	5.1	5.39		
	20		4.6			3.43		
	25		6.4			2.45		
	30		8.4			1.86		
	35		10.0			1.57		
	*40		11.4			1.38		
	*45		13.3			1.18		
	*50		15.2			1.03		
AWT BWT AUT BUT	6-20	1.0	3.7	33.15	8.6	6.57		
	25		5.3			4.61		
	30		6.9			3.53		
	35		8.3			2.94		
	40		10.0			2.45		
	*45		10.8			2.27		
	*50		12.5			1.96		
	*55		14.3			1.71		
	*60		15.6			1.57		
AWT BWT AUT BUT	8-25	1.2	5.3	41.19	9.81	5.88		
	30		7.3			4.31		
	35		9.1			3.43		
	40		11.9			2.65		
	45		13.6			2.35		
	50		15.5			2.06		
	*55		16.8			1.87		
	*60		18.8			1.67		
	*65		20.6			1.52		
	*70		22.8			1.38		
AWT BWT AUT BUT	10-30	1.6	5.2	77.47	20.59	10.89		
	35		6.8			8.34		
	40		8.4			6.77		
	45		10.0			5.69		
	50		11.6			4.9		
	55		13.2			4.31		
	60		15.2			3.73		
	*65		17.0			3.35		
	*70		19.3			2.95		
	*75		20.7			2.75		
	*80		24.1			2.36		
	*90		26.3			2.16		
	*100		29.0			1.96		
AWT BWT AUT BUT	12-40	2.0	6.6	120.62	34.3	13.04		
	45		7.7			11.18		
	50		9.4			9.22		
	55		10.5			8.24		
	60		12.1			7.16		
	65		13.1			6.57		
	70		14.9			5.79		
	75		16.0			5.39		
	80		17.6			4.9		
	*90		19.1			4.52		
	*100		22.0			3.92		
AWT	14-40	2.3	5.8	154.95	45.11	19.02		
	45		7.0			15.59		
	50		8.4			13.14		
	55		9.6			11.47		
	60		10.9			10.1		
	65		12.9			8.53		
	70		14.2			7.75		
	75		15.3			7.16		
	80		16.7			6.57		
	90		18.6			5.91		
	100		21.1			5.21		
	125		28.0			3.92		
AWT	16-50	2.6	7.5	195.15	55.9	18.63		
	55		9.0			15.49		
	60		10.4			13.34		
	65		11.9			11.67		
	70		13.4			10.4		
	75		15.0			9.32		
	80		16.5			8.43		
	90		19.4			7.16		
	100		22.4			6.18		
	125		28.4			4.90		
	150		35.5			3.92		
AWT	18-55	2.9	8.3	236.34	68.65	20.1		
	60		10.0			16.67		
	65		11.6			14.71		
	70		12.5			13.44		
	75		14.1			11.77		
	80		15.8			10.79		
	90		18.4			9.12		
	100		21.6			7.75		
	125		27.1			6.19		
	150		34.2			4.90		
AWT	20-60	3.2	9.2	281.45	82.38	21.57		
	70		11.9			16.67		
	80		14.7			13.53		
	90		17.5			11.38		
	100		20.1			9.9		
	125		27.8			7.16		
	150		33.8			5.89		
	175		40.6			4.90		
AWT	24-80	4.0	11.7	430.51	123.6	26.48		
	90		13.7			22.46		
	100		16.6			18.63		
	125		22.5			13.63		
	150		28.5			10.79		
	175		34.4			8.92		
	200		41.2			7.45		

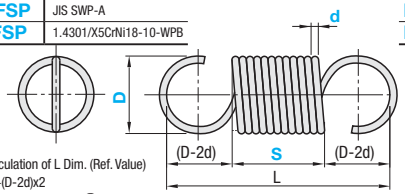
Initial tension and spring constant are for reference only. Load {kgf} = Load Nx0.101972

Tension Springs
-Configurable-

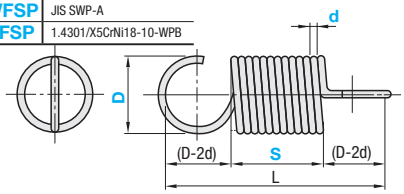


RoHS

Type	Material
WFSP	JIS SWP-A
UFSP	1.4301/X5CrNi18-10-WPB



Type	Material
BWFSP	JIS SWP-A
BUFSP	1.4301/X5CrNi18-10-WPB



Ⓡ Calculation of L Dim. (Ref. Value)
S+(D-2d)x2
ⓇHooks are reversed. ⓇThe opening part of hook is as shown in the above figure.

Part Number Type	D	Wire Dia. dmm	S Configurable 1mm	Reference Max. Elongation mm WFSP BWFSP	Reference Max. Elongation mm UFSP BUFSP	Standard Spring Constant N/mm WFSP BWFSP	Standard Spring Constant N/mm UFSP BUFSP	Initial Tension N WFSP BWFSP	Initial Tension N UFSP BUFSP
WFSP UFSP BWFSP BUFSP	3	0.3	10~300	88	87	0.025	0.021	0.18	0.21
		0.4		41	42	0.12	0.10	0.53	0.64
	4	0.4		86	87	0.04	0.04	0.31	0.38
		0.5		48	46	0.15	0.13	0.77	0.92
	5	0.5	10~500	84	82	0.07	0.06	0.49	0.59
		0.6		50	51	0.18	0.16	1.01	1.21
	6	0.6		79	82	0.10	0.09	0.71	0.85
		0.8		36	36	0.47	0.41	2.13	2.55
	8	0.8		74	76	0.18	0.16	1.26	1.51
		1.0		41	42	0.58	0.51	3.04	4.26
	9	1.0	10~550	56	57	0.39	0.34	2.45	3.43
		1.2		33	33	1.05	0.93	4.41	6.17
	10	1.0		74	70	0.27	0.24	1.96	2.74
		1.2		44	43	0.73	0.65	4.31	6.03
		1.4		29	28	1.70	1.50	7.64	10.70
	12	1.0		116	113	0.15	0.13	1.18	1.65
		1.2		71	70	0.39	0.35	2.84	3.98
		1.4		46	46	0.91	0.80	5.39	7.55
		1.6		31	30	1.88	1.66	8.72	12.21

Part Number Type	D	Wire Dia. dmm	S Configurable 1mm	Reference Max. Elongation mm WFSP BWFSP	Reference Max. Elongation mm UFSP BUFSP	Standard Spring Constant N/mm WFSP BWFSP	Standard Spring Constant N/mm UFSP BUFSP	Initial Tension N WFSP BWFSP	Initial Tension N UFSP BUFSP
WFSP UFSP BWFSP BUFSP	14	1.2	10~550	104	96	0.24	0.21	2.06	2.88
		1.4		69	65	0.54	0.48	3.82	5.35
		1.6		47	45	1.11	0.98	6.66	9.32
		1.8		34	33	2.10	1.86	10.60	14.84
	16	1.4		96	91	0.35	0.31	3.04	4.26
		1.6		66	65	0.71	0.63	5.10	7.14
		1.8		48	47	1.33	1.18	8.33	11.66
		2.0		34	35	2.37	2.10	12.60	17.64
	18	1.6		88	87	0.48	0.42	4.02	5.63
		1.8		64	64	0.90	0.80	6.47	9.06
		2.0		47	48	1.59	1.40	10.00	14.00
		2.3		31	30	3.40	3.01	18.70	26.18
	20	1.8		84	78	0.63	0.56	5.10	7.14
		2.0		61	60	1.11	0.99	7.94	11.12
		2.3		41	40	2.37	2.10	15.20	21.28
		2.6		29	29	4.64	4.10	23.60	33.04

Order Example

Part Number	-	d	-	S
WFSP3	-	0.3	-	10
UFSP20	-	2.6	-	498

Days to Ship 10 Days

Price

Volume DiscountⓇ (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	10%	20%	35%

ⓇFor orders larger than indicated quantity, please request a quotation.

- Reference maximum elongation and standard spring constant are the values when S Dimension is 50. For other dimensions, use the formula below for calculation.

- Max. Elongation

$$\text{Max. Elongation (mm)} = \frac{\text{Configurable S Dim.}}{\text{50 (Reference S Dim.)}} \times \text{Reference Max. Elongation}$$

- Spring Constant

$$\text{Spring Constant (N/mm)} = \frac{\text{50 (Reference S Dim.)}}{\text{Configurable S Dim.}} \times \text{Standard Spring Constant}$$

Accuracy Standards

- D Dimension Tolerance

D/d*1	Tolerance
8 or less	±1.5% of D dimension (Min. ±0.2mm)
8~20	±2% of D dimension (Min. ±0.3mm)

*1D/d = Spring Index

- S Dimension Tolerance

When d≤0.5, ±2 x Wire Dia.
(Ex: When d=0.3, ±0.6)
When d≥0.6, ± Wire Dia.
(Ex: When d=1.0, ±1.0)

D	d	€ Unit Price WFSP BWFSP S10 ~20	S21 ~50	S51 ~100	S101 ~200	S201 ~300	S301 ~450	S451 ~550	€ Unit Price UFSP BUFSP S10 ~20	S21 ~50	S51 ~100	S101 ~200	S201 ~300	S301 ~450	S451 ~550
3	0.3														
	0.4														
4	0.4														
	0.5														
5	0.5														
	0.6														
6	0.6														
	0.8														
8	0.8														
	1.0														
9	1.0														
	1.2														
10	1.0														
	1.2														
	1.4														
12	1.0														
	1.2														
	1.4														
	1.6														
14	1.2														
	1.4														
	1.6														
	1.8														
16	1.4														
	1.6														
	1.8														
	2.0														
18	1.6														
	1.8														
	2.0														
	2.3														
20	1.8														
	2.0														
	2.3														
	2.6														

Tension Springs
-Hook Free-

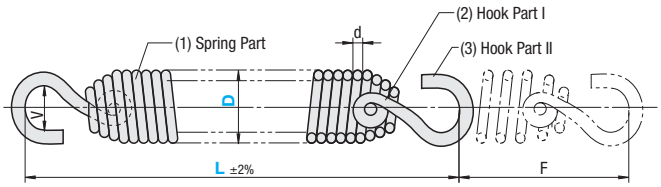
CAD Data

■Hook Free Type

RoHS



Type	Material	
	Main Body	Hook Part
AWFM	JIS SWP-A	1.4301/X5CrNi18-10-WPB
AUFM	1.4301/X5CrNi18-10-WPB	



Part Number Type	D-L	Wire Dia. dmm	Hooks Wire Dia. dmm	Hooks Inner Dia. V	Dynamic Load Max. Deflection Fmax. mm	Dynamic Load Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price AWFM	€ Unit Price AUFM
AWFM AUFM	7-25	1.0	1.2	4.6	8	39.2	7.84	3.92		
	30				11.9			2.64		
	35				16			1.96		
	40				20			1.57		
	8-30	1.2	1.4	5.2	9.6	66.25	9.81	5.88		
	35				13.7			4.12		
	40				18			3.13		
	45				22.5			2.51		
	50				25.15			2.24		
	60				32.91			1.71		
	70				40.68			1.39		
	10-30	1.4	1.6	6.8	10.1	86.69	12.4	7.35		
	35				13.8			5.39		
	40				17.25			4.31		
	45				23			3.23		
	50				27.16			2.74		
	60				36.72			2.02		
	70				46.28			1.61		
	80				55.85			1.33		
	12-30	1.6	1.8	8.4	8.7	101.29	14.71	9.99		
	35				13.6			6.37		
	40				19.2			4.50		
	45				26			3.33		
	50				28.93			2.99		
	60				34.78			2.49		
	70				44.89			1.93		
	80				54.99			1.57		
	90				65.10			1.33		
	100				75.21			1.15		

Part Number Type	D-L	Wire Dia. dmm	Hooks Wire Dia. dmm	Hooks Inner Dia. V	Dynamic Load Max. Deflection Fmax. mm	Dynamic Load Max. Load N	(Initial Tension) N	(Springs Constant) N/mm	€ Unit Price AWFM	€ Unit Price AUFM
AWFM AUFM	14-50	1.8	2	10	18.20	107.87	22.56	4.69		
	60				27.13			3.14		
	70				36.05			2.37		
	80				44.97			1.90		
	90				53.90			1.58		
	100				62.82			1.36		
	125				85.13			1.00		
	16-50	2	2.6	11.4	15.54	127	25.5	6.53		
	60				25.01			4.06		
	70				34.48			2.94		
	80				43.96			2.31		
	90				53.43			1.90		
	100				62.90			1.61		
	125				86.59			1.17		
	18-80	2.3	2.9	12.9	39.58	180	36	3.64		
	90				49.00			2.94		
	100				58.43			2.46		
	125				81.99			1.76		
	150				105.55			1.36		
	20-80	2.6	3.2	14.2	32.48	230	50.99	5.51		
	90				41.12			4.35		
	100				49.76			3.60		
	125				71.36			2.51		
	150				92.96			1.93		

Please note that Hook Wire Dia.for D16, 18, 20 are thicker.
Inner diameter is the same as the previous type.

Order Example — Part Number: AWFM8-30

Days to Ship — 6 Days P.88

Price

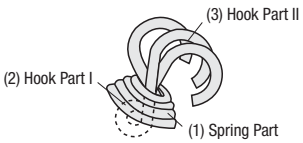
■Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Features

Being separate from the spring body, the hook can move flexibly as desired. In addition, direct contact between the spring and the hook does not generate bending stress in the hook, which is not possible with conventional tension springs.



Tension Springs / Hooks

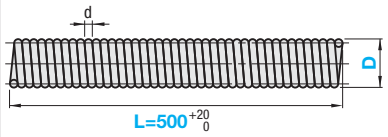
-Long, Medium Load · Hook Insertion-

CAD Data

■Tension Springs -Long, Medium Load-



Type	Material
LWS	JIS SWP-A
LUS	1.4301/X5CrNi18-10-WPB



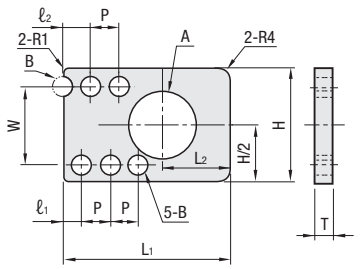
Part Number Type	D-L	Springs Constant N/mm	Wire Dia. dmm	Initial Tension N	Max. Deflection %	Applicable Hooks	€ Unit Price LWS	€ Unit Price LUS
LWS LUS	5-500	0.020	0.6	1.57	50	HBFK_5		
	6-500	0.050	0.8	3.53		HBFK_6		
	8-500	0.060	1.0	4.9		HBFK_8		
	10-500	0.075	1.2	5.49		HBFK_10		
	12-500	0.190	1.6	14.71		HBFK_12		
LWS	14-500	0.210	1.8	16.67		HBFK_14		
	16-500	0.230	2.0	19.61		HBFK_16		
	18-500	0.340	2.3	27.46		HBFK_18		

Load {kgf} = Load N x 0.101972

■Hooks



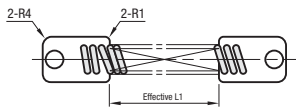
Type	Material	Surface Treatment
HBFKN	1.0330/DC01	Black Oxide
HBFKS	1.4301/X5CrNi18-10	-



Part Number Type	No.	W	A	B	P	L1	L2	H	T	ℓ1	ℓ2	€ Unit Price HBFKN	€ Unit Price HBFKS
HBFKN HBFKS	5	4.1	5	1.0	2.0	24	6	10	1.0	1.0	2.0		
	6	4.9											
	8	6.6	6	1.5	2.6	26	7	15		1.5	2.8		
	10	8.4											
	12	9.9	7	2.2	3.2	30	7.5	18	2.0	2.0	3.6		
	14	12.2			3.6			20		2.3	4.1		
	16	14.0	9	2.5	4.0	34	8.5	22		2.5	4.5		
	18	15.7		2.9	4.6			25		2.9	5.2		

Please choose the same number as D Dimension of LWS or LUS.

■How to Use



Springs can be cut to desired lengths.
Use the hook HBFKN by inserting the springs in its five holes.
Do not exceed 50% of the max. deflection for full length L1 when cutting.

Spring Constant should be L/L1 times.

Order Example — Part Number: LWS10-500 HBFKN10

Days to Ship: 6 Days / 2 Days P.88

Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~24	25~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

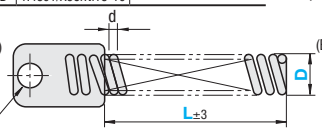
■Tension Springs -Hook Insertion-



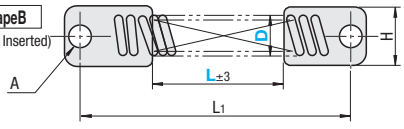
Type	Material Springs	Material Hooks	Surface Treatment Hooks
LWSH	JIS SWP-A	1.0330/DC01	Black Oxide
LUSH	1.4301-WPB	1.4301/X5CrNi18-10	-

- JIS SWP-A comes with the 1.0330/DC01 hook, and 1.4301/X5CrNi18-10-WPB comes with the 1.4301/X5CrNi18-10 hook.
- Load Formula — Load = Spring Constant x Deflection mm + Initial Tension
- The springs for LWSH and LUSH are different from that for LWS and LUS.

ShapeA (One End Inserted)



ShapeB (Both Ends Inserted)



Part Number Type	Shape	D	L 10 mm Increment	Wire Dia. dmm	A	H	Max. Deflection %	L1	Initial Tension (N) LWSH	Initial Tension (N) LUSH	Standard Spring Constant (N/mm) LWSH	Standard Spring Constant (N/mm) LUSH
LWSH LUSH	A	5	200 ~ 500	0.6	5	10	70	L+36	1.01	1.32	0.045	0.040
		6		0.8					2.28	2.96	0.114	0.101
		8		1.0	6	15		L+38	3.04	4.26	0.145	0.128
		10		1.2					4.31	6.03	0.183	0.163
	B	12		1.6	7	18	60	L+45	8.72	12.21	0.470	0.415
		14		1.8		20			10.6	14.84	0.525	0.465
		16		2.0	9	22		L+51	12.6	17.64	0.593	0.525
		18		2.3		25			18.7	26.18	0.850	0.753

Standard Spring Constant
Standard spring constant is the value when the L Dimension is 200 on shape B.
For other dimensions, use the formula below for calculation.

$$\text{Spring Constant (N/mm)} = \frac{200\ (\text{Reference L Dimension})}{\text{Configurable L Dimension}} \times \text{Standard Spring Constant}$$

Ex. LWSHB-8-400
0.0725(N/mm)= $\frac{200}{400}$ x0.145
kgf=Nx0.101972

Order Example — Part Number: LWSHA - 5 - 500

Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~14	15~20	21~30
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Shape A

D	€ Unit Price L200~250 LWSH	L200~250 LUSH	L260~300 LWSH	L260~300 LUSH	L310~350 LWSH	L310~350 LUSH	L360~400 LWSH	L360~400 LUSH	L410~450 LWSH	L410~450 LUSH	L460~500 LWSH	L460~500 LUSH
5												
6												
8												
10												
12												
14												
16												
18												

■Shape B

D	€ Unit Price L200~250 LWSH	L200~250 LUSH	L260~300 LWSH	L260~300 LUSH	L310~350 LWSH	L310~350 LUSH	L360~400 LWSH	L360~400 LUSH	L410~450 LWSH	L410~450 LUSH	L460~500 LWSH	L460~500 LUSH
5												
6												
8												
10												
12												
14												
16												
18												

Posts for Tension Springs

-Hole · Notched Hole-

CAD Data

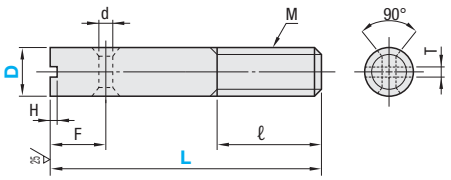
■Hole RoHS





Straight, ℓ Dimension Selectable

ASPO
SASPO(Stainless Steel)



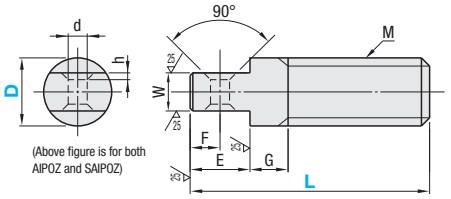
Type	Material	Surface Treatment	Accessory
ASPO AIPO AIPOZ	1.1191/C45E	Black Oxide	Nut 1 pc. 1.0038/S235JR (JIS Class 1)
SASPO	1.4305/X10CrNiS18-9	-	Nut 1 pc. 1.4301/X5CrNi18-10 (JIS Class 1)
SAIPO SAIPOZ	1.4301/X5CrNi18-10		

The ℓdimensions marked with * in the specification table are for dimensions in the right table.

Type	D-L	ℓ
ASPO SASPO	3-10	5
	5-15	8
	6-20	12
	8-20	11
	8-25	16
	10-30	17
	10-35	22
	12-40	20

Width Across Flats

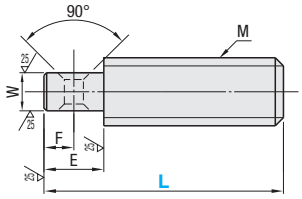
AIPO
SAIPO(Stainless Steel)



(Above figure is for both AIPOZ and SAIPOZ)

Width Across Flats, Full Thread Under Head

AIPOZ
SAIPOZ(Stainless Steel)



Part Number Type	D	L	M (Coarse)	ℓ*	F	H	T	d	ASPO € Unit Price Qty.1~49	ASPO Volume Discount Qty.50 or More	SASPO € Unit Price Qty.1~49	SASPO Volume Discount Qty.50 or More
ℓ Dimension Selectable ASPO SASPO (Stainless Steel)	3	*10 15 20 25 30 35 40	M3	10	3	1.0	1.2	1.5				
	4	15 20 25 30 35 40 50	M4					2.0				
	5	*15 20 25 30 35 40 50	M5		5	2.0						
	6	*20 25 30 35 40 45 50 60	M6	16								
	8	*20 *25 30 35 40 45 50 60 70	M8	20	6	2.5		3.0				
	10	*30 *35 40 45 50 60 70	M10	25	7			4.0				
	12	*40 50 60 70	M12	30	9		1.8	6.0				

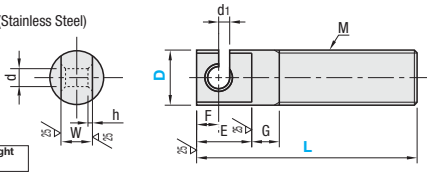
Part Number Type	D	L	M (Coarse)	d	W	G	E	F	h	AIPO € Unit Price Qty.1~49	AIPO Volume Discount Qty.50 or More	SAIPO € Unit Price Qty.1~49	SAIPO Volume Discount Qty.50 or More
Width Across Flats AIPO SAIPO (Stainless Steel)	3	15 20 25 30	M3	1.5	1.5	3	3.0	1.5	0.2				
	4	15 20 25 30 35	M4		2.5	5	3.5	1.75	0.3				
	5	15 20 25 30 35 40	M5	2.0	3.0		4.0	2.0	0.4				
	6	20 25 30 35 40 50	M6		3.5		5.0	2.5	0.5				
	8	20 25 30 35 40 50 60 70	M8	3.0	5.0		7.0	3.5	1.0				
	10	30 35 40 50 60 70	M10	4.0	6.0		10.0	4.0	1.2				
	12	35 40 50 60 70	M12	5.0	7.0		12.0	5.0	1.4				

Part Number Type	D	L	M (Coarse)	d	W	E	F	h	AIPOZ € Unit Price Qty.1~49	AIPOZ Volume Discount Qty.50 or More	SAIPOZ € Unit Price Qty.1~49	SAIPOZ Volume Discount Qty.50 or More
Full Thread Under Head AIPOZ SAIPOZ (Stainless Steel)	3	10 15 20 25	M3	1.5	1.5	3.0	1.5	0.2				
	4	10 15 20 25 30	M4		2.5	3.5	1.75	0.3				
	5	10 15 20 25 30 35	M5	2.0	3.0	4.0	2.0	0.4				
	6	15 20 25 30 35 45	M6		3.5	5.0	2.5	0.5				
	8	15 20 25 30 35 45 55 65	M8	3.0	5.0	7.0	3.5	1.0				
	10	25 30 35 45 55 65	M10	4.0	6.0	10.0	4.0	1.2				
	12	45 55 65	M12	5.0	7.0	12.0	5.0	1.4				

■Notched Hole RoHS



AIPOK
SAIPOK(Stainless Steel)



Utility Model Right Obtained

Type	Material	Surface Treatment	Accessory
AIPOK	1.1191/C45E	Black Oxide	Nut 1 pc. 1.0038/S235JR (JIS Class 1)
SAIPOK	1.4301/X5CrNi18-10	-	Nut 1 pc. 1.4301/X5CrNi18-10 (JIS Class 1)

Part Number Type	D	L	M (Coarse)	d	d1	W	G	E	F	h	Working Max. Load N AIPOK	Working Max. Load N SAIPOK	AIPOK € Unit Price Qty.1~49	AIPOK Volume Discount Qty.50 or More	SAIPOK € Unit Price Qty.1~49	SAIPOK Volume Discount Qty.50 or More
Notched Hole AIPOK SAIPOK (Stainless Steel)	4	15 20 25 30	M4	1.5		2.5		3.5	1.75	0.3	80	50				
	5	15 20 25 30 40	M5	2.0	1.0	3.0		4.0	2.0	0.4	115	72				
	6	20 25 30 40 50	M6			3.5		5.0	2.5	0.5	179	113				
	8	25 30 40 50 60 70	M8	3.0	1.5	5.0	5	7.0	3.5	1.0	300	189				
	10	30 40 50 60 70	M10	4.0	2.0	6.0		10.0	4.0	1.2	433	273				
	12	40 50 60 70	M12	5.0	2.5	7.0		12.0	5.0	1.4	590	-				

Order Example

Part Number	-	L
ASPO5	-	20
SAIPO8	-	40

Days to Ship

6	Days
2	Days

P.87

kgf=Nx0.101972

Posts for Tension Springs

-L-Shaped Hexagon Socket · Hexagon-

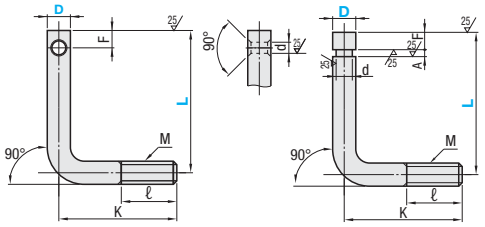
CAD Data

■L-Shaped RoHS



Hole **ASPL** **SASPL**(Stainless Steel)

Groove **BSPL** **SBSPL**(Stainless Steel)



Type	M Material	S Surface Treatment	A Accessory Material
ASPL BSPL	1.1191/C45E	Black Oxide	Nut 1 pc. 1.0038/S235JR
SASPL SBSPL	1.4301/ X5CrNi18-10	-	Nut 1 pc. 1.4301/X5CrNi18-10

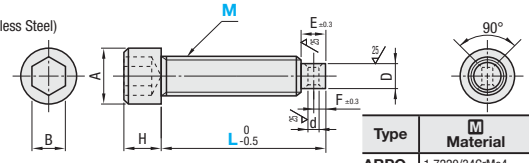
Part Number Type	D	L	M (Coarse)	K	ℓ	A	F ASPL SASPL	F BSPL SBSPL	d ASPL SASPL	d BSPL SBSPL	ASPL € Unit Price Qty.1~49	ASPL Volume Discount Qty.50 or More	SASPL € Unit Price Qty.1~49	SASPL Volume Discount Qty.50 or More	BSPL € Unit Price Qty.1~49	BSPL Volume Discount Qty.50 or More	SBSPL € Unit Price Qty.1~49	SBSPL Volume Discount Qty.50 or More
L-Shaped Hole ASPL	3	10 15	M3	20	10	1.0	3	1.5	1.5	1.8								
	4	15 20 25	M4			1.2		3		2.0								
SASPL (Stainless Steel)	5	20 25 30	M5			2.0	5	4	2.0	3.0								
	6	20 25 30	M6	30	16					3.6								
Groove BSPL	8	25 30	M8	40	20	3.0	6		3.0	5.0								
SBSPL (Stainless Steel)	10	30 40	M10	50	25		7		4.0	6.0								
	12	30 40	M12	60	30	4.0	9		6.0	6.5								

■Hexagon Socket Head



RoHS

ARPO
SARPO(Stainless Steel)



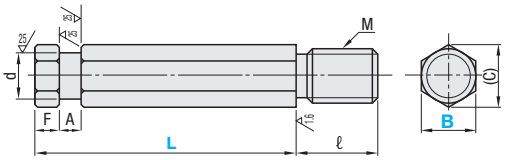
Type	M Material	S Surface Treatment	A Accessory
ARPO	1.7220/34CrMo4	Black Oxide	Nut 1 pc. 1.0038/S235JR (JIS Class 3)
SARPO	1.4301/X5CrNi18-10	-	Nut 1 pc. 1.4301/X5CrNi18-10 (JIS Class 3)

Part Number Type	M	L	d	D	E	F	A	B	H	ARPO € Unit Price Qty.1~49	ARPO Volume Discount Qty.50 or More	SARPO € Unit Price Qty.1~49	SARPO Volume Discount Qty.50 or More
Hexagon Socket Head ARPO	4	15 20 25 30	1.5	3.0	3	1.5	7	3	4				
	5	15 20 25 30 35 40	2	3.8	4	2	8.5	4	5				
	6	20 25 30 35 40		4.5			10	5	6				
SARPO (Stainless Steel)	8	20 25 30 35 40 50	3	6.1	7	3.5	13	6	8				
	10	30 35 40 50 60	4	7.8	10	4	16	8	10				
	12	40 50 60	5	9.5	12	5	18	10	12				

■Hexagon RoHS



DSPO
PDSPO



Type	M Material	S Surface Treatment
DSPO	1.0715/9SMn28	Black Oxide
PDSPO		Electroless Nickel Plating

Part Number Type	B	L	M (Coarse)	(C)	ℓ	A	F	d	DSPO € Unit Price Qty.1~49	DSPO Volume Discount Qty.50 or More	PDSPO € Unit Price Qty.1~49	PDSPO Volume Discount Qty.50 or More
	3	10 15	M3	3.5	6	1.0	3	1.8				
	4	10 15 20	M4	4.6	8	1.2		2.0				
DSPO	5	10 15 20	M5	5.8	10	2.0	4	3.0				
	6	10 15 20 25	M6	6.9	12			3.6				
PDSPO	8	10 15 20 25 30	M8	9.2	16	3.0		5.0				
	10	15 20 25 30	M10	11.5	20			6.0				
	12	20 25 30	M12	13.9	24	4.0		6.5				

Order Example

Part Number	-	L
DSPO8	-	25

Days to Ship

6 Days

2 Days

P.87

Posts for Tension Springs

-Groove Type · Roller Type-

CAD Data

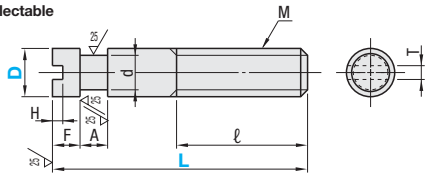
■Groove

RoHS



ℓ Dimension Selectable

BSPO
SBSPO
(Stainless Steel)

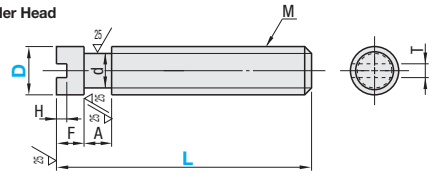


The ℓdimensions marked with * in the specification table are for dimensions in the right table.

Type	D-L	ℓ
BSPO SBSPO	5-15	8
	6-15	7
	6-20	12
	8-20	11
	8-25	16
	10-30	17
	10-35	22
	12-40	20

Full Thread Under Head

BSPOZ
SBSPOZ
(Stainless Steel)



Type	M Material	S Surface Treatment	A Accessory Material
BSPO BSPOZ	1.1191/C45E	Black Oxide	Nut 1 pc. (1.0038/S235JR Class 1)
SBSPO SBSPOZ	1.4305/ X10CrNiS18-9	-	Nut 1 pc. (JIS Class 1) 1.4301/X5CrNi18-10

Part Number Type	D	L	M (Coarse)	ℓ*	A	F	H	T	d	BSPO € Unit Price Qty.1~49	BSPO Volume Discount Qty.50 or More	SBSPO € Unit Price Qty.1~49	SBSPO Volume Discount Qty.50 or More
ℓ Dimension Selectable BSPO SBSPO (Stainless Steel)	3	15 20 25 30 35 40	M3	10	1.0	3	1.0	1.2	1.8				
	4	15 20 25 30 35 40 50	M4		1.2				2.0				
	5	*15 20 25 30 35 40 50	M5		2.0	4	2.0		3.0				
	6	*15 *20 25 30 35 40 45 50 60	M6	16	3.0				3.6				
	8	*20 *25 30 35 40 45 50 60 70	M8	20					5.0				
	10	*30 *35 40 45 50 60 70	M10	25			2.5		6.0				
	12	*40 50 60 70	M12	30	4.0			1.8	6.5				

Part Number Type	D	L	M (Coarse)	A	F	H	T	d	BSPOZ € Unit Price Qty.1~49	BSPOZ Volume Discount Qty.50 or More	SBSPOZ € Unit Price Qty.1~49	SBSPOZ Volume Discount Qty.50 or More
Full Thread Under Head BSPOZ SBSPOZ (Stainless Steel)	3	10 15 20 25	M3	1.0	3	1.0	1.2	1.8				
	4	10 15 20 25 30	M4	1.2				2.0				
	5	15 20 25 30 35	M5	2.0	4	2.0		3.0				
	6	20 25 30 35 45	M6	3.0				3.6				
	8	25 30 35 45 55 65	M8					5.0				
	10	30 35 45 55 65	M10			2.5		6.0				
	12	35 45 55	M12	4.0			1.8	6.5				

Order Example

Part Number	-	L
BSPO8	-	40

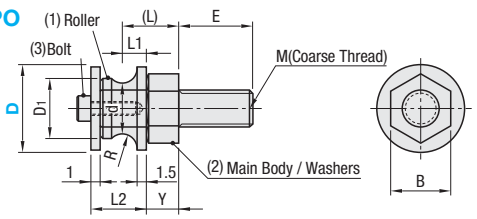
Days to Ship: 6 Days / 2 Days P.87

■Rollers

RoHS



YSPO



Parts Structure	(1) Rollers	(2) Main Body / Washers	(3) Screws
M Material	1.4305/ X10CrNiS18-9	1.1191/C45E	1.4567/ X3CrNiCu18-9-4
S Surface Treatment	Electroless Nickel Plating		-
H Hardness	Hv1000 Effective Depth 0.01	-	

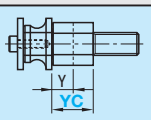
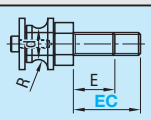
Part Number Type	D	Mounting length (L)	(1) Rollers L1	D1	d	R	(2) Main Body L2	Y	M	E	B	Accessory (3) Screws	Applicable Tension Springs	€ Unit Price Qty 1~10 pcs.	Volume Discount 11~20	21~50	51~99
YSPO	8	8	2.5	5.5	4.5	1	5.5	5.5	M4	10	7	SCB2-5	D 8				
	9	9	3	6.5	5.5	1.5	6.5	6	M5	12	8		D9 · D10				
	12	11	3.5	8	7	2	7.5	7.5	M6		10		D12 · D14				
	15	13		10	8			9.5				SCB3-5	D16 · D18				
	18	16	4	13	11	2.5	8.5	12	M8	16	13		D20 · D24				

Order Example

Part Number
YSPO12

Days to Ship: 6 Days P.87

Alterations

Alterations	Y Dimensions	E Dimensions
		
Code	YC	EC
Spec.	Changes the Y Dimension. Y<YC≤30 Specify in 1mm Increment	Changes the E Dimension. M≤EC≤Mx5 Specify in 1mm Increment
Price adder	2,00	2,00

Part Number	-	YC(EC)
YSPO9	-	YC10

8 Days

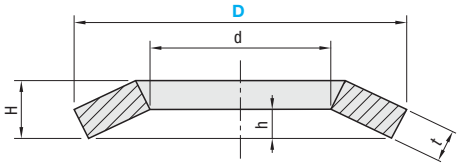
Disk Springs

CAD Data



RoHS

SRBN
SSRBN
(Stainless Steel)



t	Load Tolerance (75% Deflection)
0.3~1.1	+25% -7.5%
1.2~3	+15% -7.5%

Type	M Material	S Surface Treatment	H Hardness
SRBN	S65~70C	Black Oxide	43~50HRC
SSRBN	1.4301/X5CrNi18-10-CSP	-	37~46HRC

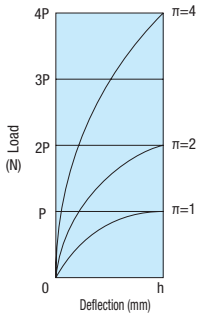
JIS B 2706-1995
JIS B 2706-1995

Part Number Type	Part Number D	Load Type	D	d	t	H	h	Load (75% Deflection) N SRBN	Load (75% Deflection) N SSRBN	SRBN € Unit Price Qty. 1~49	SRBN Volume Discount 50~74	SRBN Volume Discount 75~99	SRBN Volume Discount 100~500	SSRBN € Unit Price Qty. 1~49	SSRBN Volume Discount 50~74	SSRBN Volume Discount 75~99	SSRBN Volume Discount 100~500
SRBN SSRBN (Stainless Steel)	8	A	0 -0.15	4.2 +0.15 0	0.3	0.55 ±0.10	0.25	117	105								
		B			0.4	0.60	0.20	205	185								
	10	A		5.2	0.4	0.70	0.30	205	185								
		B			0.5	0.75	0.25	323	291								
	12.5	A	0 -0.20	6.2	0.5	0.85	0.35	294	264								
		B			0.7	1.00	0.30	657	591								
	14	A		7.2	0.5	0.90	0.40	274	247								
		B			0.8	1.10	0.30	794	714								
	16	A		8.2	0.6	1.05	0.45	411	370								
		B			0.9	1.25	0.35	1,029	926								
	18	A		9.2	0.7	1.20	0.50	568	511								
		B			1.0	1.40 ±0.15	0.40	1,274	1,147								
	20	A	0 -0.25	10.2 +0.20 0	0.8	1.35 ±0.10	0.55	745	670								
		B			1.1	1.55 ±0.15	0.45	1,520	1,368								
	22.5	A		11.2	0.8	1.45 ±0.10	0.65	706	635								
		B			1.2 (1.25)	1.7 (1.75) ±0.15	0.50	1,716	1,544								
	25	A		12.2	0.9	1.60 ±0.10	0.70	863	776								
		B			1.6 (1.5)	2.15 (2.05) ±0.15	0.55	3,530	3,177								
	28	A		14.2	1.0	1.80 ±0.10	0.80	1,127	1,015								
		B			1.6 (1.5)	2.25 (2.15)	0.65	3,432	3,089								
	31.5	A	0 -0.30	16.3	1.2 (1.25)	2.1 (2.15)	0.90	1,716	1,544								
		B			1.8 (1.75)	2.5 (2.45)	0.70	4,216	3,795								
	35.5	A		18.3 +0.25 0	1.2 (1.25)	2.2 (2.25) ±0.15	1.00	1,520	1,368								
		B			2.0	2.80	0.80	5,197	4,677								
	40	A		20.4	1.6 (1.5)	2.75 (2.65)	1.15	3,138	2,824								
		B			2.2 (2.25)	3.1 (3.15)	0.90	6,080	5,472								
	45	A		22.4	1.8 (1.75)	3.1 (3.05)	1.30	3,922	3,530								
		B			2.5	3.50 ±0.2	1.00	7,698	6,928								
	50	A		25.4	2.0	3.40 ±0.15	1.40	4,756	4,280								
		B			3.0	4.10 ±0.2	1.10	11,964	10,767								

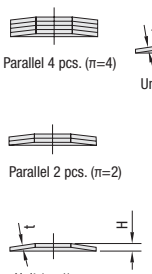
(?)t and H dimensions for SSRBN are shown in ( ). (Different from JIS Standard.) kgf=N x 0.101972

(?)Load is reference value.

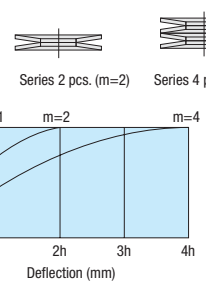
Load Characteristics in Combination Excerpt from JIS B 2706 (2003)



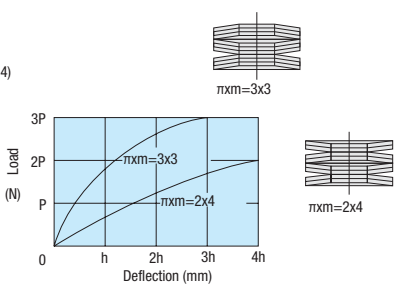
· P: load per unit



• Parallel Combination



• Series Combination



• Parallel and Series Combination

(?)A guide is necessary to keep the springs aligned.
(?)Please use the disc springs of same size and load only.

Order Example

Part Number	-	Load Type A · B
SRBN22.5	-	A

Days to Ship 6 Days P87

(?)For orders larger than indicated quantity, please request a quotation.

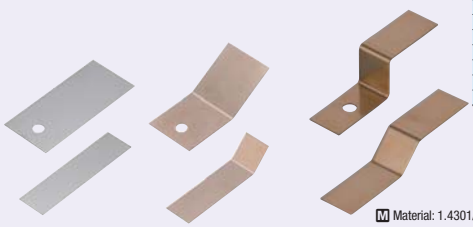
Price

For orders larger than indicated quantity, please request a quotation.

Flat Springs

-Straight · One-Point-Bend · Two-Point-Bend-

■Straight ■One-Point-Bend ■Two-Point-Bend

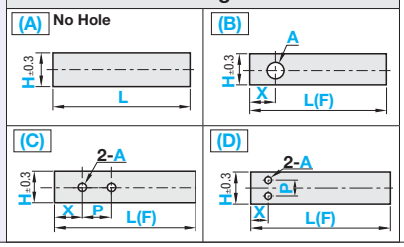


T	Tolerance
0.2	±0.02
0.3	
0.4	±0.025
0.5	
0.6	±0.035
0.7	
0.8	±0.040

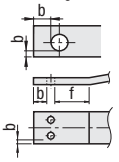
RoHS

Material: 1.4301/X5CrNi18-10-CSP

Hole Machining Selection



‹Machining Limits›



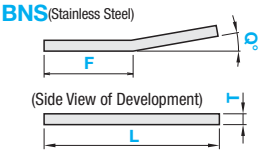
b≥1.5 The distance between the hole and the edge should be 1.5mm or more.
f≥3 The distance between holes and bends should be 3mm or more.

IBN (Stainless Steel)



Part Number Type	Shape	T Selection	H	L 1mm Increment	A Selection	0.5mm Increment X	0.5mm Increment P
IBN	A B C D	0.2 0.3 0.4 0.5	6	20~300	2.0 2.5 3.0 3.5 4.5 5.5 6.5 9.0	$\frac{L}{2}$-X≤	A+1.5≤P
		0.2 0.3 0.4 0.5	8				
		0.3 0.4 0.5 0.6	10				
		0.3 0.4 0.5 0.6	12				
		0.4 0.5 0.6 0.7	15				
		0.4 0.5 0.6 0.7	18				
		0.5 0.6 0.7 0.8	21				
		0.5 0.6 0.7 0.8	25				

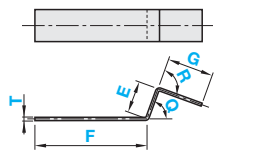
IBNS (Stainless Steel)



Due to low temperature annealing, surface color is golden brown.

Part Number Type	Shape	T Selection	H	L 1mm Increm.	(B) (C) (D) only A Selection	0.5mm Increment (B) (C) (D) only X	0.5mm Increment (C) (D) only P	F	5° Increment Q
IBNS	A B C D	0.2 0.3 0.4 0.5	6	20~300	2.0 2.5 3.0 3.5 4.5 5.5 6.5 9.0	$\frac{A}{2}$+2≤X≤$\frac{L}{2}$	A+1.5≤P	3≤F≤L-3	10~90
		0.2 0.3 0.4 0.5	8						
		0.3 0.4 0.5 0.6	10						
		0.3 0.4 0.5 0.6	12						
		0.4 0.5 0.6 0.7	15						
		0.4 0.5 0.6 0.7	18						
		0.5 0.6 0.7 0.8	21						
		0.5 0.6 0.7 0.8	25						

IBNW



Due to low temperature annealing, surface color is golden brown.

Part Number Type	Shape	T Selection	H	1mm Increment F	E	G	5° Increment Q	R	(B) (C) (D) only A Selection	(C) (D) only 0.5mm Increment X	(C) (D) only 0.5mm Increment P
IBNW	A B C D	0.2 0.3 0.4 0.5	6	10~50	10~50	10~50	5~90	5~90	2.0 2.5 3.0 3.5 4.5 5.5 6.5 9.0	$\frac{A}{2}$+2≤X≤F-A-(P)	A+1.5≤P
		0.2 0.3 0.4 0.5	8								
		0.3 0.4 0.5 0.6	10								
		0.3 0.4 0.5 0.6	12								
		0.4 0.5 0.6 0.7	15								
		0.4 0.5 0.6 0.7	18								
		0.5 0.6 0.7 0.8	21								
		0.5 0.6 0.7 0.8	25								

■IBN Straight

H	€ Unit Price Hole Machining (A) L20~65	L66~130	L131~200	L201~300	Hole Machining (B) L20~65	L66~130	L131~200	L201~300	Hole Machining (C) (D) L20~65	L66~130	L131~200	L201~300
6												
8												
10												
12												
15												
18												
21												
25												

Order Example

Part Number Type	Shape	T	H	L	A	X	P
IBN	A	T0.2	H8	L20			
IBN	C	T0.2	H8	L20	A3.5	X5	P10

Days to Ship: 10 Days

Price

- IBN Straight

■Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~24	25~29	30~50
Discount Rate	€ Unit Price	10%	20%	30%

Please request a quotation for orders of 101 or more identical pieces.

■IBNS One-Point-Bend

H	€ Unit Price Hole Machining (A) L20~65	L66~130	L131~200	L201~300	Hole Machining (B) L20~65	L66~130	L131~200	L201~300	Hole Machining (C) (D) L20~65	L66~130	L131~200	L201~300
6												
8												
10												
12												
15												
18												
21												
25												

Order Example

Part Number Type	Shape	T	H	L	A	X	P	F	Q
IBNS	B	T0.6	H15	L200	A3.5	X20		F50	Q30
IBNS	C	T0.3	H12	L40	A3.5	X5	P10	F20	Q45

■IBNW Two-Point-Bend

H	€ Unit Price Hole Machining (A)	(B)	(C) (D)
6			
8			
10			
12			
15			
18			
21			
25			

Days to Ship: 10 Days

Price

- IBNS One-Point-Bend
- IBNW Two-Point-Bend

■Volume Discount (Round down to one Cent.) P87

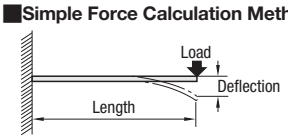
Quantity	1~9	10~14	15~19	20~50
Discount Rate	€ Unit Price	15%	25%	40%

Please request a quotation for orders of 101 or more identical pieces.

Order Example

Part Number Type	Shape	T	H	F	E	G	Q	R	A	X	P
IBNW	B	T0.6	H10	F35	E10	G15	Q10	R90	A3.0	X5	
IBNW	C	T0.5	H15	F50	E20	G40	Q90	R85	A3.5	X7	P15

■Simple Force Calculation Method (Reference)



Formula of Spring Constant
Spring Constant (N/mm) = $\frac{Ebh^3}{4L^3}$
Load Formula
Load (N) = Spring Constant x Deflection

E=186000
b = Plate width
h = Plate thickness
L = Length

Torsion Springs

CAD Data

■Right Winding 90°

RoHS



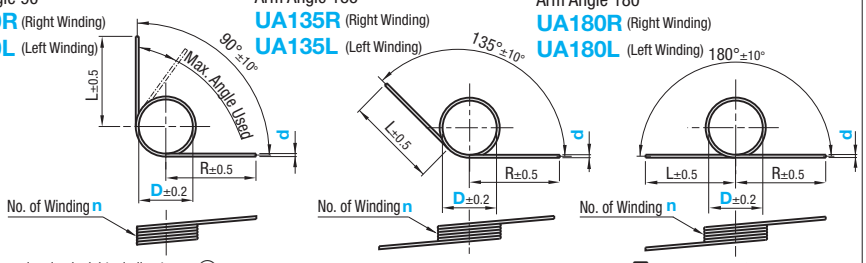
■Left Winding 180°



Arm Angle 90°
UA90R (Right Winding)
UA90L (Left Winding)

Arm Angle 135°
UA135R (Right Winding)
UA135L (Left Winding)

Arm Angle 180°
UA180R (Right Winding)
UA180L (Left Winding)



* The above drawing is right winding type. Torsion springs should be used in the winding direction.

Material: 1.4301/X5CrNi18-10-WPB

Part Number Type	Inner Ø D	No. of Winding n	Wire Ø d	Arm Length L / R	Spring Constant (Torque) Nmm/deg Arm Angle 90°	Arm Angle 135°	Arm Angle 180°	Max. Angle Used deg (deg) Arm Angle 90°	Arm Angle 135°	Arm Angle 180°	€ Unit Price
Arm Angle 90° UA90R (Right Winding) UA90L (Left Winding)	2	2	0.2	20	0.0115	0.0119	0.0124	41	40	36	
			0.3		0.0563	0.0586	0.0611	26	25	23	
		3	0.2		0.0088	0.0090	0.0093	59	58	56	
			0.3		0.0428	0.0441	0.0455	38	36	35	
		4	0.3		0.0345	0.0354	0.0363	52	50	47	
			0.4		0.1054	0.1080	0.1108	38	36	34	
		5	0.3		0.0289	0.0295	0.0302	61	60	58	
			0.4		0.0882	0.0900	0.0920	46	45	43	
	3	2	0.3	30	0.0387	0.0403	0.0420	40	38	36	
			0.4		0.1199	0.1248	0.1301	30	27	25	
		3	0.3		0.0295	0.0304	0.0314	56	54	52	
			0.4		0.0912	0.0940	0.0970	42	40	39	
		4	0.4		0.0736	0.0755	0.0774	55	53	51	
			0.5		0.1756	0.1799	0.1845	44	42	41	
		5	0.4		0.0617	0.0630	0.0643	71	68	66	
			0.5		0.1471	0.1501	0.1533	54	53	51	
Arm Angle 135° UA135R (Right Winding) UA135L (Left Winding)	4	2	0.4	40	0.0918	0.0955	0.0996	39	37	34	
			0.5		0.2206	0.2296	0.2394	29	28	27	
		3	0.4		0.0700	0.0722	0.0744	56	54	52	
			0.5		0.1680	0.1732	0.1787	42	41	40	
		4	0.5		0.1357	0.1390	0.1425	57	54	52	
			0.6		0.2763	0.2831	0.2903	48	47	45	
		5	0.5		0.1138	0.1161	0.1185	69	67	65	
			0.6		0.2315	0.2363	0.2413	60	59	58	
Arm Angle 180° UA180R (Right Winding) UA180L (Left Winding)	5	2	0.5	50	0.1793	0.1866	0.1944	39	36	34	
			0.6		0.3672	0.3821	0.3983	31	30	27	
		3	0.5		0.1368	0.1409	0.1454	55	52	51	
			0.6		0.2797	0.2883	0.2974	47	44	42	
		4	0.6		0.2259	0.2314	0.2373	60	58	56	
			0.8		0.6936	0.7108	0.7289	42	41	40	
		5	0.6		0.1894	0.1933	0.1974	75	73	71	
			0.8		0.5811	0.5931	0.6056	54	53	52	
	6	2	0.6	60	0.3099	0.3224	0.3360	37	36	34	
			0.8		0.9590	0.9981	1.0406	26	25	24	
		3	0.6		0.2363	0.2436	0.2512	56	52	50	
			0.8		0.7299	0.7523	0.7762	38	36	35	
		4	0.8		0.5891	0.6037	0.6190	50	48	47	
			1.0		1.4045	1.4394	1.4760	42	40	39	
		5	0.8		0.4939	0.5041	0.5147	63	61	60	
			1.0		1.1765	1.2008	1.2262	51	50	49	

Spring constant is a reference value when arm length is cut to be L/2, R/2.

1N=0.101972kgf

1deg = 1°(Angle)

Order Example: Part Number - n - d → UA90R4 - 3 - 0.5

10 Days

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	50%	80%	90%

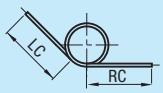
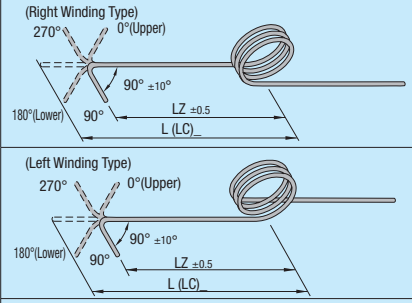
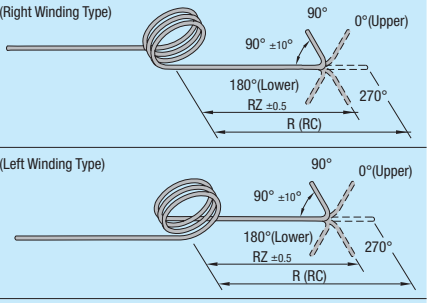
For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number - n - d - (LC / RC / LBC / RBC)

UA90R4 - 3 - 0.5 - LC12–RC15–LBC90–LZ5

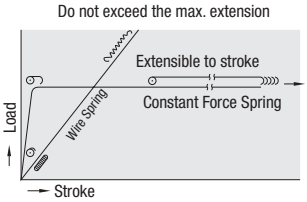
Days to Ship: - LC / RC 13 Days - LBC / RBC 15 Days

Alterations Code	Arm Cut LC	Arm Cut RC	Bend Left Arm LBC	Bend Right Arm RBC
Spec.				
	Cuts arm down to the length of LC or RC. LC≥3, RC≥3 1mm Increment Ordering Code LC12		• LBC…Specifies the angle (refer to the above drawing) Select from LBC0, LBC90, LBC180 and LBC270. • LZ……Specifies the position (1mm increment) LZ≥3L-LZ≥3 Ordering Code LBC90–LZ10	• RBC…Specifies the angle (refer to the above drawing) Select from RBC0, RBC90, RBC180 and RBC270. • RZ……Specifies the position (1mm increment) RZ≥3R-RZ≥3 Ordering Code RBC90–RZ10
Price Adder	0,50	0,50	1,50	1,50

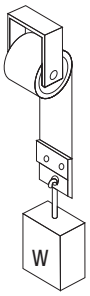
Constant Force Springs
-Overview-

Constant Force Spring:
- A long strip of material that is wound into a role. When the strip is extended the inherent stress resists the loading force at a constant rate.

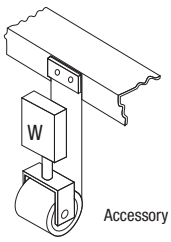
Features
- Once it reaches the maximum load the resistance is constant regardless of the stroke. (The drums reach the max.loads only after a half rotation.)
- Constant Force Springs are extremely compact compared to conventional wire springs because long stroke can be held in small drums.



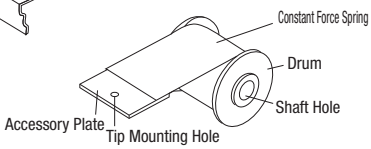
How to Use
1. Constant force spring is mounted to a drum and an accessory plate is attached to the end. The side on which a shaft goes through the drum is regarded as one end and the accessory plate side as the other end.
2. Mount with screws using mounting holes of the accessory plate.
3. Can be used in either way of fixing the body and pulling out the accessory plate (Fig.1) or fixing the accessory plate and pulling out the body (Fig.2).
4. Use more than one when the output isn't enough.



(Fig. 1)

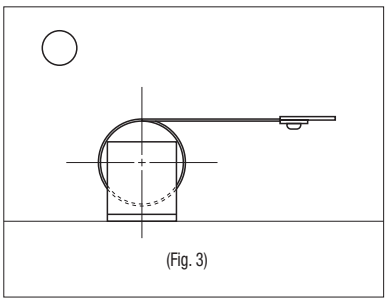


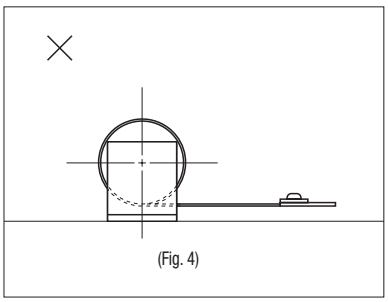
(Fig. 2)



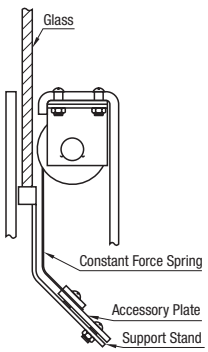
Cautions on Use
1. Springs are coiled around a drum without a stopper inside. Do not pull out the stroke beyond the specified length: the spring may come off of the drum.
2. If a suitable load constant force spring can not be found select a value one step higher and adjust using a counterweight on the mating load.
3. Although the strokes available are only three types 500mm 1000mm and 1500mm they can be used even with extra length if it's within the stroke range.
4. Durability is as shown in specification table. A set of extension and contraction is counted as one cycle. If durability expectancy is exceeded load capacity may decrease and cracks may appear partly on the spring surface.
   Continuous use under such condition is dangerous. If used in pairs both will reach the end of their service life at the same time. Please replace both of them at the same time.

Cautions on Installation
1. Make sure the spring doesn't contact other structures.
2. Spring draw direction should be perpendicular to the shaft axis.
3. Make sure a spring doesn't contact the accessory plate when retracting.
4. Set the spring so that it can be pulled out horizontally at any time in order to avoid deflection (bending).
5. If drum and shaft do not rotate smoothly the spring will deteriorate due to excessive force.
6. When using brackets orient in the position as shown in Fig. 3. Orienting in the position as shown in Fig. 4 may cause the spring to contact the brackets and allow foreign objects such as dust inside. This will deteriorate the spring.


(Fig. 3)


(Fig. 4)

Example Attachment Example to Glass Door



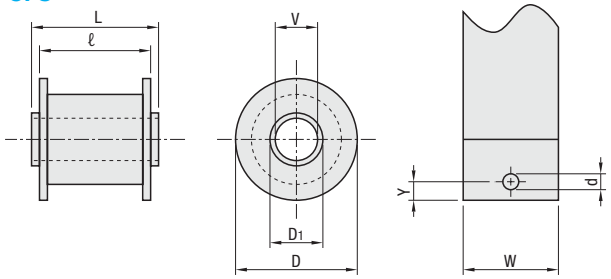
Constant Force Springs / Brackets for Constant Force Springs

CAD Data

Constant Force Springs RoHS

CFS





Material	
Main Body	Drum
1.4319/X3CrNiN17-8	Polypropylene

Material of the drums: CFS0.1 CFS0.2 and CFS5.2 are polyethylene CFS3.5 is ABS.

Part Number Type	Load (kgf)	Max. Stroke	Durability Times	Spring Plate Thickness	Accessory Plate Thickness	D	D1	V	ℓ	L	W	d	Y	€ Unit Price Qty. 1~19	Volume Discount 20~34	35~49	50~100
CFS	0.1	500	50000	0.1	1.0	26	8.2	5.2	17	18	10	3.2	5				
	0.2		35000	0.13													
	0.4	1,000	37,000			34	13	10.2	25.6	27.6	20	4.5	8				
	0.6		25,000	0.15													
	0.8	1,500	25,000			34	14		30.6	32.6	25						
	1.0	1,000	19,000	0.2		38			25.6	27.6	20						
	1.2	1,500	34,000			44			40.6	42.6	35						
	1.4	1,000	9,000			34	13		25.6	27.6	20						
	1.8	1,500	9,000			34	14		30.6	32.6	25						
	2.0	1,000	6,000	0.25		38			25.6	27.6	20						
	2.2		8,000	0.3		44											
	2.4		6,000	0.25		38			30.6	32.6	25						
	2.6		9,000	0.3		44											
	2.9		20,000		2.0	54	16		46	49	40	6.5					
	3.2		8,000		1.0	44	14		35.6	37.6	30	4.5					
	3.5		21,000		2.0	54	16		56	58	50	6.5					
	3.9		8,000		1.0	44	14		40.6	42.6	35	4.5					
	4.7		9,000		2.0		14		50.6	52.6	45	6.5					
	5.2	1,500	6,000	0.45	1.0	60	16		37	40	30	4.5					
	5.7	1,000	8,000	0.3	2.0	44	14		55.6	57.6	50	6.5					

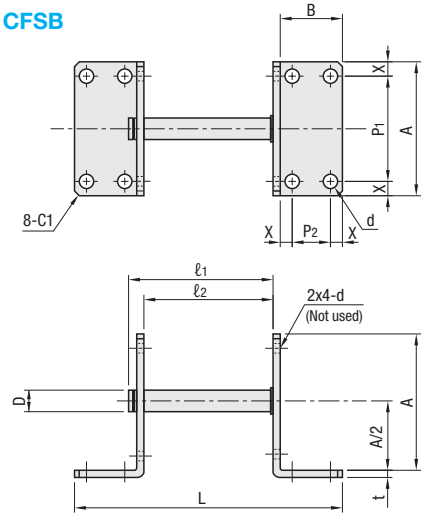
All load tolerances are from 0 to +15%.

For orders larger than indicated quantity please request a quotation.

Brackets for Constant Force Springs RoHS



CFSB



Material		Surface Treatment	A
Main Body	Shaft	Shaft	Accessory
1.4016	JIS SS41B	Nickel Plating	Retaining Ring-C Type (1.4301)

Material has been changed from 1.4301/X5CrNi18-10 to 1.4016/X6(8)Cr17 as of May 1 2009.

Part Number Type	No.	t	A	B	P1	P2	X	d	D	ℓ1	ℓ2	L	Applicable Constant Force Springs
CFSB	0.1	1.5	45	22.5	35	12.5	5	4.5	5	24.5	20.5	68.5	CFS0.1 CFS0.2
	0.4	2	55	27.5	43	15.5	6	5.5	10	34.9	30.4	89.4	CFS0.4 CFS0.6 CFS1.4
	0.8		55	27.5	43	15.5				39.9	35.4	94.4	CFS0.8 CFS1.8
	1.0		60	30	48	18				34.9	30.4	94.4	CFS1.0 CFS2.0
	1.2		65	32.5	53	20.5				49.9	45.4	114.4	CFS1.2 CFS3.9
	2.2		65	32.5	53	20.5				34.9	30.4	99.4	CFS2.2
	2.4		60	30	48	18				39.9	35.4	99.4	CFS2.4
	2.6		65	32.5	53	20.5				39.9	35.4	104.4	CFS2.6
	2.9		75	37.5	63	25.5				56.3	51.8	129.4	CFS2.9
	3.2		65	32.5	53	20.5				44.9	40.4	109.4	CFS3.2
	3.5		75	37.5	63	25.5				65.3	60.8	139.8	CFS3.5
	4.7		65	32.5	53	20.5				59.9	55.4	124.4	CFS4.7
	5.2	2.5	85	42.5	71	28.5	7	6.5		47.3	42.3	132.3	CFS5.2
	5.7	2	65	32.5	53	20.5	6	5.5		64.9	60.4	129.4	CFS5.7

Price

Part Number Type	No.	€ Unit Price Qty. 1~19	Volume Discount 20~34	35~49	50~100
CFSB	0.1				
	0.4				
	0.8				
	1.0				
	1.2				
	2.2				
	2.4				
	2.6				
	2.9				
	3.2				
	3.5				
	4.7				
	5.2				
	5.7				

For orders larger than indicated quantity please request a quotation.

Order Example

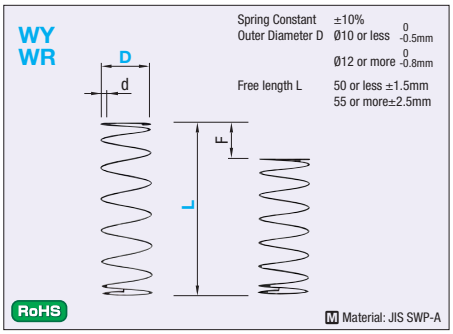
Part Number
CFS2.4
CFSB2.4

Days to Ship

6 Days P.87

Round Wire Springs

-WY · WR Outer Diameter Referenced-



Spring Constant ±10%
Outer Diameter D Ø10 or less 0 -0.5mm
Ø12 or more 0 -0.8mm
Free length L 50 or less ±1.5mm
55 or more±2.5mm

Material: JIS SWP-A

Spring Constant

(?)D12 and 14 for WY Type and D12,14 and 20 for WT Type are not available.

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				
3	N/mm 0.1 {kgf/mm} {0.01}				1.5 {0.15}	2.0 {0.2}		3.9{0.4}
4							2.9{0.3}	4.9{0.5}
5								
6		N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}			N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
8					N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}		
10	N/mm 0.2 {kgf/mm} {0.02}							
12							N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
13								
14								
16								
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}		29.4{3.0}
20							N/mm 14.7 {kgf/mm} {1.5}	
22								N/mm 29.4 {kgf/mm} {3.0}
27								
Fmax.	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%	F=Lx25%

Order Example — Part Number: WY13-60

Days to Ship: 6 Days P.87

Volume Discount

(?) (Round down to one Cent.) P.87

Quantity	1~19	20~99	100~500
Applicable Price	€ Unit Price	Volume Discount	
	Price List	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

WY: Fmax. (Allowable Deflection) = L x 75%

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.16	1.0	3.75	0.38{0.04}	WY3- 5	
0.2	2.0	7.5	0.75{0.08}	10	
0.23	3.6	11.2	1.12{0.11}	15	
0.23	3.6	15	1.5{0.15}	20	
0.25	5.5	18.7	1.87{0.19}	25	
0.26	6.5	22.5	2.25{0.23}	30	
0.2	1.1	3.75	0.38{0.04}	WY4- 5	
0.23	1.9	7.5	0.7{0.08}	10	
0.23	1.9	11.2	1.1{0.11}	15	
0.25	2.7	15	1.5{0.15}	20	
0.29	5	18.7	1.8{0.19}	25	
0.29	5	22.5	2.2{0.23}	30	
0.32	7.7	26.2	2.6{0.26}	35	
0.32	7.7	30	2.9{0.3}	40	
0.25	1.7	7.5	0.7{0.08}	WY5- 10	
0.25	1.7	11.2	1.1{0.11}	15	
0.3	3.2	15	1.5{0.15}	20	
0.3	3.2	18.7	1.8{0.19}	25	
0.35	6.3	22.5	2.2{0.23}	30	
0.35	6.3	26.2	2.6{0.26}	35	
0.38	9.2	30	2.9{0.3}	40	
0.38	9.2	33.7	3.3{0.34}	45	
0.38	9.2	37.5	3.7{0.38}	50	
0.3	2.1	7.5	0.75{0.08}	WY6- 10	
0.32	2.8	11.2	1.1{0.11}	15	
0.32	2.8	15	1.5{0.15}	20	
0.35	4.1	18.7	1.8{0.19}	25	
0.38	5.6	22.5	2.2{0.23}	30	
0.38	5.6	26.2	2.6{0.26}	35	
0.4	7.2	30	2.9{0.3}	40	
0.4	7.2	33.7	3.3{0.34}	45	
0.4	7.2	37.5	3.7{0.38}	50	
0.45	12.2	41.2	4.0{0.41}	55	
0.45	12.2	45	4.4{0.45}	60	
0.45	12.2	48.7	4.8{0.49}	65	
0.45	12.2	52.5	5.1{0.53}	70	
0.35	2.1	7.5	0.75{0.08}	WY8- 10	
0.38	3	11.2	1.1{0.11}	15	
0.4	3.5	15	1.5{0.15}	20	
0.4	3.5	18.7	1.8{0.19}	25	
0.45	5.7	22.5	2.2{0.23}	30	
0.45	5.7	26.2	2.6{0.26}	35	
0.45	5.7	30	2.9{0.3}	40	
0.45	5.7	33.7	3.3{0.34}	45	
0.5	9	37.5	3.7{0.38}	50	
0.5	9	41.2	4.0{0.41}	55	
0.5	9	45	4.4{0.45}	60	
0.5	9	48.7	4.8{0.49}	65	
0.5	9	52.5	5.1{0.53}	70	
0.5	3	11.2	2.26{0.23}	WY10- 15	
0.55	4.6	15	2.9{0.3}	20	
0.55	4.6	18.7	3.7{0.37}	25	
0.6	6.6	22.5	4.4{0.45}	30	
0.6	6.6	26.2	5.1{0.52}	35	
0.65	9.1	30	5.9{0.6}	40	
0.65	9.1	33.7	6.6{0.67}	45	
0.65	9.1	37.5	7.4{0.75}	50	
0.7	12.6	41.2	8.1{0.82}	55	
0.7	12.6	45	8.8{0.9}	60	
0.7	12.6	48.7	9.6{0.97}	65	
0.7	12.6	52.5	10.3{1.05}	70	
0.6	3.9	15	2.9{0.3}	20	
0.65	5.1	18.7	3.7{0.37}	25	
0.65	5.1	22.5	4.4{0.45}	WY13- 30	
0.7	6.7	26.2	5.1{0.52}	35	
0.75	8.7	30	5.9{0.6}	40	
0.75	8.7	33.7	6.6{0.67}	45	
0.8	11.6	37.5	7.4{0.75}	50	
0.8	11.6	41.2	8.1{0.82}	55	
0.8	11.6	45	8.8{0.9}	60	
0.85	15.3	48.7	9.6{0.97}	65	
0.85	15.3	52.5	10.3{1.05}	70	
0.65	3.6	15	2.9{0.3}	20	
0.7	4.6	18.7	3.7{0.37}	25	
0.75	5.7	22.5	4.4{0.45}	WY16- 30	
0.8	7	26.2	5.1{0.52}	35	
0.85	9	30	5.9{0.6}	40	
0.85	9	33.7	6.6{0.67}	45	
0.9	11.3	37.5	7.4{0.75}	50	
0.9	11.3	41.2	8.1{0.82}	55	
0.9	11.3	45	8.8{0.9}	60	
0.9	11.3	48.7	9.6{0.97}	65	
0.9	11.3	52.5	10.3{1.05}	70	

- Load Calculation Method: Load = Spring Constant x Deflection
(Int'l Unit)N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

(?)Both ends of WY Type springs are not ground.
(?)The values of solid length are for reference only.
There may be some variations depending on the lot.
(?)Operation frequency: One million times
(?)Product Overview P.307
(?)How to use coil springs and precautions P.308

WR: Fmax. (Allowable Deflection) = L x 60%

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.23	1.8	3	0.9{0.09}	WR3- 5	
0.25	2.3	6	1.8{0.18}	10	
0.3	4.8	9	2.6{0.27}	15	
0.3	4.8	12	3.5{0.36}	20	
0.32	6.8	15	4.4{0.45}	25	
0.32	6.8	18	5.3{0.54}	30	
0.35	11.5	21	6.2{0.63}	35	
0.35	11.5	24	7.1{0.72}	40	
0.26	1.6	3	0.9{0.09}	WR4- 5	
0.29	2.2	6	1.8{0.18}	10	
0.32	3.2	9	2.6{0.27}	15	
0.38	6.5	12	3.5{0.36}	20	
0.38	6.5	15	4.4{0.45}	25	
0.4	8.4	18	5.3{0.54}	30	
0.4	8.4	21	6.2{0.63}	35	
0.45	15	24	7.1{0.72}	40	
0.45	15	27	7.9{0.81}	45	
0.45	15	30	8.8{0.9 }	50	
0.45	15	33	9.7{0.99}	55	
0.5	23.5	36	10.6{1.08}	60	
0.5	25	39	11.5{1.17}	65	
0.5	25	42	12.4{1.26}	70	
0.3	1.6	3	0.9{0.09}	WR5- 5	
0.35	1.6	6	1.8{0.18}	10	
0.35	2.8	9	2.6{0.27}	15	
0.4	4.8	12	3.5{0.36}	20	
0.45	8	15	4.4{0.45}	25	
0.45	8	18	5.3{0.54}	30	
0.5	12.5	21	6.2{0.63}	35	
0.5	12.5	24	7.1{0.72}	40	
0.55	17.6	27	7.9{0.81}	45	
0.55	18	30	8.8{0.9}	50	
0.55	20	33	9.7{0.99}	55	
0.55	20	36	10.6{1.08}	60	
0.55	20.9	39	11.5{1.2}	65	
0.55	20.9	42	12.4{1.3}	70	
0.32	1.6	3	0.9{0.09}	WR6- 5	
0.4	3.2	6	1.8{0.18}	10	
0.4	3.2	9	2.6{0.27}	15	
0.5	7.5	12	3.5{0.36}	20	
0.5	7.5	15	4.4{0.45}	25	
0.5	7.5	18	5.3{0.54}	30	
0.55	11.5	21	6.2{0.63}	35	
0.55	11.5	24	7.1{0.72}	40	
0.6	17.4	27	7.9{0.81}	45	
0.6	17.4	30	8.8{0.9}	50	
0.6	17.4	33	9.7{0.99}	55	
0.6	17.4	36	10.6{1.08}	60	
0.6	17.4	39	11.5{1.17}	65	
0.6	17.4	42	12.4{1.26}	70	
0.65	27.3	48	14.1{1.4}	80	
0.45	2.7	6	1.8{0.18}	WR8- 10	
0.5	4	9	2.6{0.27}	15	
0.5	4	12	3.5{0.36}	20	
0.55	5.8	15	4.4{0.45}	25	
0.6	8.4	18	5.3{0.54}	30	
0.6	8.4	21	6.2{0.63}	35	
0.6	8.4	24	7.1{0.72}	40	
0.7	16	27	7.9{0.81}	45	
0.7	16	30	8.8{0.9}	50	
0.7	16	33	9.7{0.99}	55	
0.7	16	36	10.6{1.08}	60	
0.7	16	39	11.5{1.17}	65	
0.7	16	42	12.4{1.26}	70	
0.75	22.9	48	14.1{1.4}	80	

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.55	3.6	6	1.8{0.18}	WR10- 10	
0.6	4.8	9	2.6{0.27}	15	
0.65	6.5	12	3.5{0.36}	20	
0.65	6.5	15	4.4{0.45}	25	
0.7	8.8	18	5.3{0.54}	30	
0.7	8.8	21	6.2{0.63}	35	
0.7	8.8	24	7.1{0.72}	40	
0.8	16	27	7.9{0.81}	45	
0.8	16	30	8.8{0.9}	50	
0.8	16	33	9.7{0.99}	55	
0.85	21	36	10.6{1.08}	60	
0.85	21	39	11.5{1.17}	65	
0.85	21	42	12.4{1.26}	70	
0.9	28.8	48	14.1{1.4}	80	
0.6	3.6	6	1.8{0.18}	WR12- 10	
0.65	4.6	9	2.6{0.27}	15	
0.65	4.6	12	3.5{0.36}	20	
0.7	6	15	4.4{0.45}	25	
0.7	6	18	5.3{0.54}	30	
0.7	6	21	6.2{0.63}	35	
0.8	10.4	24	7.1{0.72}	40	
0.8	10.4	27	7.9{0.81}	45	
0.9	17.1	30	8.8{0.9}	50	
0.9	17.1	33	9.7{0.99}	55	
0.9	17.1	36	10.6{1.08}	60	
0.9	17.1	39	11.5{1.17}	65	
0.9	17.1	42	12.4{1.26}	70	
1.0	28	48	14.1{1.4}	80	
0.6	3.2	6	1.8{0.18}	WR13- 10	
0.7	4.9	9	2.6{0.27}	15	
0.7	4.9	12	3.5{0.36}	20	
0.8	8.4	15	4.4{0.45}	25	
0.8	8.4	18	5.3{0.54}	30	
0.8	8.4	21	6.2{0.63}	35	
0.9	13.5	24	7.1{0.72}	40	
0.9	13.5	27	7.9{0.81}	45	
0.9	13.5	30	8.8{0.9}	50	
0.9	13.5	33	9.7{0.99}	55	
1.0	22	36	10.6{1.08}	60	
1.0	22	39	11.5{1.17}	65	
1.0	22	42	12.4{1.26}	70	
1.0	22	48	14.1{1.4}	80	
1.0	22	54	15.9{1.62}	90	
0.7	4.6	9	2.6{0.27}	WR14- 15	
0.75	5.6	12	3.5{0.36}	20	
0.8	7.2	15	4.4{0.45}	25	
0.8	7.2	18	5.3{0.54}	30	
0.8	7.2	21	6.2{0.63}	35	
0.9	11.3	24	7.1{0.72}	40	
0.9	11.3	27	7.9{0.81}	45	
0.9	11.3	30	8.8{0.9}	50	
1.0	18	33	9.7{0.99}	55	
1.0	18	36	10.6{1.08}	60	
1.0	18	39	11.5{1.17}	65	
1.0	18	42	12.4{1.26}	70	
1.1	28.6	48	14.1{1.4}	80	
1.1	28.6	54	15.9{1.62}	90	

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.75	4.5	9	2.6{0.27}	WR16- 15	
0.8	5.6	12	3.5{0.36}	20	
0.9	8	15	4.4{0.45}	25	
0.9	8	18	5.3{0.54}	30	
0.9	8	21	6.2{0.63}	35	
1.0	13	24	7.1{0.72}	40	
1.0	13	27	7.9{0.81}	45	
1.0	13	30	8.8{0.9}	50	
1.0	13	33	9.7{0.99}	55	
1.1	20	36	10.6{1.08}	60	
1.1	20	39	11.5{1.17}	65	
1.1	20	42	12.4{1.26}	70	
1.1	20	48	14.1{1.4}	80	
1.2	28.8	54	15.9{1.62}	90	
1.0	7	12	5.8{0.6}	WR18- 20	
1.0	7	15	7.4{0.75}	25	
1.1	9.9	18	8.8{0.9}	30	
1.1	9.9	21	10.3{1.05}	35	
1.2	14.4	24	11.8{1.2}	40	
1.2	14.4	27	13.2{1.35}	45	
1.2	14.4	30	14.7{1.5}	50	
1.3	19.5	33	16.2{1.65}	55	
1.3	19.5	36	17.7{1.8}	60	
1.3	19.5	39	19.1{1.95}	65	
1.3	19.5	42	20.6{2.1}	70	
1.4	27.3	48	23.5{2.4}	80	
1.0	6	12	5.8{0.6}	WR20- 20	
1.1	8.3	15	7.4{0.75}	25	
1.1	8.3	18	8.8{0.9}	30	
1.2	10.8	21	10.3{1.05}	35	
1.2	10.8	24	11.8{1.2}	40	
1.2	10.8	27	13.2{1.35}	45	
1.3	15	30	14.7{1.5}	50	
1.3	15	33	16.2{1.65}	55	
1.3	15	36	17.7{1.8}	60	
1.3	15	39	19.1{1.95}	65	
1.4	21	42	20.6{2.1}	70	
1.4	21	48	23.5{2.4}	80	
1.1	6.9	12	5.9{0.6}	WR22- 20	
1.2	9	15	7.4{0.75}	25	
1.2	9	18	8.8{0.9}	30	
1.3	12.4	21	10.3{1.05}	35	
1.3	12.4	24	11.8{1.2}	40	
1.3	12.4	27	13.2{1.35}	45	
1.4	16.1	30	14.7{1.5}	50	
1.4	16.1	33	16.2{1.65}	55	
1.4	16.1	36	17.7{1.8}	60	
1.5	22.5	39	19.1{1.95}	65	
1.5	22.5	42	20.6{2.1}	70	
1.5	22.5	48	23.5{2.4}	80	
1.3	8.5	18	8.8{0.9}	WR27- 30	
1.4	10.5	21	10.3{1.05}	35	
1.4	10.5	24	11.8{1.2}	40	
1.4	10.5	27	13.2{1.35}	45	
1.6	17.6	30	14.7{1.5}	50	
1.6	17.6	33	16.2{1.65}	55	
1.6	17.6	36	17.7{1.8}	60	
1.7	22.1	39	19.1{1.95}	65	
1.7	22.1	42	20.6{2.1}	70	
1.7	22.1	48	23.5{2.4}	80	

- Load Calculation Method: Load = Spring Constant x Deflection
  (Int'l Unit)N=N/mmxFmm
  kgf=kgf/mmxFmm
  (kgf=Nx0.101972)

Both ends of WR Type springs are not ground.
The values of solid length are for reference only. There may be some variations depending on the lot.
Operation frequency: One million times
Product Overview P.307
How to use coil springs and precautions P.308

Round Wire Springs

-WF / WL Outer Diameter Referenced-

CAD Data

Order Example | Part Number: WF13-60 | Days to Ship: 6 Days P.87

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~99	100~500
Applicable Price	€ Unit Price	Volume Discount	
	Price List	5%	10%

For orders larger than indicated quantity, please request a quotation.

WF: Fmax. (Allowable Deflection) = L x 45%

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.26	2	2.25	1.1{0.11}	WF3- 5*	
0.32	5	4.5	2.2{0.22}	10*	
0.32	5	6.7	3.2{0.33}	15*	
0.35	7	9	4.4{0.45}	20*	
0.35	7	11.2	5.5{0.56}	25*	
0.4	13.2	13.5	6.6{0.67}	30	
0.4	13.2	15.7	7.6{0.78}	35	
0.4	13.2	18	8.8{0.9}	40	
0.32	2.3	2.25	1.1{0.11}	WF4- 5*	
0.35	3.1	4.5	2.2{0.22}	10*	
0.4	5.6	6.7	3.2{0.33}	15*	
0.4	5.6	9	4.4{0.45}	20*	
0.45	9.9	11.2	5.5{0.56}	25*	
0.45	9.9	13.5	6.6{0.67}	30*	
0.5	16.5	15.7	7.6{0.78}	35	
0.5	16.5	18	8.8{0.9}	40	
0.5	16.5	20	9.8{1.0}	45	
0.5	16.5	22.5	10.8{1.1}	50	
0.5	16.5	24.7	12.1{1.23}	55	
0.5	16.5	27	12.7{1.3}	60	
0.55	26.4	29.2	14.3{1.46}	65*	
0.55	26.4	31.5	15.4{1.58}	70*	
0.35	2	2.25	1.1{0.11}	WF5- 5*	
0.38	2.8	4.5	2.2{0.22}	10*	
0.4	3.4	6.7	3.2{0.33}	15*	
0.45	5.4	9	4.4{0.45}	20*	
0.5	8.5	11.2	5.5{0.56}	25*	
0.55	13.2	13.5	6.6{0.67}	30	
0.55	13.2	15.7	7.6{0.78}	35	
0.55	20.4	18	8.8{0.9}	40	
0.6	20.4	20	9.8{1.0}	45	
0.6	20.4	22.5	10.8{1.1}	50	
0.6	20.4	24.7	12.1{1.23}	55	
0.6	20.4	27	12.7{1.3}	60	
0.6	20.4	29.2	14.3{1.5}	65	
0.6	20.4	31.5	15.4{1.6}	70	
0.4	2.3	2.25	1.1{0.11}	WF6- 5*	
0.5	5	4.5	2.2{0.22}	10	
0.55	8	6.7	3.2{0.33}	15	
0.55	8	9	4.4{0.45}	20	
0.6	12	11.2	5.5{0.56}	25	
0.65	16	13.5	6.6{0.67}	30	
0.65	17	15.7	7.6{0.78}	35	
0.65	17	18	8.8{0.9}	40	
0.65	17	20	9.8{1.0}	45	
0.7	25.2	22.5	10.8{1.1}	50	
0.7	25.2	24.7	12.1{1.23}	55	
0.7	25.2	27	12.7{1.3}	60	
0.7	25.2	29.2	14.3{1.46}	65	
0.7	25.2	31.5	14.7{1.5}	70	
0.7	25.2	36	17.7{1.8}	80	
0.6	5	4.5	2.2{0.22}	WF8-10	
0.65	7.5	6.7	3.2{0.33}	15	
0.7	10.8	9	4.4{0.45}	20	
0.7	10.8	11.2	5.5{0.56}	25	
0.75	14.5	13.5	6.6{0.67}	30	
0.75	14.5	15.7	7.6{0.78}	35	
0.8	20	18	8.8{0.9}	40	
0.8	20	20	9.8{1.0}	45	
0.8	20	22.5	10.8{1.1}	50	
0.8	20	24.7	12.1{1.23}	55	
0.85	27.6	27	12.7{1.3}	60	
0.85	27.6	29.2	14.3{1.46}	65	
0.85	27.6	31.5	14.7{1.5}	70	
0.85	28.1	36	17.7{1.8}	80	

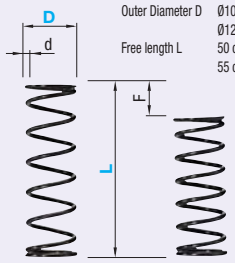
d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.65	5	4.5	2.2{0.22}	WF10- 10	
0.65	5	6.7	3.2{0.33}	15	
0.8	10.4	9	4.4{0.45}	20	
0.8	10.4	11.2	5.5{0.56}	25	
0.85	14	13.5	6.6{0.67}	30	
0.85	14	15.7	7.6{0.78}	35	
0.9	17.5	18	8.8{0.9}	40	
0.9	17.5	20	9.8{1.0}	45	
0.9	17.5	22.5	10.8{1.1}	50	
0.9	17.5	24.7	12.1{1.23}	55	
1.0	31	27	12.7{1.3}	60	
1.0	31	29.2	14.3{1.46}	65	
1.0	31	31.5	14.7{1.5}	70	
1.0	31	36	17.7{1.8}	80	
0.7	4.6	4.5	2.3{0.23}	WF12- 10	
0.7	4.6	6.7	3.2{0.33}	15	
0.8	7.2	9	4.4{0.45}	20	
0.8	7.2	11.2	5.5{0.56}	25	
0.9	11.3	13.5	6.6{0.67}	30	
0.9	11.3	15.7	7.6{0.78}	35	
0.9	11.3	18	8.8{0.9}	40	
0.9	11.3	20	9.8{1.0}	45	
1.0	18	22.5	10.8{1.1}	50	
1.0	18	24.7	12.1{1.23}	55	
1.0	18	27	12.7{1.3}	60	
1.0	18	29.2	14.3{1.46}	65	
1.1	28.1	31.5	14.7{1.5}	70	
1.1	27.5	36	17.7{1.8}	80	
0.75	4.9	4.5	2.3{0.23}	WF13- 10	
0.8	6	6.7	3.2{0.33}	15	
0.8	6	9	4.4{0.45}	20	
0.85	7.2	11.2	5.5{0.56}	25	
1.0	15	13.5	6.6{0.67}	30	
1.0	15	15.7	7.6{0.78}	35	
1.0	15	18	8.8{0.9}	40	
1.0	15	20	9.8{1.0}	45	
1.0	15	22.5	10.8{1.1}	50	
1.1	22	24.7	12.1{1.23}	55	
1.1	22	27	12.7{1.3}	60	
1.1	22	29.2	14.3{1.46}	65	
1.1	22	31.5	14.7{1.5}	70	
1.1	22	36	17.7{1.8}	80	
1.2	33.6	40.5	19.9{2.0}	90	
0.8	5.2	6.7	3.2{0.33}	WF14- 15	
0.9	7.9	9	4.4{0.45}	20	
0.9	7.9	11.2	5.5{0.56}	25	
1.0	12	13.5	6.6{0.67}	30	
1.0	12	15.7	7.6{0.78}	35	
1.0	12	18	8.8{0.9}	40	
1.0	12	20	9.8{1.0}	45	
1.1	18.2	22.5	10.8{1.1}	50	
1.1	18.2	24.7	12.1{1.23}	55	
1.1	18.2	27	12.7{1.3}	60	
1.2	27.6	29.2	14.3{1.46}	65	
1.2	27.6	31.5	14.7{1.5}	70	
1.2	27.6	36	17.7{1.8}	80	
1.3	39.7	40.5	19.9{2.0}	90	

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.9	6.3	6.7	3.2{0.33}	WF16- 15	
1.0	8.7	9	4.4{0.45}	20	
1.0	8.7	11.2	5.5{0.56}	25	
1.1	12.8	13.5	6.6{0.67}	30	
1.1	12.8	15.7	7.6{0.78}	35	
1.2	18.6	18	8.8{0.9}	40	
1.2	18.6	20	9.8{1.0}	45	
1.2	18.6	22.5	10.8{1.1}	50	
1.2	18.6	24.7	12.1{1.23}	55	
1.3	26.8	27	12.7{1.3}	60	
1.3	26.8	29.2	14.3{1.46}	65	
1.3	26.8	31.5	14.7{1.5}	70	
1.4	36	36	17.7{1.8}	80	
1.4	36.4	40.5	19.9{2.0}	90	
1.2	9	9	8.8{0.9}	WF18- 20	
1.3	12.4	11.2	10.8{1.1}	25	
1.3	12.4	13.5	12.7{1.3}	30	
1.4	16.1	15.7	14.7{1.5}	35	
1.5	21	18	17.7{1.8}	40	
1.5	21	20	19.9{2.03}	45	
1.5	21	22.5	22.1{2.25}	50	
1.6	28.8	24.7	24.3{2.48}	55	
1.6	28.8	27	26.5{2.7}	60	
1.6	28.8	29.2	28.7{2.93}	65	
1.7	37.4	31.5	30.9{3.15}	70	
1.7	37.4	36	35.3{3.6}	80	
1.2	7.2	9	8.8{0.9}	WF20- 20	
1.3	9.8	11.2	10.8{1.1}	25	
1.4	12.6	13.5	12.7{1.3}	30	
1.4	12.6	15.7	14.7{1.5}	35	
1.5	16.5	18	17.7{1.8}	40	
1.5	16.5	20	19.9{2.03}	45	
1.6	21.6	22.5	22.1{2.25}	50	
1.6	21.6	24.7	24.3{2.48}	55	
1.6	21.6	27	26.5{2.7}	60	
1.7	28.1	29.2	28.7{2.93}	65	
1.7	28.1	31.5	30.9{3.15}	70	
1.7	28.1	36	35.3{3.6}	80	
1.3	7.8	9	8.8{0.9}	WF22- 20	
1.4	10.5	11.2	11.0{1.12}	25	
1.4	10.5	13.5	13.2{1.35}	30	
1.5	13.5	15.7	15.4{1.57}	35	
1.5	13.5	18	17.7{1.8}	40	
1.7	22.1	20.2	19.8{2.02}	45	
1.7	22.1	22.5	22.1{2.25}	50	
1.7	22.1	24.7	24.2{2.47}	55	
1.8	28.8	27	26.5{2.7}	60	
1.8	28.8	29.2	28.6{2.92}	65	
1.8	28.8	31.5	30.9{3.15}	70	
1.8	28.8	36	35.3{3.6}	80	
1.7	14.1	13.5	13.2{1.35}	WF27- 30	
1.7	14.1	15.7	15.4{1.57}	35	
1.7	14.1	18	17.7{1.8}	40	
1.9	21.4	20.2	19.8{2.02}	45	
1.9	21.4	22.5	22.1{2.25}	50	
2.0	26	24.7	24.2{2.47}	55	
2.0	26	27	26.5{2.7}	60	
2.0	26	29.2	28.6{2.92}	65	
2.0	26	31.5	30.9{3.15}	70	
2.0	26	36	35.3{3.6}	80	

- Load Calculation Method: Load = Spring Constant x Deflection
  (Int'l Unit)N=N/mmxFmm
  kgf=kgf/mmxFmm
  (kgf=Nx0.101972)

Both ends of * marked WF Type springs are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times
Product Overview P.307
How to use coil springs and precautions P.308

WF
WL



Spring Constant ±10%
Outer Diameter D Ø10 or less $^{0}_{-0.5mm}$
Ø12 or more $^{0}_{-0.8mm}$
Free length L 50 or less ±1.5mm
55 or more±2.5mm

RoHS

Material: JIS SWP-A

Spring Constant

D12 and 14 for WY Type and D12,14 and 20 for WT Type are not available.

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				
3	N/mm 0.1 {kgf/mm} {0.01}	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5 {0.15}	2.0 {0.2}		3.9{0.4}
4							2.9{0.3}	4.9{0.5}
5					N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
6								
8								
10	N/mm 0.2 {kgf/mm} {0.02}							
12								
13							N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
14								
16								
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	29.4{3.0}
20								
22								N/mm 29.4 {kgf/mm} {3.0}
27								
Fmax.	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%	F=Lx25%

WL: Fmax. (Allowable Deflection) = L x 40%

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.2	1.7	2	0.98{0.1}	WL2- 5*	
0.26	5.2	4	2.0{0.2}	10*	
0.26	5.2	6	2.9{0.3}	15*	
0.29	9	8	3.9{0.4}	20*	
0.29	9	10	4.9{0.5}	25*	
0.3	10.8	12	5.9{0.6}	30*	
0.3	2.1	2	2.0{0.2}	WL3- 5*	
0.35	3.9	4	3.9{0.4}	10*	
0.4	6.5	6	5.9{0.6}	15*	
0.4	6.5	8	7.8{0.8}	20*	
0.45	13	10	9.8{1.0}	25*	
0.45	13	12	11.8{1.2}	30*	
0.45	13	14	13.7{1.4}	35*	
0.5	21	16	15.7{1.6}	40*	
0.35	2.1	2	2.0{0.2}	WL4- 5*	
0.45	5	4	3.9{0.4}	10*	
0.45	5	6	5.9{0.6}	15*	
0.5	9	8	7.8{0.8}	20	
0.5	9	10	9.8{1.0}	25	
0.55	13.9	12	11.8{1.2}	30	
0.55	13.9	14	13.7{1.4}	35	
0.6	21.6	16	15.7{1.6}	40	
0.6	21.6	18	17.7{1.8}	45	
0.6	21.6	20	19.6{2.0}	50	
0.6	21.6	22	21.6{2.2}	55	
0.65	33	24	23.5{2.4}	60	
0.4	2.3	2	2.0{0.2}	WL5- 5*	
0.45	3.4	4	3.9{0.4}	10*	
0.5	5	6	5.9{0.6}	15*	
0.55	7.7	8	7.8{0.8}	20	
0.6	10.8	10	9.8{1.0}	25	
0.6	10.8	12	11.8{1.2}	30	
0.65	15.6	14	13.7{1.4}	35	
0.65	15.6	16	15.7{1.6}	40	
0.7	20	18	17.7{1.8}	45	
0.7	20	20	19.6{2.0}	50	
0.7	23.1	22	21.6{2.2}	55	
0.75	33	24	23.5{2.4}	60	
0.75	32.3	26	25.5{2.6}	65	
0.75	32.3	28	27.5{2.8}	70	
0.45	2.5	2	2.0{0.2}	WL6- 5*	
0.55	4.7	4	3.9{0.4}	10	
0.55	4.7	6	5.9{0.6}	15	
0.65	9	8	7.8{0.8}	20	
0.65	9	10	9.8{1.0}	25	
0.7	13.7	12	11.8{1.2}	30	
0.7	13.7	14	13.7{1.4}	35	
0.7	13.7	16	15.7{1.6}	40	
0.75	18.9	18	17.7{1.8}	45	
0.75	18.9	20	19.6{2.0}	50	
0.75	18.9	22	21.6{2.2}	55	
0.8	26.4	24	23.5{2.4}	60	
0.8	26.4	26	25.5{2.6}	65	
0.85	30.6	28	27.5{2.8}	70	
0.85	34.9	32	31.4{3.2}	80	
0.65	4.7	4	3.9{0.4}	WL8- 10	
0.75	8.5	6	5.9{0.6}	15	
0.75	8.5	8	7.8{0.8}	20	
0.75	8.5	10	9.8{1.0}	25	
0.8	11.2	12	11.8{1.2}	30	
0.8	11.2	14	13.7{1.4}	35	
0.8	11.2	16	15.7{1.6}	40	
0.85	15.3	18	17.7{1.8}	45	
0.85	15.3	20	19.6{2.0}	50	
0.85	15.3	22	21.6{2.2}	55	
0.9	19.4	24	23.5{2.4}	60	
0.9	19.4	26	25.5{2.6}	65	
1.0	31	28	27.5{2.8}	70	
1.0	31	32	31.4{3.2}	80	
0.75	5.3	4	3.9{0.4}	WL10- 10	
0.8	6.4	6	5.9{0.6}	15	
0.8	6.4	8	7.8{0.8}	20	
0.9	10.8	10	9.8{1.0}	25	
0.9	10.8	12	11.8{1.2}	30	
0.9	10.8	14	13.7{1.4}	35	
0.9	10.8	16	15.7{1.6}	40	
1.0	17	18	17.7{1.8}	45	
1.0	17	20	19.6{2.0}	50	
1.0	17	22	21.6{2.2}	55	
1.0	17	24	23.5{2.4}	60	
1.1	24	26	25.5{2.6}	65	
1.1	24	28	27.5{2.8}	70	
1.1	24.2	32	31.4{3.2}	80	
0.8	4.8	4	4.0{0.4}	WL12- 10	
0.9	7.2	6	5.9{0.6}	15	
0.9	7.2	8	7.8{0.8}	20	
0.9	7.2	10	9.8{1.0}	25	
1.0	10.5	12	11.8{1.2}	30	
1.0	10.5	14	13.7{1.4}	35	
1.0	10.5	16	15.7{1.6}	40	
1.1	15.4	18	17.7{1.8}	45	
1.1	15.4	20	19.6{2.0}	50	
1.1	15.4	22	21.6{2.2}	55	
1.2	22.8	24	23.5{2.4}	60	
1.2	22.8	26	25.5{2.6}	65	
1.2	22.8	28	27.5{2.8}	70	
1.3	34.5	32	31.4{3.2}	80	
0.85	5.1	4	4.0{0.4}	WL13- 10	
0.9	6.3	6	5.9{0.6}	15	
1.0	8.7	8	7.8{0.8}	20	
1.0	8.7	10	9.8{1.0}	25	
1.1	13.2	12	11.8{1.2}	30	
1.1	13.2	14	13.7{1.4}	35	
1.1	13.2	16	15.7{1.6}	40	
1.1	13.2	18	17.7{1.8}	45	
1.1	13.2	20	19.6{2.0}	50	
1.1	13.2	22	21.6{2.2}	55	
1.1	13.2	24	23.5{2.4}	60	
1.2	18.6	26	25.5{2.6}	65	
1.2	18.6	28	27.5{2.8}	70	
1.4	37.8	32	31.4{3.2}	80	
1.4	37.8	36	35.3{3.6}	90	
1.0	7.5	6	5.9{0.6}	WL14- 15	
1.0	7.5	8	7.8{0.8}	20	
1.0	7.5	10	9.8{1.0}	25	
1.1	11	12	11.8{1.2}	30	
1.1	11	14	13.7{1.4}	35	
1.1	11	16	15.7{1.6}	40	
1.2	15.6	18	17.7{1.8}	45	
1.2	15.6	20	19.6{2.0}	50	
1.2	15.6	22	21.6{2.2}	55	
1.2	15.6	24	23.5{2.4}	60	
1.3	22.1	26	25.5{2.6}	65	
1.3	22.1	28	27.5{2.8}	70	
1.3	22.1	32	31.4{3.2}	80	
1.5	43.5	36	35.3{3.6}	90	
1.1	8.2	6	5.9{0.6}	WL16- 15	
1.1	8.2	8	7.8{0.8}	20	
1.2	10	10	9.8{1.0}	25	
1.2	10	12	11.8{1.2}	30	
1.2	10	14	13.7{1.4}	35	
1.2	10	16	15.7{1.6}	40	
1.4	21	18	17.7{1.8}	45	
1.4	21	20	19.6{2.0}	50	
1.4	21	22	21.6{2.2}	55	
1.4	21	24	23.5{2.4}	60	
1.5	29.7	26	25.5{2.6}	65	
1.5	29.7	28	27.5{2.8}	70	
1.5	29.7	32	31.4{3.2}	80	
1.6	40	36	35.3{3.6}	90	
1.5	10	8	23.5{2.4}	WL18- 20	
1.6	12	10	29.4{3.0}	25	
1.6	12	12	35.3{3.6}	30	
1.7	16.2	14	41.2{4.2}	35	
1.7	16.2	16	47.1{4.8}	40	
1.8	19.8	18	53.0{5.4}	45	
1.8	19.8	20	58.8{6.0}	50	
1.8	19.8	22	64.7{6.6}	55	
1.8	19.8	24	70.6{7.2}	60	
2.0	32	26	76.5{7.8}	65	
2.0	32	28	82.4{8.4}	70	
2.0	32	32	94.1{9.6}	80	
2.2	43	36	105.9{10.8}	90	
2.2	43	40	117.7{12.0}	100	
1.6	10.4	8	23.5{2.4}	WL20- 20	
1.6	10.4	10	29.4{3.0}	25	
1.7	12.8	12	35.3{3.6}	30	
1.7	12.8	14	41.2{4.2}	35	
1.8	15.8	16	47.1{4.8}	40	
1.8	15.8	18	53.0{5.4}	45	
1.8	15.8	20	58.8{6.0}	50	
1.8	15.8	22	64.7{6.6}	55	
2.0	24	24	70.6{7.2}	60	
2.0	24	26	76.5{7.8}	65	
2.0	24	28	82.4{8.4}	70	
2.2	37.4	32	94.1{9.6}	80	
2.2	37.4	36	105.9{10.8}	90	
2.2	37.4	40	117.7{12.0}	100	
1.7	10.8	8	23.5{2.4}	WL22- 20	
1.8	13.3	10	29.4{3.0}	25	
1.8	13.3	12	35.3{3.6}	30	
1.8	13.3	14	41.2{4.2}	35	
2.0	20	16	47.1{4.8}	40	
2.0	20	18	53.0{5.4}	45	
2.0	20	20	58.8{6.0}	50	
2.0	20	22	64.7{6.6}	55	
2.2	28.6	24	70.6{7.2}	60	
2.2	28.6	26	76.5{7.8}	65	
2.2	28.6	28	82.4{8.4}	70	
2.2	28.6	32	94.1{9.6}	80	
2.3	34.5	36	105.9{10.8}	90	
2.3	34.5	40	117.7{12.0}	100	
2.1	14	12	35.3{3.6}	WL27- 30	
2.1	14	14	41.2{4.2}	35	
2.3	19	16	47.1{4.8}	40	
2.3	19	18	53.0{5.4}	45	
2.3	19	20	58.8{6.0}	50	
2.3	19	22	64.7{6.6}	55	
2.5	28	24	70.6{7.2}	60	
2.5	28	26	76.5{7.8}	65	
2.6	34.5	28	82.4{8.4}	70	
2.6	34.5	32	94.1{9.6}	80	
2.8	46.7	36	105.9{10.8}	90	
2.8	46.7	40	117.7{12.0}	100	

- Load Calculation Method: Load = Spring Constant x Deflection
(Int'l Unit)N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

Both ends of * marked WL Type springs are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times
Product Overview P.307
How to use coil springs and precautions P.308

Round Wire Springs

-WT · WM Outer Diameter Referenced-

CAD Data

Order Example **Part Number** WT13-60

Days to Ship **6 Days** P.87

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~99	100~500
Applicable Price	€ Unit Price	Volume Discount	
	Price List	5%	10%

For orders larger than indicated quantity, please request a quotation.

WT: Fmax. (Allowable Deflection) = L x 40% (L x 35%)

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.3	1.73	2	2.9{0.3}	WT3- 5*	
0.4	5	4	5.9{0.6}	10*	
0.45	8.78	6	8.8{0.9}	15*	
0.45	8.78	8	11.8{1.2}	20*	
0.5	14.5	10	14.7{1.5}	25*	
0.4	2.7	2	2.9{0.3}	WT4- 5*	
0.4	2.7	4	5.9{0.6}	10*	
0.5	6.5	6	8.8{0.9}	15*	
0.55	9.63	8	11.8{1.2}	20	
0.55	9.63	10	14.7{1.5}	25	
0.6	15	12	17.7{1.8}	30	
0.6	15	14	20.6{2.1}	35	
0.65	22.1	16	23.5{2.4}	40	
0.45	2.36	2	3.9{0.4}	WT5- 5*	
0.5	3.25	4	7.8{0.8}	10*	
0.6	6.3	6	11.8{1.2}	15	
0.6	6.3	8	15.7{1.6}	20	
0.7	12.6	10	19.6{2.0}	25	
0.7	12.6	12	23.5{2.4}	30	
0.75	17.3	14	27.5{2.8}	35	
0.75	17.3	14	27.5{2.8}	(40)	
0.8	24	15.8	30.9{3.2}	(45)	
0.8	24	17.5	34.3{3.5}	(50)	
0.85	32.3	19.3	37.8{3.9}	(55)	
0.85	32.3	21	41.2{4.2}	(60)	
0.85	34	22.7	44.5{4.5}	(65)	
0.9	44.6	24.5	48.1{4.9}	(70)	
0.5	2.38	2	3.9{0.4}	WT6- 5*	
0.6	4.35	4	7.8{0.8}	10	
0.6	4.35	6	11.8{1.2}	15	
0.7	7.7	8	15.7{1.6}	20	
0.7	7.7	10	19.6{2.0}	25	
0.8	14	12	23.5{2.4}	30	
0.8	14	14	27.5{2.8}	35	
0.85	18.7	16	31.4{3.2}	40	
0.85	18.7	18	35.3{3.6}	45	
0.9	24.8	20	39.2{4.0}	50	
0.9	24.8	19	37.8{3.9}	(55)	
0.9	24.8	21	41.2{4.2}	(60)	
0.9	26.1	22.7	44.5{4.5}	(65)	
1	43	24.5	48.1{4.9}	(70)	
1	43	28	54.9{5.6}	(80)	
0.7	4.38	4	7.8{0.8}	WT8-10	
0.8	6.8	6	11.8{1.2}	15	
0.8	6.8	8	15.7{1.6}	20	
0.8	6.8	10	19.6{2.0}	25	
0.9	10.8	12	23.5{2.4}	30	
0.9	10.8	14	27.5{2.8}	35	
1	17.5	16	31.4{3.2}	40	
1	17.5	18	35.3{3.6}	45	
1	17.5	20	39.2{4.0}	50	
1.1	27.5	22	43.1{4.4}	55	
1.1	27.5	24	47.1{4.8}	60	
1.1	27.5	26	51.0{5.2}	65	
1.1	27.5	28	54.9{5.6}	70	
1.2	42	32	62.8{6.4}	80	
0.85	5.53	4	7.8{0.8}	WT10-10	
0.9	6.75	6	11.8{1.2}	15	
0.9	6.75	8	15.7{1.6}	20	
1	10	10	19.6{2.0}	25	
1	10	12	23.5{2.4}	30	
1	10	14	27.5{2.8}	35	
1	10	16	31.4{3.2}	40	
1.1	14.3	18	35.3{3.6}	45	
1.1	14.3	20	39.2{4.0}	50	
1.2	21.6	22	43.1{4.4}	55	
1.2	21.6	24	47.1{4.8}	60	
1.2	21.6	26	51.0{5.2}	65	
1.3	32.5	28	54.9{5.6}	70	
1.3	32.5	32	62.8{6.4}	80	
1	6	6	11.8{1.2}	WT13-15	
1.1	8.25	8	15.7{1.6}	20	
1.1	8.25	10	19.6{2.0}	25	
1.2	11.1	12	23.5{2.4}	30	
1.2	11.1	14	27.5{2.8}	35	
1.2	11.1	16	31.4{3.2}	40	
1.2	11.1	18	35.3{3.6}	45	
1.3	15.6	20	39.2{4.0}	50	
1.3	15.6	22	43.1{4.4}	55	
1.3	15.6	24	47.1{4.8}	60	
1.4	21	26	51.0{5.2}	65	
1.4	21	28	54.9{5.6}	70	
1.4	21	32	62.8{6.4}	80	
1.2	7.5	6	11.8{1.2}	WT16-15	
1.3	9.43	8	15.7{1.6}	20	
1.4	12.6	10	19.6{2.0}	25	
1.4	12.6	12	23.5{2.4}	30	
1.4	12.6	14	27.5{2.8}	35	
1.4	12.6	16	31.4{3.2}	40	
1.6	22.4	18	35.3{3.6}	45	
1.6	22.4	20	39.2{4.0}	50	
1.6	22.4	22	43.1{4.4}	55	
1.7	28.9	24	47.1{4.8}	60	
1.7	28.9	26	51.0{5.2}	65	
1.7	28.9	28	54.9{5.6}	70	
1.7	28.9	32	62.8{6.4}	80	
1.6	10.8	8	31.4{3.2}	WT18-20	
1.7	13.6	10	39.2{4.0}	25	
1.7	13.6	12	47.1{4.8}	30	
1.7	13.6	14	54.9{5.6}	35	
1.8	16.7	16	62.8{6.4}	40	
1.9	20.5	18	70.6{7.2}	45	
1.9	20.5	20	78.5{8.0}	50	
2	26	22	86.3{8.8}	55	
2	26	24	94.1{9.6}	60	
2	26	26	102.0{10.4}	65	
2	26	28	109.8{11.2}	70	
2.1	31.5	32	125.5{12.8}	80	
1.8	11.3	8	31.4{3.2}	WT22-20	
1.8	11.3	10	39.2{4.0}	25	
1.9	13.3	12	47.1{4.8}	30	
1.9	13.3	14	54.9{5.6}	35	
2	16	16	62.8{6.4}	40	
2.1	19.5	18	70.6{7.2}	45	
2.1	19.5	20	78.5{8.0}	50	
2.3	28.2	22	86.3{8.8}	55	
2.3	28.2	24	94.1{9.6}	60	
2.3	28.2	26	102.0{10.4}	65	
2.3	28.2	28	109.8{11.2}	70	
2.4	33.6	32	125.5{12.8}	80	
2.1	13.2	12	47.1{4.8}	WT27-30	
2.3	17.9	14	54.9{5.6}	35	
2.3	17.9	16	62.8{6.4}	40	
2.4	20.4	18	70.6{7.2}	45	
2.6	28.6	20	78.5{8.0}	50	
2.6	28.6	22	86.3{8.8}	55	
2.6	28.6	24	94.1{9.6}	60	
2.6	28.6	26	102.0{10.4}	65	
2.8	39.2	28	109.8{11.2}	70	
2.8	39.2	32	125.5{12.8}	80	

- Load Calculation Method: Load = Spring Constant x Deflection
  (Int'l Unit)N=N/mmxFmm
  kgf=kgf/mmxFmm
  (kgf=Nx0.101972)

Allowable Deflection of (L) Size
- WT5-40Fmax.= L x 35%
- WT5-45Fmax.= L x 35%
- WT5-50Fmax.= L x 35%
- WT5-55Fmax.= L x 35%
- WT5-60Fmax.= L x 35%
- WT5-65Fmax.= L x 35%
- WT5-70Fmax.= L x 35%
- WT6-55Fmax.= L x 35%
- WT6-60Fmax.= L x 35%
- WT6-65Fmax.= L x 35%
- WT6-70Fmax.= L x 35%
- WT6-80Fmax.= L x 35%

Both ends of * marked WT Type springs are not ground.

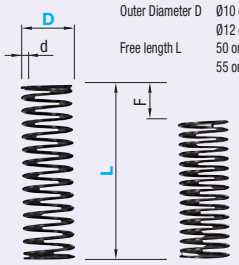
The values of solid length are for reference only.
There may be some variations depending on the lot.

Operation frequency: One million times

Product Overview P.307

How to use coil springs and precautions P.308

WT
WM



Spring Constant ±10%
Outer Diameter D Ø10 or less $^{0}_{-0.5mm}$
Ø12 or more $^{0}_{-0.8mm}$
Free length L 50 or less ±1.5mm
55 or more±2mm

RoHS

Material: JIS SWP-A

Spring Constant

D12 and 14 for WY Type and D12,14 and 20 for WT Type are not available.

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				
3	N/mm 0.1 {kgf/mm} {0.01}	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5 {0.15}	2.0 {0.2}		3.9{0.4}
4							2.9{0.3}	4.9{0.5}
5					N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
6								
8								
10	N/mm 0.2 {kgf/mm} {0.02}						N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
12								
13								
14								
16								
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	29.4{3.0}
20								
22								N/mm 29.4 {kgf/mm} {3.0}
27								
Fmax.	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%	F=Lx25%

WM:Fmax. (Allowable Deflection) = L x 35%

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.35	2.5	1.8	3.4{0.4}	WM 3- 5*	
0.38	3.3	3.5	6.9{0.7}	10*	
0.45	7	5.3	10.3{1.1}	15*	
0.5	11.5	7	13.7{1.4}	20*	
0.5	11.5	7.5	14.7{1.5}	(25)	
0.55	20.4	9	17.7{1.8}	(30)	
0.4	2.3	1.7	3.9{0.4}	WM 4- 5*	
0.45	3.4	3.5	6.9{0.7}	10*	
0.5	5.1	5.2	10.8{1.1}	15*	
0.55	7.7	7	13.7{1.4}	20	
0.6	11.7	8.7	17.7{1.8}	25	
0.6	11.7	10.5	20.6{2.1}	30	
0.65	17.6	12.2	24.0{2.5}	35	
0.65	17.6	12	23.5{2.4}	(40)	
0.5	2.8	1.7	4.9{0.5}	WM 5- 5*	
0.6	4.2	3.5	9.8{1.0}	10	
0.65	6.5	5.2	14.7{1.5}	15	
0.65	6.5	7	20.6{2.1}	20	
0.7	9.1	8.7	25.5{2.6}	25	
0.75	12.7	10.5	30.4{3.1}	30	
0.8	17.4	12.2	35.3{3.6}	35	
0.85	23.8	14	41.2{4.2}	40	
0.85	23.8	15.8	46.1{4.7}	45	
0.9	23.8	15	43.5{4.5}	(50)	
0.9	30	16.5	49.0{5.0}	(55)	
0.9	30	18	53.0{5.4}	(60)	
0.9	30	17.6	52.0{5.3}	(65)	
0.9	30	19.6	58.8{6.0}	(70)	
0.55	2.8	1.7	4.9{0.5}	WM 6- 5*	
0.65	4.7	3.5	9.8{1.0}	10	
0.75	8	5.2	14.7{1.5}	15	
0.75	8	7	20.6{2.1}	20	
0.85	13.6	8.7	25.5{2.6}	25	
0.85	13.6	10.5	30.4{3.1}	30	
0.9	18	12.2	35.3{3.6}	35	
0.9	18	14	41.2{4.2}	40	
0.9	18	15.8	46.1{4.7}	45	
0.9	18	17.5	51.0{5.2}	50	
1.0	31	19.2	55.9{5.7}	55	
1.0	31	18	53.0{5.4}	(60)	
1.0	31	18.8	54.9{5.6}	(65)	
1.1	47.3	20	58.8{6.0}	(70)	
1.1	48.4	22.4	65.9{6.7}	(80)	
0.75	4.2	3.5	9.8{1.0}	WM 8- 10	
0.9	8.5	5.2	14.7{1.5}	15	
0.9	8.5	7	20.6{2.1}	20	
0.9	8.5	8.7	25.5{2.6}	25	
0.9	8.5	10.5	30.4{3.1}	30	
1.0	13	12.2	35.3{3.6}	35	
1.0	13	14	41.2{4.2}	40	
1.1	19.8	15.8	46.1{4.7}	45	
1.1	19.8	17.5	51.0{5.2}	50	
1.2	31.2	19.2	55.9{5.7}	55	
1.2	31.2	21	61.8{6.3}	60	
1.2	31.2	22.7	64.7{6.6}	65	
1.2	31.2	24.5	71.6{7.3}	70	
1.3	44.2	28	82.4{8.4}	80	

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
0.9	5.2	3.5	9.8{1.0}	WM 10- 10	
1.0	7.7	5.2	14.7{1.5}	15	
1.0	7.7	7	20.6{2.1}	20	
1.1	11	8.7	25.5{2.6}	25	
1.1	11	10.5	30.4{3.1}	30	
1.2	16.2	12.2	35.3{3.6}	35	
1.2	16.2	14	41.2{4.2}	40	
1.3	22.1	15.8	46.1{4.7}	45	
1.3	22.1	17.5	51.0{5.2}	50	
1.3	22.1	19.2	55.9{5.7}	55	
1.4	32.1	21	61.8{6.3}	60	
1.4	32.1	22.7	64.7{6.6}	65	
1.4	32.1	24.5	71.6{7.3}	70	
1.4	32.2	28	82.4{8.4}	80	
1.0	5.5	3.5	10.3{1.1}	WM 12- 10	
1.1	7.4	5.2	14.7{1.5}	15	
1.1	7.4	7	20.6{2.1}	20	
1.1	7.4	8.7	25.5{2.6}	25	
1.2	10.2	10.5	30.4{3.1}	30	
1.2	10.2	12.2	35.3{3.6}	35	
1.3	14.3	14	41.2{4.2}	40	
1.3	14.3	15.8	46.1{4.7}	45	
1.3	14.3	17.5	51.0{5.2}	50	
1.4	19.6	19.2	55.9{5.7}	55	
1.4	19.6	21	61.8{6.3}	60	
1.5	26.3	22.7	64.7{6.6}	65	
1.5	26.3	24.5	71.6{7.3}	70	
1.6	36.8	28	82.4{8.4}	80	
1.0	5	3.5	10.3{1.1}	WM 13- 10	
1.2	8.4	5.2	14.7{1.5}	15	
1.3	11.7	7	20.6{2.1}	20	
1.3	11.7	8.7	25.5{2.6}	25	
1.4	14.5	10.5	30.4{3.1}	30	
1.4	14.5	12.2	35.3{3.6}	35	
1.4	14.5	14	41.2{4.2}	40	
1.4	14.5	15.8	46.1{4.7}	45	
1.4	14.5	17.5	51.0{5.2}	50	
1.5	22.5	19.2	55.9{5.7}	55	
1.5	22.5	21	61.8{6.3}	60	
1.6	28.8	22.7	64.7{6.6}	65	
1.6	28.8	24.5	71.6{7.3}	70	
1.7	37.4	28	82.4{8.4}	80	
1.7	37.4	31.5	92.9{9.5}	90	
1.2	7.5	5.2	14.7{1.5}	WM 14- 15	
1.3	9.8	7	20.6{2.1}	20	
1.4	13.3	8.7	25.5{2.6}	25	
1.4	13.3	10.5	30.4{3.1}	30	
1.4	13.3	12.2	35.3{3.6}	35	
1.4	13.3	14	41.2{4.2}	40	
1.5	17.3	15.8	46.1{4.7}	45	
1.5	17.3	17.5	51.0{5.2}	50	
1.5	17.3	19.2	55.9{5.7}	55	
1.6	23.2	21	61.8{6.3}	60	
1.6	23.2	22.7	64.7{6.6}	65	
1.7	30.6	24.5	71.6{7.3}	70	
1.7	30.6	28	82.4{8.4}	80	
1.8	39.6	31.5	92.7{9.5}	90	

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	€ Unit Price Qty. 10~19
1.3	7.8	5.2	14.7{1.5}	WM 16- 15	
1.4	9.8	7	20.6{2.1}	20	
1.5	12.5	8.7	25.5{2.6}	25	
1.5	12.5	10.5	30.4{3.1}	30	
1.6	15	12.2	35.3{3.6}	35	
1.6	15	14	41.2{4.2}	40	
1.7	20.4	15.8	46.1{4.7}	45	
1.7	20.4	17.5	51.0{5.2}	50	
1.8	27	19.2	55.9{5.7}	55	
1.8	27	21	61.8{6.3}	60	
1.8	27	22.7	64.7{6.6}	65	
1.8	27	24.5	71.6{7.3}	70	
1.8	27	28	82.4{8.4}	80	
1.9	34.2	31.5	92.7{9.5}	90	
1.7	11.9	7	34.3{3.5}	WM 18- 20	
1.8	14.4	8.7	42.2{4.3}	25	
1.8	14.4	10.5	51.0{5.2}	30	
1.8	14.4	12.2	59.8{6.1}	35	
1.8	14.4	14	68.6{7.0}	40	
2.0	22	15.8	77.5{7.9}	45	
2.0	22	17.5	85.3{8.7}	50	
2.0	22	19.2	94.1{9.6}	55	
2.0	22	21	103.0{10.5}	60	
2.2	34.1	22.7	110.8{11.3}	65	
2.2	34.1	24.5	119.6{12.2}	70	
2.2	34.1	28	137.3{14.0}	80	
2.3	41.4	31.5	154.0{15.7}	90	
2.3	41.4	35	171.6{17.5}	100	
1.8	11.7	7	34.3{3.5}	WM 20- 20	
1.8	11.7	8.7	42.2{4.3}	25	
1.9	14.3	10.5	51.0{5.2}	30	
1.9	14.3	12.2	59.8{6.1}	35	
1.9	14.3	14	68.6{7.0}	40	
2.0	17	15.8	77.5{7.9}	45	
2.0	17	17.5	85.3{8.7}	50	
2.2	24.8	19.2	94.1{9.6}	55	
2.2	24.8	21	103.0{10.5}	60	
2.2	24.8	22.7	110.8{11.3}	65	
2.2	24.8	24.5	119.6{12.2}	70	
2.4	36	28	137.3{14.0}	80	
2.4	36	31.5	154.0{15.7}	90	
2.4	36	35	171.6{17.5}	100	
1.9	12	7	34.3{3.5}	WM 22- 20	
2.0	14	8.7	42.2{4.3}	25	
2.0	14	10.5	51.0{5.2}	30	
2.0	14	12.2	59.8{6.1}	35	
2.0	14	14	68.6{7.0}	40	
2.3	23	15.8	77.5{7.9}	45	
2.3	23	17.5	85.3{8.7}	50	
2.3	23	19.2	94.1{9.6}	55	
2.3	23	21	103.0{10.5}	60	
2.4	30	22.7	110.8{11.3}	65	
2.4	30	24.5	119.6{12.2}	70	
2.4	30	28	137.3{14.0}	80	
2.6	40	31.5	154.0{15.7}	90	
2.6	40	35	171.6{17.5}	100	
2.3	14	10.5	51.0{5.2}	WM 27- 30	
2.4	17	12.2	59.8{6.1}	35	
2.4	17	14	68.6{7.0}	40	
2.4	18	15.8	77.5{7.9}	45	
2.6	23	17.5	85.3{8.7}	50	
2.6	23	19.2	94.1{9.6}	55	
2.6	23	21	103.0{10.5}	60	
2.8	31	22.7	110.8{11.3}	65	
2.8	31	24.5	119.6{12.2}	70	
2.8	31	28	137.3{14.0}	80	
3.0	43.5	31.5	154.0{15.7}	90	
3.0	43.5	35	171.6{17.5}	100	

- Load Calculation Method: Load = Spring Constant x Deflection
(Int'l Unit)N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times
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How to use coil springs and precautions P.308

Allowable Deflection of (L) Size
WM3-25Fmax.= L x 30%
WM3-30Fmax.= L x 30%
WM4-40Fmax.= L x 30%
WM5-50Fmax.= L x 30%
WM5-55Fmax.= L x 30%
WM5-60Fmax.= L x 30%
WM5-65Fmax.= L x 27%
WM5-70Fmax.= L x 28%
WM6-60Fmax.= L x 30%
WM6-65Fmax.= L x 29%
WM6-70Fmax.= L x 28%
WM6-80Fmax.= L x 28%

Both ends of * marked WM Type springs are not ground.

Round Wire Springs

-WH / WB Outer Diameter Referenced-

CAD Data

Order Example — Part Number: WH13-60

Days to Ship: 6 Days P.87

Volume Discount (Round down to one Cent.)

Quantity	1~19	20~99	100~500
Applicable Price	€ Unit Price	Volume Discount	
	Price List	5%	10%

For orders larger than indicated quantity, please request a quotation.

WH: Fmax. (Allowable Deflection) = L x 30%

d	Solid Length	F max.	Load N{kgf} max.	Part Number TypeD-L	€ Unit Price Qty. 10~19
0.45	2.7	1.5	4.9{0.5}	WH4- 5*	
0.45	2.7	3	8.8{0.9}	10*	
0.55	5.8	4.5	13.7{1.4}	15	
0.6	8.4	6	17.7{1.8}	20	
0.65	12.4	7.5	22.6{2.3}	25	
0.65	12.4	9	26.5{2.7}	30	
0.6	3.3	1.5	8.8{0.9}	WH5- 5*	
0.7	5.5	3	17.7{1.8}	10	
0.75	7.5	4.5	26.5{2.7}	15	
0.75	7.5	6	35.3{3.6}	20	
0.85	13.6	7.5	44.1{4.5}	25	
0.85	13.6	7.5	44.3{4.5}	(30)	
0.9	17.1	8.8	51.6{5.3}	(35)	
0.9	17.1	8.8	51.9{5.3}	(40)	
0.65	3.3	1.5	8.8{0.9}	WH6- 5*	
0.75	5.2	3	17.7{1.8}	10	
0.8	6.4	4.5	26.5{2.7}	15	
0.9	9.9	6	35.3{3.6}	20	
0.9	9.9	7.5	44.1{4.5}	25	
1.0	16	9	53.0{5.4}	30	
1.0	16	10.5	61.8{6.3}	35	
1.1	25	12	70.6{7.2}	40	
1.1	25	11.3	66.7{6.8}	(45)	
1.2	39.6	10	58.8{6.0}	(50)	
1.2	39.6	14.5	85.3{8.7}	(55)	
1.2	39.6	14	82.4{8.4}	(60)	
1.2	39.6	14	82.4{8.4}	(65)	
1.2	39.6	15	88.3{9.0}	(70)	
0.9	5.4	3	17.7{1.8}	WH8- 10	
1.0	8	4.5	26.5{2.7}	15	
1.1	11.5	6	35.3{3.6}	20	
1.1	11.5	7.5	44.1{4.5}	25	
1.2	16.8	9	53.0{5.4}	30	
1.2	16.8	10.5	61.8{6.3}	35	
1.2	16.8	12	70.6{7.2}	40	
1.3	24.7	13.5	79.4{8.1}	45	
1.3	24.7	15	88.3{9.0}	50	
1.4	35	16.5	97.1{9.9}	55	
1.4	35	18	105.9{10.8}	60	
1.4	35	17	100.0{10.2}	(65)	
1.4	35	19	111.8{11.4}	(70)	
1.0	5.4	3	17.7{1.8}	WH10- 10	
1.1	7	4.5	26.5{2.7}	15	
1.2	9.6	6	35.3{3.6}	20	
1.2	9.6	7.5	44.1{4.5}	25	
1.3	13.9	9	53.0{5.4}	30	
1.4	18	10.5	61.8{6.3}	35	
1.4	18	12	70.6{7.2}	40	
1.5	25	13.5	79.4{8.1}	45	
1.5	25	15	88.3{9.0}	50	
1.5	25	16.5	97.1{9.9}	55	
1.5	25	18	105.9{10.8}	60	
1.6	35	19.5	114.7{11.7}	65	
1.6	35	21	123.6{12.6}	70	
1.7	45.9	24	141.0{14.4}	80	
1.2	6.9	3	17.7{1.8}	WH12- 10	
1.3	9.1	4.5	26.5{2.7}	15	
1.3	9.1	6	35.3{3.6}	20	
1.3	9.1	7.5	44.1{4.5}	25	
1.4	11.9	9	53.0{5.4}	30	
1.4	11.9	10.5	61.8{6.3}	35	
1.5	15.4	12	70.6{7.2}	40	
1.5	15.4	13.5	79.4{8.1}	45	
1.6	20.4	15	88.3{9.0}	50	
1.6	20.4	16.5	97.1{9.9}	55	
1.7	26.8	18	105.9{10.8}	60	
1.7	26.8	19.5	114.7{11.7}	65	
1.8	35.1	21	123.6{12.6}	70	
1.9	45.6	24	141.0{14.4}	80	
1.3	6.2	3	29.4{3.0}	WH13- 10	
1.5	9.3	4.5	44.1{4.5}	15	
1.6	12.3	6	58.8{6.0}	20	
1.6	12.3	7.5	73.5{7.5}	25	
1.7	15	9	88.3{9.0}	30	
1.7	15	10.5	103.0{10.5}	35	
1.8	19	12	117.7{12.0}	40	
1.9	25	13.5	132.4{13.5}	45	
1.9	25	15	147.1{15.0}	50	
2.0	30	16.5	161.8{16.5}	55	
2.0	30	18	176.5{18.0}	60	
2.1	39	19.5	191.2{19.5}	65	
2.1	39	21	205.9{21.0}	70	
2.1	39	24	235.4{24.0}	80	
1.6	10.4	4.5	44.1{4.5}	WH14- 15	
1.6	10.4	6	58.8{6.0}	20	
1.6	10.4	7.5	73.5{7.5}	25	
1.7	12.8	9	88.3{9.0}	30	
1.7	12.8	10.5	103.0{10.5}	35	
1.9	20	12	117.7{12.0}	40	
1.9	20	13.5	132.4{13.5}	45	
2.1	30.5	15	147.1{15.0}	50	
2.1	30.5	16.5	161.8{16.5}	55	
2.1	30.5	18	176.5{18.0}	60	
2.2	37.4	19.5	191.2{19.5}	65	
2.2	37.4	21	205.9{21.0}	70	
2.3	47.2	24	235.4{24.0}	80	
1.7	10.2	4.5	44.1{4.5}	WH16- 15	
1.8	12.6	6	58.8{6.0}	20	
1.9	14.5	7.5	73.5{7.5}	25	
1.9	14.5	9	88.3{9.0}	30	
2.0	18	10.5	103.0{10.5}	35	
2.1	21	12	117.7{12.0}	40	
2.2	26	13.5	132.4{13.5}	45	
2.2	26	15	147.1{15.0}	50	
2.2	26	16.5	161.8{16.5}	55	
2.3	32	18	176.5{18.0}	60	
2.3	32	19.5	191.2{19.5}	65	
2.4	38	21	205.9{21.0}	70	
2.5	47.5	24	235.4{24.0}	80	
2.1	12.6	6	88.3{9.0}	WH18- 20	
2.2	15.4	7.5	109.8{11.2}	25	
2.2	15.4	9	132.4{13.5}	30	
2.3	18.4	10.5	154.0{15.7}	35	
2.4	21.6	12	176.5{18.0}	40	
2.5	25	13.5	199.1{20.3}	45	
2.5	25	15	220.6{22.5}	50	
2.6	30	16.5	242.2{24.7}	55	
2.6	30	18	264.8{27.0}	60	
2.8	42	19.5	286.4{29.2}	65	
2.8	42	21	308.9{31.5}	70	
2.9	49.3	24	353.0{36.0}	80	
3.0	57	26.1	397.2{40.5}	(90)	
3.0	57	24	441.3{45.0}	(100)	
2.2	12.7	6	88.3{9.0}	WH20- 20	
2.3	15	7.5	109.8{11.2}	25	
2.3	15	9	132.4{13.5}	30	
2.5	20	10.5	154.0{15.7}	35	
2.5	20	12	176.5{18.0}	40	
2.5	20	13.5	199.1{20.3}	45	
2.6	22.8	15	220.6{22.5}	50	
2.6	22.8	16.5	242.2{24.7}	55	
2.8	30.8	18	264.8{27.0}	60	
2.8	30.8	19.5	286.4{29.2}	65	
3.0	42	21	308.9{31.5}	70	
3.0	42	24	353.0{36.0}	80	
3.2	56.8	27	397.2{40.5}	90	
3.2	56.8	30	441.3{45.0}	100	
2.3	12.7	6	88.3{9.0}	WH22- 20	
2.5	16.7	7.5	109.8{11.2}	25	
2.5	16.7	9	132.4{13.5}	30	
2.6	18.2	10.5	154.0{15.7}	35	
2.8	25	12	176.5{18.0}	40	
2.8	25	13.5	199.1{20.3}	45	
2.8	25	15	220.6{22.5}	50	
3.0	33	16.5	242.2{24.7}	55	
3.0	33	18	264.8{27.0}	60	
3.0	33	19.5	286.4{29.2}	65	
3.2	43	21	308.9{31.5}	70	
3.2	43	24	353.0{36.0}	80	
3.2	43	26.1	397.2{40.5}	(90)	
3.5	64.4	26	441.3{45.0}	(100)	
2.8	16.8	9	132.4{13.5}	WH27- 30	
2.8	16.8	10.5	154.0{15.7}	35	
2.9	18.8	12	176.5{18.0}	40	
2.9	19.4	13.5	199.1{20.3}	45	
3.2	25.5	15	220.6{22.5}	50	
3.2	25.5	16.5	242.2{24.7}	55	
3.5	35.5	18	264.8{27.0}	60	
3.5	35.5	19.5	286.4{29.2}	65	
3.5	35.5	21	308.9{31.5}	70	
3.5	35.5	24	353.0{36.0}	80	
3.5	35.5	27	397.2{40.5}	90	
4.0	68	30	441.3{45.0}	100	

- Load Calculation Method: Load = Spring Constant x Deflection
  (Int'l Unit)N=N/mmxFmm
  kgf=kgf/mmxFmm
  (kgf=Nx0.101972)

The values of solid length are for reference only.
There may be some variations depending on the lot.

Operation frequency: One million times

Product Overview P.307

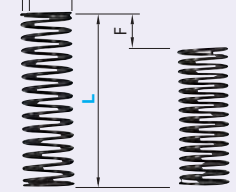
How to use coil springs and precautions P.308

Allowable Deflection of (L) Size

WH5-30Fmax.= L x 25%
WH5-35Fmax.= L x 25%
WH5-40Fmax.= L x 22%
WH6-45Fmax.= L x 25%
WH6-50Fmax.= L x 20%
WH6-55Fmax.= L x 26%
WH6-60Fmax.= L x 23%
WH6-65Fmax.= L x 21%
WH6-70Fmax.= L x 21%
WH8-65Fmax.= L x 26%
WH8-70Fmax.= L x 27%
WH18 -90Fmax.= L x 29%
WH18 - 100Fmax.= L x 24%
WH22 -90Fmax.= L x 29%
WH22 - 100Fmax.= L x 26%

Both ends of * marked WH Type springs are not ground.

WH
WB



Spring Constant ±10%
Outer Diameter D Ø10 or less $^{0}_{-0.5}$mm
Ø12 or more $^{0}_{-0.8}$mm
Free length L 50 or less ±1.5mm
55 or more±2mm

RoHS

M Material: JIS SWP-A

Spring Constant

D12 and 14 for WY Type and D12,14 and 20 for WT Type are not available.

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				
3	N/mm 0.1 {kgf/mm} {0.01}	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5 {0.15}	2.0 {0.2}		3.9{0.4}
4							2.9{0.3}	4.9{0.5}
5					N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
6								
8								
10	N/mm 0.2 {kgf/mm} {0.02}							
12							N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
13								
14								
16								29.4{3.0}
18		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 3.9 {kgf/mm} {0.4}	N/mm 4.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	
20								N/mm 29.4 {kgf/mm} {3.0}
22								
27								
Fmax.	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%	F=Lx25%

WB:Fmax. (Allowable Deflection) = L x 25%

d	Solid Length	F max.	Load N{kgf} max.	Part Number TypeD-L	€ Unit Price Qty. 10~19
0.4	3.2	1.3	4.9{0.5}	WB3- 5*	
0.5	6.5	2.5	9.8{1.0}	10*	
0.55	10.5	3.8	14.7{1.5}	15*	
0.55	12.7	5	19.6{2.0}	20*	
0.6	17.4	6.3	24.5{2.5}	25*	
0.6	21.0	7.5	29.4{3.0}	30*	
0.65	24.0	8.8	34.3{3.5}	35*	
0.65	27.0	10.0	39.2{4.0}	40*	
0.5	3	1.3	5.9{0.6}	WB4- 5*	
0.6	6	2.5	12.3{1.3}	10	
0.65	9.8	3.8	18.1{1.9}	15	
0.7	12.6	5	24.5{2.5}	20	
0.75	16.5	6.3	30.4{3.1}	25	
0.75	20.3	7.5	36.8{3.8}	30	
0.8	24	8.8	43.1{4.4}	35	
0.8	28	10	49.0{5.0}	40	
0.8	29	11.3	55.4{5.7}	45	
0.85	34	12.5	61.3{6.3}	50	
0.65	3.3	1.3	12.7{1.3}	WB5- 5*	
0.8	7	2.5	24.5{2.5}	10	
0.8	7	3.8	37.3{3.8}	15	
0.9	13	5	49.0{5.0}	20	
0.9	13	6.3	61.8{6.3}	25	
1.0	21	7.5	73.5{7.5}	30	
1.0	25	8.8	86.3{8.8}	35	
1.0	25	10	98.1{10.0}	40	
1.1	31	11.3	110.8{11.3}	45	
1.1	34	12.5	122.6{12.5}	50	
1.1	39	13.8	135.3{13.8}	55	
1.1	43	15	147.1{15.0}	60	
1.2	46	16.3	159.8{16.3}	65	
1.2	50	17.5	171.6{17.5}	70	
0.7	3.5	1.3	12.7{1.3}	WB6- 5*	
0.8	7	2.5	24.5{2.5}	10	
0.9	7.5	3.8	37.3{3.8}	15	
1.0	11.5	5	49.0{5.0}	20	
1.1	17.5	6.3	61.8{6.3}	25	
1.1	19.5	7.5	73.5{7.5}	30	
1.1	20	8.8	86.3{8.8}	35	
1.2	28	10	98.1{10.0}	40	
1.2	30	11.3	110.8{11.3}	45	
1.2	32	12.5	122.6{12.5}	50	
1.2	32	13.8	135.3{13.8}	55	
1.3	43	15	147.1{15.0}	60	
1.3	46	16.3	159.8{16.3}	65	
1.3	50	17.5	171.6{17.5}	70	
1.4	57	20	196.1{20.0}	80	
1.0	6	2.5	24.5{2.5}	WB8- 10	
1.2	10.8	3.8	37.3{3.8}	15	
1.2	11.5	5	49.0{5.0}	20	
1.3	17	6.3	61.8{6.3}	25	
1.3	17	7.5	73.5{7.5}	30	
1.4	24.5	8.8	86.3{8.8}	35	
1.4	25.2	10	98.1{10.0}	40	
1.5	32	11.3	110.8{11.3}	45	
1.5	33	12.5	122.6{12.5}	50	
1.5	36.5	13.8	135.3{13.8}	55	
1.5	36.5	15	147.1{15.0}	60	
1.6	48	16.3	159.8{16.3}	65	
1.6	48	17.5	171.6{17.5}	70	
1.6	55	20	196.1{20.0}	80	

d	Solid Length	F max.	Load N{kgf} max.	Part Number TypeD-L	€ Unit Price Qty. 10~19
1.2	6	2.5	24.5{2.5}	WB10- 10	
1.3	8.5	3.8	37.3{3.8}	15	
1.4	12	5	49.0{5.0}	20	
1.5	16.5	6.3	61.8{6.3}	25	
1.5	17	7.5	73.5{7.5}	30	
1.6	23	8.8	86.3{8.8}	35	
1.6	24	10	98.1{10.0}	40	
1.7	30	11.3	110.8{11.3}	45	
1.7	31.5	12.5	122.6{12.5}	50	
1.8	40	13.8	135.3{13.8}	55	
1.8	40	15	147.1{15.0}	60	
1.8	43	16.3	159.8{16.3}	65	
1.8	43	17.5	171.6{17.5}	70	
1.8	54	20	196.1{20.0}	80	
1.4	6.5	2.5	24.5{2.5}	WB12- 10	
1.4	7.7	3.8	36.3{3.7}	15	
1.6	12.5	5	49.0{5.0}	20	
1.6	13.6	6.3	60.8{6.2}	25	
1.7	18	7.5	73.5{7.5}	30	
1.8	22.5	8.8	85.3{8.7}	35	
1.8	24	10	98.1{10.0}	40	
1.8	24	11.3	109.8{11.2}	45	
2.0	34	12.5	122.6{12.5}	50	
2.0	38	13.8	134.4{13.7}	55	
2.0	40	15	147.1{15.0}	60	
2.0	42	16.3	158.9{16.2}	65	
2.1	48.5	17.5	171.6{17.5}	70	
2.1	52.5	20	196.1{20.0}	80	
1.6	6.4	2.5	49.0{5.0}	WB13- 10	
1.8	11	3.8	74.5{7.6}	15	
1.8	11	5	98.1{10.0}	20	
2.0	17	6.3	123.6{12.6}	25	
2.0	18	7.5	147.1{15.0}	30	
2.1	22	8.8	172.6{17.6}	35	
2.1	22	10	196.1{20.0}	40	
2.3	32	11.3	221.6{22.6}	45	
2.3	32	12.5	245.2{25.0}	50	
2.4	40	13.8	270.7{27.6}	55	
2.4	42	15	294.2{30.0}	60	
2.4	42	16.3	319.7{32.6}	65	
2.5	50	17.5	343.2{35.0}	70	
2.5	50	20	392.3{40.0}	80	
1.8	9	3.8	72.6{7.4}	WB14- 15	
2.0	13	5	98.1{10.0}	20	
2.0	14	6.3	121.6{12.4}	25	
2.1	18	7.5	147.1{15.0}	30	
2.1	23	8.8	170.6{17.4}	35	
2.3	26.3	10	196.1{20.0}	40	
2.3	27.6	11.3	219.7{22.4}	45	
2.4	31	12.5	245.2{25.0}	50	
2.5	37.5	13.8	268.7{27.4}	55	
2.5	41	15	294.2{30.0}	60	
2.5	43.5	16.3	317.7{32.4}	65	
2.6	48	17.5	343.2{35.0}	70	
2.6	52	20	392.3{40.0}	80	

d	Solid Length	F max.	Load N{kgf} max.	Part Number TypeD-L	€ Unit Price Qty. 10~19
2.0	10	3.8	74.5{7.6}	WB16- 15	
2.1	12.5	5	98.1{10.0}	20	
2.3	17	6.3	123.6{12.6}	25	
2.3	18.5	7.5	147.1{15.0}	30	
2.4	21.5	8.8	172.6{17.6}	35	
2.4	21.5	10	196.1{20.0}	40	
2.5	27.5	11.3	221.6{22.6}	45	
2.5	27.5	12.5	245.2{25.0}	50	
2.6	32	13.8	270.7{27.6}	55	
2.6	32	15	294.2{30.0}	60	
2.8	46	16.3	319.7{32.6}	65	
2.8	46	17.5	343.2{35.0}	70	
2.9	55	20	392.3{40.0}	80	
2.5	13.5	5	147.1{15.0}	WB18- 20	
2.6	17	6.3	185.3{18.9}	25	
2.6	17	7.5	220.6{22.5}	30	
2.8	23.5	8.8	258.9{26.4}	35	
2.9	27.5	10	294.2{30.0}	40	
2.9	27.5	11.3	332.4{33.9}	45	
3.0	33	12.5	367.7{37.5}	50	
3.0	33	13.8	406.0{41.4}	55	
3.2	43	15	441.3{45.0}	60	
3.2	44.5	16.3	479.5{48.9}	65	
3.2	44.5	17.5	514.8{52.5}	70	
3.4	58	20	588.4{60.0}	80	
3.4	61	22.5	661.9{67.5}	90	
3.5	71	25	735.5{75.0}	100	
2.8	13.5	5	147.1{15.0}	WB22- 20	
2.9	16	6.3	185.3{18.9}	25	
3.0	18	7.5	220.6{22.5}	30	
3.0	18	8.8	258.9{26.4}	35	
3.2	24	10	294.2{30.0}	40	
3.2	24	11.3	332.4{33.9}	45	
3.5	36	12.5	367.7{37.5}	50	
3.5	36	13.8	406.0{41.4}	55	
3.5	36	15	441.3{45.0}	60	
3.6	45	16.3	479.5{48.9}	65	
3.6	45	17.5	514.8{52.5}	70	
3.8	57	20	588.4{60.0}	80	
3.8	57	22.5	661.9{67.5}	90	
4.0	72	25	735.5{75.0}	100	
3.5	19	7.5	220.6{22.5}	WB27- 30	
3.6	21	8.8	258.9{26.4}	35	
3.6	21	10	294.2{30.0}	40	
3.8	30	11.3	332.4{33.9}	45	
3.8	30	12.5	367.7{37.5}	50	
4.0	38	13.8	406.0{41.4}	55	
4.0	38	15	441.3{45.0}	60	
4.0	38	16.3	479.5{48.9}	65	
4.0	38	17.5	514.8{52.5}	70	
4.5	57	20	588.4{60.0}	80	
4.5	63	22.5	661.9{67.5}	90	
4.5	67	25	735.5{75.0}	100	

- Load Calculation Method: Load = Spring Constant x Deflection
(Int'l Unit)N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

Both ends of * marked WB Type springs are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times
Product Overview P.307
How to use coil springs and precautions P.308

Round Wire Springs
-Inner Diameter Referenced-

CAD Data

For WP (Long Type), refer to Standard Components for Press Molds.

Round Wire Springs

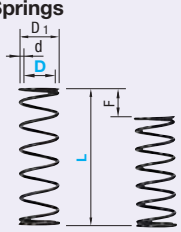
NWL NWM

Material: Spring Steel (JIS SWP-A)

VUR

Material: 1.4301/X5CrNi18-10-WPB

RoHS



Spring Constant ±10%

Inner Dia. D
- NWL · NWM
  - Ø8.5 or less ±0.3
  - Ø10.6 or more ±0.4mm
- VUR
  - Ø8 or less $^{+0.6}_{+0.1}$
  - Ø10 or more $^{+0.8}_{+0.1}$

Free length L: 50 or less ±1; 60 or more ±2

Order Example: Part Number NWL6.5-50

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

For orders larger than indicated quantity, please request a quotation.

Quantity	1~19	20~99	100~500
Applicable Price	€ Unit Price	Volume Discount	
	Price List	5%	10%

Features: For round wire springs, inner diameter is used as a base to keep load constant.
- Load Calculation Method: Load = Spring Constant x Deflection
  - (Int'l Unit) N = N/mmxFmm
  - kgf=kgf/mmxFmm
  - (kgf=Nx0.101972)

The values of solid length are for reference only. There may be some variations depending on the lot.

Operation frequency: One million times

NWL : Fmax. (Allowable Deflection) = L x 40%

Pin Dia.	D	D1	d	F max.	Solid Length	N{kgf} max.	N/mm {kgf/mm}	Part Number TypeD-L	€ Unit Price Qty. 10~19
5	5.5	7	0.75	12	10.9	13.7{1.4}	1.1{0.12}	NWL5.5- 30	
				14	12		1.0{0.10}	35	
				16	13.5		0.9{0.09}	40	
				18	15		0.8{0.08}	45	
				20	16.5		0.7{0.07}	50	
6	6.5	8.1	0.8	12	9.6	13.7{1.4}	1.1{0.12}	NWL6.5- 30	
				14	10.8		1.0{0.10}	35	
				16	12		0.9{0.09}	40	
				18	13.2		0.8{0.08}	45	
				20	14.4		0.7{0.07}	50	
8	8.5	10.5	1.0	12	9.8	20.6{2.1}	1.7{0.18}	NWL8.5- 30	
				14	10.8		1.5{0.15}	35	
				16	12		1.3{0.13}	40	
				18	13		1.1{0.12}	45	
				20	14		1.0{0.11}	50	
				24	16.5		0.9{0.09}	60	
10	10.6	12.8	1.1	12	9.1	20.6{2.1}	1.7{0.18}	NWL10.6- 30	
				14	9.9		1.5{0.15}	35	
				16	11		1.3{0.13}	40	
				18	12.1		1.1{0.12}	45	
				20	12.7		1.0{0.11}	50	
				24	14.9		0.9{0.09}	60	
13	13.6	16.4	1.4	14	12.3	27.5{2.8}	2.0{0.20}	NWL13.6- 35	
				16	13.3		1.7{0.18}	40	
				18	14.7		1.5{0.16}	45	
				20	15.8		1.4{0.14}	50	
				24	18.2		1.1{0.12}	60	
16	16.6	19.8	1.6	14	13.6	27.5{2.8}	2.0{0.20}	NWL16.6- 35	
				16	14.8		1.7{0.18}	40	
				18	16		1.5{0.16}	45	
				20	17.2		1.4{0.14}	50	
				24	20		1.1{0.12}	60	

NWM : Fmax. (Allowable Deflection) = L x 32%

Pin Dia.	D	D1	d	F max.	Solid Length	N{kgf} max.	N/mm {kgf/mm}	Part Number TypeD-L	€ Unit Price Qty. 10~19
5	5.5	7.3	0.9	9.6	13.1	20.6{2.1}	2.1{0.22}	NWM5.5- 30	
				11.2	14.9		1.8{0.19}	35	
				12.8	16.2		1.6{0.16}	40	
				14.4	18		1.4{0.15}	45	
				16	19.8		1.3{0.13}	50	
6	6.5	8.5	1.0	9.6	14	20.6{2.1}	2.1{0.22}	NWM6.5- 30	
				11.2	15.5		1.8{0.19}	35	
				12.8	17.5		1.6{0.16}	40	
				14.4	19.5		1.4{0.15}	45	
				16	21		1.3{0.13}	50	
8	8.5	10.7	1.1	9.6	9.4	27.5{2.8}	2.9{0.29}	NWM8.5- 30	
				11.2	10.5		2.5{0.25}	35	
				12.8	11.6		2.1{0.22}	40	
				14.4	12.7		1.9{0.19}	45	
				16	13.8		1.7{0.18}	50	
				19.2	16		1.4{0.15}	60	
10	10.6	13.2	1.3	9.6	11.4	27.5{2.8}	2.9{0.29}	NWM10.6- 30	
				11.2	12.7		2.5{0.25}	35	
				12.8	14		2.1{0.22}	40	
				14.4	15.3		1.9{0.19}	45	
				16	16.6		1.7{0.18}	50	
				19.2	19.2		1.4{0.15}	60	
13	13.6	16.8	1.6	11.2	14.4	34.3{3.5}	3.1{0.31}	NWM13.6- 35	
				12.8	15.6		2.7{0.27}	40	
				14.4	17.2		2.4{0.24}	45	
				16	18.4		2.1{0.22}	50	
				19.2	20.8		1.8{0.18}	60	
16	16.6	20.2	1.8	11.2	15.3	34.3{3.5}	3.1{0.31}	NWM16.6- 35	
				12.8	16.7		2.7{0.27}	40	
				14.4	18.5		2.4{0.24}	45	
				16	19.4		2.1{0.22}	50	
				19.2	22.5		1.8{0.18}	60	

VUR: Fmax. (Allowable Deflection) = LX60% Spring Constant 0.294N/mm {0.03kg/mm}

Part Number Type D - L	Outer Ø D1	Wire Ø d	F max.	N{kgf} max.	Reference Pitch	Reference Solid Length	Reference Total coils	€ Unit Price Qty 1~3	Volume Discount 4~9	Volume Discount 10~19	Volume Discount 20~49
VUR 5 - 15	5.9	0.45	9	0.03 {0.27}	1.7	5.0	10				
20	5.9	0.45	12	0.04 {0.36}	2.2	5.0	10				
25	6.0	0.50	15	0.05 {0.45}	1.9	7.5	14				
30	6.0	0.50	18	0.06 {0.54}	2.3	7.5	14				
35	6.1	0.55	21	0.06 {0.63}	1.9	11.0	19				
40	6.1	0.55	24	0.07 {0.72}	2.2	11.0	19				
45	6.2	0.60	27	0.08 {0.81}	1.9	15.6	25				
50	6.2	0.60	30	0.09 {0.90}	2.1	15.6	25				
VUR 6 - 15	7.0	0.50	9	0.03 {0.27}	1.9	5.0	9				
20	7.1	0.55	12	0.04 {0.36}	1.8	7.2	12				
25	7.1	0.55	15	0.05 {0.45}	2.3	7.2	12				
30	7.1	0.55	18	0.06 {0.54}	2.7	7.2	12				
35	7.2	0.60	21	0.06 {0.63}	2.3	10.2	16				
40	7.2	0.60	24	0.07 {0.72}	2.7	10.2	16				
45	7.3	0.65	27	0.08 {0.81}	2.3	14.3	21				
50	7.3	0.65	30	0.09 {0.90}	2.5	14.3	21				
55	7.4	0.70	33	0.10 {0.99}	2.1	19.6	27				
60	7.4	0.70	36	0.11 {1.08}	2.3	19.6	27				
VUR 8 - 20	9.3	0.65	12	0.04 {0.36}	2.1	7.5	10.5				
25	9.3	0.65	15	0.05 {0.45}	2.6	7.5	10.5				
30	9.4	0.70	18	0.06 {0.54}	2.5	9.8	13				
35	9.4	0.70	21	0.06 {0.63}	2.9	9.8	13				
40	9.4	0.70	24	0.07 {0.72}	3.3	9.8	13				
45	9.6	0.80	27	0.08 {0.81}	2.4	16.8	20				
50	9.6	0.80	30	0.09 {0.90}	2.6	16.8	20				
55	9.6	0.80	33	0.10 {0.99}	2.9	16.8	20				
60	9.6	0.80	36	0.11 {1.08}	3.2	16.8	20				
65	9.8	0.90	39	0.12 {1.17}	2.2	28.8	31				
70	9.8	0.90	42	0.13 {1.26}	2.3	28.8	31				
80	9.8	0.90	48	0.15 {1.44}	2.7	28.8	31				
VUR 10 - 20	11.4	0.70	12	0.04 {0.36}	3.3	5.6	7				
25	11.5	0.75	15	0.05 {0.45}	2.8	8.3	10				
30	11.6	0.80	18	0.06 {0.54}	2.7	10.4	12				
35	11.6	0.80	21	0.06 {0.63}	3.2	10.4	12				
40	11.6	0.80	24	0.07 {0.72}	3.6	10.4	12				
45	11.8	0.90	27	0.08 {0.81}	2.8	16.2	17				
50	11.8	0.90	30	0.09 {0.90}	3.1	16.2	17				
55	11.8	0.90	33	0.10 {0.99}	3.4	16.2	17				
60	11.8	0.90	36	0.11 {1.08}	3.8	16.2	17				
65	11.8	0.90	39	0.12 {1.17}	4.1	16.2	17				
70	12.0	1.00	42	0.13 {1.26}	2.9	26.0	25				
80	12.0	1.00	48	0.15 {1.44}	3.3	26.0	25				

Part Number Type D - L	Outer Ø D1	Wire Ø d	F max.	N{kgf} max.	Reference Pitch	Reference Solid Length	Reference Total coils	€ Unit Price Qty 1~3	Volume Discount 4~9	Volume Discount 10~19	Volume Discount 20~49
VUR 12 - 25	13.6	0.80	15	0.05 {0.45}	3.6	7.2	8				
30	13.6	0.80	18	0.06 {0.54}	4.3	7.2	8				
35	13.8	0.90	21	0.06 {0.63}	3.3	11.3	11.5				
40	13.8	0.90	24	0.07 {0.72}	3.8	11.3	11.5				
45	13.8	0.90	27	0.08 {0.81}	4.3	11.3	11.5				
50	14.0	1.00	30	0.09 {0.90}	3.3	17.0	16				
55	14.0	1.00	33	0.10 {0.99}	3.7	17.0	16				
60	14.0	1.00	36	0.11 {1.08}	4.0	17.0	16				
65	14.0	1.00	39	0.12 {1.17}	4.3	17.0	16				
70	14.2	1.10	42	0.13 {1.26}	3.3	25.3	22				
80	14.2	1.10	48	0.15 {1.44}	3.8	25.3	22				
90	14.2	1.10	54	0.17 {1.62}	4.3	25.3	22				
VUR 16 - 35	18.0	1.00	21	0.06 {0.63}	4.7	9.5	8.5				
40	18.0	1.00	24	0.07 {0.72}	5.3	9.5	8.5				
45	18.2	1.10	27	0.08 {0.81}	4.5	13.2	11				
50	18.2	1.10	30	0.09 {0.90}	5.0	13.2	11				
55	18.2	1.10	33	0.10 {0.99}	5.5	13.2	11				
60	18.2	1.10	36	0.11 {1.08}	6.0	13.2	11				
65	18.4	1.20	39	0.12 {1.17}	4.6	19.2	15				
70	18.4	1.20	42	0.13 {1.26}	5.0	19.2	15				
80	18.4	1.20	48	0.15 {1.44}	5.7	19.2	15				
90	18.4	1.20	54	0.17 {1.62}	6.4	19.2	15				
100	18.4	1.20	60	0.18 {1.80}	7.1	19.2	15				

Order Example: Part Number VUR10 - L - 40

Days to Ship: 6 Days P.87

The values of solid length are for reference only. There may be some variations depending on the lot.

Both ends are not ground.

Operation frequency: One million times

Round Wire Springs

-L Dimension Configurable · Outer Diameter Referenced Stainless Steel-

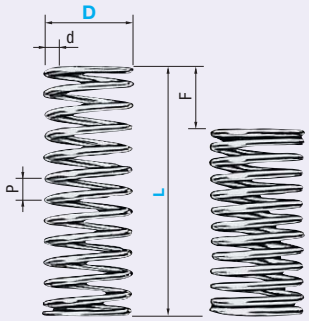
CAD Data

■Compression Springs

RoHS

Type	Allowable Deflection	Material
FWR	F=Lx60%	JIS SWP-A
FWF	F=Lx50%	
FWT	F=Lx40%	
FUR	F=Lx60%	1.4301/ X5CrNi18-10-WPB
FUF	F=Lx50%	
FUT	F=Lx40%	

(1) Use within the range of allowable deflection %.
(2) No grinding on both ends for d less than 0.9.
(3) P is for reference only.



<How to Calculate Spring Constant>

$$\text{Spring Constant} = \frac{\text{Max.Load (N(kgf))}}{\text{Lx Allowable Deflection (\%)}}$$

D Tolerance	Ø5~14	±0.3
	Ø16~20	±0.4
L Tolerance	~ 50	±1
	51~100	±2
	101~200	±4

Part Number Type	D	1mm Increment L	Load Type Selection	Max. Load N{kgf} JIS SWP-A FWR60%	FWF50%	FWT40%	1.4301/X5CrNi18-10-WPB FUR60%	FUF50%	FUT40%	d FWR FUR	FWF FUF	FWT FUT	P (Reference) FWR FUR	FWF FUF	FWT FUT
FWR FWF FWT / FUR FUF FUT (Stainless Steel)	5	15~65	A	28.{0.29}	5.2{0.53}	8.1{0.83}	2.5{0.25}	4.5{0.46}	7.1{0.73}	0.4	0.5	0.6	1.8	1.5	1.3
			B	3.7{0.38}	6.7{0.69}	10.6{1.08}	3.3{0.33}	5.9{0.60}	9.3{0.95}				2.3	1.9	1.7
	6	15~80	A	2.9{0.30}	7.3{0.75}	9.9{1.01}	2.5{0.26}	6.4{0.65}	8.7{0.89}	0.45	0.6	0.7	2.0	1.7	1.5
			B	3.8{0.38}	9.6{0.97}	12.9{1.32}	3.3{0.34}	8.4{0.85}	11.3{1.15}				2.6	2.3	1.9
	7	15~90	A	3.1{0.32}	10.1{1.03}	11.5{1.17}	2.7{0.28}	8.8{0.90}	10.0{1.02}	0.5	0.7	0.8	2.2	2.0	1.7
			B	4.0{0.41}	13.1{1.34}	14.9{1.52}	3.5{0.36}	11.5{1.17}	13.0{1.33}				2.9	2.7	2.2
	8	20~100	A	5.2{0.53}	12.2{1.24}	13.8{1.41}	4.6{0.47}	10.7{1.09}	12.1{1.23}	0.6	0.8	0.9	2.7	2.2	1.9
			B	6.8{0.70}	15.9{1.62}	17.9{1.83}	6.0{0.61}	13.9{1.42}	15.7{1.60}				3.5	2.9	2.4
	10	20~120	A	10.6{1.08}	19.2{1.96}	30.5{3.11}	9.3{0.95}	16.9{1.72}	26.7{2.72}	0.8	1.0	1.2	3.4	2.8	2.5
			B	13.7{1.40}	24.9{2.54}	39.5{4.03}	12.1{1.23}	21.8{2.22}	34.6{3.53}				4.4	3.6	3.2
	12	25~140	A	11.0{1.12}	27.6{2.81}	37.7{3.84}	9.6{0.98}	24.1{2.46}	33.0{3.34}	0.9	1.2	1.4	3.8	3.3	2.9
			B	14.2{1.45}	35.8{3.65}	48.9{4.99}	12.5{1.27}	31.3{3.19}	42.9{4.37}				4.9	4.3	3.8
	14	30~160	A	11.6{1.18}	37.7{3.84}	45.9{4.68}	10.1{1.03}	33.0{3.36}	40.2{4.10}	1.0	1.4	1.6	4.2	3.9	3.3
			B	15.1{1.54}	48.9{4.99}	59.6{6.08}	13.1{1.34}	42.8{4.36}	52.2{5.32}				5.5	5.1	4.3
	16	30~180	A	19.4{1.98}	49.7{5.07}	55.1{5.62}	17.0{1.73}	43.4{4.43}	48.2{4.91}	1.2	1.6	1.8	5.0	4.5	3.7
			B	25.1{2.56}	64.5{6.58}	71.2{7.26}	22.0{2.24}	56.5{5.76}	62.6{6.38}				6.5	5.8	4.8
	18	35~200	A	29.9{3.05}	62.1{6.33}	65.2{6.65}	26.2{2.67}	54.3{5.54}	57.1{5.82}	1.4	1.8	2.0	5.9	5.0	4.1
			B	38.9{3.97}	80.7{8.23}	84.6{8.63}	34.0{3.47}	70.6{7.2}	74.0{7.55}				7.7	6.5	5.4
	20	40~200	A	42.7{4.35}	76.9{7.84}	99.0{10.1}	37.4{3.81}	67.3{6.86}	86.6{8.83}	1.6	2.0	2.3	6.7	5.5	4.8
			B	55.2{5.63}	100{10.2}	128{13.1}	48.3{4.93}	87.2{8.89}	113{11.5}				8.7	7.2	6.3
	23	45~200	A	51.9{5.29}	103.0{10.50}	121.0{12.34}	45.4{4.63}	90.2{9.20}	106.0{10.81}	1.8	2.3	2.6	7.8	6.4	5.5
			B	67.4{6.87}	133.0{13.56}	156.0{15.91}	58.9{6.01}	113.0{11.52}	137.0{13.97}				10.1	8.1	7.1

Load {kgf} = Load N x 0.101972

Part Number Type	D	€ Unit Price L15~40	L41~80	L81~120	L121~160	L161~200
FWR FWF FWT	5					
	6					
	7					
	8					
	10					
	12					
	14					
	16					
	18					
	20					
	23					

Part Number Type	D	€ Unit Price L15~40	L41~80	L81~120	L121~160	L161~200
FUR FUF FUT (Stainless Steel)	5					
	6					
	7					
	8					
	10					
	12					
	14					
	16					
	18					
	20					
	23					

(1) The values of solid length are for reference only. There may be some variations depending on the lot.
(2) Operation frequency: One million times

Order Example

Part Number	-	L	-	Load Type A / B
FWF10	-	119	-	A

Days to Ship

8 Days

Price

■Volume Discount(1) (Round down to one Cent.) P87

Quantity	1~3	4~10	11~30	31~50
Discount Rate	€ Unit Price	50%	70%	85%

(1) For orders larger than indicated quantity, please request a quotation.

Round Wire Springs

-Outer Diameter Referenced Stainless Steel-

CAD Data

Order Example — Part Number: UY4-25, UR13-60, UF8-70

Days to Ship: 6 Days P.87

Volume Discount (Round down to one Cent.) P.87

Quantity	1~3	4~9	10~19	20~100
Discount Rate	€ Unit Price	30%	50%	60%

For orders larger than indicated quantity, please request a quotation.

UV: Fmax. (Allowable Deflection) =LxFa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UV 3- 5	0.15	1.1	4	0.02{0.0018}	70	
10	0.18	2.5	7	0.04{0.0036}		
15	0.18	2.5	11	0.05{0.0054}		
20	0.20	3.3	14	0.07{0.0071}		
25	0.23	6.2	18	0.09{0.0089}		
30	0.23	6.2	21	0.11{0.0107}		
UV 4- 5	0.18	1.2	4	0.02{0.0018}		
10	0.20	1.7	7	0.04{0.0036}		
15	0.23	3.0	11	0.05{0.0054}		
20	0.23	3.0	14	0.07{0.0071}		
25	0.26	4.9	18	0.09{0.0089}		
30	0.26	4.9	21	0.11{0.0107}		
UV 5- 5	0.20	1.2	4	0.02{0.0018}		
10	0.23	1.8	7	0.04{0.0036}		
15	0.26	2.9	11	0.05{0.0054}		
20	0.29	4.5	14	0.07{0.0071}		
25	0.29	4.5	18	0.09{0.0089}		
30	0.29	4.5	21	0.11{0.0107}		
UV 6- 10	0.26	2.0	7	0.04{0.0036}		
15	0.30	3.3	11	0.05{0.0054}		
20	0.30	3.3	14	0.07{0.0071}		
25	0.35	6.5	18	0.09{0.0089}		
30	0.35	6.5	21	0.11{0.0107}		
35	0.35	6.5	25	0.12{0.0125}		
40	0.35	6.5	28	0.14{0.0143}		
UV 8- 10	0.30	1.9	7	0.04{0.0036}		
15	0.35	3.2	11	0.05{0.0054}		
20	0.35	3.2	14	0.07{0.0071}		
25	0.40	5.6	18	0.09{0.0089}		
30	0.40	5.6	21	0.11{0.0107}		
35	0.40	5.6	25	0.12{0.0125}		
40	0.45	9.3	28	0.14{0.0143}		
45	0.45	9.3	32	0.16{0.0161}		
50	0.45	9.3	35	0.18{0.0179}		

UY: Fmax.(Allowable Deflection) =LxFa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UY 2- 5	0.13	1.5	3	0.15{0.015}	60	
10	0.13	1.5	6	0.29{0.03}		
15	0.15	2.7	9	0.44{0.045}		
20	0.15	2.7	12	0.59{0.06}		
25	0.18	6.3	15	0.74{0.075}		
30	0.18	6.3	18	0.88{0.09}		
UY 3- 5	0.16	0.92	3.75	0.37{0.0375}	75	
10	0.2	2	7.5	0.74{0.075}		
15	0.23	3.45	11.25	1.10{0.1125}		
20	0.23	3.45	15	1.47{0.15}		
25	0.26	6.24	15	1.47{0.15}	60	
30	0.26	6.24	18	17.7{0.18}		
UY 4- 5	0.2	1.05	3.75	0.37{0.0375}	75	
10	0.23	1.84	7.5	0.74{0.075}		
15	0.26	2.86	11.25	1.10{0.1125}		
20	0.29	4.64	15	1.47{0.15}		
25	0.3	5.4	18.75	1.84{0.1875}		
30	0.3	5.4	22.5	2.26{0.23}		
UY 5- 5	0.23	1.15	3.75	0.37{0.0375}	75	
10	0.26	1.82	7.5	0.74{0.075}		
15	0.3	3.15	11.25	1.10{0.1125}		
20	0.3	3.15	15	1.47{0.15}		
25	0.32	4.16	18.75	1.84{0.1875}		
30	0.32	4.16	22.5	2.26{0.23}		
35	0.35	6	26.25	2.55{0.26}		
40	0.35	6	30	2.94{0.3}		

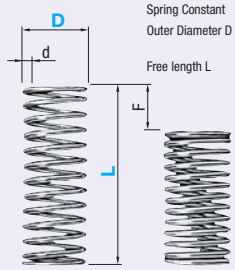
Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UY 6- 5	0.26	1.24	3.5	0.34{0.035}	70	
10	0.3	2.1	7.5	0.74{0.075}	75	
15	0.32	2.64	11.25	1.10{0.1125}		
20	0.35	3.85	15	1.47{0.15}		
25	0.38	5.32	18.75	1.84{0.1875}		
30	0.4	6.8	22.5	2.21{0.225}		
35	0.4	6.8	26.25	2.55{0.26}		
40	0.4	6.8	30	2.94{0.3}		
UY 8- 10	0.35	2.19	7.5	0.74{0.075}	75	
15	0.4	3.4	11.25	1.10{0.1125}		
20	0.4	3.4	15	1.47{0.15}		
25	0.45	5.4	18.75	1.84{0.1875}		
30	0.45	5.4	22.5	2.21{0.225}		
35	0.5	8.3	26.25	2.55{0.26}		
40	0.5	8.3	30	2.94{0.3}		
45	0.5	8.3	33.75	3.33{0.34}		
50	0.55	12.7	35	3.43{0.35}	70	
UY 10- 10	0.5	3.25	6	1.18{0.12}	60	
15	0.5	3.25	11.25	2.21{0.225}	75	
20	0.55	4.4	15	2.94{0.3}		
25	0.55	4.4	18.75	3.68{0.375}		
30	0.6	6.15	22.5	4.41{0.45}		
35	0.6	6.3	26.25	5.10{0.52}		
40	0.6	6.3	30	5.88{0.6}		
45	0.65	8.45	33.75	6.62{0.675}		
50	0.65	8.45	37.5	7.35{0.75}		
UY 12- 15	0.55	3.3	11.25	2.206{0.225}	75	
20	0.55	3.3	15	2.942{0.3}		
25	0.6	4.2	18.75	3.68{0.375}		
30	0.65	5.53	22.5	4.41{0.45}		
35	0.65	5.53	26.25	5.15{0.525}		
40	0.7	7.35	30	5.88{0.6}		
45	0.7	7.35	33.75	6.62{0.675}		
50	0.7	7.35	37.5	7.35{0.75}		
60	0.8	13.6	45	8.83{0.9}		
70	0.8	13.6	52.5	10.30{1.05}		
80	0.8	13.6	60	11.77{1.2}		
UY 13- 15	0.6	3.75	10.5	2.06{0.21}	70	
20	0.6	3.75	15	2.94{0.3}	75	
25	0.65	4.9	18.75	3.68{0.375}		
30	0.65	4.9	22.5	4.41{0.45}		
35	0.7	6.3	26.25	5.15{0.525}		
40	0.75	8.25	30	5.88{0.6}		
45	0.75	8.25	33.75	6.62{0.675}		
50	0.8	11.2	37.5	7.35{0.75}		
60	0.8	11.2	45	8.83{0.9}		
70	0.85	14.45	52.5	10.30{1.05}		
80	0.85	14.45	60	11.77{1.2}		
UY 16- 15	0.7	4.2	9	17.7{0.18}	60	
20	0.7	4.2	15	2.94{0.3}	75	
25	0.7	4.2	18.75	3.68{0.375}		
30	0.75	5.44	22.5	4.41{0.45}		
35	0.8	6.8	26.25	5.15{0.525}		
40	0.8	6.8	30	5.88{0.6}		
45	0.85	8.5	33.75	6.62{0.675}		
50	0.9	10.8	37.5	7.35{0.75}		
60	0.9	10.8	45	8.83{0.9}		
70	1	17	52.5	10.30{1.05}		
80	1	17	60	11.77{1.2}		
UY 20- 20	0.9	5.4	12	3.53{0.36}	60	
25	0.9	5.4	18.75	5.49{0.56}	75	
30	0.9	5.4	22.5	6.62{0.675}		
35	1	7.5	26.25	7.65{0.78}		
40	1	7.5	30	8.83{0.9}		
45	1	7.5	33.75	9.90{1.01}		
50	1.1	11	37.5	11.03{1.125}		
60	1.1	11	45	13.24{1.35}		
70	1.2	15.6	52.5	15.45{1.58}		
80	1.2	15.6	60	17.65{1.8}		

For all types, both ends are not ground.
The values of solid length are for reference only. There may be some variations depending on the lot.
Operation frequency: One million times

UR: Fmax.(Allowable Deflection) =LxFa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UR 2- 5	0.18	2.0	2.5	0.49{0.05}	50	
10	0.18	2.0	5	0.98{0.1}		
15	0.23	6.0	7.5	1.5{0.15}		
20	0.23	6.0	10	2.0{0.2}		
25	0.26	11.2	12.5	2.5{0.25}		
30	0.26	11.2	15	2.9{0.3}		
UR 3- 5	0.23	1.6	3	0.9{0.09}	60	
10	0.25	2.1	6	1.8{0.18}		
15	0.3	4.5	9	2.6{0.27}		
20	0.3	4.5	12	3.5{0.36}		
25	0.32	6.4	15	4.4{0.45}		
30	0.32	6.4	18	5.3{0.54}		
35	0.35	9.8	21	6.2{0.63}		
40	0.35	9.8	24	7.1{0.72}		
UR 4- 5	0.26	1.4	3	0.9{0.09}	60	
10	0.29	2	6	1.8{0.18}		
15	0.32	3	9	2.6{0.27}		
20	0.38	6.1	12	3.5{0.36}		
25	0.38	6.1	15	4.4{0.45}		
30	0.40	8	18	5.3{0.54}		
35	0.40	8	21	6.2{0.63}		
40	0.45	14.4	24	7.1{0.72}		
45	0.45	14.4	27	7.9{0.81}		
50	0.45	14.4	30	8.8{0.9}		
60	0.5	23	36	10.6{1.08}		
UR 5- 5	0.3	1.65	3	0.9{0.09}	60	
10	0.35	2.71	6	1.8{0.18}		
15	0.38	3.61	9	2.6{0.27}		
20	0.38	3.61	12	3.5{0.36}		
25	0.45	7.43	15	4.4{0.45}		
30	0.45	7.43	18	5.3{0.54}		
35	0.5	12.25	21	6.2{0.63}		
40	0.5	12.25	24	7.1{0.72}		
45	0.5	12.25	27	7.9{0.81}		
50	0.55	19.53	30	8.8{0.9}		
60	0.55	19.53	36	10.6{1.08}		
UR 6- 5	0.32	1.5	3	0.9{0.09}	60	
10	0.4	3	6	1.8{0.18}		
15	0.4	3	9	2.6{0.27}		
20	0.5	7	12	3.5{0.36}		
25	0.5	7	15	4.4{0.45}		
30	0.5	7	18	5.3{0.54}		
35	0.55	11	21	6.2{0.63}		
40	0.55	11	24	7.1{0.72}		
45	0.6	17.4	27	7.9{0.81}		
50	0.6	17.4	30	8.8{0.9}		
60	0.65	23.4	36	10.6{1.08}		
70	0.65	23.4	42	12.4{1.26}		
UR 8- 10	0.45	2.6	6	1.8{0.18}	60	
15	0.5	3.6	9	2.6{0.27}		
20	0.5	3.6	12	3.5{0.36}		
25	0.55	5.9	15	4.4{0.45}		
30	0.65	10.4	18	5.3{0.54}		
35	0.65	10.4	21	6.2{0.63}		
40	0.7	15.4	24	7.1{0.72}		
45	0.75	21	22	7.9{0.81}	50	
50	0.75	21	27	8.8{0.9}	55	
60	0.8	27.6	31	10.6{1.08}	52	
70	0.8	27.6	40	12.4{1.26}	57	
80	0.8	27.6	48	14.1{1.44}	60	
UR 10- 10	0.55	3.3	6	1.8{0.18}	60	
15	0.6	4.2	9	2.6{0.27}		
20	0.65	6.2	12	3.5{0.36}		
25	0.65	6.2	15	4.4{0.45}		
30	0.7	8.4	18	5.3{0.54}		
35	0.7	8.4	21	6.2{0.63}		
40	0.7	8.4	24	7.1{0.72}		
45	0.8	15.2	27	7.9{0.81}		
50	0.8	15.2	30	8.8{0.9}		
60	0.85	20.4	36	10.6{1.08}		
70	0.85	20.4	42	12.4{1.26}		
80	0.85	20.4	48	14.1{1.44}		

UV
UY
UR
UF



Spring Constant ±10%
Outer Diameter D Ø10 or less $^{0}_{-0.5}$mm
Ø12 or more $^{0}_{-0.8}$mm
Free length L 50 or less ±1.5mm
55 or more±2.5mm

RoHS

Material: 1.4301/X5Crni18-10-WPB

Spring Constant

D12 is applicable to UY, UR, UF and UBB Types only. D14 is applicable to UBB Type only.

D \ Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB	Type \ D
2		0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}					2
3						1.5 {0.15}				3
4	N/mm 0.05 {kgf/mm} {0.005}	N/mm 0.098 {kgf/mm} {0.01}	N/mm 0.29 {kgf/mm} {0.03}	N/mm 0.49 {kgf/mm} {0.05}	N/mm 0.98 {kgf/mm} {0.1}		2.0 {0.2}	2.9 {0.3}	4.9{0.5}	4
5						N/mm 2.0 {kgf/mm} {0.2}				5
6							N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}	6
8										8
10		N/mm 0.2 {kgf/mm} {0.02}						N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}	10
12										12
13										13
14										14
16										16
20		0.3{0.03}	0.5{0.05}	0.98{0.1}	2.9{0.3}	3.9{0.4}	4.9{0.5}	14.7{1.5}	29.4{3.0}	20
Fmax.	F=Lx70%	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%	F=Lx25%	Fmax.

UF: Fmax.(Allowable Deflection) =Lx45%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UR12- 15	0.6	3.5	9	2.6{0.27}		
20	0.7	5.6	12	3.5{0.36}		
25	0.7	5.6	15	4.4{0.45}		
30	0.8	9.6	18	5.3{0.54}		
35	0.8	9.6	21	6.2{0.63}		
40	0.8	9.6	24	7.1{0.72}	60	
45	0.9	16.2	27	7.9{0.81}		
50	0.9	16.2	30	8.8{0.9}		
60	0.9	16.2	36	10.6{1.08}		
70	1	26	42	12.4{1.26}		
80	1	26	48	14.1{1.44}		
UR13- 15	0.7	4.7	9	2.6{0.27}		
20	0.7	4.7	12	3.5{0.36}		
25	0.8	8	15	4.4{0.45}		
30	0.8	8	18	5.3{0.54}		
35	0.8	8	21	6.2{0.63}		
40	0.9	12.8	24	7.1{0.72}	60	
45	0.9	12.8	27	7.9{0.81}		
50	0.9	12.8	30	8.8{0.9}		
60	1.0	21	36	10.6{1.08}		
70	1.0	21	42	12.4{1.26}		
80	1.0	21	48	14.1{1.44}		
UR16- 15	0.75	4.3	9	2.6{0.27}		
20	0.8	5.4	12	3.5{0.36}		
25	0.9	7.7	15	4.4{0.45}		
30	0.9	7.7	18	5.3{0.54}		
35	1.0	12	21	6.2{0.63}		
40	1.0	12	24	7.1{0.72}	60	
45	1.0	12	27	7.9{0.81}		
50	1.1	19	30	8.8{0.9}		
60	1.1	19	36	10.6{1.08}		
70	1.2	26.4	42	12.4{1.26}		
80	1.2	26.4	48	14.1{1.44}		
UR20- 20	1.0	6	12	5.9{0.6}		
25	1.1	7.7	15	7.4{0.75}		
30	1.1	7.7	18	8.8{0.9}		
35	1.2	10.8	21	10.3{1.05}		
40	1.2	10.8	24	11.8{1.2}	60	
45	1.3	14.3	27	13.2{1.35}		
50	1.3	14.3	30	14.7{1.5}		
60	1.4	19.6	36	17.7{1.8}		
70	1.4	19.6	42	20.6{2.1}		
80	1.5	27	48	23.5{2.4}		

Both ends of UR Type springs are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	€ Unit Price
UF 2- 5*	0.2	2.35	2.25	0.66 {0.068}	
10*	0.2	2.35	4.5	1.3 {0.14}	
15*	0.26	7.8	6.7	2.0 {0.20}	
20*	0.26	7.8	9	2.7 {0.27}	
25*	0.29	13.6	11.2	3.3 {0.34}	
30*	0.29	13.6	13.5	4.0 {0.41}	
UF 3- 5*	0.26	1.8	2.25	1.1{0.11}	
10*	0.32	3.5	4.5	2.2{0.22}	
15*	0.32	3.5	6.7	3.2{0.33}	
20*	0.35	6.3	9	4.4{0.45}	
25*	0.35	6.3	11.2	5.5{0.56}	
30*	0.4	12.4	13.5	6.6{0.67}	
35*	0.4	12.4	15.7	7.6{0.78}	
40*	0.4	12.4	18	8.8{0.9}	
UF 4- 5*	0.32	2	2.25	1.1{0.11}	
10*	0.35	3	4.5	2.2{0.22}	
15*	0.4	5.2	6.7	3.2{0.33}	
20*	0.4	5.2	9	4.4{0.45}	
25*	0.45	9.5	11.2	5.5{0.56}	
30*	0.45	9.5	13.5	6.6{0.67}	
35*	0.5	15.5	15.7	7.6{0.78}	
40*	0.5	15.5	18	8.8{0.9}	
45*	0.5	15.5	20	9.8{1}	
50*	0.5	15.5	22.5	10.8{1.1}	
60*	0.55	22.6	27	12.7{1.3}	
UF 5- 5*	0.35	2.01	2.25	1.1{0.11}	
10*	0.4	3.2	4.5	2.2{0.23}	
15*	0.4	3.2	6.75	3.3{0.34}	
20*	0.45	4.95	9	4.4{0.45}	
25*	0.45	4.95	11.25	5.5{0.56}	
30*	0.5	7.75	13.5	6.7{0.68}	
35*	0.5	7.75	15.75	7.7{0.79}	
40	0.6	19.5	18	8.8{0.9}	
45	0.6	19.5	20.25	10{1.01}	
50	0.6	19.5	22.5	11.2{1.13}	
60	0.65	27.95	27	13.4{1.35}	
UF 6- 5*	0.4	2.2	2.25	1.1{0.11}	
10*	0.5	5	4.5	2.2{0.22}	
15*	0.55	7.7	6.7	3.2{0.33}	
20*	0.55	7.7	9	4.4{0.45}	
25	0.6	10.8	11.2	5.5{0.56}	
30	0.65	15.6	13.5	6.6{0.67}	
35	0.65	15.6	15.7	7.6{0.78}	
40	0.65	15.6	18	8.8{0.9}	
45	0.65	15.6	20	9.8{1}	
50	0.7	23.1	22.5	10.8{1.1}	
60	0.7	23.1	27	12.7{1.3}	
70	0.75	30.8	31.5	14.7{1.5}	
UF 8-10	0.6	5.4	4.5	2.2{0.22}	
15	0.65	7.2	6.7	3.2{0.33}	
20	0.7	10.5	9	4.4{0.45}	
25	0.7	10.5	11.2	5.5{0.56}	
30	0.75	13.5	13.5	6.6{0.67}	
35	0.75	13.5	15.7	7.6{0.78}	
40	0.8	18.4	18	8.8{0.9}	
45	0.8	18.4	20	9.8{1}	
50	0.8	18.4	22.5	10.8{1.1}	
60	0.85	26.4	27	12.7{1.3}	
70	0.85	26.4	31.5	14.7{1.5}	
80	0.85	26.4	36	17.7{1.8}	
UF10-10	0.65	4.6	4.5	2.2{0.22}	
15	0.65	4.6	6.7	3.2{0.33}	
20	0.8	9.6	9	4.4{0.45}	
25	0.8	9.6	11.2	5.5{0.56}	
30	0.85	12.8	13.5	6.6{0.67}	
35	0.85	12.8	15.7	7.6{0.78}	
40	0.9	17	18	8.8{0.9}	
45	0.9	17	20	9.8{1}	
50	0.9	17	22.5	10.8{1.1}	
60	1.0	28	27	12.7{1.3}	
70	1.0	28	31.5	14.7{1.5}	
80	1.0	28	36	17.7{1.8}	

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	€ Unit Price
UF12- 15	0.8	6.8	6.7	3.2{0.33}	
20	0.8	6.8	9	4.4{0.45}	
25	0.8	6.8	11.2	5.5{0.56}	
30	0.9	10.8	13.5	6.6{0.67}	
35	1.0	17	15.7	7.6{0.78}	
40	1.0	17	18	8.8{0.9}	
45	1.0	17	20	9.8{1}	
50	1.1	26.4	22.5	10.8{1.1}	
60	1.1	26.4	27	12.7{1.3}	
70	1.1	26.4	31.5	14.7{1.5}	
80	1.2	39.6	36	17.7{1.8}	
UF13- 15	0.8	5.6	6.7	3.2{0.33}	
20	0.8	5.6	9	4.4{0.45}	
25	0.85	7.2	11.2	5.5{0.56}	
30	1.0	14	13.5	6.6{0.67}	
35	1.0	14	15.7	7.6{0.78}	
40	1.0	14	18	8.8{0.9}	
45	1.1	21.5	20	9.8{1}	
50	1.1	21.5	22.5	10.8{1.1}	
60	1.1	21.5	27	12.7{1.3}	
70	1.2	30	31.5	14.7{1.5}	
80	1.2	30	36	17.7{1.8}	
UF16- 15	0.9	5.6	6.7	3.2{0.33}	
20	1.0	7.7	9	4.4{0.45}	
25	1.0	7.7	11.2	5.5{0.56}	
30	1.1	12.1	13.5	6.6{0.67}	
35	1.1	12.1	15.7	7.6{0.78}	
40	1.2	18	18	8.8{0.9}	
45	1.2	18	20	9.8{1}	
50	1.2	18	22.5	10.8{1.1}	
60	1.3	26	27	12.7{1.3}	
70	1.3	26	31.5	14.7{1.5}	
80	1.4	35	36	17.7{1.8}	
UF20- 20	1.2	7.2	9	8.8{0.9}	
25	1.3	9.1	11.3	11.1{1.13}	
30	1.4	11.9	13.5	13.2{1.35}	
35	1.4	11.9	15.8	15.5{1.58}	
40	1.5	15.8	18	17.7{1.8}	
45	1.5	15.8	20.3	19.9{2.03}	
50	1.6	20.8	22.5	22.1{2.25}	
60	1.6	20.8	27	26.5{2.7}	
70	1.7	26.4	31.5	30.9{3.15}	
80	1.7	26.4	36	35.3{3.6}	

kgf (Load)=N/mm (Spring Constant) x 0.101972 x F (Deflection)
{kgf}=Nx0.101972

Both ends of * marked UF Type springs are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times

Round Wire Springs

-Outer Diameter Referenced Stainless Steel-

CAD Data

Order Example

Part Number
UL16-80
UTT16-80

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~3	4~9	10~19	20~100
Discount Rate	€ Unit Price	30%	50%	60%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

6 Days P.87

UL: Fmax. (Allowable Deflection) = L x 40%

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	€ Unit Price
UL 2- 5*	0.2	1.65	2	0.98 {0.1}	
10*	0.26	5.07	4	1.96 {0.2}	
15*	0.26	5.07	6	2.94 {0.3}	
20*	0.3	9.9	8	3.92 {0.4}	
25*	0.32	14.1	10	4.90 {0.5}	
30*	0.32	14.1	12	5.88 {0.6}	
UL 3- 5*	0.30	2	2	2.0 {0.2}	
10*	0.35	3.7	4	3.9 {0.4}	
15*	0.4	6.6	6	5.9 {0.6}	
20*	0.4	6.6	8	7.8 {0.8}	
25*	0.45	11.7	10	9.8 {1 }	
30*	0.45	11.7	12	11.8 {1.2}	
35*	0.45	11.7	14	13.7 {1.4}	
40*	0.5	20	16	15.7 {1.6}	
UL 4- 5*	0.35	2.1	2	2.0 {0.2}	
10*	0.45	5.3	4	3.9 {0.4}	
15*	0.45	5.3	6	5.9 {0.6}	
20*	0.5	8	8	7.8 {0.8}	
25*	0.5	8	10	9.8 {1 }	
30*	0.55	12.7	12	11.8 {1.2}	
35*	0.55	12.7	14	13.7 {1.4}	
40	0.6	19.8	16	15.7 {1.6}	
45	0.6	19.8	18	17.7 {1.8}	
50	0.6	19.8	20	19.6 {2 }	
60	0.65	29.9	24	23.5 {2.4}	
UL 5- 5*	0.4	2.2	2	2.0 {0.2}	
10*	0.5	4.75	4	3.9 {0.4}	
15*	0.5	4.75	6	5.9 {0.6}	
20*	0.55	6.88	8	7.8 {0.8}	
25*	0.55	6.88	10	9.8 {1 }	
30	0.65	14.95	12	11.8 {1.2}	
35	0.65	14.95	14	13.7 {1.4}	
40	0.65	14.95	16	15.7 {1.6}	
45	0.7	21.7	18	17.7 {1.8}	
50	0.7	21.7	20	19.6 {2 }	
60	0.75	30.75	24	23.5 {2.4}	
UL 6- 5*	0.45	2.3	2	2.0 {0.2}	
10*	0.55	4.4	4	3.9 {0.4}	
15*	0.55	4.4	6	5.9 {0.6}	
20	0.65	8.5	8	7.8 {0.8}	
25	0.65	8.5	10	9.8 {1 }	
30	0.7	12.6	12	11.8 {1.2}	
35	0.7	12.6	14	13.7 {1.4}	
40	0.7	12.6	16	15.7 {1.6}	
45	0.75	17.3	18	17.7 {1.8}	
50	0.75	17.3	20	19.6 {2 }	
60	0.8	24.8	24	23.5 {2.4}	
70	0.8	24.8	28	27.5 {2.8}	
UL 8- 10	0.65	4.6	4	3.9 {0.4}	
15	0.75	8.3	6	5.9 {0.6}	
20	0.75	8.3	8	7.8 {0.8}	
25	0.75	8.3	10	9.8 {1 }	
30	0.8	10.4	12	11.8 {1.2}	
35	0.8	10.4	14	13.7 {1.4}	
40	0.8	10.4	16	15.7 {1.6}	
45	0.85	14.5	18	17.7 {1.8}	
50	0.85	14.5	20	19.6 {2 }	
60	0.9	18	24	23.5 {2.4}	
70	1.0	30	28	27.5 {2.8}	
80	1.0	30	32	31.4 {3.2}	

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	€ Unit Price
UL 10- 10	0.75	4.7	4	3.9 {0.4}	
15	0.8	6.2	6	5.9 {0.6}	
20	0.8	6.2	8	7.8 {0.8}	
25	0.9	9.5	10	9.8 {1 }	
30	0.9	9.5	12	11.8 {1.2}	
35	0.9	9.5	14	13.7 {1.4}	
40	1.0	15.5	16	15.7 {1.6}	
45	1.0	15.5	18	17.7 {1.8}	
50	1.0	15.5	20	19.6 {2 }	
60	1.1	23.7	24	23.5 {2.4}	
70	1.1	23.7	28	27.5 {2.8}	
80	1.1	23.7	32	31.4 {3.2}	
UL 12- 15	0.9	6.5	6	5.9 {0.6}	
20	1	9	8	7.8 {0.8}	
25	1	9	10	9.8 {1.0}	
30	1.1	12.5	12	11.8 {1.2}	
35	1.1	12.5	14	13.7 {1.4}	
40	1.2	17	16	15.7 {1.6}	
45	1.2	17	18	17.7 {1.8}	
50	1.2	17	20	19.6 {2.0}	
60	1.3	24	24	23.5 {2.4}	
70	1.3	24	28	27.5 {2.8}	
80	1.4	32	32	31.4 {3.2}	
UL 13- 15	0.9	5.4	6	5.9 {0.6}	
20	1.0	8.25	8	7.8 {0.8}	
25	1.0	8.25	10	9.8 {1 }	
30	1.1	12.1	12	11.8 {1.2}	
35	1.1	12.1	14	13.7 {1.4}	
40	1.1	12.1	16	15.7 {1.6}	
45	1.2	16.8	18	17.7 {1.8}	
50	1.2	16.8	20	19.6 {2 }	
60	1.2	16.8	24	23.5 {2.4}	
70	1.4	35	28	27.5 {2.8}	
80	1.4	35	32	31.4 {3.2}	

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	€ Unit Price
UL 16- 15	1.1	7.7	6	5.9 {0.6}	
20	1.1	7.7	8	7.8 {0.8}	
25	1.2	10.8	10	9.8 {1 }	
30	1.2	10.8	12	11.8 {1.2}	
35	1.3	14.3	14	13.7 {1.4}	
40	1.3	14.3	16	15.7 {1.6}	
45	1.4	19.6	18	17.7 {1.8}	
50	1.4	19.6	20	19.6 {2 }	
60	1.4	19.6	24	23.5 {2.4}	
70	1.5	27	28	27.5 {2.8}	
80	1.5	27	32	31.4 {3.2}	
UL 20- 20	1.6	10.4	8	23.5 {2.4}	
25	1.6	10.4	10	29.4 {3 }	
30	1.7	12.8	12	35.3 {3.6}	
35	1.7	12.8	14	41.2 {4.2}	
40	1.8	15.3	16	47.1 {4.8}	
45	1.8	15.3	18	53.0 {5.4}	
50	2	23	20	58.8 {6 }	
60	2	23	24	70.6 {7.2}	
70	2.2	35.2	28	82.4 {8.4}	
80	2.2	35.2	32	94.1 {9.6}	

kgf (Load)=N/mm (Spring Constant) x 0.101972 x F (Deflection)
{kgf}=Nx0.101972

For Types marked with *, both ends are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times

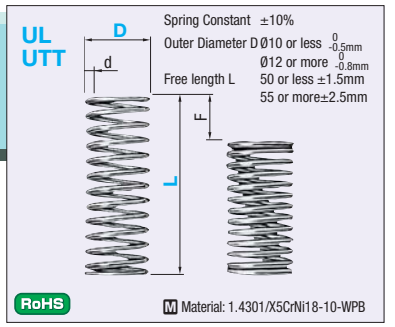
Alterations

Part Number - (LKC)
UL6-20 - LKC
10 Days
Express B 2.00 EUR/piece P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations	Code	Spec.	Price adder
LKC	LKC	Changes Length and Spring Constant Tolerance (Refer to the below table).	Refer to the table on the left. Values are € Unit Price. No need to add on the price.

Part Number Type	D	L: Specify in 5mm Increment	L: Alterations	L: Tolerance	Spring Constant Tolerance	€ Unit Price Qty 1~3	Volume Discount 4~9	Volume Discount 10~19	Volume Discount 20~49
UL	5	30~50	LKC	±0.5	±5%				
		60		±0.8					
	6	20		±0.4					
		25~50		±0.5					
		60, 70		±0.8					
	8 10	10~20		±0.4					
		25~50		±0.5					
		60, 70		±0.8					
	12	15~30		±0.5					
	13 16	35~50		±0.5					
		60, 70, 80		±0.8					
	20	20~30		±0.5					
		35~50		±0.5					
		60, 70, 80		±0.8					

Both ends are ground.
Applicable to D5 or more.



Spring Constant

D12 is applicable to UY, UR, UF, UL and UBB Types only. D14 is applicable to UBB Type only.

D \ Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB
2	N/mm 0.05 {kgf/mm} {0.005}	0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}	N/mm 1.5 {kgf/mm} {0.15}	2.0{0.2}	2.9{0.3}	4.9{0.5}
3		N/mm 0.098 {kgf/mm} {0.01}	N/mm 0.29 {kgf/mm} {0.03}	N/mm 0.49 {kgf/mm} {0.05}	N/mm 0.98 {kgf/mm} {0.1}	N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
4									
5									
6									
8									
10									
12		N/mm 0.2 {kgf/mm} {0.02}						N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
13									
14									
16									
20		0.3{0.03}	0.5{0.05}	0.98{0.1}	2.9{0.3}	3.9{0.4}	4.9{0.5}	14.7{1.5}	29.4{3.0}
Fmax.	F=Lx70%	F=LxFa%	F=LxFa%	F=Lx45%	F=Lx40%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%

UTT: Fmax. (Allowable Deflection) = L x Fa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.		Fa%	€ Unit Price
UTT 3- 5*	0.35	2.8	2	2.9	{0.3}		
10*	0.4	4.8	4	5.9	{0.6}	40	
15*	0.45	8.3	6	8.8	{0.9}		
20*	0.45	8.3	6	8.8	{0.9}	30	
25*	0.5	14	8	11.8	{1.2}	32	
30*	0.5	14	8	11.8	{1.2}	27	
UTT 4- 5*	0.4	2.6	2	2.9	{0.3}		
10*	0.45	3.9	4	5.9	{0.6}		
15*	0.5	6	6	8.8	{0.9}	40	
20*	0.55	9.4	8	11.8	{1.2}		
25	0.6	14.4	10	14.7	{1.5}		
30	0.6	14.4	10	14.7	{1.5}	33	
UTT 5- 5*	0.45	2.6	2	2.9	{0.3}		
10*	0.5	3.6	4	5.9	{0.6}		
15	0.6	7.5	6	8.8	{0.9}		
20	0.6	7.5	8	11.8	{1.2}	40	
25	0.65	10.7	10	14.7	{1.5}		
30	0.7	15.4	12	17.7	{1.8}		
35	0.7	15.4	14	20.6	{2.1}		
UTT 6- 5*	0.5	2.4	2	3.9	{0.4}		
10	0.6	4.2	4	7.8	{0.8}		
15	0.7	7.4	6	11.8	{1.2}		
20	0.7	7.4	8	15.7	{1.6}		
25	0.8	13.6	10	19.6	{2.0}	40	
30	0.8	13.6	12	23.5	{2.4}		
35	0.85	17.5	14	27.5	{2.8}		
40	0.9	23.4	16	31.4	{3.2}		
45	0.9	23.4	18	35.3	{3.6}		
50	0.9	23.4	18	35.3	{3.6}	36	
60	1.0	41	18	35.3	{3.6}	30	
70	1.0	41	24	47.1	{4.8}	34	

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.		Fa%	€ Unit Price
UTT 8- 10	0.75	5.3	4	7.8	{0.8}		
15	0.75	5.3	6	11.8	{1.2}		
20	0.9	10.4	8	15.7	{1.6}		
25	0.9	10.4	10	19.6	{2.0}		
30	1.0	17	12	23.5	{2.4}		
35	1.0	17	14	27.5	{2.8}	40	
40	1.0	17	16	31.4	{3.2}		
45	1.1	25.3	18	35.3	{3.6}		
50	1.1	25.3	20	39.2	{4.0}		
60	1.1	25.3	24	47.1	{4.8}		
70	1.2	39.6	28	54.9	{5.6}		
UTT 10- 10	0.85	5.1	4	7.8	{0.8}		
15	0.85	5.1	6	11.8	{1.2}		
20	1.0	9.5	8	15.7	{1.6}		
25	1.0	9.5	10	19.6	{2.0}		
30	1.1	14.3	12	23.5	{2.4}	40	
35	1.1	14.3	14	27.5	{2.8}		
40	1.2	20.4	16	31.4	{3.2}		
45	1.2	20.4	18	35.3	{3.6}		
50	1.2	20.4	20	39.2	{4.0}		
60	1.3	29.9	24	47.1	{4.8}		
70	1.4	43.4	24	47.1	{4.8}	34	
UTT 13- 15	1.0	5.75	6	11.8	{1.2}		
20	1.2	10.5	8	15.7	{1.6}		
25	1.2	10.5	10	19.6	{2.0}		
30	1.3	15	12	23.5	{2.4}		
35	1.3	15	14	27.5	{2.8}		
40	1.4	20.3	16	31.4	{3.2}	40	
45	1.4	20.3	18	35.3	{3.6}		
50	1.5	27.8	20	39.2	{4.0}		
60	1.5	27.8	24	47.1	{4.8}		
70	1.6	38.4	28	54.9	{5.6}		
80	1.6	38.4	32	62.8	{6.4}		

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.		Fa%	€ Unit Price
UTT 16- 15	1.2	7.2	6	11.8	{1.2}		
20	1.3	9.1	8	15.7	{1.6}		
25	1.3	9.1	10	19.6	{2.0}		
30	1.4	12.3	12	23.5	{2.4}		
35	1.5	16.5	14	27.5	{2.8}		
40	1.6	21.6	16	31.4	{3.2}	40	
45	1.6	21.6	18	35.3	{3.6}		
50	1.7	28	20	39.2	{4.0}		
60	1.7	28	24	47.1	{4.8}		
70	1.8	36	28	54.9	{5.6}		
80	1.8	36	32	62.8	{6.4}		
UTT 20- 20	1.7	10.6	8	31.4	{3.2}		
25	1.8	12.6	10	39.2	{4.0}		
30	1.8	12.6	12	47.1	{4.8}		
35	2.0	19	14	54.9	{5.6}		
40	2.0	19	16	62.8	{6.4}	40	
45	2.0	19	18	70.6	{7.2}		
50	2.2	27.5	20	78.5	{8.0}		
60	2.2	27.5	24	94.1	{9.6}		
70	2.3	34.5	28	109.8	{11.2}		
80	2.4	40.8	32	125.5	{12.8}		

kgf (Load)=N/mm (Spring Constant) x 0.101972 x F (Deflection)
{kgf}=Nx0.101972

For Types marked with *, both ends are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times

Alterations

Part Number - (LKC)
UTT6-35 - LKC
10 Days
Express B 2.00 EUR/piece
P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations	Code	Spec.	Price adder
LKC	LKC	Changes Length and Spring Constant Tolerance (Refer to the below table).	Refer to the table on the left. Values are € Unit Price. No need to add on the price.

Part Number Type	D	L Specify in 5mm Increment	L Alterations	L Tolerance	Spring Constant Tolerance	€ Unit Price Qty 1~3	Volume Discount 4~9	Volume Discount 10~19	Volume Discount 20~49
UTT	5	15, 20	LKC	±0.4	±5%				
		25, 30		±0.5					
	6 8 10	10~20		±0.4					
		25~50		±0.5					
		60, 70		±0.8					
	13 16	15~30		±0.5					
		35~50		±0.5					
		60, 70, 80		±0.8					
	20	20~30		±0.5					
		35~50		±0.5					
		60, 70, 80		±0.8					

Both ends are ground.
Applicable to D5 or more.

Round Wire Springs

-Outer Diameter Referenced Stainless Steel-

CAD Data

Order Example — Part Number: UM16-80, UH16-80

Price — Volume Discount (Round down to one Cent.) P87

Quantity	1~3	4~9	10~19	20~100
Discount Rate	€ Unit Price	30%	50%	60%

For orders larger than indicated quantity, please request a quotation.

Days to Ship — 6 Days P87

UM: Fmax. (Allowable Deflection) = L x Fa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UM 4- 5*	0.4	2.2	1.75	3.4 {0.35}	35	
10*	0.5	4.9	3.5	6.8 {0.7}		
15	0.55	7.5	5.25	10.3 {1.05}		
20	0.6	11.1	7	13.7 {1.4}		
25	0.6	11.1	8.75	17.2 {1.75}		
30	0.65	16.3	10.5	20.6 {2.1}		
UM 5- 5*	0.45	2.25	1.75	3.4 {0.35}	35	
10*	0.5	3.13	3.5	6.8 {0.7}		
15	0.65	8.45	5.25	10.3 {1.05}		
20	0.65	8.45	7	13.7 {1.4}		
25	0.7	11.9	8.75	17.2 {1.75}		
30	0.7	11.9	10.5	20.6 {2.1}		
35	0.75	16.5	12.25	24.0 {2.45}		
40	0.8	23.2	14	27.5 {2.8}		
45	0.8	23.2	15.75	30.9 {3.15}		
50	0.85	31.45	17.5	34.3 {3.5}		
UM 6- 5*	0.55	2.7	1.7	4.9 {0.5}	35	
10	0.7	5.6	3.5	10.8 {1.1}		
15	0.75	7.4	5.2	15.7 {1.6}		
20	0.75	7.4	7	20.6 {2.1}		
25	0.85	12.8	8.7	25.5 {2.6}		
30	0.85	12.8	10.5	31.4 {3.2}		
35	0.9	16.7	12.2	36.3 {3.7}		
40	0.9	16.8	14	41.2 {4.2}		
45	1.0	27.8	15.8	46.1 {4.7}		
50	1.0	28.0	17.5	52.0 {5.3}		
60	1.0	28.0	18	53.0 {5.4}	30	
70	1.1	46.2	20	58.8 {6 }	28	
UM 8- 10	0.85	6.4	3.5	10.8 {1.1}	35	
15	0.9	7.9	5.2	15.7 {1.6}		
20	0.9	7.9	7	20.6 {2.1}		
25	0.9	7.9	8.7	25.5 {2.6}		
30	1.0	12.0	10.5	31.4 {3.2}		
35	1.0	12.0	12.2	36.3 {3.7}		
40	1.1	18.7	14	41.2 {4.2}		
45	1.1	18.7	15.8	46.1 {4.7}		
50	1.1	18.7	17.5	52.0 {5.3}		
60	1.2	28.2	21	61.8 {6.3}		
70	1.3	42.0	24.5	72.6 {7.4}		

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UM10- 10	0.9	5.2	3.5	10.8 {1.1}	35	
15	1.0	7.3	5.2	15.7 {1.6}		
20	1.0	7.3	7	20.6 {2.1}		
25	1.1	10.5	8.7	25.5 {2.6}		
30	1.1	10.5	10.5	31.4 {3.2}		
35	1.2	15	12.2	36.3 {3.7}		
40	1.2	15	14	41.2 {4.2}		
45	1.3	21.8	15.8	46.1 {4.7}		
50	1.3	21.8	17.5	52.0 {5.3}		
60	1.4	30.8	21	61.8 {6.3}		
70	1.4	30.8	24.5	72.6 {7.4}		
UM13- 15	1.2	8.4	5.2	15.7 {1.6}	35	
20	1.3	11.1	7	20.6 {2.1}		
25	1.3	11.1	8.7	25.5 {2.6}		
30	1.4	15.1	10.5	31.4 {3.2}		
35	1.4	15.1	12.2	36.3 {3.7}		
40	1.4	15.1	14	41.2 {4.2}		
45	1.4	15.1	15.8	46.1 {4.7}		
50	1.4	15.1	17.5	52.0 {5.3}		
60	1.6	27.2	21	61.8 {6.3}		
70	1.6	27.2	24.5	72.6 {7.4}		
80	1.7	36.2	28	82.4 {8.4}		

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UM16- 15	1.4	9.6	5.2	15.7 { 1.6}	35	
20	1.5	12.4	7	20.6 { 2.1}		
25	1.5	12.4	8.7	25.5 { 2.6}		
30	1.5	12.4	10.5	31.4 { 3.2}		
35	1.6	15.6	12.2	36.3 { 3.7}		
40	1.6	15.6	14	41.2 { 4.2}		
45	1.7	20.4	15.8	46.1 { 4.7}		
50	1.7	20.4	17.5	52.0 { 5.3}		
60	1.8	26.1	21	61.8 { 6.3}		
70	1.8	26.1	24.5	72.6 { 7.4}		
80	1.8	26.1	28	82.4 { 8.4}		
UM20- 20	1.8	11.3	7	34.3 { 3.5}	35	
25	1.9	13.3	8.8	43.1 { 4.4}		
30	1.9	13.3	10.5	52.0 { 5.3}		
35	2	16	12.3	59.8 { 6.1}		
40	2	16	14	68.6 { 7 }		
45	2.2	23.7	15.8	77.5 { 7.9}		
50	2.2	23.7	17.5	86.3 { 8.8}		
60	2.2	23.7	21	103.0 {10.5}		
70	2.4	34.8	24.5	120.6 {12.3}		
80	2.4	34.8	28	137.3 {14 }		

kgf (Load)=N/mm (Spring Constant) x 0.101972 x F (Deflection)

{kgf}=Nx0.101972

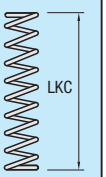
For Types marked with *, both ends are not ground.

The values of solid length are for reference only. There may be some variations depending on the lot.

Operation frequency: One million times

Alterations — Part Number - (LKC): UM6-30 - LKC; 10 Days; Express B 2,00 EUR/piece P88

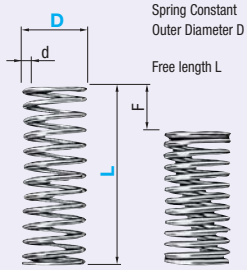
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations	Code	Spec.	Price adder
	LKC	Changes Length and Spring Constant Tolerance (Refer to the below table).	Refer to the table on the left. Values are € Unit Price. No need to add on the price.

Part Number Type	D	L Specify in 5mm Increment	L Alterations	L Tolerance	Spring Constant Tolerance	€ Unit Price Qty 1~3	Volume Discount 4~9	Volume Discount 10~19	Volume Discount 20~49
UM	4	15, 20	LKC	±0.4	±5%				
		25, 30		±0.5					
	5	15, 20		±0.4					
		25~50		±0.5					
	6 8 10	10~20		±0.4					
		25~50		±0.5					
		60, 70		±0.8					
	13 16	15~30		±0.5					
		35~50		±0.5					
		60, 70, 80		±0.8					
	20	20~30		±0.5					
		35~50		±0.5					
		60, 70, 80		±0.8					

Both ends are ground.

UM
UH



Spring Constant ±10%
Outer Diameter D Ø10 or less $^{0}_{-0.5mm}$
Ø12 or more $^{0}_{-0.8mm}$
Free length L
50 or less ±1.5mm
55 or more±2.5mm

RoHS

Material: 1.4301/X5CrNi18-10-WPB

Spring Constant

D12 is applicable to UY, UR, UF, UL and UBB Types only. D14 is applicable to UBB Type only.

D \ Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB
2		0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}				
3						N/mm 1.5 {kgf/mm} {0.15}			
4	N/mm 0.05 {kgf/mm} {0.005}	N/mm 0.098 {kgf/mm} {0.01}					2.0{0.2}	2.9{0.3}	4.9{0.5}
5									
6			N/mm 0.29 {kgf/mm} {0.03}	N/mm 0.49 {kgf/mm} {0.05}	N/mm 0.98 {kgf/mm} {0.1}	N/mm 2.0 {kgf/mm} {0.2}		N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
8							N/mm 2.9 {kgf/mm} {0.3}		
10									
12		N/mm 0.2 {kgf/mm} {0.02}						N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
13									
14									
16									
20		0.3{0.03}	0.5{0.05}	0.98{0.1}	2.9{0.3}	3.9{0.4}	4.9{0.5}	14.7{1.5}	29.4{3.0}
Fmax.	F=Lx70%	F=LxFa%	F=LxFa%	F=Lx45%	F=Lx40%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%

■UH: Fmax.(Allowable Deflection)= L x Fa%

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UH 4- 5*	0.45	2.7	1.5	4.4 {0.45}	30	
10*	0.5	3.8	3	8.8 { 0.9}		
15	0.6	8.1	4.5	13.2 {1.35}		
20	0.65	11.7	6	17.6 { 1.8}		
25	0.7	16.8	7.5	22.1 {2.25}		
30	0.7	16.8	9	26.5 { 2.7}		
UH 5- 5*	0.55	3.3	1.5	4.4 {0.45}	30	
10	0.6	4.65	3	8.8 { 0.9}		
15	0.6	4.65	4.5	13.2 {1.35}		
20	0.75	11.81	6	17.6 { 1.8}		
25	0.75	11.81	7.5	22.1 {2.25}		
30	0.8	16	9	26.5 { 2.7}		
35	0.85	21.68	10.5	30.9 {3.15}		
40	0.85	21.68	12	35.3 { 3.6}		
45	0.9	28.8	13.5	39.7 {4.05}		
UH 6- 5*	0.65	3.2	1.5	8.8 { 0.9}	30	
10	0.7	3.9	3	17.7 { 1.8}		
15	0.85	7.7	4.5	26.5 { 2.7}		
20	0.9	9.7	6	35.3 { 3.6}		
25	1.0	15.5	7.5	44.1 { 4.5}		
30	1.0	15.5	9	53.0 { 5.4}		
35	1.1	24.8	9.8	57.9 { 5.9}	28	
40	1.1	24.8	10	58.8 { 6 }	25	
45	1.1	24.8	11.3	66.7 { 6.8}		
50	1.2	39.0	10	58.8 { 6 }	20	
60	1.2	39.0	14	82.4 { 8.4}	23	
70	1.2	39.0	15	88.3 { 9 }	21	
UH 8- 10	0.9	5.3	3	17.7 { 1.8}	30	
15	0.9	5.3	4.5	26.5 { 2.7}		
20	1.1	11	6	35.3 { 3.6}		
25	1.1	11	7.5	44.1 { 4.5}		
30	1.2	15.9	9	53.0 { 5.4}		
35	1.2	15.9	10.5	61.8 { 6.3}		
40	1.3	23.1	12	70.6 { 7.2}		
45	1.3	23.1	13.5	79.4 { 8.1}		
50	1.4	33.3	15	88.3 { 9 }		
60	1.4	33.3	18	105.9 {10.8}		
70	1.5	48.0	19	111.8 {11.4}	27	

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UH 10- 10	1.1	6.9	3	17.7 { 1.8}	30	
15	1.1	6.9	4.5	26.5 { 2.7}		
20	1.2	9.3	6	35.3 { 3.6}		
25	1.2	9.3	7.5	44.1 { 4.5}		
30	1.3	12.7	9	53.0 { 5.4}		
35	1.4	17.5	10.5	61.8 { 6.3}		
40	1.4	17.5	12	70.6 { 7.2}		
45	1.5	23.8	13.5	79.4 { 8.1}		
50	1.5	23.8	15	88.3 { 9 }		
60	1.6	32.4	18	105.9 {10.8}		
70	1.7	44.2	21	123.6 {12.6}		
UH 13- 15	1.5	9.2	4.5	44.1 { 4.5}	30	
20	1.5	9.2	6	58.8 { 6 }		
25	1.5	9.2	7.5	73.5 { 7.5}		
30	1.8	18	9	88.3 { 9 }		
35	1.8	18	10.5	103.0 {10.5}		
40	1.8	18	12	117.7 {12 }		
45	1.8	18	13.5	132.4 {13.5}		
50	2.0	28.5	15	147.0 {15 }		
60	2.1	36	18	176.5 {18 }		
70	2.2	45.1	21	205.9 {21 }		
80	2.2	45.1	20	196.1 {20 }	25	
UH 16- 15	1.7	9.6	4.6	44.1 { 4.5}	30	
20	1.9	14	6	58.8 { 6 }		
25	1.9	14	7.5	73.5 { 7.5}		
30	1.9	14	9	88.3 { 9 }		
35	1.9	14	10.5	103.0 {10.5}		
40	2.2	25.1	12	117.7 {12 }		
45	2.2	25.1	13.5	132.4 {13.5}		
50	2.2	25.1	15	147.1 {15 }		
60	2.3	30.5	18	176.5 {18 }		
70	2.5	44.7	21	205.9 {21 }		
80	2.5	44.7	24	235.4 {24 }		

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UH 20- 25	2.3	13.8	7.5	110.8 {11.3}	30	
30	2.3	13.8	9	132.4 {13.5}		
35	2.5	18.8	10.5	154.9 {15.8}		
40	2.5	18.8	12	176.5 {18 }		
45	2.8	29.4	13.5	199.1 {20.3}		
50	2.8	29.4	15	220.6 {22.5}		
60	3	40.5	18	264.8 {27 }		
70	3	40.5	21	308.9 {31.5}		
80	3.2	54.4	24	353.0 { 36 }		

kgf (Load)=N/mm (Spring Constant) x 0.101972 x F (Deflection)
{kgf}=Nx0.101972

For Types marked with *, both ends are not ground.
The values of solid length are for reference only.
There may be some variations depending on the lot.
Operation frequency: One million times

Alterations

Part Number - (LKC)
UH20-25 - LKC
10 Days
Express B 2.00 EUR/piece
P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations	Code	Spec.	Price adder
	LKC	Changes Length and Spring Constant Tolerance (Refer to the below table).	Refer to the table on the left. Values are € Unit Price. No need to add on the price.

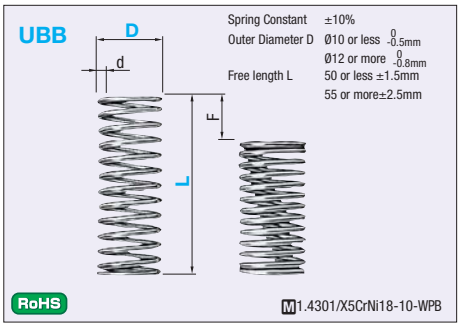
Part Number Type	D	L Specify in 5mm Increment	L Alterations	L Tolerance	Spring Constant Tolerance	€ Unit Price Qty 1~3	Volume Discount 4~9	Volume Discount 10~19	Volume Discount 20~49
UH	4	15, 20	LKC	±0.4	±5%				
		25, 30		±0.5					
	5	10~20		±0.4					
		25~45		±0.5					
	6 8 10	10~20		±0.4					
		25~50		±0.5					
		60, 70		±0.8					
	13 16	15, 30		±0.5					
		35~50		±0.5					
		60, 70, 80		±0.8					
	20	25, 30		±0.5					
		35~50		±0.8					
		60, 70, 80		±0.8					

Both ends are ground.

Round Wire Springs

-Outer Diameter Referenced Stainless Steel-

CAD Data



Spring Constant

D12 is applicable to UY, UR, UF and UBB Types only. D14 is applicable to UBB Type only.

D \ Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB
2		0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}				
3						N/mm 1.5 {kgf/mm} {0.15}			
4	N/mm 0.05 {kgf/mm} {0.005}	N/mm 0.098 {kgf/mm} {0.01}					2.0{0.2}	2.9{0.3}	4.9{0.5}
5									
6			N/mm 0.29 {kgf/mm} {0.03}	N/mm 0.49 {kgf/mm} {0.05}	N/mm 0.98 {kgf/mm} {0.1}			N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
8						N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}		
10									
12		N/mm 0.2 {kgf/mm} {0.02}							
13								N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
14									
16									
20		0.3{0.03}	0.5{0.05}	0.98{0.1}	2.9{0.3}	3.9{0.4}	4.9{0.5}	14.7{1.5}	29.4{3.0}
Fmax.	F=Lx70%	F=LxFa%	F=LxFa%	F=Lx45%	F=Lx40%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%

Order Example — Part Number: UBB16-80

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~3	4~9	10~19	20~100
Discount Rate	€ Unit Price	30%	50%	60%

For orders larger than indicated quantity, please request a quotation.

UBB: Fmax.(Allowable Deflection)= L x Fa%

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UBB4-5*	0.55	3.3	1.25	6.1 {0.63}	25	
10	0.65	7.0	2.5	12.3 { 1.3}		
15	0.7	10.3	3.75	18.4 { 1.9}		
20	0.75	14.4	5	24.5 { 2.5}		
25	0.8	19.4	5	24.5 { 2.5}	20	
UBB5-5	0.6	2.9	1.25	6.1 {0.63}	25	
10	0.75	6.9	2.5	12.3 { 1.3}		
15	0.8	9.8	3.75	18.4 { 1.9}		
20	0.85	13.4	5	24.5 { 2.5}		
25	0.9	17.8	6.25	30.6 { 3.1}		
30	0.9	21.8	7.5	36.8 { 3.8}		
UBB6-5	0.8	3.6	1.25	12.3 { 1.3}	25	
10	0.9	6.8	2.5	24.5 { 2.5}		
15	1	10.5	3.75	36.8 { 3.8}		
20	1.1	14.6	5	49.0 { 5.0}		
25	1.1	17.9	6.25	61.3 { 6.3}		
30	1.2	23.1	6	58.8 { 6.0}	20	
35	1.2	27.3	7	68.6 { 7.0}		
40	1.2	31.2	8	78.5 { 8.0}		
45	1.3	34.8	9	88.3 { 9.0}		
50	1.3	38.4	10	98.1 {10.0}		
60	1.3	44.2	9	88.3 { 9.0}	15	
70	1.4	58.5	10.5	103 {10.5}		
UBB8-10	1.1	6.9	2.5	24.5 { 2.5}	25	
15	1.2	9.9	3.75	36.8 { 3.8}		
20	1.3	14.0	5	49.0 { 5.0}		
25	1.3	14.5	6.25	61.3 { 6.3}		
30	1.4	21.4	7.5	73.5 {7.5}		
35	1.4	22.0	8.75	85.8 { 8.8}		
40	1.5	28.9	10	98.1 {10.0}		
45	1.5	32.6	11.25	110 {11.3}		
UBB10-10	1.3	7.2	2.5	24.5 { 2.5}	25	
15	1.4	10.2	3.75	36.8 { 3.8}		
20	1.5	13.9	5	49.0 { 5.0}		
25	1.5	16.1	6.25	61.3 { 6.3}		
30	1.6	20.4	7.5	73.5 {7.5}		
35	1.6	22.8	8.75	85.8 { 8.8}		
40	1.7	27.2	10	98.1 {10.0}		
45	1.7	30.6	11.25	110 {11.3}		
50	1.8	36.5	12.5	123 {12.5}		
60	1.8	41.4	15	147 {15.0}		
70	1.9	50.8	17.5	172 {17.5}		
UBB12-15	1.5	9.4	3.75	36.8 { 3.8}	25	
20	1.6	12.4	5	49.0 { 5.0}		
25	1.7	16.2	6.25	61.3 { 6.3}		
30	1.8	20.3	7.5	73.5 {7.5}		
40	1.9	28.0	10	98.1 {10.0}		
50	2	35.5	12.5	123 {12.5}		
60	2.1	43.6	15	147 {15.0}		
70	2.1	48.8	17.5	172 {17.5}		
80	2.2	58.5	20	196 {20.0}		

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UBB13-15	1.8	9.5	3.75	73.5 {7.5}	25	
20	1.9	12.9	5	98.1 {10.0}		
25	2	17.0	6.25	123 {12.5}		
30	2.1	20.5	7.5	147 {15.0}		
40	2.3	28.2	10	196 {20.0}		
45	2.3	32.2	11.25	221 {22.5}		
50	2.4	36.0	12.5	245 {25.0}		
60	2.5	44.4	12	235 {24.0}	20	
70	2.6	54.0	14	275 {28.0}		
UBB14-15	1.9	10.0	3.75	73.5 {7.5}	25	
20	2	13.5	5	98.1 {10.0}		
25	2.1	16.3	6.25	123 {12.5}		
30	2.3	21.3	7.5	147 {15.0}		
35	2.3	24.7	8.75	172 {17.5}		
40	2.4	28.2	10	196 {20.0}		
60	2.6	43.6	15	294 {30.0}		
80	2.7	61.4	16	314 {32.0}	20	

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	€ Unit Price
UBB16-15	2	10.0	3.75	73.5 {7.5}	25	
20	2.1	12.1	5	98.1 {10.0}		
25	2.3	17.3	6.25	123 {12.5}		
30	2.4	21.0	7.5	147 {15.0}		
35	2.5	24.4	8.75	172 {17.5}		
40	2.6	28.0	10	196 {20.0}		
45	2.7	31.7	11.25	221 {22.5}		
50	2.7	35.8	12.5	245 {25.0}		
60	2.9	43.5	15	294 {30.0}		
70	2.9	49.4	17.5	343 {35.0}		
80	3	59.3	16	314 {32.0}	20	
UBB20-25	2.9	16.7	6.25	184 {18.8}	25	
30	3	20.3	7.5	221 {22.5}		
35	3	22.7	8.75	257 {26.3}		
40	3.2	27.2	10	294 {30.0}		
45	3.2	29.6	9	265 {27.0}	20	
50	3.4	38.3	10	294 {30.0}		
60	3.5	44.6	12	353 {36.0}		

kgf (Load)=N/mm (Spring Constant) x 0.101972 x F (Deflection)

{kgf}=Nx0.101972

For Types marked with *, both ends are not ground.

The values of solid length are for reference only.
There may be some variations depending on the lot.

Operation frequency: One million times

Washers for Coil Springs

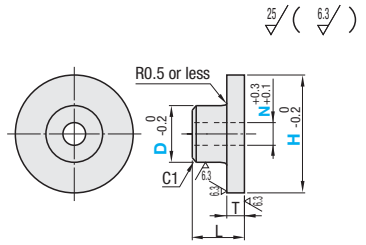
-Standard / Female Thread-

CAD Data

■Standard



	Type	Material	Surface Treatment	Color
Metal	SPGCC	1.1191/C45E	Black Oxide	-
	SPGCS	1.4301/X5CrNi18-10	-	-
Resin	SPGCJ	Polyacetal	-	White
	SPGCK	Polyacetal	-	Black
	SPGCM	MC Nylon	-	Blue
	SPGCW	MC Nylon	-	Ivory



Part Number Type	H	1mm Increment D	Selection N	L	T	€ Unit Price SPGCC	€ Unit Price SPGCS
(Metal) SPGCC SPGCS	8	6	3	5	2		
	10	6~8	3				
			4				
	12	7~10	4				
			5				
			6				
	15	7~13	4	6			
			5				
			6				
			8				
			10				
	20	9~17	6		3		
			8				
			10				
			12				
	25	11~22	8				
			10				
			12				
	30	15~25	12		5		
			16				

D-N≥3

Part Number Type	H	1mm Increment D	Selection N	L	T	€ Unit Price SPGCJ SPGCK	€ Unit Price SPGCM SPGCW
(Resin) SPGCJ SPGCK SPGCM SPGCW	10	6~8	3	6	3		
			4				
	15	7~13	4	7			
			5				
			6				
	20	9~17	6				
			8				
			10				
	25	11~22	8	10	5		
			10				
			12				
	30	15~25	12				
			16				

D-N≥3

Order Example

Part Number	-	D	-	N
SPGCS20	-	9	-	6

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~49	50~74	75~99
Discount Rate	€ Unit Price	5%	10%

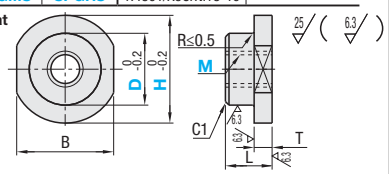
For orders larger than indicated quantity, please request a quotation.

■Female Thread

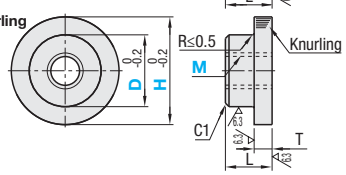
Type 2-Flat	Type Knurling	Material	Surface Treatment
SPGMC	SPGRC	1.1191/C45E	Black Oxide
SPGMS	SPGRS	1.4301/X5CrNi18-10	-



2-Flat



Knurling



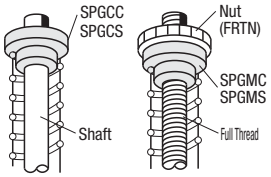
Part Number Type	H	1mm Increment D	Selection M (Course)	L	T	B	SPGMC € Unit Price Qty. 1~9.	SPGMC Volume Discount 10~50	SPGMS € Unit Price Qty. 1~9.	SPGMS Volume Discount 10~50
(2-Flat) SPGMC SPGMS	10	7~8	4	8	3	8				
	15	7~13	4 6	8	3	13				
	20	9~17	4 6 8 10	8	3	17				
	25	12~20	4 6 8 10 12	10	5	22				
	30	16~25	6 8 10 12 16	10	5	27				

D-M≥3 For orders larger than indicated quantity, please request a quotation.

Part Number Type	H	1mm Increment D	Selection M (Course)	L	T	SPGRC € Unit Price Qty. 1~9.	SPGRC Volume Discount 10~50	SPGRS € Unit Price Qty. 1~9.	SPGRS Volume Discount 10~50
(Knurling) SPGRC SPGRS	10	7~8	4	8	3				
	15	7~13	4 6	8	3				
	20	9~17	4 6 8 10	8	3				
	25	12~20	4 6 8 10 12	10	5				
	30	16~25	6 8 10 12 16	10	5				

D-M≥3 For orders larger than indicated quantity, please request a quotation.

Example



Order Example

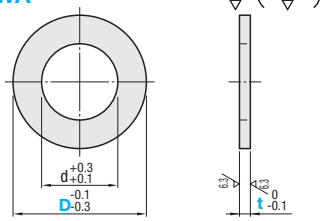
Part Number	-	D	-	M
SPGMC20	-	16	-	6
SPGRS25	-	20	-	12

Days to Ship: 8 Days

■Washer RoHS

SSWA





M Material: 1.0038/S235JR

d	Applicable Springs	Part Number Type	Part Number D	t	€ Unit Price t=1.0	t=2.0	t=3.0	t=4.0	t=5.0
3.0	6	SSWA	5	1.0					
5.0	8		7						
6.0	10		9						
7.0	12		11.5	2.0					
8.0	14		13						
9.0	16		15						
10.0	18		17	3.0					
12.0	20		19						
12.0	22		21						
14.5	25		24	4.0					
15.0	27		26						
17.0	30		29	5.0					
20.0	35		34						
23.0	40		39						

Order Example

Part Number	-	t
SSWA15	-	2.0

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~49	50~199	200~500
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

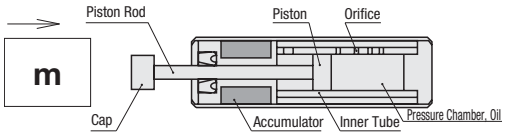
Shock Absorbers -Oil Type-

-Overview-

■Shock Absorbers -Oil Type-

For this system, oil is mainly utilized. Compared with other cushioning materials (rubber, spring, air etc.), they are compact and capable of repeatedly absorbing large impact energy softly without rebound.
Internal structure and basic principle of oil type shock absorbers are shown as follows.
When an object collides with a piston rod, the oil in the pressure chamber is compressed by a piston.
The clearance between inner tube and piston is so small that compressed oil is forced out of the orifices.
At this point, the impact energy is converted into heat energy by dynamic resistance.

The piston rod sinks into the shock absorber body so that the oil equal in volume to the piston moves into the accumulator.
This mechanism provides an ideal shock absorbing action.
Various absorption characteristics can be obtained depending on the number and size of orifices. (Refer to classification according to absorption characteristics structures **P.342**.)
Please note that when the wrong collision speed is selected, some abnormal reaction may occur during collision or the impact energy may not be absorbed in an ideal manner.



■Procedure of Selection

(1) Calculation of Inertial Energy (E1)

According to examples of calculation for selection, calculate inertial energy based on collision mass (m), collision velocity (V), moment of inertia (I) and collision angular velocity (ω).

(2) Temporary Decision of Absorber Stroke

Obtain the temporary stroke (S') based on Fig. 1.

(3) Calculation of Additional Energy (E2')

Confirm whether there is propulsion (F) or not and calculate the additional energy according to examples of calculation for selection.

(4) Calculation of Total Energy

Calculate the total energy from the sum of inertial energy (E1) and additional energy (E2').

(5) Check Mass

According to examples of calculation for selection, calculate the equivalent mass and confirm whether it is less than the max. equivalent mass in the catalog (me').

(6) Select Absorption Characteristics Structures from Energy Ratio

Select an orifice type from Fig 2 temporarily.

(7) Check Max. Absorbed Energy per Minute

Calculate the energy (ET) corresponding to one minute from the operating cycle (time/min) and total energy, and confirm whether or not the value is within the operating range.

Fig.1 Calculate the temporary stroke S' with the Inertial Energy E1.
(Adjustable · Fixed Type)

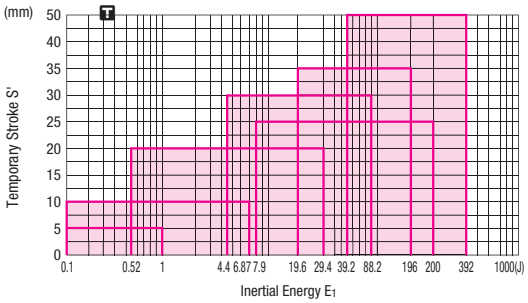
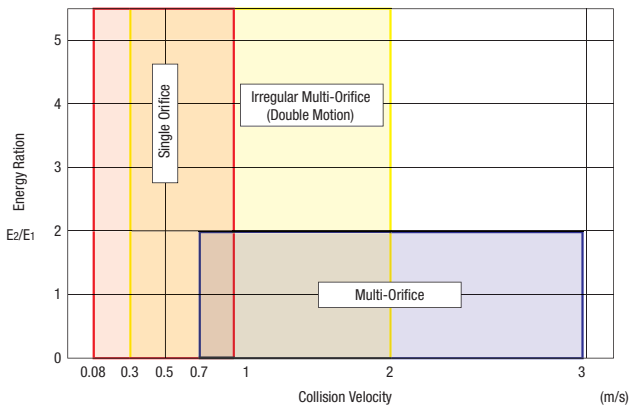


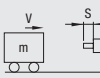
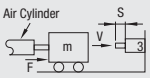
Fig. 2 Select the orifice type from energy ratio (additional energy E2 · inertial energy E1)



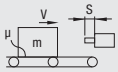
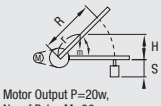
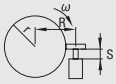
For Single, Irregular Multi, Multi Orifice Types, these are the values of The Adjustable and The Fixed Types.

* If both Single Orifice and Multi-Orifice are applicable, select irregular Multi-Orifice.
* If both Irregular Multi-Orifice and Multi-Orifice are applicable, select Multi-Orifice.
* For Speed S Type, the collision velocity is 0.08~0.5m/s.

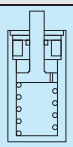
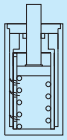
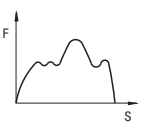
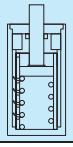
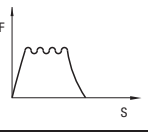
Examples of Calculation for Selection

	Ex.: Pure Inertial Collision (Horizontal Collision without Thrust Force)	Ex.: Horizontal Collision with Air Cylinder Thrust Force	Ex.: Soft Stop in the Cylinder Falling
Example of Use and Collision Conditions	 <Collision Conditions> m=25kg V=0.6m/s F=0N N=30 times/min	 <Collision Conditions> m=30kg V=0.6m/s N=20 times/min Air Cylinder Inner Dia. Ø40 Operating Pressure 0.5MPa	 <Collision Conditions> m=15kg V=0.2m/s N=10 times/min Air Cylinder Inner Dia. Ø25 Operating Pressure 0.5MPa
Collision Velocity V[m/s]	V=0.6m/s	V=0.6m/s	V=0.2m/s * Collision velocity V is actual measurements or 1.5~2 times the average speed.
Absorbed Energy — **Inertial Energy [J] E_1**	$E_1=\frac{mV^2}{2}=\frac{25x0.6^2}{2}=4.5J$	$E_1=\frac{mV^2}{2}=\frac{30x0.6^2}{2}=5.4J$	$E_1=\frac{mV^2}{2}=\frac{15x0.2^2}{2}=0.3J$
Absorbed Energy — **Temporary Stroke S'[mm]**	From Fig.1, S'=20mm (Select Adjustable type)	From Fig.1, S'=15mm (Select Adjustable type)	From Fig.1, S'=10mm (Select Adjustable type)
Absorbed Energy — **Additional Energy [J] E_2'**	$E_2'=0J$	Thrust of the cylinder is F=628.4N $E_2'=FxS'=628.4x0.015=9.4J$	Thrust of the cylinder is F=245.4N $E_2'=(F+mg)xS'=(245.4+15x9.8)x0.01=3.92J$
Absorbed Energy — **Total Energy E'[J]**	$E'=E_1+E_2'=4.5+0=4.5J$	$E=E1+E2'=5.4+9.4=14.8J$	$E'=E1+E2'=0.3+3.92=4.22J$
Mass [kg] me'	$me'=\frac{2xE'}{V^2}=\frac{2x4.5}{0.6^2}=25kg$	$me'=\frac{2xE}{V^2}=\frac{2x14.8}{0.6^2}=82.2kg$	$me'=\frac{2xE'}{V^2}=\frac{2x4.22}{0.2^2}=211kg$
Temporary selection	Select Adjustable type Select L from the collision velocity. Select MAC1612 from E and me'. (Stroke S=12mm)	Select Adjustable type Select Medium Speed M from the collision velocity. Select MAC2016M from E' and me'. (Stroke S=16mm)	Select Adjustable type Select Ultra Low Speed S from Fig. 2. Select MAC1612S from E' and me'. (Stroke S=12mm)
Recalculation	$E_2=0J$ $E=E_1+E_2=4.5J$ $me=\frac{2xE}{V^2}=25kg$	$E_2=FxS=10.1J$ $E=E_1+E_2=15.5J$ $me=\frac{2xE}{V^2}=86.1kg$	$E_2=(F+mg)xS=4.71J$ $E=E_1+E_2=0.3+4.71=5.01J$ $me=\frac{2xE}{V^2}=250kg$
Energy per Minute E_T	$E_T=ExN=4.5x30=135J/min$	$E_T=ExN=15.5Jx20=310J/min$	$E_T=ExN=5.01x10=50.1J/min$
Confirmation	E, me, N and E_T are OK. Select MAC1612L	E, me, N and E_T are OK. Select MAC2016M	E, me, N and E_T are OK. Select MAC1612S

* For horizontal collision without thrust force, select the orifice type only by collision velocity.

	Ex.: Horizontal Collision with Belt Conveyor Thrust Force	Ex.: Collision with synchronous motor driven load	Ex.: Horizontal Collision with Belt Conveyor Thrust Force
Example of Use and Collision Conditions	 <Collision Conditions> m=5kg V=0.5m/s N=20 times/min Dynamic Friction Coefficient μ=0.4	 <Collision Conditions> m=1kg R=0.4m r=0.3m Ø=20° N=10 times/min $I=\frac{3}{10}mr^2$ $3mr^2=0.12kgm2$ ω=5.6rad/s F=59.3N Motor Output P=20w, No. of Poles M=36 Power Supply Frequency f=50Hz, Deceleration Ratio K=20	 <Collision Conditions> $I=125.5kgm^2$ ω=1.8rad/s R=1.25m N=6 times/min T=68.6Nm
Collision Velocity V[m/s]	V=0.5m/s	$V=R\omega=0.4x5.6=2.24m/s$	$V=R\omega=1.25x1.8=2.25m/s$
Absorbed Energy — **Inertial Energy [J] E_1**	$E1=\frac{mV^2}{2}=\frac{5x0.5^2}{2}=0.625J$	$E1=\frac{I\omega^2}{2}=\frac{0.12x5.6^2}{2}=1.88J$	$E1=\frac{I\omega^2}{2}=\frac{125.5x1.8^2}{2}=203.31J$
Absorbed Energy — **Temporary Stroke S'[mm]**	From Fig.1, S'=5mm (Select Fixed type)	From Fig.1, S'=10mm (Select Adjustable type)	From Fig.1, S'=50mm (Select Adjustable type)
Absorbed Energy — **Additional Energy [J] E_2'**	$F=\mu mg=0.4x5x9.8=19.6N$ $E_2'=F.S'=19.6x0.005=0.098J$	$E_2'=(F+mg)xS'=(59.3+1x9.8)x0.01=0.69J$	$E_2'=\frac{T}{R}$, $S'=\frac{68.6}{1.25}$ x0.05=2.74J
Absorbed Energy — **Total Energy E'[J]**	$E'=E_1+E_2'=0.625+0.098=0.723J$	$E'=E1+E2'=1.88+0.69=2.57J$	$E'=E_1+E_2'=203.31+2.74=206.05J$
Mass [kg] me'	$me'=\frac{2xE'}{V^2}=\frac{2x0.723}{0.5^2}=5.8kg$	$me'=\frac{2xE'}{V^2}=\frac{2x2.57}{2.24^2}=1.0kg$	$me'=\frac{2xE'}{V^2}=\frac{2x206.05}{2.25^2}=81.4kg$
Temporary selection	Select Fixed Type Select Single Orifice from V Select MAKC1005B from E' and me'. (Stroke S=5mm)	Select Adjustable type Select Multi-Orifice from Fig. 2. Select MAC1210H from E' and me'. (Stroke S=10mm)	Select Adjustable type Select Speed H Type from Fig. 2. Select MAC3650H from E' and me'. (Stroke S=50mm)
Recalculation	$E_2=E_2'=0.098J$ $E=E_1+E_2=0.723J$ $me=\frac{2xE}{V^2}=5.8kg$	$E_2=0.69J$ $E=E_1+E_2=2.57J$ $me=1.0kg$	$E_2=\frac{T}{R}$, $S=2.74J$ $E=E_1+E_2=206.05J$ $me=\frac{2xE'}{V^2}=81.4kg$
Energy per Minute ET	$E_T=ExN=0.723x20=14.46J/min$	$E_T=ExN=2.57x10=25.7J/min$	$E_T=ExN=206.05x6=1236.3J/min$
Confirmation	E, me, N and E_T are OK. Select MAKC1005B	E, me, N and E_T are OK. Select MAC1210H	E, me, N and E_T are OK. Select MAC3650H

■Shock Absorbers (P.343~348) Classification according to Absorption Characteristics Structures

Structure	Adjustable *	Fixed		
Single Orifice	**S Type A Type B Type L Type**		Single orifice structure has the same resistance properties as forms of a dashed pot structure with a space between the piston and cylinder tube, a single tube structure with an orifice in the piston, and a double tube single orifice structure. Ex. Description of a single tube structure. A piston with a single orifice slides into an oil-filled cylinder tube. Because the office area is constant over the entire stroke, as the shock absorption characteristics shown in the right graph, the resistance is the largest immediately after a collision but gradually reduces speed as the stroke continues.	
Irregular Multi Orifice	**Medium Speed M Type**		In this double-tube structure, the piston slides in the inner tube. This inner tube has several orifices along the direction of strokes, and not only constant energy but energy depending on various purposes can be absorbed. It is designed to absorb kinetic energy during the first half of stroke and control speed during the second half. Therefore, it is well suited to absorb energy against air cylinder thrust.	
Multi Orifice	**High Speed H Type**		In this double-tube structure, the piston slides in the inner tube. This inner tube has several orifices along the direction of strokes. Because the orifice area becomes small gradually as the stroke speed slows down, drag remains largely constant, though the drag fluctuates like a ripple.	

* Adjustable Type No.0806M is single orifice structure and No.3625L type is multi-orifice structure.

Shock Absorbers
-Adjustable-

Price Reduction
14% on Average

CAD Data

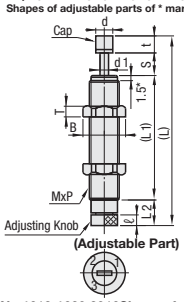


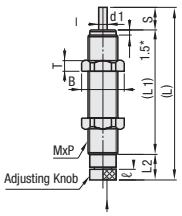
RoHS

MAC(Cap) **MAS**(No Cap)

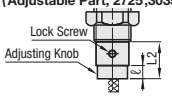
(No.0806 · 1008 · 1210* · 1214 · 1410 · 1417 · 1612* · 1620 · 2016* · 2530* · 2725* · 3035* · 3650*)

Shapes of adjustable parts of * marked products are as shown in figures below.





(No.1612,1620,2016Shape of Adjustable Part, 2725,3035,3650)



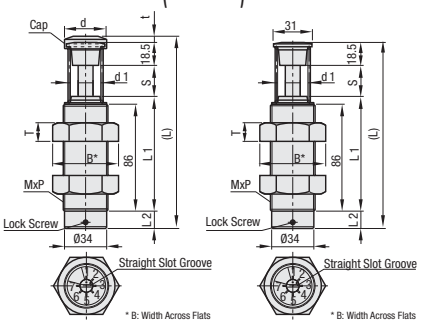
(No.1210 Shape of Adjustable Part)



(No.2530 Shape of Adjustable Part)



(No.3625)



- Avoid parallel use of adjustable type as synchronization of absorption property is difficult.
- Impact force can be easily adjusted by turning the adjusting knob on the bottom.
- Operating ambient temperature -5~70°C
- 1.5* is the dimension of thread dia. M14 or smaller (except M8). M8 is 2.3, and M16 or larger is threaded to the tip.
- Replace after 1,000,000 cycles.

No.	M Material (Main Body)	S Surface Treatment
0806	1.4305/X10CrNiS18-9	-
1008 · 1210 · 1214 · 1410 · 1417 · 1612 · 1620 · 3625	JIS SUM	Non-electrolytic Nickel Plating
2016 · 2530 · 2725 · 3035 · 3650	1.0038/S235JRG2	
Cap	Polyacetal 3035 · 3625 and 3650 are Urethane Rubber.	-

Part Number Type	No.	Speed	Thread Diameter MxP	Stroke S	Max. Absorbed Energy (E') Per Impact (J)	Per minute (J)	Max. Mass (me')(kg)	Piston Rod Return Force (N)	Max. Drag Value (N)	(L)	(L1)	L2	ℓ	d	d1	t	B Width Across Flats	T	MAC € Unit Price Qty.1~4	MAC Volume Discount Qty.5 or More	MAS € Unit Price Qty.1~4	MAS Volume Discount Qty.5 or More
MAC (Cap) / MAS (No Cap)	0806	M	M8 X 0.75	6	1.4	36.7	15	9 or less	670	58 (53)	41	6	3	6	2.5	5	12.7 (11)	2				
	1008	S	M10 X 1.0	8	1.02	58.8	90	5.88 or less	637	65.2 (58.9)	42.2	8.7	3.5	6	2.4	6.3	14.2 (13)	3				
		L			1.47		10															
		M			1.76		2.5															
		H																				
	1210	S	M12 X 1.0	10	2.94	98	100	9.8 or less	1470	84 (76)	61	5	-	8	3.5	8	16.2 (14)	4				
		L					30															
		M			4.9		4															
		H																				
	1214	H		14	5.4		30	12.7 or less	1156	92 (84)	59.5	10.5	5									
	1410	S	M14 X 1.5	10	3.62	147	120	9.8 or less	1813	88 (80)	59	11	6	10			19.6 (17)	6				
		L			3.92		30															
		M			5.88		35															
		H					4.5															
	1417	H		17	14.7	176	50	15.7 or less	2646	115 (105)	77.8	10.2	5		4	10						
	1612	S	M16 X 1.5	12	6.3	235	270	14.7 or less	2646	117 (102)	75.5	14.5	4.5	13.5	5	15	20 (19)	6				
		L			9.8		50															
		M					10															
		H																				
	1620	H		20	17.6		60	19.6 or less		143 (128)	93.5											
	2016	S	M20 X 1.5	16	20	343	600	18.1 or less	3528	127 (110)	76	18	4	18	6	17	27.7 (24)	8				
		L			29.4		300															
		M					200															
		H					120															
	2530	S	M25 X 1.5	30	23	490	1100	33.2 or less	3920	173 (155)	110	15	-	22	8	18	37 (32)	10				
		L			49		400															
		M					300															
		H					150															
	2725	S	M27 X 1.5	25	32	539	1500	27.3 or less	6370	156 (136)	91	20	5	23		20						
		L			79.3		650															
		M					450															
		H					300															
	3035	S	M30 X 1.5	35	100	1176	2000	44.1 or less	16660	206.5 (188)	128	25		27	10	18.5	41.6 (36)	14				
		M			196		1300															
		H					700															
	3625	S	M36 X 1.5	25	125	1500	3500	100 or less	25000	155 (150)	92.5	14	-	34	12	5	53.1 (46)	10				
		L			200		2000															
		H					700															
	3650	S		50	235	2352	6700	68.6 or less	23520	254.5 (235)	160	25	5	33	12	19.5		15				
		M			392		2700															
		H					1400															

L Dimension values in ( ) are for MAS.

kgfm=Jx0.101972kgf=Nx0.101972

Collision Velocity Type	Collision Velocity Range	Max. Operating Cycle
Ultra Low Speed S	0.08~0.5m/s	60cycle/min*
Low Speed L	0.3 ~1 m/s	
Medium Speed M	0.3 ~2 m/s	
High Speed H	0.7 ~3 m/s	

* No.0806 is 45cycle/min, No.3035 · 3625 and 3650 are 30cycle/min.

Order Example

Part Number
MAC1008H

Days to Ship: 8 Days

Express A 2,00 EUR/ piece

P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Shock Absorbers
-Set-

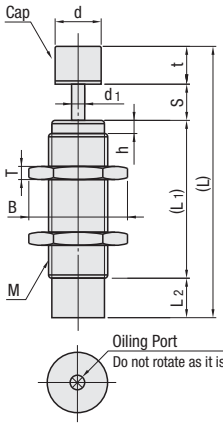
Price Reduction
14% on Average

CAD Data

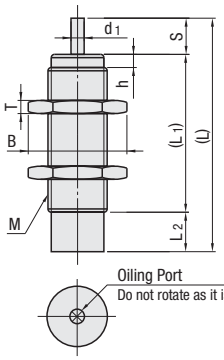
RoHS



MAKC
(Cap)



MAKS
(No Cap)



- For parallel use of more than 2 pieces, be sure to use the same type and install them to receive the shock equally.
- Operating ambient temperature -5~70°C
- Dimension h is applicable to thread diameter M14 or less.
  M16 or larger is threaded to the tip.
- Replace after 1,000,000 cycles.

No.	M Material (Main Body)	S Surface Treatment
0404	1.4305/X10CrNiS18-9	-
0604		
0805	CW614N/CuZn39Pb3	Electroless Nickel Plating
1005	JIS SUM	
1008		
1210		
1412		
1612		
2016		
2022	1.0038/S235JRG2	
2530		
2725		
3035		
Cap	Polyacetal · Only 2022 is urethane rubber.	-

Part Number			Thread Diameter M	Stroke S	Max. Absorbed Energy (E')		Max. Mass (me') (kg)	Piston Rod Return Force (N)	Max. Drag Value (N)	(L)	(L1)	L2	d	d1	t	B (Width Across Flats)	T	h	MAKC		MAKS	
Type	No.	Speed			Per Impact (J)	Per minute (J)													€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
																			Qty.1~4	Qty.5 or More	Qty.1~4	Qty.5 or More
MAKC (Cap) MAKS (No Cap)	0404	A	M4 X 0.5	4	0.1	4.5	1	2.5 or Less	214	32.6 (28.6)	20.1	4.5	3	1.2	4	8.1 (7)	2	0.5				
		B			0.3	13.5	3															
	0604	A	M6 X 0.75		0.1	4.5	1	3 or Less	363	33 (29)	20.5		4.6	1.8		9.2 (8)	2					
		B			0.3	13.5	2															
		L			0.5	22.5	3															
	0805	A	M8 X 0.75	5	0.39	17.6	3	4.9 or Less	490	37 (32)	22	5	6	2	5	12.7 (11)	2	1.5				
		B			0.68	22.5	5		588													
	1005	A	M10 X 1.0			41.1		5.88 or Less	735	39 (32)				3	7	14.2 (13)	3					
		B			0.98		8															
	1008	A		8		58.8	7	5.88 or Less		53 (46)	33											
		B			1.47		10															
		L			2.94		20	4.9 or Less	1078	55 (48)	34.5	5.5										
		M					6															
		H					2.5															
	1210	A	M12 X 1.0	10	1.96	98	15	9.8 or Less	1470	68 (60)	45	5	8	3.5	8	16.2 (14)	4	1.5				
		B			2.45		30															
		L			6.86		50		1960	71 (63)	47.5	5.5										
		M					14															
		H					6															
	1412	L	M14 X 1.5	12	9.8	176	75	8.9 or Less	2156	78 (70)	52.5		10			19.6 (17)	6					
		M					20															
		H					8															
	1612	L	M16 X 1.5	12	14.7	235	110	9.8 or Less	2940	90 (75)	57.5		13.5	5	15	20 (19)						
		M					30															
		H					13															
	2016	L	M20 X 1.5	16	29.4	343	230	18.1 or Less	3528	110 (93)	63	14	18	6	17	27.7 (24)	8	-				
		M					60															
		H					25															
	2022	L	M20 X 1.5	22	44.1	392	73	39.2 or Less	3920	126.5 (112)	76				14.5							
		M					30															
		H					15															
	2530	L	M25 X 1.5	30	88.2	490	390	29.4 or Less	6370	158 (140)	95	15	22	8	18	37 (32)	10					
		M					175															
		H					75															
	2725	L	M27 X 1.5	25	79	539	420	27.3 or Less	6370	137.5 (117.5)	77.5		23		20							
		M					105															
		H					47															
	3035	L	M30 X 1.5	35	196	1176	1560	47.1 or Less	14700	190 (171.5)	116.5	20	27	10	18.5	41.6 (36)	14					
		M					390															
		H					173															

L Dimension values in ( ) are for MAKS.

kgfm=Jx0.101972, kgf=Nx0.101972

Collision Velocity Type	Collision Velocity Range	Max. Operating Cycle
A Low Speed B L	0.3~1m/s	60cycle/min*
Medium Speed M	0.3~2m/s	
High Speed H	0.3~3m/s	

* No.0404 · 0604 and 0805 are 45cycle/min, No.3035 is 30cycle/min.

Order Example

Part Number
MAKC1008L

Days to Ship
8 Days

Express A 2,00 EUR/ piece

P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Eccentric Angle Adapters / Stopper Nuts for Shock Absorbers

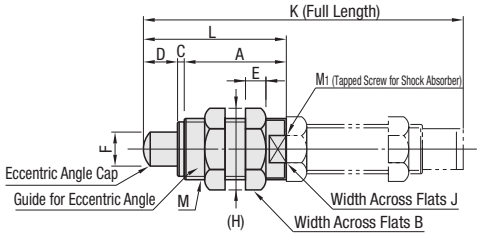
-Adjustable · Fixed-

CAD Data

Eccentric Angle Adapters RoHS



OPCP



Use an Eccentric Angle Adapter with the same number as the Shock Absorber.

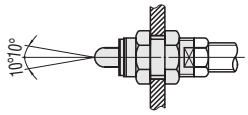
No.	Material		Surface
	Main Body	Cap	Treatment
0805 · 1005 · 1008 · 1210 · 1410 · 1612	JIS SUM	Polyacetal	Electroless Nickel Plating
2016 · 2530 · 2725 · 3035 · 3650		1.7242/16CrMo4	

Part Number		M_1	L	A	C	D	E	F	M	Reference (H)	B	J	Reference K		€ Unit Price	Volume Discount
Type	No.												MAS	MAKS	Qty.1~4	Qty.5 or More
OPCP	0805	M8x0.75	28	21	2	5	4	6	M12x1.0	16.2	14	10	66.5	44.5		
	1005	M10x1.0					6	8	M16x1.5	20.0	19	13	-			
	1008		38	28		8							75.7	65		
	1210	M12x1.0	48	35	3	10	5	10	M18x1.5	24.3	21	14	97.8	82		
	1410	M14x1.5	51	38			7	11	M22x1.5	27.7	24	19	103	-		
	1612	M16x1.5	60	45		12		12					129	102		
	2016	M20x1.5	68	49		16	10	14	M27x1.5	37	32	24	146	129		
	2530	M25x1.5	107.5	67.5	10	30	15	16	M36x1.5	53.1	46	32	212	198		
	2725	M27x1.5	97	62		25							188	170		
	3035	M30x1.5	127	82		35		18	M40x1.5	57.7	50	36	255	239		
	3650	M36x1.5	167	107		50		20	M45x1.5	63.5	55	41	322	-		

How to Use Note the following points when using the eccentric angle adapter (For Adjustable and Fixed Type).

- It cannot be used for Cap Type shock absorbers (MAC, MAKC). Please use it for No Cap Types MAS, MAKS.
- When installing an eccentric angle adapter on a shock absorber, screw the shock absorber to the eccentric angle adapter cap and tighten it with the standard nut for shock absorbers.

Usable Max. Eccentric Angle	±10°
Replacement Interval (cycle)	1,000,000

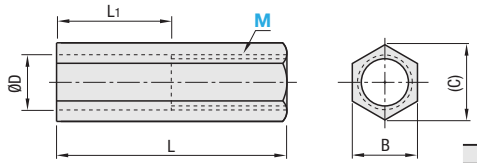


For Shock Absorbers Stopper Nuts RoHS



STNC (For Cap Type)
STNS (For No Cap Type)

STNC and STNS for M36 are same products.



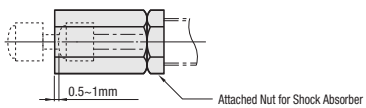
M	Material	Surface Treatment	Hardness
06~14	1.1191/C45E	Non-electrolytic Nickel Plating	-
16~30			40~47HRC
36		Trivalent Chrome (Chromate)	-

Part Number		L		D	L_1		(C)	B	M	STNC		STNS	
Type	M	STNC	STNS		STNC	STNS				€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
										Qty. 1~4	5pcs. or More	Qty. 1~4	5pcs. or More
STNC (Cap)	06	10	6	6	5	-	9.2	8	M6x0.75				
	08	15	10	8	6	-	12.7	11	M8x0.75				
	10	16		10	5	-	15	13	M10x1.0				
	12	16	12	12	3	-	16.2	14	M12x1.0				
	14	20		14	4	-	19.6	17	M14x1.5				
	16	30	15	16	11	2	21.9	19	M16x1.5				
STNS (No Cap)	20	47	30	20	23	6	27.7	24	M20x1.5				
	25	32	20	25	6	-	37	32	M25x1.5				
	27	55	35	27	23	6			M27x1.5				
	30	58	38	30	7	7	41.6	36	M30x1.5				
	36	45	45	38	18	18	53.1	46	M36x1.5				

How to Use Note the following points when using the stopper nuts (For Adjustable and Fixed Type).

- How to Attach Stopper Nuts
  For The No Cap Type, put the stopper nut out forward 0.1mm~1mm from the shock absorber body (cylinder) to the direction of the piston rod.
  For The Cap Type, put the stopper nut out forward the cap length 0.5mm~1mm from the shock absorber body (cylinder) to the direction of the piston rod.
- After installing the stopper nuts, tighten it with a Standard Nut for Shock Absorbers.

STNC and STNS cannot be used for EMACN.



Order Example

Part Number
OPCP1008
STNC12

Days to Ship

8 Days

Express A 2,00 EUR/ piece

P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Shock Absorbers
-Compact Adjustable · Compact Fixed-

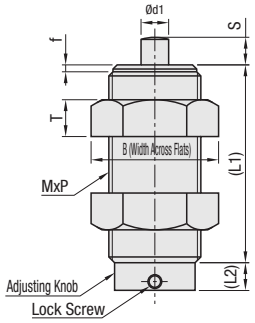
CAD Data

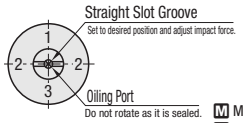
Feature:More compact than conventional absorbers. Fits in space-savings.

Compact Adjustable RoHS

MAMS







- Operating ambient temperature -5~70°C
- Collision Velocity Range 0.3~1m/s
- Max. Operating Cycle 60cycle/min
- Impact force can be easily adjusted by turning the flat head screwdriver adjusting slot.

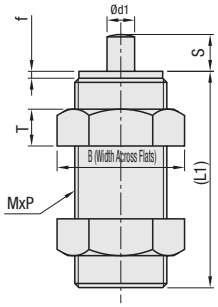
M Material: JIS-SUM
S Surface Treatment: Electroless Nickel Plating

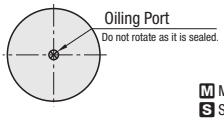
Part Number		Thread Diameter	Stroke	Max. Absorbed Energy (E')		Max. Mass (me') (kg)	Piston Rod Return Force (N)	Max. Drag Value (N)	(L1)	(L2)	d1	f	B (Width Across Flats)	T	€ Unit Price	Volume Discount
Type	No.	MxP	S	Per Impact (J)	Per minute (J)										Qty.1~4	Qty.5 or More
MAMS	1406	M14x1.5	6	3.5	100	80	15	2,000	41	8	4	2	19.6 (17)	6		
	1606	M16x1.5		4.8	130	120	20	2,700			5		20 (19)			
	2006	M20x1.5		7.8	200	60	16.7	3,920	43	6	6	1.5	27.7 (24)	8		
	2506	M25x1.5		11.7	300	90	19.6	5,880			8		37 (32)	10		
	2706	M27x1.5		15.6	350	120	22.6	7,840								

Compact Fixed RoHS

MAMKS







- Operating ambient temperature -5~70°C
- Collision Velocity Range 0.3~1m/s
- Max. Operating Cycle 60cycle/min

M Material: JIS-SUM
S Surface Treatment: Electroless Nickel Plating

Part Number		Thread Diameter	Stroke	Max. Absorbed Energy (E')		Max. Mass (me') (kg)	Piston Rod Return Force (N)	Max. Drag Value (N)	(L1)	d1	f	B (Width Across Flats)	T	€ Unit Price	Volume Discount
Type	No.	MxP	S	Per Impact (J)	Per minute (J)									Qty.1~4	Qty.5 or More
MAMKS	1406	M14x1.5	6	4.5	100	80	15	2,000	40	4	2	19.6 (17)	6		
	1606	M16x1.5		5.5	130	120	20	2,700		5		20 (19)			
	2008	M20x1.5	8	8.8	200	70	14.7	3,430	47	6	1.5	27.7 (24)	8		
	2508	M25x1.5		13.7	300	110	21.6	5,390		8		37 (32)	10		
	2708	M27x1.5		19.6	350	150	23.5	7,350							

Order Example — Part Number: MAMS2006, MAMKS2508

Days to Ship: 8 Days — Express A — 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

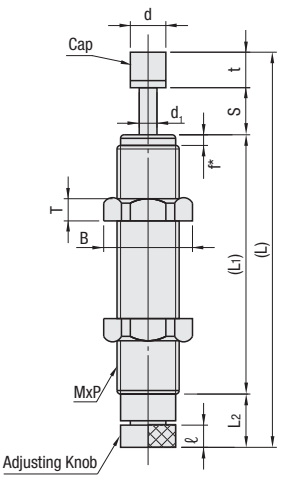
Shock Absorbers
-Coolant-Resistant / Economy-

■Shock Absorbers Coolant-Resistant

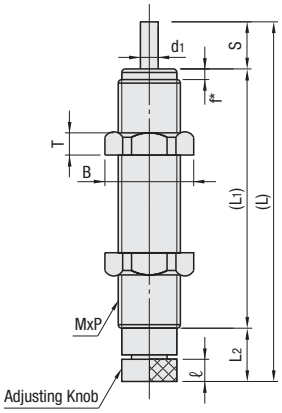
RoHS



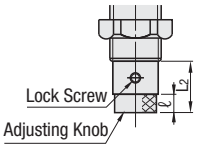
MACC (Cap)



MACS (No Cap)



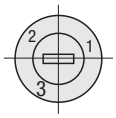
(No.1612 2016 Shape of Adjustable Part)



(1No.1210 Shape of Adjustable Part)



(Cap)



- f* is the dimension of thread dia. M14 or smaller. M16 or larger is threaded to the tip.
- Avoid parallel use of adjustable type as synchronization of shock absorption characteristics is difficult
- Impact force can be easily adjusted by turning the adjusting knob on the bottom.
- Operating ambient temperature -5~70°C

No.	Material(Main Body)	Surface Treatment
0806	1.4305/X10CrNiS18-9	-
1008, 1210, 1410, 1612	JIS SUM	Electroless Nickel Plating
2016	1.0038/S235JRG2	
Cap	Polyacetal	-

Part Number			Thread Dia. MxP	Stroke S	Max. Absorbed Energy (E')		Max. Mass (me') (kg)	Piston Rod Return Force (N)	Max. Drag Value (N)	(L)	(L1)	L2	ℓ	d	d1	t	f	B (Width Across Flats)	T	MACC		MACS	
					1 time (J)	Per minute (J)														€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	No.	Speed																		Qty. 1~4	Qty.5 or More	Qty. 1~4	Qty.5 or More
MACC (Cap) / MACS (No Cap)	0806	M	M8X0.75	6	1.4	36.7	15	9 or Less	670	64 (59)	47	6	3	6	2.5	5	2.3	12.7 (11)	2				
	1008	L	M10x1.0	8	1.47	58.8	10	9 or Less	637	79.5 (73.2)	56.7	8.5	3.5	6	2.4	6.3	1.6	14.2 (13)	3				
		M			1.76																		
		H					2.5																
	1210	L	M12x1.0	10	2.94	98	30	13 or less	1470	90.6 (82.6)	67.6	5	-	8	3.5	8	1.5	16.2 (14)	4				
		M			4.9																		
		H					4																
	1410	L	M14x1.5	10	3.92	147	30	14 or less	1813	108.2 (98.2)	77.8	10.4	5	10	4	10	1.7	19.6 (17)	6				
		M			5.88		35																
		H					4.5																
	1612	L	M16x1.5	12	9.8	235	50	20 or less	2646	122.7 (107.7)	81.2	14.5	4.5	13.5	5	15	-	20 (19)	6				
		M																					
		H					10																
	2016	L	M20x1.5	16	29.4	343	300	33 or less	3528	137 (120)	86	18	4	18	6	17	-	27.7 (24)	8				
		M					200																
		H					120																

L Dimension values in ( ) are for MACS type.

kgfm=Jx0.101972kgf=Nx0.101972

Collision Velocity Type	Collision Velocity Range	Max. Operating Cycle
Low Speed L	0.3~1m/s	60cycle/min*
Medium Speed M	0.3~2m/s	
High Speed H	0.7~3m/s	

*For No.0806, max. operating cycle should be 45cycle / min.

Order Example — Part Number: MACC1008H

Days to Ship: 8 Days

Express A — 2,00 EUR/ piece

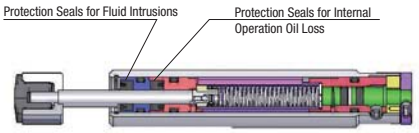
P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Features of Coolant-Resistant Type

-Having a structure of Protection Seals for fluid intrusions makes usable in wet conditions.
This is best suited for machine tools and related applications.
-Replacement is possible with Standard type since Mounting Outer Dia. Screw size is the same.
-Suitable for water-soluble cutting oil A1 [JIS K2241-2000], but also available for water-insoluble cutting oil or under wet conditions.
(In case of using water instead of water-soluble cutting oil, the durability may be inferior.)

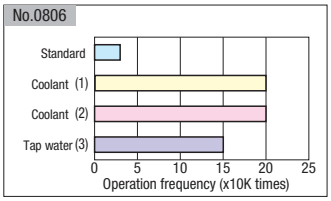
Inner Structure

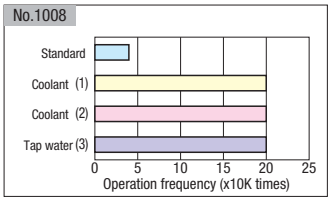


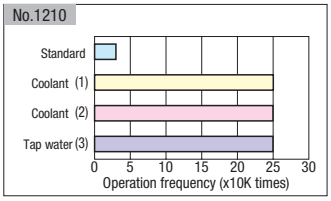
Durability Test Data (Ref.)

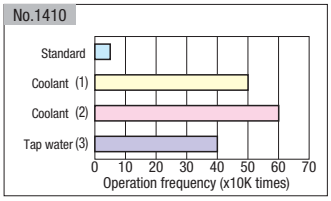
Test Condition

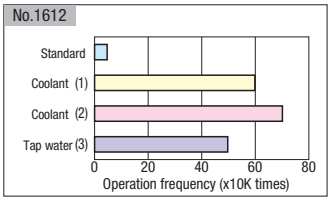
- Coolant (1): JIS A1 emulsion Water-soluble cutting oil
(Yushiro Chemical Industry Co., Ltd. Yushiroken FGE330 Dilution 20 times)
- Coolant (2): JIS N1 Water-Insoluble Cutting Oil
(Yushiro Chemical Industry Co., Ltd. Yushiro Oil CG8)
- (3): Tap water
- Load: Ø40 Air Cylinder (Cylinder propulsion only)
- Collision Cycle 30/min. - Dripping 4cc / min.

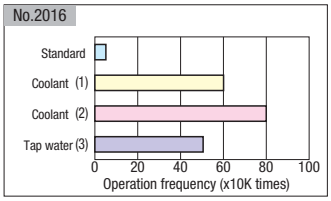




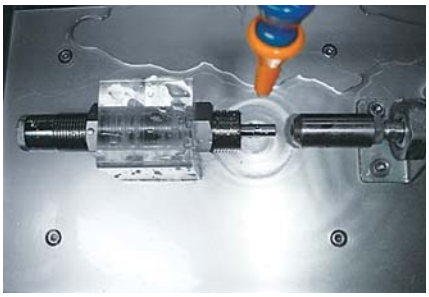






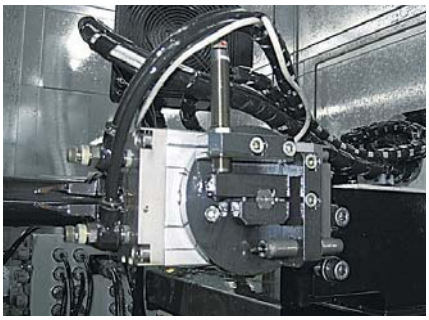


Test Scene



Example

Rotating Table Stopper [Dedicated machining equipment]

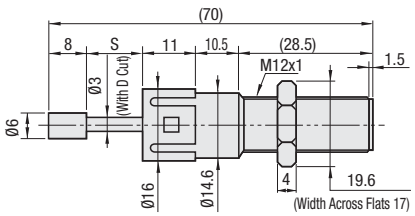


Durability results may vary depending on each test condition. Testing fluid or volume may affect the results.
Prior tests are recommended to obtain appropriate results.
If used in environments where the piston rods are kept from fluid contacts, the internal oil may be lost by premature leakage.

Shock Absorbers Economy Type RoHS



EMACN



Operating Temp. Range: -10~50°C
Durability: 500,000 times
Collision Velocity Range :
No.1212 A / B / C : 0.3~1.0m/s
No.1212D : 0.1~0.7m/s
No.1212E : 0.1~0.5m/s
Max. Tightening Torque: 1.5N/m
When shouldering to Ø14.6, tighten up at 1.0N/m.

Parts	M Material	S Surface Treatment
Main Body	JIS PPS	-
Cap	JIS POM	
Piston Rod	CW614N/CuZn39Pb3	Electroless Nickel Plating

A Accessory: Nut ‹Opposite Angle 19.6, Opposite Side17›

Part Number Type	Part Number No.	Cap Color	Thread Diameter M	Stroke S	Max. Absorbed Energy (E') Per Impact (J)	Max. Absorbed Energy (E') Per minute (J)	Max. Mass (me') (kg)	Piston Rod Return Force (N)	Max. Drag Value (N)	€ Unit Price Qty.1~4	Volume Discount Qty.5 or More
EMACN	1212A	White	M12x1	12	0.29	14.7	1.5	2.45	245		
	1212B	Black			0.49		3.0				
	1212C	Yellow			1.0	5.0	5.0		294		
	1212D	Green					7.5				
	1212E	Red					10.0				

Order Example Part Number EMACN1212A

Days to Ship 8 Days Express A 2,00 EUR/piece P88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Gas Springs
-Overview-

Gas Springs

- High pressure gas (Nitrogen gas: non-combustible) is sealed in a cylinder, and the gas reaction force is used as spring. Because this small gas spring receive small spring constant from large initial load in spite of its size, it can be used for wide range of applications including machines, furniture, cars, office automation equipments, etc.

Features

In spite of its size and weight, large spring (reaction) force can be obtained.

Spring (reaction) force is almost constant throughout its stroke.

Can be designed as required for wide applications.

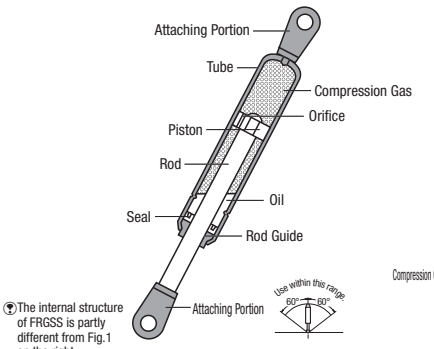


Fig.1 Gas Springs (FGS · GSS · HFGSS · FRGSS)

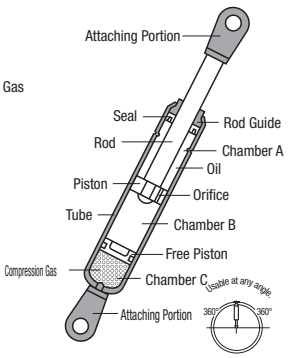


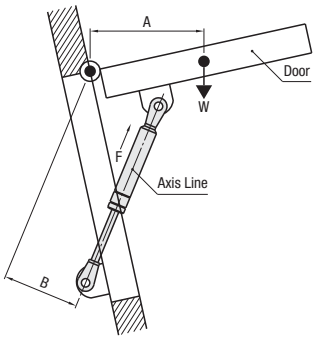
Fig.2 Gas Spring – Mounting Orientation Free Type (FGSS)

About Initial Selection

1. Calculate the necessary reaction force (F) through the following formula, then find out possible model types.

$$F = \frac{WxA}{B}$$

F : Necessary reaction force (at max. length)
W : Weight of doors, etc.
A : Horizontal distance between fulcrum (door hinge, etc.) and the center of gravity
B : Vertical distance between fulcrum (door hinge, etc.) and the axis of gas spring



2. Select Fx1.1 or more for the gas spring reaction force. Gas reaction forces may vary within about ±10%.
3. If required reaction force (Fx1.1) is larger than the reaction force at the max. length of gas spring - ( ) mm, use 2 or more springs.
4. Reaction forces are designed at 20°C. Reaction forces increases or decreases as the temperature changes.

Gas reaction force at the max. length-10 (5) mm and the max. length- mm are listed in this catalog. Since gas reaction force generally changes proportionately, if the gas reaction force on a certain stroke is required, connect the 2 points as shown in Fig3 with a straight line and read and conjecture the value on the stroke.

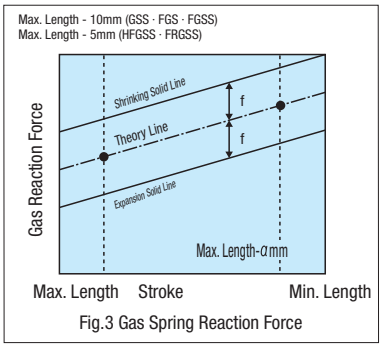


Fig.3 Gas Spring Reaction Force

f=Internal Sliding Resistance (Theoretical Value x 0.1)

About Final Selection

- Load may vary depending on door angles or gas spring mounting positions. Calculate the reaction force moment based on the subject design drawing.

Precautions for Use (for FGS, GSS, FGSS, HFGSS and FRGSS)

- Pay attention to temperature of gas springs during use. Do not store for prolonged duration. It will cause premature seal deterioration and reaction force decline. (Product temperature range: GSS, FGSS: -20°C~60°C / HFGSS: -20°C~80°C / FRGSS: -30°C~80°C)
- Gas reaction forces are slightly different among individual products and may change depending on the temperature.
- Reaction force may decrease depending on the operating condition and times of use. Please replace it when it cannot reach the necessary reaction force.
- Do not store or use in the environments where the rod rusts or in chemical atmosphere. Furthermore, do not paint the gas spring.
- Do not damage the cylinders and rods. Furthermore, do not apply forces like bending load and torsion etc.
- Do not extend gas springs beyond its max. length. Even in the max. stroke (during compression), it must remain about 10 mm away from the stroke end. Moreover, do not extend and compress at high speed (with 1m/s or more).
- Use FGS and GSS with the cylinder side up and the rod side down, so that internal oil protects the rubber seal. For FGS, GSS and FRGSS, do not tilt more than 60 degrees. When storing temporarily with no choice, also do not tilt more than 60 degrees.
- Although there is no restriction in the use angle for the FGSS and HFGSS, rod downward is recommended.

Features: Mounting Orientation Free Gas Springs (FGSS)

- Gas Springs of Free Attachable

1. Nitrogen gas (non-combustible) is sealed in the gas chamber C with a free moving piston intervening, and gas reaction force is used as a spring.
2. Gas chamber C has a constant reaction force in extending direction since it pressurizes oil chamber AB. Therefore the size of reaction force depends on the inner pressure of gas chamber C.
3. When rod moves from the predetermined position, oil in chamber AB moves through orifice hole of the piston.
4. The rod volume change in the cylinder is adjusted by the change of gas chamber C.

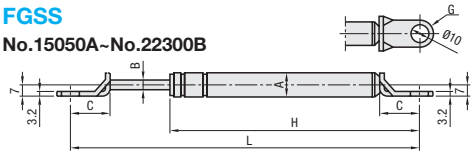
Gas Springs
-Mounting Orientation Free Type-

CAD Data

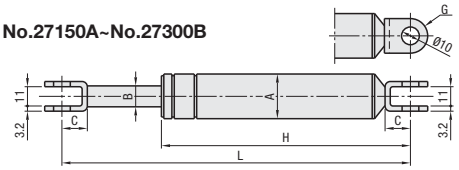


FGSS

No.15050A~No.22300B



No.27150A~No.27300B



Operation Temperature -20~60°C
M Material:
Cylinders: 1.0034/S205G2T (JIS STKM Hollows for Machine Structural Use)
Rod : 1.1151/C22E
Gas : Nitrogen Gas (N2)
S Surface Treatment:
Cylinders: Baked-on Finish (Black matt)
Rod : Hard Chrome Plating

Part Number Type	No.	Max. Length (Lmax)	Min. Length (Lmin)	Stroke	Gas Reaction Force (20°C) Max. Length-10mm (kgf)	Max. Length -( )mm (kgf)	A	B	C	G	H	Applicable Mounting Brackets	Weight (g)	€ Unit Price
FGSS	15050A	246	196	50	5	7 (40)	15	7	24	R9	164	GSSB8A GSSB8B GSSB8C GSSB8D GSSB8E (P.353) GSBR8A-S GSBR8B-S GSBR8C-S GSBR8D-S (P.352)	125	
	15050B				10	13 (40)								
	15080A	330	250	80	5	7 (70)					218		150	
	15080B				10	13 (70)								
	15090A	360	270	90	5	7 (80)					238		155	
	15090B				10	13 (80)								
	15100A	386	286	100	5	7 (90)					254		170	
	15100B				10	13 (90)								
	18100A	386	286	100	20	26 (90)	18	8			253		210	
	18100B				30	39 (90)								
	18150A	526	376	150	20	27 (140)					343		280	
	18150B				30	40 (140)								
	22050A	246	196	50	20	27 (40)	22	10			163		215	
	22050B				30	41 (40)								
	22050C				40	54 (40)								
	22080A	330	250	80	20	28 (70)					217		270	
	22080B				30	42 (70)								
	22080C				40	55 (70)								
	22090A	360	270	90	20	27 (80)					237		280	
	22090B				30	41 (80)								
	22090C				40	54 (80)								
	22100A	386	286	100	20	28 (90)					253		305	
	22100B				30	42 (90)								
	22100C				40	56 (90)								
	22120A	440	320	120	20	28 (110)					287		320	
	22120B				30	41 (110)								
	22120C				40	55 (110)								
	22130A	470	340	130	20	28 (120)					307		330	
	22130B				30	41 (120)								
	22130C				40	55 (120)								
	22150A	526	376	150	20	28 (140)					343		400	
	22150B				30	41 (140)								
	22150C				40	55 (140)								
	22180A	610	430	180	20	28 (170)					397		420	
	22180B				30	41 (170)								
	22180C				40	55 (170)								
	22200A	666	466	200	20	27 (190)					433		480	
	22200B				30	41 (190)								
	22200C				40	54 (190)								
	22250A	750	500	250	20	31 (240)					467		540	
	22250B				30	46 (240)								
	22250C				40	61 (240)								
	22300A	850	550	300	20	33 (290)					517		600	
	22300B				30	50 (290)								
	27150A	526	376	150	50	67 (140)	27.4	12.5	16	R11	351	GSBR8F-S (P.352)	610	
	27150B				60	80 (140)								
	27150C				70	94 (140)								
	27200A	666	466	200	50	67 (190)					441		760	
	27200B				60	80 (190)								
	27200C				70	94 (190)								
	27250A	750	500	250	50	74 (240)					475		900	
	27250B				60	89 (240)								
	27250C				70	104 (240)								
	27300A	850	550	300	50	79 (290)					525		1000	
	27300B				60	95 (290)								

For Mounting Brackets, refer to P.352, 353

Order Example Part Number FGSS15050A

Days to Ship 8 Days

Express A 2,00 EUR/ piece

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P87

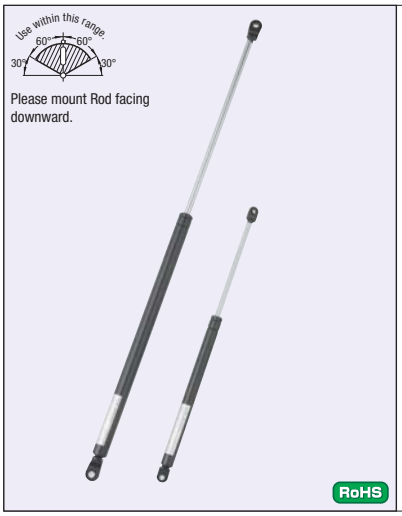
Quantity	1~9	10~12	13~14	15~19
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

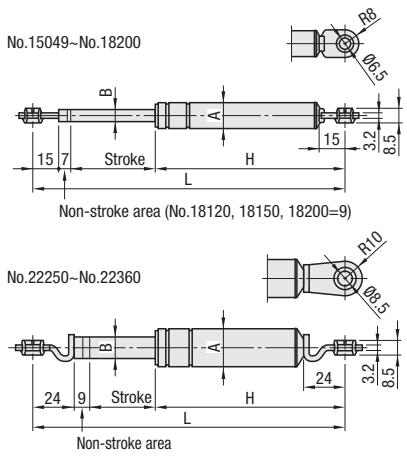
Alterations ■ Dust Boots Mounting P.352

Gas Springs / Mounting Brackets for Gas Springs / Dust Boots

-Mounting Orientation Limited Type-



FGS



Operation Temperature: -20~60°C
For No.15049, operating temperature should be 0~60°C.

M Material:
Cylinders: 1.0034/S205G2T
(JIS STKM Hollows for Machine Structural Use)
Rod :1.1151/C22E
Bushings : Polyacetal Resin (White)
Gas : Nitrogen Gas (N2)

S Surface Treatment:
Cylinders : Baking Finish (Black Matt)
Rod : Hard Chrome Plating

Part Number - Reaction			Max. Length	Min. Length	Stroke	Gas Reaction Force (20°C)					Outer Dia.	Rod Dia.	H	Applicable Mounting Brackets	Weight (g)	€ Unit Price
						Lmax - 10mm Stroke		Lmax - (S) In the stroke								
						Fa		Fb								
Type	No.	(N)	Lmax	Lmin	max	N	kgf	N	kgf	(S)	A	B				
FGS	15049 -	030	181	132	49	30	3.0	40	4.1	39	15	7	110	GSBR6A (P.352) GSSB6A (P.353)	83	
	15049 -	055				55	6.0	71	7.2							
	15049 -	085				85	9.0	109	11.1							
	15049 -	150				150	15.0	191	19.5							
	15069 -	050	221	152	69	50	5.0	67	6.8	59			130		96	
	15069 -	080				80	8.0	107	10.9							
	15069 -	120				120	12.0	158	16.1							
	15089 -	070	261	172	89	70	7.0	94	9.6	79			150		109	
	15089 -	100				100	10.0	135	13.8							
	15089 -	150				150	15.0	202	20.6							
	15089 -	200				200	20.0	268	27.3							
	15099 -	075	281	182	99	75	8.0	101	10.3	89			160		116	
	15099 -	120				120	12.0	162	16.5							
	15099 -	200				200	20.0	270	27.6							
	18120 -	100	365	245	120	100	10.0	123	13.0	110	18	8	221		183	
	18120 -	200				200	20.0	245	25.0							
	18120 -	300				300	31.0	367	37.0							
	18120 -	400				400	41.0	489	50.0							
	18150 -	100	420	270	150	100	10.0	126	12.9	140			246		205	
	18150 -	150				150	15.0	188	19.2							
	18150 -	200				200	20.0	251	25.6							
	18150 -	250				250	26.0	313	31.9							
	18200 -	100	525	325	200	100	10.0	127	13.0	190			301		248	
	18200 -	150				150	15.0	190	19.4							
	18200 -	200				200	20.0	253	25.8							
	18200 -	300				300	31.0	379	38.7							
	22250 -	100	635	385	250	100	10.0	129	13.2	240	22	10	352	GSBR8A GSBR8B GSBR8C GSBR8D (P.352) GSSB8A GSSB8B GSSB8C GSSB8D GSSB8E (P.353)	409	
	22250 -	200				200	20.0	257	26.2							
	22250 -	300				300	31.0	384	39.2							
	22250 -	400				400	41.0	511	52.1							
	22270 -	345	670	400	270	345	35.0	528	53.9	260		12.5	367		531	
	22270 -	500				500	51.0	763	77.9							
	22270 -	700				700	71.0	1065	108.7							
	22290 -	745	700	410	290	745	76.0	1160	118.4	280			377		556	
	22290 -	845				845	86.0	1314	134.1							
	22300 -	200	740	440	300	200	20.0	257	26.2	290		10	407		469	
	22300 -	250				250	26.0	321	32.8							
	22300 -	300				300	31.0	385	39.3							
	22360 -	215	833	473	360	215	22.0	284	29.0	350			440		523	
	22360 -	345				345	35.0	456	46.5							

Order Example Part Number: FGS15049 - Reaction: 150

Days to Ship: 8 Days; Express A 2,00 EUR/piece

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

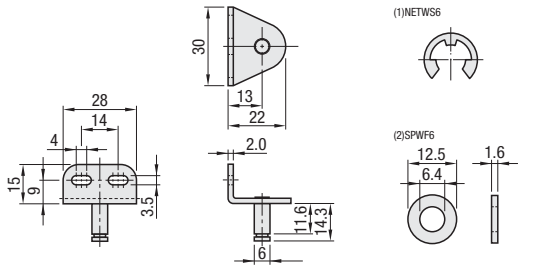
Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

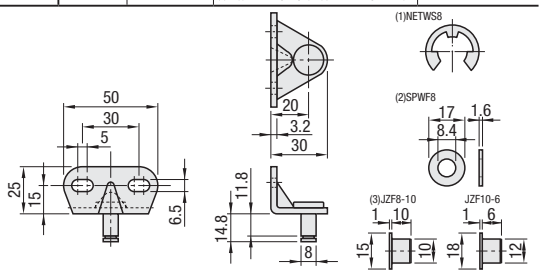
For orders larger than indicated quantity, please request a quotation.

■Attaching Brackets

Part Number	M Material	S Surface Treatment	A Accessory	Applicable Gas Springs
GSBR6A	1.0038/ S235JR	Trivalent Chromate Black	(1) E Type Retaining Ring 1pc. (2) Washer 1pc.	FGS15__FGS18__

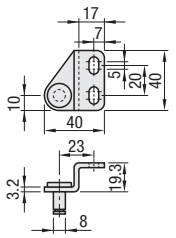


Part Number	M Material	S Surface Treatment	A Accessory	Applicable Gas Springs
GSBR8A	1.0038/ S235JR	Trivalent Chromate Black	(1) E Type Retaining Ring 1pc. (2) Washer 1pc.	FGSS22__
GSBR8A-S			(1) E Type Retaining Ring 1pc. (3) POA Bushings each 1pc.	FGSS15__/18__/22__

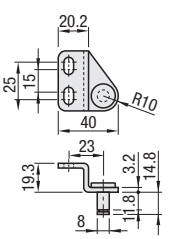


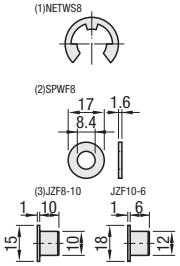
Part Number	M Material	S Surface Treatment	A Accessory	Applicable Gas Springs
GSBR8_	1.0038/ S235JR	Trivalent Chromate Black	(1) E Type Retaining Ring 1pc. (2) Washer 1pc.	FGS22__
GSBR8_-S			(1) E Type Retaining Ring 1pc. (3) POA Bushings each 1pc.	FGSS15__/18__/22__

GSBR8B

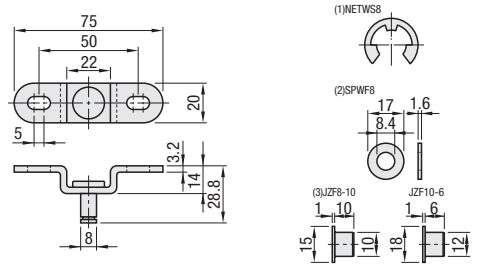


GSBR8C

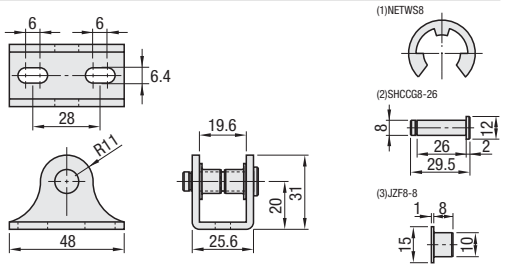




Part Number	M Material	S Surface Treatment	A Accessory	Applicable Gas Springs
GSBR8_	1.0038/ S235JR	Trivalent Chromate Black	(1) E Type Retaining Ring 1pc. (2) Washer 1pc.	FGS22__
GSBR8_-S			(1) E Type Retaining Ring 1pc. (3) POA Bushings each 1pc.	FGSS15__/18__/22__



Part Number	M Material	S Surface Treatment	A Accessory	Applicable Gas Springs
GSBR8F-S	1.0038/ S235JR	Trivalent Chromate Black	(1) E Type Retaining Ring 1pcs. (2) Precision Pivot Pin 1pcs. (3) POA Bushings 2pcs.	FGSS27__



Part Number Type	No.	Mass (g)	€ Unit Price Qty. 1~9.
GSBR	6A	15	
	8A	61	
	8B	53	
	8C	53	
	8D	53	
	8A-S	62	
	8B-S	54	
	8C-S	54	
	8D-S	54	
	8F-S	67	

Order Example Part Number: GSBR6A

Days to Ship 8 Days — Express A 2,00 EUR/ piece

(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount(?) (Round down to one Cent.) P87

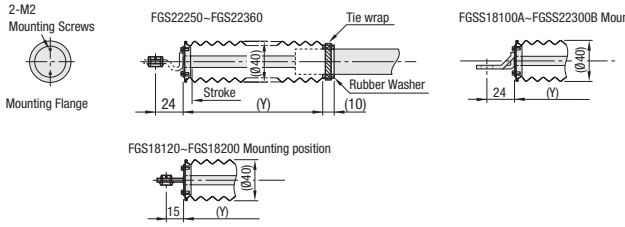
Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

Alterations ■Dust Boots Mounting Alteration

Applicable to FGSS and FGS, No.18_ _ _~22_ _ _.





Gas Springs Stroke	Boots Free Length (Y)
50	90
80	135
90	150
100	160
120	190
130	205
150	230
180	275
200	300
250	370
270	400
290	425
300	440
360	530

M Materials: Tarpaulin (Polyester fiber + Vinyl chloride resin), Flange 1.0038/S235JR, Trivalent Chromate Black

Part Number Type	Applicable No.	Alteration fee € Unit Price Stroke ~100	~200	~300	~360
FGSS	18___				
	22___				
FGS	18___				
	22___				

(?)Please add the alteration fee to the Gas Spring body price.
(?)Limit the use within a stroke range with approx. 10mm travel margin remaining from the end stop.

Order Example Part Number - (DBT): FGSS22250A - DBT

Part Number - Reaction - (DBT): FGS18120 - 200 - DBT

Days to Ship 8 Days ⊗Express Serviceis not available.

■Volume Discount(?) (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

Price

(?)For orders larger than indicated quantity, please request a quotation.

Gas Springs/Attaching Brackets for Gas Springs
-Mounting Orientation Limited Type-

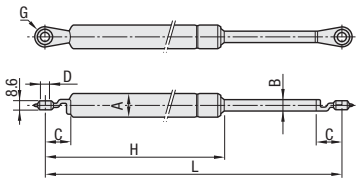


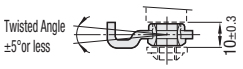
Please mount Rod facing downward.

RoHS

Operation Temperature: -20~60°C

GSS





M Material:
Cylinders: 1.0034/S205G2T
(JIS STKM Hollows for Machine Structural Use)
Rod : 1.1181/C35E
Bushings: Polyacetal Resin (White)
Gas : Nitrogen Gas (N2)

S Surface Treatment:
Cylinders: Baking Finish (Black Matt)
Rod : Gas Soft Nitriding Treatment

Gas Springs

Part Number Type	Part Number No.	Max. Length (Lmax)	Min. Length (Lmin)	Stroke	Gas Reaction Force (20°C) Max. Length-10mm (kgf)	Gas Reaction Force (20°C) Max. Length-( )mm (kgf)	A	B	C	D	G	H	Applicable Mounting Brackets	Weight (g)	€ Unit Price
GSS	15050A	181.0	131.0	50.0	2.8	3.3 (40)	15	6	15	6.5	R8	111	GSSB6A (P.353)	75	
	15050B				8.7	10.4 (40)									
	15050C				15.0	17.8 (40)									
	15070A	221.0	151.0	70.0	8.3	10.4 (40)						131		90	
	15070B				12.1	12.6 (41.5)									
	15090A	261.0	171.0	90.0	7.0	9.1 (80)						151		108	
	15090B				8.1	10.5 (80)									
	15090C				9.0	11.7 (80)									
	15090D				15.0	19.5 (80)									
	15100A	281.0	181.0	100.0	7.8	10.5 (90)						161		120	
	15100B				20.0	26.2 (90)									
	18090A	261.0	171.0	90.0	26.8	36.0 (90)	18	8			R8	154		170	
	18100A	281.0	181.0	100.0	33.0	43.6 (90)						163		190	
	22235A	580.0	344.5	235.5	13.2	19.9 (206)	22	10	24	8.5	R10	320.5	GSSB8A GSSB8B GSSB8C GSSB8D GSSB8E (P.353)	370	
	22080A	279.0	199.0	80.0	20.0	25.0 (80)						169.5		178	
	22096A	306.0	210.0	96.0	40.0	51.6 (91)						186		195	
	22142A	472.0	330.0	142.0	28.5	37.8 (125)						306		300	
	22147A	412.0	265.0	147.0	15.0	19.7 (130)						241		265	
	22235B	580.0	344.5	235.5	25.3	31.9 (206)						320.5		370	
	22356A	833.0	476.5	356.5	22.0	29.4 (350)						452		530	
	22356B				35.2	46.9 (350)									
	22243A	627.0	384.0	243.0	20.0	30.7 (215)		12.5				360		470	
	22243B				44.2	67.0 (215)									
	22270A	670.0	400.0	270.0	35.0	49.6 (240)						376		500	
	22270B				51.7	75.1 (240)									
	22300A	700.0	400.0	300.0	76.0	118.3 (275)			20					525	
	22300B				86.2	134.6 (275)									

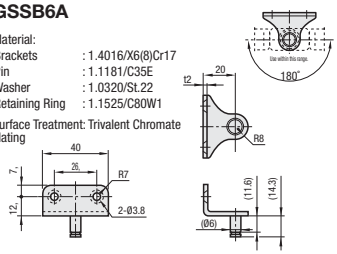
Mounting Brackets for Gas Springs (Washer 1pc. and Retaining Ring 1pc. included)

RoHS

GSSB6A

M Material:
Brackets : 1.4016/X6(8)Cr17
Pin : 1.1181/C35E
Washer : 1.0320/St.22
Retaining Ring : 1.1525/C80W1

S Surface Treatment: Trivalent Chromate Plating

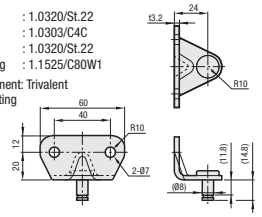


Part Number	Mass (g)	€ Unit Price
GSSB 6A	20	

GSSB8A

M Material:
Brackets : 1.0320/St.22
Pin : 1.0303/C4C
Washer : 1.0320/St.22
Retaining Ring : 1.1525/C80W1

S Surface Treatment: Trivalent Chromate Plating

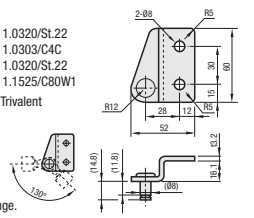


Part Number	Mass (g)	€ Unit Price
GSSB 8A	60	

GSSB8B

M Material:
Brackets : 1.0320/St.22
Pin : 1.0303/C4C
Washer : 1.0320/St.22
Retaining Ring : 1.1525/C80W1

S Surface Treatment: Trivalent Chromate Plating



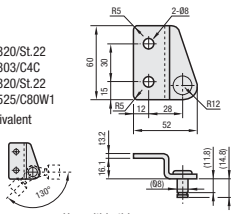
Use within this range.

Part Number	Mass (g)	€ Unit Price
GSSB 8B	60	

GSSB8C

M Material:
Brackets : 1.0320/St.22
Pin : 1.0303/C4C
Washer : 1.0320/St.22
Retaining Ring : 1.1525/C80W1

S Surface Treatment: Trivalent Chromate Plating



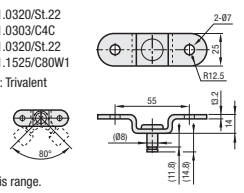
Use within this range.

Part Number	Mass (g)	€ Unit Price
GSSB 8C	60	

GSSB8D

M Material:
Brackets : 1.0320/St.22
Pin : 1.0303/C4C
Washer : 1.0320/St.22
Retaining Ring : 1.1525/C80W1

S Surface Treatment: Trivalent Chromate Plating



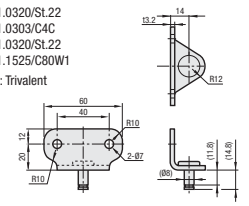
Use within this range.

Part Number	Mass (g)	€ Unit Price
GSSB 8D	60	

GSSB8E

M Material:
Brackets : 1.0320/St.22
Pin : 1.0303/C4C
Washer : 1.0320/St.22
Retaining Ring : 1.1525/C80W1

S Surface Treatment: Trivalent Chromate Plating



Part Number	Mass (g)	€ Unit Price
GSSB 8E	60	

Order Example

Part Number
GSS15050B

Days to Ship 8 Days

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Gas Springs/Stainless Steel Gas Springs

-Gas Reaction Force Configurable Type-

CAD Data

■Gas Springs

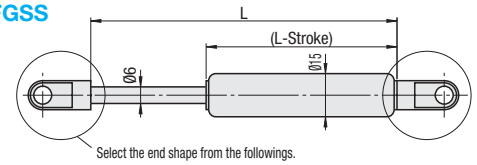


* Though usable at any angle, rod facing downward is recommended.

Operating Temp. -20°C~80°C

RoHS

HFGSS



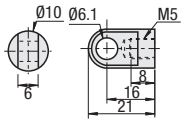
Select the end shape from the followings.
Right and left ends are of the same shape.

M Material:
Rod : Alloy Tool Steel (SKS)
Main Body : JIS STKM Hollow for Pressure Service (STPG) (DIN Standards: St37-2)
Clevis : Rolled Steel for General Structure (SS or Equivalent Gas)
Tips : Rolled Steel for General Structure (JIS-SS or Equivalent)

S Surface
Rod : Ceramic Coating
Main Body : Black Painting
Clevis : Zinc Galvanizing
Tips : Zinc Galvanizing

■Tips

A



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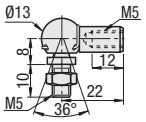

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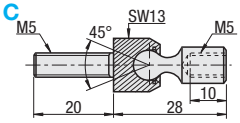


Part Number			Gas Reaction Force Change Rate Min. Length + 5mm	L max	Gas Reaction Force Change Rate Min. Length + 5mm	Weight (g)	€ Unit Price		
Type	Tip Shapes	Stroke					Tip Shape A	Tip Shape B	Tip Shape C
HFGSS	A	40	N	106	126%	49			
		50		126		55			
	B	60	20~400	146		61			
		80		186		73			
	C	100	10N Increment	226		84			
		120		266		96			
		150		326	128%	113			

Kgf (Load)=N x 0.101972

Order Example: Part Number: Type - Tip Shapes - Stroke - N → HFGSS - A - 60 - N300

Days to Ship: 10 Days

Price

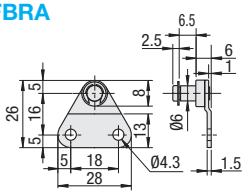
■Volume Discount (Round down to one Cent.) P88

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Brackets for HFGSS

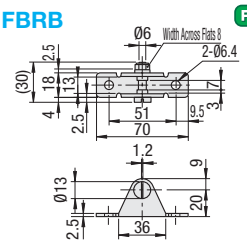
HFBRA



M Material: Rolled Steel for General Structure (SS)
S Surface Treatment: Zinc Plating

HFBRB

RoHS



Part Number	Mass (g)	€ Unit Price
HFBRA	10	
HFBRB	55	

Order Example: Part Number → HFBRA

Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

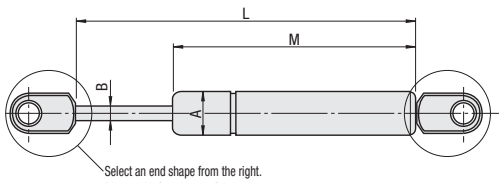
For orders larger than indicated quantity, please request a quotation.

■Stainless Steel Gas Springs

RoHS



FRGSS



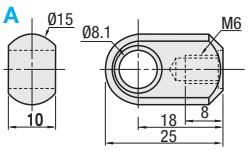
Select an end shape from the right.
Right and left ends are of the same shape.

Operation Temperature : -30°C~80°C
Operating Range : Within 60° with rod facing downward

M Material: Cylinders : DIN EN 10088-1 (1.4301/X5CrNi18-10)
Rod : DIN EN 10088-1 (1.4301/X5CrNi18-10)
Gas : Nitrogen Gas
Tips : 1.4301/X5CrNi18-10 equivalent

■Tips

A



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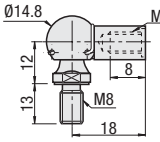


* M8 thread can tilt 10° from the center.

Part Number			Gas Reaction Force (20°C)N Max. Length-5mm	L max.	M	A	B	Weight (g)	€ Unit Price	
Type	Tip Shapes	Stroke							Tip Shape A	Tip Shape B
FRGSS	A	60	100 (10.2kgf)	171	104.5	18	8	140		
			125 (12.8kgf)							
			150 (15.3kgf)							
			200 (20.4kgf)							
		80	100 (10.2kgf)	211	126.5			190		
			150 (15.3kgf)							
			200 (20.4kgf)							
			300 (30.6kgf)							
	B	100	100 (10.2kgf)	251	145.5			200		
			200 (20.4kgf)							
			300 (30.6kgf)							
			400 (40.8kgf)							

*Example of Gas Reaction Calculation

Specified Gas Reaction Force Min. Length-5mm (Lmax-5)	Min. Length +5mm (Lmax-Stroke+5)
100N	134N

Gas reaction force change rate is 34% regardless of the stroke.
Kgf (Load)=N x 0.101972

Order Example: Part Number: Type - Tip Shapes - Stroke - N → FRGSS - A - 60 - 100

Days to Ship: 13 Days

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~49
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Urethane · Rubbers · Sponges · Felts

Urethane · Rubbers · Sponges · Felts






Product Name	Urethane / Antistatic Urethane Washers	Abrasion Resistant / Heat Resistant Urethane Washers	Rubber Washers	Sponge Washers
Page	361	362	363	364

Added


Price Reduction Up to 5%

Price Reduction Up to 17%




Urethane Bumpers -L Dimension Standard / L Dimension Configurable-	Male Thread Urethane · Rubber Bumpers L Dimension Fixed	Bumper with Metal Washer	Urethane Bumpers -Counterbore L Standard / L Configurable-	Urethane Bumpers - Counterbored, Fully Configurable / Flanged Collars for Urethane Bumpers
365~368	369	370	371	372






Abrasion Resistant / Heat Resistant Counterbored Urethane Bumpers	Rubber Bumpers -Configurable-	Rubber Bumpers -Counterbored-	Urethane · Rubbers -Spherical Tip-
373	374	374	375


Price Reduction Up to 26%





Urethane / Rubber -Tapered Tip-	Urethane / Rubbers –Pilot Type–	Urethane / Rubbers –Cap Type–	Super Low Hardness	Extra Low Hardness Urethane Sheets
375	376	377	378	378

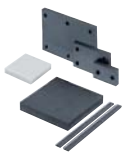
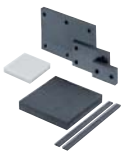
Added


Price Reduction Up to 10%
NEW

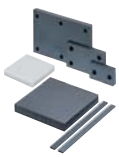

Price Reduction Up to 31%

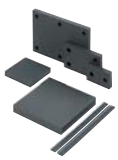


Shock Absorbing Bumpers -Female Thread / Male Thread-	Plate Type / Holder Type	Urethane Sheets	Highly Abrasion Resistant / Heat Resistant Urethane Sheets	Urethane Sheets with Oil-Resistant Adhesives
379	380	381~383	385	387


Antistatic Urethane Sheets / Low Rebound Urethane Sheets	Nitrile Rubber Sheets / Nitrile Rubber Sheets with Oil-Resistant Adhesives	Chloroprene · Non-Staining Chloroprene Rubber Sheets	Ethylene Rubber Sheets · Butyl Rubber Sheets / Amber Color Rubber Sheets
388	389	391	393


Price Reduction Up to 40%

Price Reduction Up to 33%


Price Reduction Up to 42%

Fluorine Rubber Sheets	Silicon / High Strength Silicon Rubber Sheets	Low Elasticity (Hanenaito®) Rubber Sheets	TPE Sheets / TPE Washers & Bumpers
395	397	399	401



Metal-Plated Urethane Sheets
403



Urethane · Rubber Blocks
404



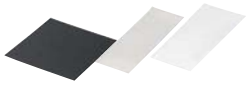
Anti-Skid Rubber Sheets
405



Nonskid Rubber Sheets
406



Silicon Gel Sheets
406



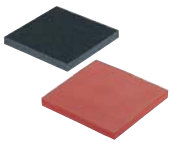
Low Friction Rubber Sheets -Nitrile / Silicon-
407



Resin Sheets
408



Fluororesin Tapes
408



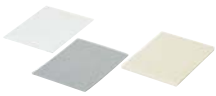
Urethane · Rubber Sponge Sheets
409



Low Elasticity / Antistatic Low Rebound / Low Strain Sponge Sheets
411



Dust-proof General - Purpose Sponge
412



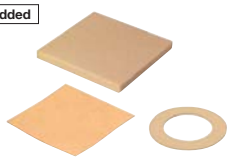
Felt Sheets
413

NEW



Felt Washers / Felt Bumpers
414

Added



Heat Insulation Sponge (Polyimide) Sheets · Washes
415-416



Heat Insulation Sheets
417



Heat Insulation Tapes
417



Heatsink
418



Heat Radiation Gel Sheets
418



Sponge Tapes
419

Round Cord - Sealing Elastomer
420



Urethane · Rubber Round Strings -Ring Type-
420



Price Reduction
Up to 52%

Rubber / Rubber Sponge Strings -Round · Square-
421

NEW



Round Dome Ropes · Trapezoidal Dome Ropes
422



Urethane · Rubber / Sponge Gaskets
423~426

Material Shop 24 Urethane, Rubbers, Sponge Sheets Site

[Contents]
When materials are selected, product numbers, Delivery Time and Price are displayed at the same time.
Orders can be placed on the same page.

[Selection Steps]

Website for both Sheets & Round Bars / Hollows selection will open in June 2010!

Not Available

STEP 1 Select materials.

Urethane 6 materials, 15 types (hardness)
Rubbers 22 materials, 29 types (hardness)
Sponges 10 materials, 12 types (hardness, color)
Wide varieties are available from general-purpose materials to high-performance materials!!

Easy selection with a simple guidance!

STEP 2 Select adhesives and hole machining

Oil-resistant adhesives are available as an alternative!
Through Hole and Counterbore Hole are selectable!

Wide selections in accordance with the mounting method or the intended use!

STEP 3 Input sizes and quantities

Various width or length such as 1000mm long size are available, which are not covered in Mechanical Standard Components for Factory Automation Catalog!!

Urethane is selectable up to 80mm thickness, which was up to 30mm previously!

Quotation / Product number Created

Rubber Properties

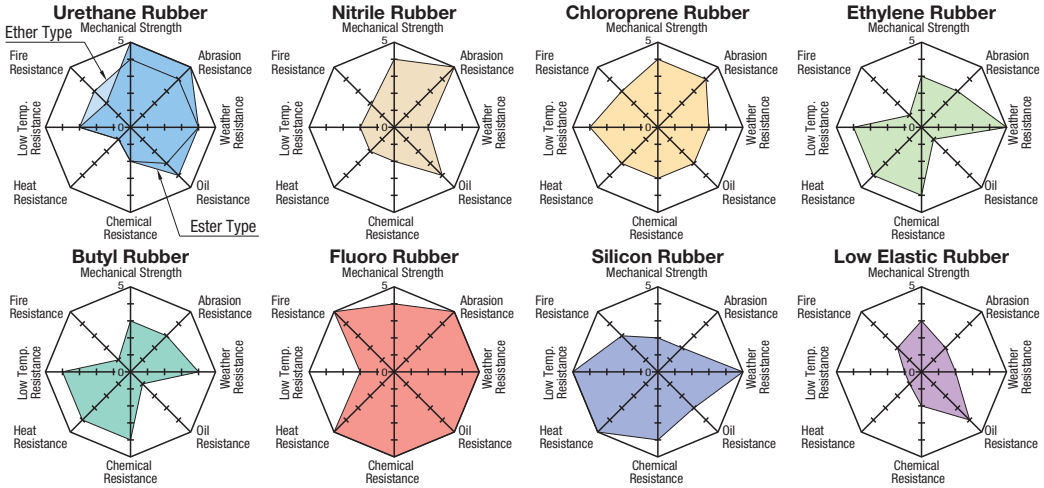
Features

Urethane	Excels in mechanical strength. Weak in heat and chemical resistance. Wide range of hardness variations.
Nitrile (NBR)	Excels in abrasion resistance and oil resistance, and economical. Inferior in weather resistance. Avoid using in areas where it may be exposed to direct sunlight or around ozone-generating electrical devices.
Chloroprene (CR)	Well-balanced in properties and economical.
Ethylene (EPDM Synthetic Rubber)	Excels in weather resistance and economical. Inferior in oil resistance and fire resistance.
Butyl (IIR)	Excels in weather resistance and airtightness. Suited for inner tube of air tire. Inferior in oil resistance and fire resistance.
Fluorine (FPM)	Excels in most properties.
Silicon (SI)	Excels in heat resistance. Inferior in mechanical strength.
Low Elastic (Hanenaito®)	Excels in shock absorption and oil resistance. Inferior in heat resistance and low temperature resistance.

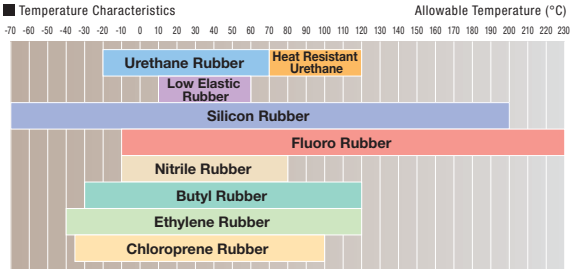
Property Order

Item	Weak → Strong							
Mechanical Strength	Silicon	Low Elastic	Butyl	Ethylene	Nitrile	Fluorine	Chloroprene	Urethane
Weather Resistance	Nitrile	Low Elastic	Chloroprene	Urethane	Butyl	Silicon	Ethylene	Fluorine
Abrasion Resistance	Silicon	Low Elastic	Butyl	Ethylene	Chloroprene	Urethane	Nitrile	Fluorine
Heat Resistance	Low Elastic	Urethane	Nitrile	Chloroprene	Butyl	Ethylene	Silicon	Fluorine
Oil Resistance	Butyl	Ethylene	Silicon	Chloroprene	Urethane	Low Elastic	Nitrile	Fluorine

Property Comparison Chart



Comparison of Allowable Temperature



Comparison of Chemical Resistance

	Urethane	Nitrile	Chloroprene	Ethylene	Butyl	Fluorine	Silicon	Low Elastic
Gasoline Light Oil	◎	◎	○	X	X	◎	Δ - ○	Δ
Water	Δ	◎	◎	◎	◎	◎	○	Δ
Strong Acid	X	○	○	○	◎	◎	Δ	Δ
Strong Alkali	X	○	◎	◎	◎	X	◎	○
Ether	X	X - Δ	X - Δ	○	Δ - ○	X - Δ	X - Δ	Δ
Keton	X	X	X - ○	◎	◎	X	○	X

◎=Excellent, ○=Good, Δ=Acceptable, X=Not Acceptable

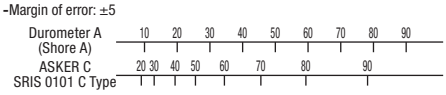
Hardness images

Shore A95	Golf balls
Shore A90	Baseball
Shore A70	Softball
Shore A50	Plastic erasers
Shore A30	Bicycle tubes

Hard

Soft

-Margin of error: ±5



Indication of Hardness

Three hardness categories are used for MISUMI's Urethane / Rubbers / Sponges.

(1) Shore A

Used for Urethane and Rubbers.

"Shore A 70" means a hardness measured by using type-A Durometer in accordance with New JIS Standard K6253.

(2) ASKER C

Used to describe the hardness of Sponges.

"Asker C 25" means a hardness measured by using a spring type hardness tester Asker C in accordance with SRIS 0101 (Standard by the Society of Rubber Industry, Japan).

For those two above, larger value indicates harder material.

(3) Penetration

Used to describe the hardness of gel materials.

Penetration is standardized by JIS K2207. It indicates hardness by the penetrated length that a pin of specified weight penetrates in a sample perpendicularly.

The value is one penetration for 1/10mm length. (Larger value indicates softer material.)

Properties of Urethane and High Performance Urethane

Urethane Properties

Item	Unit	Urethane Rubber					Low Rebound Urethane	Super Low Hardness Urethane	Vulkollan®		High Abrasion Resistant Urethane		Heat Resistant Urethane
Hardness	Shore A	95	90	70	50	30	70	15	92	68	90	70	90
Specific Gravity	-	1.13		1.20	1.15	1.20	1.03	1.02	1.26		44.6	31.3	44.6
Tensile Strength	Mpa	44.1	44.6	31.3	27.4	18.5	11.8	0.6	46.5	60.0	44.6	31.3	44.6
Elongation	%	400	530	650	690	600	250	445	690	650	530	650	530
Heat	°C	70					70	80	80 (120 for short time)		70		120
Low Temp. Resistance	°C	-40	-20				-20	-40	-20		-20		-20

The characteristic values of tensile strength and elongation are tested based on the JIS standard K6251.

Urethane (Ether Type, Ester Type) Properties Comparison

Properties		Ether Type (Shore A95 - 90)	Ester Type (Shore A70 - 50 - 30)
Tensile Strength			○
Elongation			○
Tear Strength			○
Impact Resilience		○	
Abrasion Resistance	Slip Wear		○
	Shock Wear	○	
Hydrolysis Resistance		○	
Oil Resistance			○
Strength			○
Durability			○
Acid Resistance, Alkali Resistance		○	

Discoloration of Urethane

Urethane may experience discoloration and yellowing with age.
Discoloration is distinct especially with antistatic urethane (gray), but physical property or characteristics remain unchanged.

- Aging Discoloration



* Time to turn to yellow and level of yellowing differ greatly depending on operating environment etc.

White rubber may experience yellowing as well, which please note.

Super Abrasion Resistant Urethane: Vulkollan®

Vulkollan® is a super abrasion resistant urethane which is far superior to conventional urethanes in abrasion resistance and load bearing.
It is six times higher in abrasion resistance and half as much again in material strength. (MISUMI's internal test)
Vulkollan® withstands up to 80°C in long-time uses, and up to 120°C in short-time uses about for 15-20 mins.

Discoloration of Vulkollan®
Discoloration of Vulkollan® has poorer color stability against ultraviolet rays than general urethanes due to its unique composition.
Pictures below show the process of change in colors of a sample exposed to outdoor sunlight.



* No change in physical property or characteristics due to discoloration.

Abrasion Resistant Urethane

Unique composition realized abrasion resistance 2.5 times higher than general urethane at low cost. Color is dark brown.

-Vulkollan®, Abrasion Resistant Urethane Taber Abrasion Test Results

Test \ Material	General Urethane	High Abrasion Resistant Urethane	Super Abrasion Resistant Vulkollan®
Abrasion Test (Taber Method) Abraded Volume (mm^3)	197.3	73.8	33.9

Testing Method
JIS K 7204: 1999 "Plastics–Determination of resistance to wear by abrasive wheels

Abrasive Wheel:	H - 22
Load:	9.8N
No. of Strokes:	1,000
Test Parameter:	1

Abrasive wheels are applied to the sample using a fixed weight for a specified number of cycles.
From the weight loss of the sample it is possible to measure the abrasion resistance of a material.
The above values are not guaranteed but an experiment log.

Advantages
High abrasion resistance and material strength provide longer product life and replacement interval.

Heat Resistant Urethane

This urethane has greater heat resistance up to 120°C (general urethane withstands up to 70°C).
Suitable for use in applications where high material strength in high-temperature range is required, such as work receiver for hot air dryer.
Product color is brown.

Vulkollan® · Abrasion Resistant Urethane / Heat Resistant Urethane Products

Washer	Cushion	Sheet	Gasket Products
P.362	P.366 P.373	P.385	P.423 Heat Resisting Urethane only

Urethane is a difficult-to-adhere material.
MISUMI offers Adhesives only for Urethane.
For Instant Adhesives only for Urethane, please refer to ☞P.448

Rubber Properties / Characteristics of Shock Absorbing Materials

Rubber Properties

Item	Unit	Nitrile Rubber		Chloroprene Rubber	Ethylene Rubber	Butyl Rubber	Fluoro Rubber		Silicon Rubber		High Strength Silicon Rubber	Low Elasticity Rubber	
Hardness	Shore A	70	50	65	65	65	80	60	70	50	50	57	32
Specific Gravity	-	1.6	1.3	1.6	1.2	1.5	1.8	1.9	1.2	1.2	1.2	1.3	1.2
Tensile Strength	Mpa	12.7	4.4	13.3	12.8	7.5	12.5	10.8	7.4	8.8	7.8	8.3	10.3
Elongation	%	370	400	460	490	380	330	270	300	330	400	810	840
Maximum Operation Temperature	°C	90	99	100	120	120	230		200		200	60	
Temperature of Continuous Use	°C	80		80	80	80	210		150		150	30	
Low Temp. Resistance	°C	-10		-35	-40	-30	-10		-70		-50	10	

The characteristic values of tensile strength and elongation are tested based on the JIS standard K6251.

Features of Low Rebound Urethane / Low Elasticity Rubber (Hanenaito®)

Hanenaito® is a registered trademark of Naigai Rubber Industry Co., Ltd.

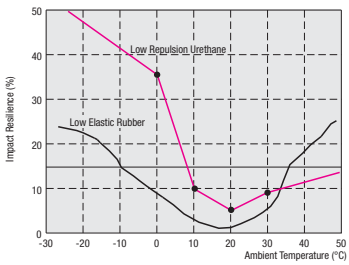
- Low Rebound Urethane
  It has the same properties as urethane, and excels in shock absorption. With more resistance to compression than normal urethane, it is hard to deform. Not suitable for the absorption of large impact energy because its tensile strength and elongation are weaker than that of urethane of the same hardness.
- Low Elasticity Rubber (Hanenaito®)
  It is used as cushioning material pallet damper, conveyor machine, precision instrument etc, because of its good elongation and shock absorption. Also it is used as vibration absorption materials of various precision instruments because of its excellent vibration absorption.

Reference: Compression set of low-rebound urethane

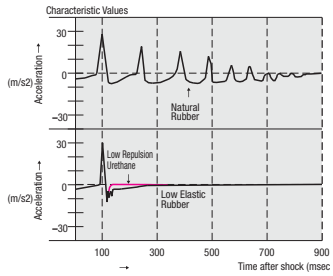
Low Rebound Urethane	1%
Urethane (Shore A70)	25%

* The above data is measured at room temperature 23°C.
* 70°Cx24H 25% Compression

Impact Resilience Variation by Temperature of Low Elasticity Rubber · Low Rebound Urethane

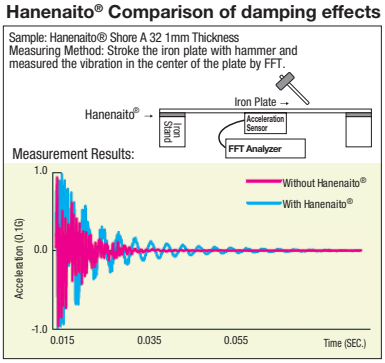


Comparison of Shock Absorption of Low Elasticity Rubber · Low Rebound Urethane



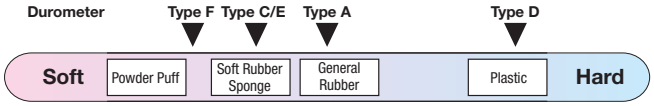
Above data are standard values, not guaranteed values.

Hanenaito® Comparison of damping effects



Hardness of Shock Absorbing Materials

-Types of durometers and objects of measurement



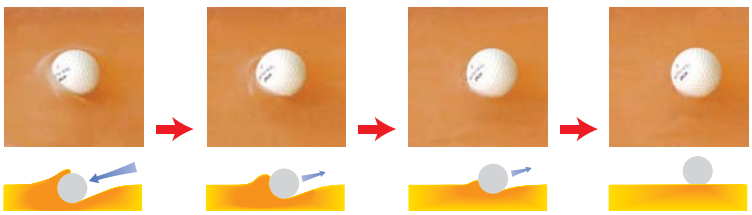
There are various types of durometer, instrument to measure the hardness of a material, depending on the property of the measured material. For urethane and rubber, Type A (Asker Durometer Type A) is most commonly used. Hardness of materials softer than urethane and rubber is measured by Asker Type C or Type E. Shock-absorbing gel is soft and super flexible material whose hardness is measured by Asker Type F.

-Correlation of hardness and rebound force of shock absorbing materials

		Hardness	
		Extra Low (F Hardness)	High (A Hardness)
Rebound	Low	Shock Absorbing Gel	Low Rebound Urethane Low Elasticity Rubber
	Large		General Purpose Urethane General purpose rubber

Shock Absorbing Gel

Shock absorbing gel is extremely soft gel which has an Asker F hardness. Being an urethane-based synthetic rubber, it has high material strength. A major characteristic is the three-dimensional slow recovery, the function to recover after compression slowly and in multiple directions.
* The material slowly recovers its shape in 1 - 2 seconds, after pressed with a golf ball.
(Hardness of the product material is enhanced further and the actual reaction differs to those in the pictures)



For the shock absorbing capability of the bumpers made of this material, please see gravitational acceleration comparison test data on **P.379**.

- Properties of Shock Absorbing Gel

Item	Unit	Shock Absorbing Gel
Specific Gravity	-	1.0
Hardness	Asker F	75
Tensile Strength	Mpa	0.81
Elongation	%	885
Heat	°C	100
Low Temp. Resistance	°C	-10

*Above figures are the measured values for the shock absorbing gel as a material, and there are slight differences between the values for the bumping products made with the material, featured on **P.379**

Low rebound urethane · Low elasticity rubber · Shock absorbing gel products

	Washer	Cushion	Sheet
Low Elasticity Rubber Hanenaito®	P.363	P.369	P.399
Low Rebound Urethane	-	P.367 P.372	P.388
Shock Absorbing Gel	-	P.379	-

Urethane Washers / Antistatic Urethane Washers

CAD Data



Type	Standard Class	Precision Class	M Material	H Hardness
Standard Type	URWS	UAWS	Ether Polyurethane	Shore A95
	URWH	UAWH		Shore A90
	URWM	UAWM	Ester Polyurethane	Shore A70
	URWL	-		Shore A50
Configurable Type	URFS	UAFSN	Ether Polyurethane	Shore A95
	URFH	UAFH		Shore A90
	URFM	UAFM	Ester Polyurethane	Shore A70
	URFL	-		Shore A50
	URFY	-		Shore A30
	URFHE	-	Antistatic Polyurethane	Shore A90
	URFME	-		Shore A70
	URFLE	-		Shore A50

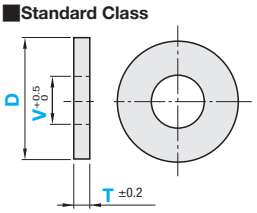
Antistatic urethanes are gray colors. (Others are natural color.)

Characteristic Values of Antistatic Urethane

Specific Volume Resistivity	$2.1 \times 10^8 \Omega$cm
Surface Resistivity	$4.0 \times 10^9 \Omega$

(Conditions: Temperature 30°C Humidity 60%)
All other properties are equal to that of urethane of the same hardness.

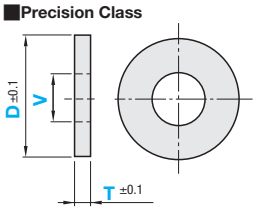
Standard Class



D Tolerance

D	Tolerance
6~40	±0.2
40~60	±0.3
61~100	±0.4

Precision Class



V Tolerance

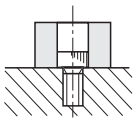
V	Tolerance
2~50	+0.1 0
51~80	+0.2 0

The tolerances are verified at 23°C ± 2 and 40~80% humidity.

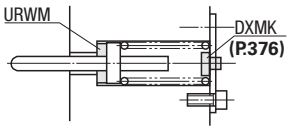
Standard Type

Part Number Type	D	V Selection	T Selection	€ Unit Price URWS	URWH	URWM	URWL	UAWS	UAWH	UAWM
Standard Class URFS (Shore A95) / Precision Class UAWS (Shore A95)	6	2	1 2 3							
URWH (Shore A90) / UAWH (Shore A90)	8	2 3 4	1 2 3							
URWM (Shore A70) / UAWM (Shore A70)	10	3 4 5 6	1 2 3 5							
URWL (Shore A50)	12	4 5 6 8	1 2 3 5							
	15	4 5 6 8 10	1 2 3 5							
	20	5 6 8 10 12	3 5 10							
	25	5 6 8 10 12 16 20	3 5 10							
	30	5 6 8 10 12 16 20	3 5 10							
	35	8 10 12 16 20 25	5 10							
	40	8 10 12 16 20 25 30	5 10							
	50	8 10 12 16 20 25 30	5 10							
	60	12 16 20 25 30 40	5 10							

Example - For Bumper



- Urethane Washers



Configurable Type (Regular Class · Precision Class)

Part Number Type	D 1mm Increment	V 1mm Increment	T 0.5mm Increment	€ Unit Price URFS	URFH	URFM	URFL	URFY	UAFSN	UAFH	UAFM	URFHE	URFME	URFLE
Standard Class / Precision Class (Shore A95) URFS / UAFSN	6~15	0 (No Hole) 2~41 (V≤D−4)	1.0~5.0											
			5.5~10.0											
(Shore A90) URFH / UAFH	16~30		1.0~5.0											
			5.5~10.0											
(Shore A70) URFM / UAFM	31~45		1.0~5.0											
			5.5~10.0											
(Shore A50) URFL	46~60	0 (No Hole) 10~70 (V≤D−4)	1.0~5.0											
(Shore A30) URFY			5.5~10.0											
(Antistatic · Shore A90) URFHE	61~80		1.0~5.0											
(Antistatic · Shore A70) URFME			5.5~10.0											
(Antistatic · Shore A50) URFLE	81~100	0 (No Hole) 20~80 (V≤D−4)	1.0~5.0											
			5.5~10.0											

When V=0, there is no hole.

Order Example

Standard Type

Part Number	-	V	-	T
URWL20	-	10	-	5

Configurable Type

Part Number	-	D	-	V	-	T
URFM	-	D19	-	V3	-	T4.5
URFH	-	D35	-	V18	-	T8.0

Days to Ship

Standard Type: 6 Days P.88

Configurable Type (URFS · URFH · URFM · URFL): 8 Days

Configurable Type (URFY · Precision Class · Antistatic): 10 Days — Express B 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Standard Type

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Discount Rate	€ Unit Price	20%	30%	35%

For orders of 200 or more identical pieces, please request a quotation.

Configurable Type

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	15%	35%

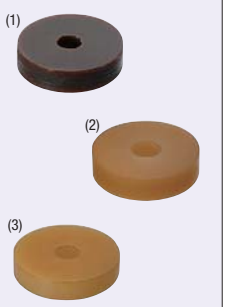
For orders larger than indicated quantity, please request a quotation.

Abrasion Resistant Urethane Washers / Heat Resistant Urethane Washers

CAD Data

■Vulkollan® has 6 times more, Abrasion Resistant Urethane has 2.5 times more resistance to abrasion than the standard urethane. For property details, refer to P.359
■Heat-Resistant Urethane is more sustainable under high temperature up to 120 °C than the standard urethane.

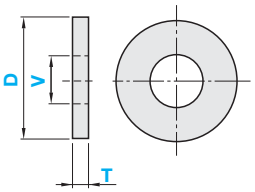
RoHS



Type	Type	Material	Hardness	Color
Standard Type	UREWH	Abrasion Resistant Urethane	Shore A90	Dark Brown (1)
	UREWM		Shore A70	
	URHWH	Heat Resistant Urethane	Shore A90	Brown (2)
Configurable Type	VULFH	Super Abrasion Resistant Urethane Discoloration of Vulkollan®	Shore A92	Beige (3)
	VULFM		Shore A68	
	UREFH	Abrasion Resistant Urethane	Shore A90	Dark Brown (1)
	UREFM		Shore A70	
	URHFH	Heat Resistant Urethane	Shore A90	Brown (2)

Vulkollan® is a registered trademark of Bayer AG.
No change in physical property or characteristics due to aged discoloration.

VULKOLLAN
THE ULTIMATE ELASTOMER



-Vulkollan® (3)
D Tolerance

D	Tolerance
6~40	±0.5
40~60	±0.6
61~100	±0.7

V Tolerance±0.3

-Others
D Tolerance (1)(2)

D	Tolerance
6~40	±0.2
40~60	±0.3
61~100	±0.4

V Tolerance $^{+0.5}_{0}$

T Tolerance

t	Tolerance
3~5	±0.5
5.5~10	±0.2

■Standard Type

Part Number Type	D	V Selection	T Selection	€ Unit Price UREWH	UREWM	URHWH
Abrasion Resistant Urethane UREWH (Shore A90) UREWM (Shore A70) Heat Resistant Urethane URHWH (Shore A90)	6	2	1 2 3			
	8	2 3 4	1 2 3			
	10	3 4 5 6	1 2 3 5			
	12	4 5 6 8	1 2 3 5			
	15	4 5 6 8 10	1 2 3 5			
	20	5 6 8 10 12	3 5 10			
	25	5 6 8 10 12 16 20	3 5 10			
	30	5 6 8 10 12 16 20	3 5 10			
	35	8 10 12 16 20 25	5 10			
	40	8 10 12 16 20 25 30	5 10			
	50	8 10 12 16 20 25 30	5 10			
	60	12 16 20 25 30 40	5 10			

■Configurable Type

Part Number Type		D 1mm Increment	V 1mm Increment	T 0.5mm Increment	€ Unit Price VULFH	VULFM	UREFH	UREFM	URHFH
Super Abrasion Resistant Vulkollan® (Shore A92) (Shore A68)	VULFH VULFM	6~15	0 (No Hole) 2~41 (V≤D−4)	1.0~5.0					
				5.5~10.0					
		16~30		1.0~5.0					
				5.5~10.0					
		31~45		1.0~5.0					
				5.5~10.0					
Abrasion Resistant Urethane (Shore A90) (Shore A70)	UREFH UREFM	46~60	0 (No Hole) 10~70 (V≤D−4)	1.0~5.0					
				5.5~10.0					
Heat Resistant Urethane (Shore A90)	URHFH	61~80		1.0~5.0					
				5.5~10.0					
		81~100	0 (No Hole) 20~80 (V≤D−4)	1.0~5.0					
				5.5~10.0					

When V=0, there is no hole. Vulkollan® is available with T=3.0 or larger.

Order Example

■Standard Type

Part Number	-	V	-	T
UREWH20	-	10	-	5

■Configurable Type

Part Number	-	D	-	V	-	T
VULFH	-	D19	-	V3	-	T4.5

Days to Ship

■Standard Type
6 Days

■Configurable Type
10 Days | Express B | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

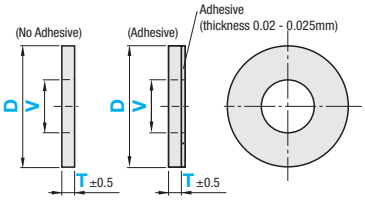
Rubber Washers

CAD Data



Standard Type		Configurable Type	Material	Hardness	Color
No Adhesive	Adhesive				
WRBN	WRBNA	FWRBN	Nitrile Rubber (NBR)	Shore A70	Black
WRBC	WRBCA	FWRBC	Chloroprene Rubber (CR)	Shore A65	Black
WRBP	WRBPA	FWRBP	Ethylene Rubber (EPDM)	Shore A65	Black
WUNS	WUNSA	FWUNS	Low Elasticity Rubber (Hanenaito®)	Shore A32	Black
WRBS	WRBSA	FWRBS	Silicon Rubber (SI)	Shore A70	Light Gray
WRBA	WRBAA	FWRBA	Silicon Rubber (SI)	Shore A50	Milky White
WRBF	WRBFA	FWRBF	Fluoro Rubber (FPM)	Shore A80	Black
WRBR	WRBRA	FWRBR	Butyl Rubber (IIR)	Shore A65	Black
WRBW	WRBWA	FWRBW	White Butyl Rubber (IIR)	Shore A65	White

Hanenaito® is a registered trademark of Naigai Rubber Industry Co., Ltd.
The milky white color of silicone rubber shore A 50 is translucent.



D Tolerance

D	Tolerance
6~40	±0.5
41~60	±0.6
61~100	±0.7

V Tolerance

Material	Tolerance
Low Elasticity Rubber	±0.5
Others	+0.5 0

Rubber Washers Standard Type (No Adhesive)

Part Number Type	D	V Selection	T Selection	€ Unit Price WRBN	WRBC	WRBP	WUNS	WRBS	WRBA	WRBF	WRBR	WRBW
WRBN WRBC WRBP WUNS WRBS WRBA WRBF WRBR WRBW	6	2	1 2 3									
	8	2 3 4	1 2 3									
	10	3 4 5 6	1 2 3 5									
	12	4 5 6 8	1 2 3 5									
	15	4 5 6 8 10	1 2 3 5									
	20	5 6 8 10 12	3 5									
	25	5 6 8 10 12 16 20	3 5									
	30	5 6 8 10 12 16 20	3 5									
	35	8 10 12 16 20 25	5									
	40	8 10 12 16 20 25 30	5									
	50	8 10 12 16 20 25 30	5									
	60	12 16 20 25 30 40	5									

Rubber Washers Standard Type (With Adhesive)

Part Number Type	D	V Selection	T Selection	€ Unit Price WRBNA	WRBCA	WRBPA	WUNSA	WRBSA	WRBAA	WRBFA	WRBRA	WRBWA
WRBNA WRBCA WRBPA WUNSA WRBSA WRBAA WRBFA WRBRA WRBWA	6	2	1 2 3									
	8	2 3 4	1 2 3									
	10	3 4 5 6	1 2 3 5									
	12	4 5 6 8	1 2 3 5									
	15	4 5 6 8 10	1 2 3 5									
	20	5 6 8 10 12	3 5									
	25	5 6 8 10 12 16 20	3 5									
	30	5 6 8 10 12 16 20	3 5									
	35	8 10 12 16 20 25	5									
	40	8 10 12 16 20 25 30	5									
	50	8 10 12 16 20 25 30	5									
	60	12 16 20 25 30 40	5									

Rubber Washers Configurable Type

Part Number Type	1mm Increment D	V	T	€ Unit Price FWRBN	FWRBC	FWRBP	FWUNS	FWRBS	FWRBA	FWRBF	FWRBR	FWRBW
FWRBN FWRBC FWRBP FWUNS FWRBS FWRBA FWRBF FWRBR FWRBW	6~15	0 (No Hole) 2~39 (V≤D−6)	1~5									
			6~10									
	16~30		1~5									
			6~10									
	31~45		1~5									
			6~10									
	46~60	0 (No Hole) 10~70 (V≤D−6)	1~5									
			6~10									
	61~80		1~5									
			6~10									
	81~100	0 (No Hole) 20~80 (V≤D−6)	1~5									
			6~10									

When V=0, there is no hole.

Order Example

Standard Type

Part Number	-	V	-	T
WUNS20	-	10	-	5

Configurable Type

Part Number	-	D	-	V	-	T
FWUNS	-	D19	-	V3	-	T5

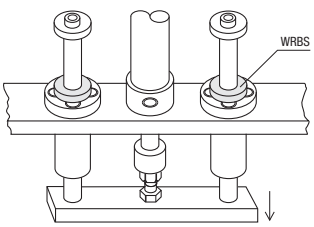
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example



Days to Ship

Standard Type · Low Elasticity Rubber (Hanenaito® gurable Type (FWUNS)

8 Days

Configurable Type

10 Days | Express B | 3,00 EUR/ piece | P.88

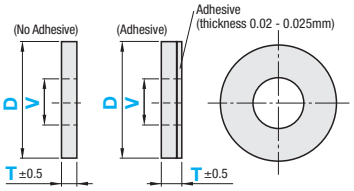
A Express Charge of 8,10 EUR for 3 or more identical pieces.

Sponge Washers



Standard Type		Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
WSGC	WSGCA	WSGNC	WSGNCA	Chloroprene Rubbers Sponge	Asker C25	Black
WSGP	WSGPA	WSGNP	WSGNPA	EPDM Sponge	ASKER 80	Black
WSGB	WSGBA	WSGNB	WSGNBA	NBR Sponge	ASKER C30	Black
WSEA	WSEAA	WSEPA	WSEPAA	EPT SEALER®	(ASKER C5 or less)	Black
WSGA	WSGAA	WSGNA	WSGNAA	Silicon Rubber Sponge	Asker C35	Orange
WSGF	WSGFA	WSGNF	WSGNFA	Fluoro Rubber Sponge	Asker C35	Black

For EPT SEALER® (Dust Prevention General-Purpose Sponge), refer to **P.412**



D · V Tolerance

D · V	Tolerance
10~40	±1.0
41~60	±1.5
61~100	±2.0

Standard Type (No Adhesive)

Part Number Type	D	V Selection	T Selection	€ Unit Price WSGC	WSGP	WSGB	WSEA	WSGA	WSGF
WSGC WSGP WSGB WSEA WSGA WSGF	6	2	3						
	8	2 3 4	3						
	10	3 4 5 6	3 5						
	12	4 5 6 8	3 5						
	15	4 5 6 8 10	3 5						
	20	5 6 8 10 12	3 5 10						
	25	5 6 8 10 12 16 20	3 5 10						
	30	5 6 8 10 12 16 20	3 5 10						
	35	8 10 12 16 20 25	5 10						
	40	8 10 12 16 20 25 30	5 10						
	50	8 10 12 16 20 25 30	5 10						
	60	12 16 20 25 30 40	5 10						

Standard Type (With Adhesive)

Part Number Type	D	V Selection	T Selection	€ Unit Price WSGCA	WSGPA	WSGBA	WSEAA	WSGAA	WSGFA
WSGCA WSGPA WSGBA WSEAA WSGAA WSGFA	6	2	3						
	8	2 3 4	3						
	10	3 4 5 6	3 5						
	12	4 5 6 8	3 5						
	15	4 5 6 8 10	3 5						
	20	5 6 8 10 12	3 5 10						
	25	5 6 8 10 12 16 20	3 5 10						
	30	5 6 8 10 12 16 20	3 5 10						
	35	8 10 12 16 20 25	5 10						
	40	8 10 12 16 20 25 30	5 10						
	50	8 10 12 16 20 25 30	5 10						
	60	12 16 20 25 30 40	5 10						

Configurable Type

The unit price of Configurable Type "No Adhesive" is shown in the table below. The Seal Attached Type price is the price shown in the table multiplied by material rate (x1.2).(Round down to ten Cent.)

Part Number Type (x Material Rate)		T	T Tolerance	D 1mm Increment	V 1mm Increment	€ Unit Price D10~20	D21~40	D41~60	D61~80	D81~100
WSGNC(x1.0) WSGNP(x1.0) WSGNB(x1.0) WSEPA(x1.0)	WSGNCA(x1.2) WSGNPA(x1.2) WSGNBA(x1.2) WSEPAA(x1.2)	3	±0.5	10~100	0 (No Hole) 5~80 ※When D≤40, D−V≥5 When D>40, D−V≥8					
		5								
		8	±1							
		10								
WSGNA(x1.0) WSGNAA(x1.2)		3	±0.5							
		5								
		8	±1.5							
		10								
WSGNF(x1.0) WSGNFA(x1.2)		2	±0.5							
		3								
		5								
		10	±1.5							

Order Example

Standard Type

Part Number	-	V	-	T
WSGPA15	-	6	-	5

Configurable Type

Part Number	-	D	-	V
WSGNA3	-	D12	-	V6

Price

Volume Discount (※Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

※For orders larger than indicated quantity, please request a quotation.

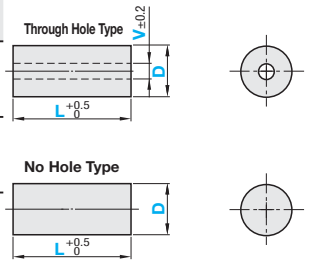
Days to Ship 8 Days

Urethane Bumpers

-L Dimension Standard · L Dimension Configurable-

CAD Data

Type	Through Hole Type	No Hole Type	Material	Hardness	Color
L Standard Type	AXNSK	CXSK	Ether Polyurethane	Shore A95	Natural Color
	AXNHK	CXHK		Shore A90	
	AXNMK	CXMK	Ester Polyurethane	Shore A70	
	AXNLK	CXLK		Shore A50	
L Configurable Type	AXNS	CXS	Ether Polyurethane	Shore A95	Natural Color
	AXNH	CXH		Shore A90	
	AXNM	CXM	Ester Polyurethane	Shore A70	
	AXNL	CXL		Shore A50	



D Tolerance

D	Tolerance
8~40	±0.2
50, 60	±0.3

The tolerances are verified at 23°C±2 and 40~80% humidity.

L Dimension Standard Type

Part Number Type	D	L Selection	V	(M) Applicable Bolts	€ Unit Price L10	L15	L20	L25	L30	L35	L40	L45	L50	L100	L200	L500
Through Hole Type <D Dimension 15~60> AXNSK(Shore A95) AXNHK(Shore A90) AXNMK(Shore A70) AXNLK(Shore A50) No Hole Type <D Dimension 8~60> CXSK(Shore A95) CXHK(Shore A90) CXMK(Shore A70) CXLK(Shore A50)	(8)	10 15 20 25 30 35 40 45 50 100 200	-	-												
	(10)	10 15 20 25 30 35 40 45 50 100 200														
	15	10 15 20 25 30 35 40 45 50 100 200	7	M4												
	20	10 15 20 25 30 35 40 45 50 100 200	8.5	M5												
	25	10 15 20 25 30 35 40 45 50 100 200	10	M6												
	30	10 15 20 25 30 35 40 45 50 100 200 500	13	M8												
	40	50 100 200 500														
	50	100 200 500	16	M10												
	60	100 200 500														

D = 8 or 10 is applicable to No Hole Type only.

L Dimension Configurable Type

Part Number Type	D	L 1mm Increment	V	(M) Applicable Bolts	€ Unit Price L10~20	L21~40	L41~60	L61~80	L81~100	L101~150	L151~200
Through Hole Type <D Dimension 15~60> AXNS(Shore A95) AXNH(Shore A90) AXNM(Shore A70) AXNL(Shore A50) No Hole Type <D Dimension 8~60> CXS(Shore A95) CXH(Shore A90) CXM(Shore A70) CXL(Shore A50)	(8)	10~200	-	-							
	(10)										
	15		7	M4							
	20		8.5	M5							
	25		10	M6							
	30		13	M8							
	40										
	50		16	M10							
	60										

D = 8 or 10 is applicable to No Hole Type only.

Order Example

Part Number	-	L
AXNLK15	-	30
CXM15	-	125

Days to Ship: 6 Days P.88

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~29	30~49
Discount Rate	€ Unit Price	5%	10%	15%

For orders of 200 or more identical pieces, please request a quotation.

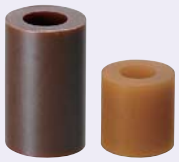
Abrasion Resistant Urethane / Heat Resistant Urethane

-L Dimension Fixed / Configurable-

CAD Data

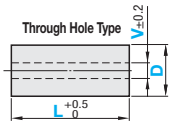
■Fixed

RoHS



Type	Through Hole Type	No Hole Type	M Material	H Hardness	Color
L Standard Type	AEXHK	CXEHK	Abrasion Resistant Urethane	Shore A90	Dark Brown
	AEXMK	CXEMK		Shore A70	
	AXHHK	CXHHK	Heat Resistant Urethane	Shore A90	Brown

(?)L Dimension Fixed Type is now available online.

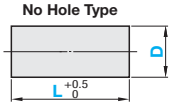




D Tolerance

D	Tolerance
8~40	±0.2
50, 60	±0.3

(?)The tolerances are verified at 23°C±2 and 40~80% humidity.





(?)Price of abrasion resistant urethane / heat resistant urethane product is found by multiplying the unit price by the material rate.

Part Number Type	D	L Selection	V	(M) Applicable Bolts	€ Unit Price L10	L15	L20	L25	L30	L35	L40	L45	L50	L100	L200	L500
Through Hole Type <D Dimension 15~60> AEXHK(Shore A90) (x1.0) AEXMK(Shore A70) (x1.0) AXHHK(Shore A90) (x1.2)	(8)	10 15 20 25 30 35 40 45 50 100 200	-	-												
	(10)	10 15 20 25 30 35 40 45 50 100 200														
	15	10 15 20 25 30 35 40 45 50 100 200	7	M4												
	20	10 15 20 25 30 35 40 45 50 100 200	8.5	M5												
	25	10 15 20 25 30 35 40 45 50 100 200	10	M6												
No Hole Type <D Dimension 8~60> CXEHK(Shore A90) (x1.0) CXEMK(Shore A70) (x1.0) CXHHK(Shore A90) (x1.2)	30	10 15 20 25 30 35 40 45 50 100 200 500	13	M8												
	40	50 100 200 500														
	50	100 200 500	16	M10												
	60	100 200 500														

(?)D = 8 or 10 is applicable to No Hole Type only.

Order Example

Part Number	-	L
AEXHK15	-	30
CXEMK15	-	100

Price

■Volume Discount ((?)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~29	30~49
Discount Rate	€ Unit Price	5%	10%	15%

(?)For orders of 200 or more identical pieces, please request a quotation.

Days to Ship: **6 Days**

■Configurable Type

RoHS



Type	Through Hole Type	No Hole Type	M Material	H Hardness	Color
Configurable Type	VULHF	CXVHF	Super Abrasion Resistant Discoloration of Vulkollan®	Shore A92	Beige
	VULMF	CXVMF		Shore A68	
	AEXHF	CXEHF	Abrasion Resistant Urethane	Shore A90	Dark Brown
	AEXMF	CXEMF		Shore A70	
	AXHHF	CXHHF	Heat Resistant Urethane	Shore A90	Brown

(?)Vulkollan® is a registered trademark of Bayer AG.
(?)No change in physical property or characteristics due to aged discoloration.

VULKOLLAN THE ULTIMATE ELASTOMER

(?)For property details, refer to P.359

Thickness Condition

L	V
L≤30	V≤D−4
L>30	V≤D−6

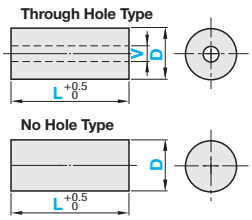
D Tolerance

D	Tolerance
6~40	±0.2
41~60	±0.3
61~100	±0.4

V Tolerance

V	Tolerance
30 or Less	±0.2
31~86	±0.5

(?)The tolerances are verified at 23°C±2 and 40~80% humidity.



D	V (Through Hole Type)	€ Unit Price VULHF · CXVHF(x1.0) VULMF · CXVMF(x1.2) L 10~20	21~40	41~50	AEXHF · CXEHF · AEXMF · CXEMF(x1.0) AXHHF · CXHHF(x1.2) L 10~20	21~40	41~60	61~80	81~100	101~150	151~200	201~250	251~300
6~15	2~11												
16~30	4~26												
31~45	6~41												
46~60	6~56												
61~80	6~76												
81~100	6~86												

( ) Material Rate

Order Example

Part Number	-	D	-	L	-	V
VULHF	-	D31	-	L49	-	V21
CXVHF	-	D39	-	L42		

Price

■Volume Discount ((?)Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	15%	35%

(?)For orders larger than indicated quantity, please request a quotation.

(?)The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - D - L - V
VULMF - D15 - L20 - V3

(€ Unit Price) x (Material Rate)
9,30 X 1.2 = 11,16
→ 11,10 EUR

Days to Ship: **10 Days**

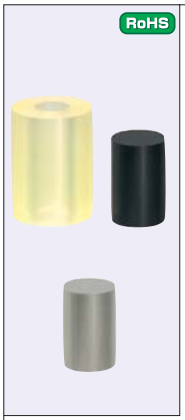
Express B 3,00 EUR/piece P.88

(?)A Express Charge of 8,10 EUR for 3 or more identical pieces.

Urethane Bumpers
-Configurable-

CAD Data

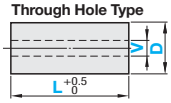
■Color (Natural Color or Black) is selectable for the standard urethane.



Type	Through Hole Type		No Hole Type		M Material	H Hardness	Color
	Standard Class	Precision Class	Standard Class	Precision Class			
Configurable Type (Color Selectable Type)	AXFS	AAFS	CXFS	CAFS	Ether Polyurethane	Shore A95	Selection Natural Color or Black
	AXFH	AAFH	CXFH	CAFH		Shore A90	
	AXFM	AAFM	CXFM	CAFM	Ester Polyurethane	Shore A70	
	AXFL	-	CXFL	-		Shore A50	
	AXFY	-	CXFY	-		Shore A30	
	AXFHE	-	CXFHE	-	Antistatic Polyurethane	Shore A90	Gray
	AXFME	-	CXFME	-		Shore A70	
	AXFLE	-	CXFLE	-		Shore A50	
	AXFAN	-	CXFAN	-	Low Rebound Urethane	Shore A70	

■Standard Class

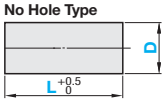
Through Hole Type



D Tolerance

D	Tolerance
6~40	±0.2
41~60	±0.3
61~100	±0.4

No Hole Type

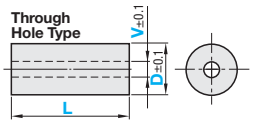


V Tolerance

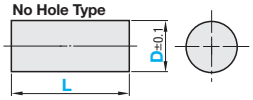
V	Tolerance
30 or Less	±0.2
31~86	±0.5

■Precision Class

Through Hole Type



No Hole Type



L Tolerance

L	Tolerance
10~100	±0.1
101~300	±0.2

Thickness Condition

L	V
L≤30	V≤D−4
L>30	V≤D−6

■Configurable Type (Regular Class / Precision Class)

Part Number					1mm Increment			C Color
	Through Hole Type		No Hole Type		D	L	V (Through Hole Type)	
	Standard Class	Precision Class	Standard Class	Precision Class	6~15	10~300	2~11	N (Natural Color)
(Shore A95)	AXFS	AAFS	CXFS	CAFS	16~30		4~26	
(Shore A90)	AXFH	AAFH	CXFH	CAFH				
(Shore A70)	AXFM	AAFM	CXFM	CAFM	31~45		6~41	B (Black)
(Shore A50)	AXFL		CXFL					
(Shore A30)	AXFY		CXFY		46~60		6~56	
(Antistatic, Shore A90)	AXFHE		CXFHE		61~80		6~76	*Only gray color is available for antistatic or low rebound urethanes. (Only Gray)
(Antistatic, Shore A70)	AXFME		CXFME					
(Antistatic, Shore A50)	AXFLE		CXFLE					
(Low Rebound, Shore A70)	AXFAN		CXFAN		81~100		6~86	

The thickness of Through Hole Type (D−V)/2 is restricted by L. Refer to the table (thickness condition) in the figure. If V=2, L≤50.
When L≥201, V≥8
Only gray color is available for antistatic or low rebound urethanes.

Order Example

Part Number	-	D	-	L	-	V	-	C
AXFME	-	D35	-	L51	-	V23		
CXFM	-	D39	-	L42			-	B

Days to Ship

10 Days | Express B | 3,00 EUR/ piece | P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~19	20~49	50~99	100~199
Discount Rate	€ Unit Price	5%	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

■Characteristic Values of Antistatic Urethane

Specific Volume Resistivity	$2.1 \times 10^8 \Omega$cm
Surface Resistivity	$4.0 \times 10^9 \Omega$

(Conditions: Temperature 30°C Humidity 60%)
All other properties are equal to that of urethane of the same hardness.

■Compression Set of Low rebound urethane

Low Rebound Urethane	1%
Urethane (Shore A70)	25%

* The above data is measured at room temperature 23°C.
* 70°Cx24H 25% Compression

■Low Rebound Urethane

It has the same properties as urethane, and excels in shock absorption. Also less plastic deformation by compression than normal urethane. However, this is not suitable for absorbing large impact energy as its tensile strength or elongation is weaker compared to the urethane with same level of hardness.

Price Reduction
Up to 5%

■Regular Class (Ether Type, Ester Type)

D	€ Unit Price																	
	AXFH · CXFH (Shore A90)									AXFS · CXFS (Shore A95) AXFM · CXFM (Shore A70) AXFL · CXFL (Shore A50) AXFY · CXFY (Shore A30)								
	L									L								
	10~20	21~40	41~60	61~80	81~100	101~150	151~200	201~250	251~300	10~20	21~40	41~60	61~80	81~100	101~150	151~200	201~250	251~300
6~15																		
16~30																		
31~45																		
46~60																		
61~80																		
81~100																		

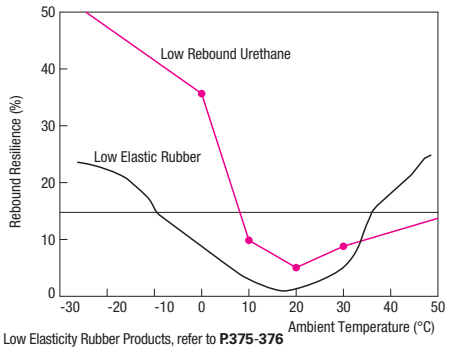
■Regular Class (Antistatic, Low rebound)

D	€ Unit Price																	
	AXFHE · CXFHE (Shore A90)									AXFME · CXFME (Shore A70) AXFLE · CXFLE (Shore A50) AXFAN · CXFAN (Shore A30)								
	L									L								
	10~20	21~40	41~60	61~80	81~100	101~150	151~200	201~250	251~300	10~20	21~40	41~60	61~80	81~100	101~150	151~200	201~250	251~300
6~15																		
16~30																		
31~45																		
46~60																		
61~80																		
81~100																		

■Precision Class (Ether Type, Ester Type)

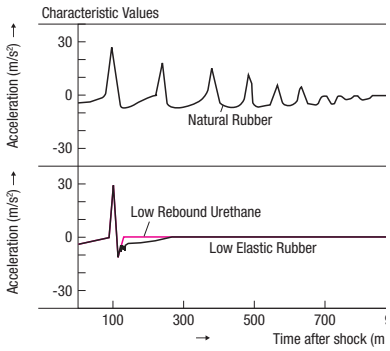
D	€ Unit Price																	
	AAFH · CAFH (Shore A90)									AAFS · CAFS (Shore A95) AAFM · CAFM (Shore A70)								
	L									L								
	10~20	21~40	41~60	61~80	81~100	101~150	151~200	201~250	251~300	10~20	21~40	41~60	61~80	81~100	101~150	151~200	201~250	251~300
6~15																		
16~30																		
31~45																		
46~60																		
61~80																		
81~100																		

■Impact Resilience Variation by Temperature of Low Elasticity rubber · Low rebound urethane



For Low Elasticity Rubber Products, refer to P.375-376

■Shock Absorption Comparison of Low elasticity rubber · Low rebound urethane



NEW

Male Thread Urethane · Rubber Bumpers

-L Dimension Standard · L Dimension Configurable-

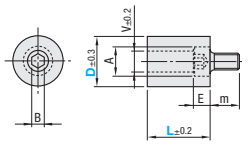
Price Reduction
Up to 17%

■Contribute to reduce assembly time, improve tightening force and save space by integrating conventional parts [counterbore type bumper, bolt and collar] into a single part.

RoHS



Type	Screw Material 1.7220/34CrMo4	Screw Material 1.4567/X3CrNiCu18-9-4	M Material	H Hardness	Color
L Standard Type	USBK	USBKS	Ether Polyurethane	Shore A95	Natural Color
	UHBK	UHBKS		Shore A90	
	UMBK	UMBKS	Ester Polyurethane	Shore A70	
	ULBK	ULBKS		Shore A50	
	UEHBK	UEHBKS	High Abrasion Resistant Urethane	Shore A90	Dark Brown
	UEMBK	UEMBKS		Shore A70	
	NBBK	NBBKS	Nitrile Rubber (NBR)	Shore A70	Black
	UNBK	NSBKS	Low Elasticity Rubber (Hanenaito®)	Shore A32	
L Configurable Type	USBY	USBYS	Ether Polyurethane	Shore A95	Natural Color
	UHBY	UHBYS		Shore A90	
	UMBY	UMBYS	Ester Polyurethane	Shore A70	
	ULBY	ULBYS		Shore A50	
	UEHBY	UEHBYS	High Abrasion Resistant Urethane	Shore A90	Dark Brown
	UEMBY	UEMBYS		Shore A70	
	NBBY	NBBYS	Nitrile Rubber (NBR)	Shore A70	Black
	UNBY	UNBYS	Low Elasticity Rubber (Hanenaito®)	Shore A32	



Material of Screw part
M Material: 1.7220/34CrMo4
S Surface Treatment: Black Oxide

M Material: 1.4567/X3CrNiCu18-9-4
S Surface Treatment: None

■L Dimension Standard Type

Ⓟ Added spec. for Urethane type.

Part Number Type	D	L Selection	M (Coarse Thread)	B	A	V	E	m	€ Unit Price 1.7220/34CrMo4 Black Oxide U_BK	UE_BK	NBBK	UNBK	1.4567/X3CrNiCu18-9-4 (No surface treatment) U_BKS	UE_BKS	NBBKS	NSBKS
Black Oxide Screws USBK UHBK UMBK ULBK UEHBK UEMBK NBBK UNBK	12	10 15	M4 x 0.7	3	7	5	4	6								
1.4567/X3CrNiCu18-9-4 Screws USBKS UHBKS UMBKS ULBKS UEHBKS UEMBKS NBBKS NSBKS	15	10 15 20	M4 x 0.7	3	7	5	4	6								
			M6 x 1.0	5	10	8	6	10								
	20	20 25 30	M5 x 0.8	4	9	7	5	8								
			M8 x 1.25	6	13	9	8	12								
	25	20 25 30	M6 x 1.0	5	10	8	6	10								
			M10 x 1.5	8	16	11	10	15								
	30	20 25 30	M6 x 1.0	5	10	8	6	10								
			M8 x 1.25	6	13	9	8	12								
			M10 x 1.5	8	16	11	10	15								

Ⓟ U_BK indicates USBK, UHBK, UMBK and ULBK.

■L Dimension Configurable Type

Part Number Type	D	L 1mm Increment	M (Coarse Thread)	B	A	V	E	m	€ Unit Price 1.7220/34CrMo4 Black Oxide U_BY	UE_BY	NBBY	UNBY	1.4567/X3CrNiCu18-9-4 (No surface treatment) U_BYS	UE_BYS	NBBYS	UNBYS
Black Oxide Screws USBY UHBY UMBY ULBY UEHBY UEMBY NBBY UNBY	12	5~50	M4 x 0.7	3	7	5	4	6								
1.4567/X3CrNiCu18-9-4 Screws USBYS UHBYS UMBYS ULBYS UEHBYS UEMBYS NBBYS UNBYS	15	7~50	M6 x 1.0	5	10	8	6	10								
	20	9~50	M8 x 1.25	6	13	9	8	12								
	25	11~50	M10 x 1.5	8	16	11	10	15								
	30		M10 x 1.5	8	16	11	10	15								

Order Example

Part Number	-	L	-	M
USBY12	-	10	-	M4

Days to Ship

-Urethane L Dimension Fixed
6 Days

-Rubber L Dimension Fixed, Urethane · Rubber L Dimension Configurable
8 Days

Express A 3,00 EUR/ piece P.88

Ⓟ A Express Charge of 8,10 EUR for 3 or more identical pieces.

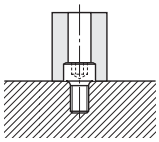
Price

■Volume Discount (Ⓟ Round down to one Cent.) P.87

Quantity	1~4	5~19	20~49
Discount Rate	€ Unit Price	5%	10%

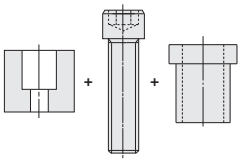
Ⓟ For orders larger than indicated quantity, please request a quotation.

Example

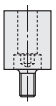


■Product Feature

Before Bumper · Bolt · Collar 3 pcs.



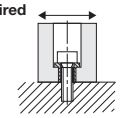
Male Thread Urethane Bumper 1 pc.



- Reduced number of parts → reduced assembly time
- Increased tightening force
- Space saving

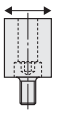
With M8 Bolt

Space for 25mm outer dia. is required



Before

Installable in a space for a bumper with 20mm outer dia.



Space saving approx. 20%

Male Thread Urethane Bumper

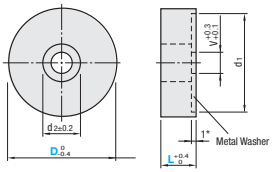
Bumper with Metal Washer

–Urethane · Antistatic Urethane · Rubber–

■MISUMI original product. Baked Metal Washer, Urethane and Rubber.



L Standard Type	L Configurable Type	Urethane · Rubber			Washer
		M Material	Color	H Hardness	M Material
AYSK	AYFS	Ether Polyurethane	Black	Shore A95	1.4301/ X5CrNi18-10
AYHK	AYFH		Black	Shore A90	
AYMK	AYFM	Ester Polyurethane	Black	Shore A70	
AYLK	AYFL		Black	Shore A50	
-	AYFY		Black	Shore A30	
-	AYFHE	Antistatic Polyurethane	Gray	Shore A90	
-	AYFME		Gray	Shore A70	
-	AYFLE		Gray	Shore A50	
-	RBFN	Nitrile Rubber (NBR)	Black	Shore A70	
-	RBFU	Low Elasticity Rubber (Hanenaito®)	Black	Shore A57	
-	RBFS	Silicon Rubber (SI)	Light Gray	Shore A70	
-	RBFF	Fluoro Rubber (FPM)	Black	Shore A80	



* The washer thickness of **RBF_** is 2mm.

Hanenaito® is a registered trademark of Naigai Rubber Industry Co., Ltd.

■L Dimension Fixed (Urethane)

Part Number Type	D	L Selection	(M) Applicable Bolts	d1	d2	V	€ Unit Price L10	L15	L20	L25	L30	L40	L50
AYSK (x1.1) AYHK (x1.0) AYMK (x1.1) AYLK (x1.1)	12	10	M3	11	6	3							
	15	10 15 20	M4	14	8	4							
	20	10 15 20 25	M5	19	9.5	5							
	25	10 15 20 25 30	M6	24	11	6							
( ) Material Rate	30	15 20 25 30 40	M8	29	14	8							
	40	25 30 40 50	M10	39	17	10							

■L Dimension Configurable (Urethane)

Part Number Type		D	L 1mm Increment	(M) Applicable Bolts	d1	d2	V	€ Unit Price L5~40	L41~60	L61~80
AYFS	(x1.1)	12	5~80	M3	11	6	3			
AYFH	(x1.0)	15		M4	14	8	4			
AYFM	(x1.1)	20		M5	19	9.5	5			
AYFL	(x1.0)	25		M6	24	11	6			
AYFY	(1.3)	30		M8	29	14	8			
AYFHE	(x1.2)	40		M10	39	17	10			
AYFME	(x1.2)									
AYFLE	(x1.4)									
( ) Material Rate										

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - L
AYFHE30 - 30
When (€ Unit Price) 9,90 x (Material Rate) 1.2 = 11,88 → 11,80EUR

■Characteristic Values of Antistatic Urethane

Specific Volume Resistivity	2.1x108Ωcm
Surface Resistivity	4.0x109Ω

(Conditions: Temperature 30°C Humidity 60%)
All other properties are equal to that of urethane of the same hardness.

■L Dimension Configurable (Rubber)

Part Number Type	D	L 1mm Increment	(M) Applicable Bolts	d1	d2	V	€ Unit Price RBFN	RBFU	RBFS	RBFF
RBFN RBFU RBFS RBFF	15	5~30	M4	14	8	4				
	20		M5	19	9.5	5				
	25		M6	24	11	6				
	30		M8	29	14	8				

Order Example

Part Number	-	L
AYSK12	-	10
AYFY25	-	52

Days to Ship

■L Dimension Standard Type
8 Days
Express A 3,00 EUR/ piece P.88
A Express Charge of 8,10 EUR for 3 or more identical pieces.

■L Dimension Configurable Type
10 Days
Express B 3,00 EUR/ piece P.88
A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Counterbored Urethane Bumpers

-L Dimension Standard · L Dimension Configurable-

CAD Data

■Collar is selectable to match the counterbored hole size.



Type		Urethane Only	With Collar: Black Oxide	With Collar: Electroless Nickel Plating	With Collar: 1.4301/X5CrNi18-10	(M) Material	(H) Hardness	Color
L Dimension Standard Type		AZXSK	AZXSC	AZXSM	AZXSS	Ether Polyurethane	Shore A95	Natural Color
		AZXHK	AZXHC	AZXHM	AZXHS		Shore A90	
		AZXMK	AZXMC	AZXMM	AZXMS	Ester Polyurethane	Shore A70	
		AZXLK	AZXLC	AZXLM	AZXLS		Shore A50	
L Dimension Configurable Type		AZXS	AZCS	-	-	Ether Polyurethane	Shore A95	Natural Color
		AZXH	AZCH	-	-		Shore A90	
		AZXM	AZCM	-	-	Ester Polyurethane	Shore A70	
		AZXL	AZCL	-	-		Shore A50	

RoHS

Electroless Nickel Plating with Collar and 1.4301/X5CrNi18-10 type are now available online.

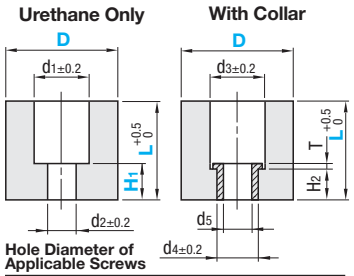
H1 · H2 Tolerance

H1 · H2	Tolerance
30 or Less	±0.2
31~	±0.5

D Tolerance

D	Tolerance
40 or Less	±0.2

D	Tolerance
50	±0.3
60	
80	±0.4
100	



Hole Diameter of Applicable Screws

Screw Size	Urethane Only d1	Urethane Only d2	With Collar d3	With Collar d4	With Collar d5	With Collar T
M3	6	4	8	5.5	3.5	2
M4	8	5	9.5	6.5	4.5	
M5	9.5	6	11	8	5.5	
M6	11	7	13	9	6.6	
M8	14	9	15.5	11.5	9	
M10	18	11	19	14	11	3
M12	20	14	22	17	14	
M16	26	18	28	22	18	4

■L Dimension Standard Type

Part Number Type	D	L Selection	(M) Applicable Screw	Urethane Only H1	With Collar H2	With Collar Applicable Collar No.	€ Unit Price Urethane Only AZX_K	With Flanged Collar € Unit Price Black Oxide AZX_C	Electroless Nickel Plating AZX_M	1.4301/X5CrNi18-10 AZX_S
Urethane Only AZXSK(Shore A95) AZXHK(Shore A90) AZXMK(Shore A70) AZXLK(Shore A50)	12	12	M3	5	-	-				
	15	12 15			5	3				
		15 20	M4			4				
	20	20 25		7	7	4A				
		20 25	M5			5				
	25	20 25	M6	8	8	6				
		20 25	M8		6	8A				
	30	20 25 30	M6	10	8	6				
		25 30 40	M8			8				
With Collar Black Oxide AZXSC AZXHC AZXMC AZXLC Electroless Nickel Plating AZXSM AZXHM AZXMM AZXLM 1.4301/X5CrNi18-10 AZXSS AZXHS AZXMS AZXLS	40	30 40	M10	12	10	10				
		30 40 50	M12			12				
	50	30 40	M10	15		10				
		40 50	M12			12				
	60	30 40	M10			10				
		40 50	M12			12				

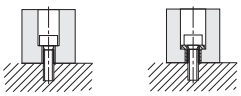
D12 is not available for Collar Type. For detailed collar dimensions, see below.

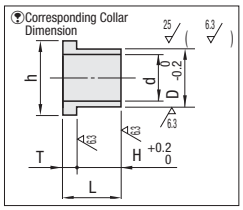
■L Dimension Configurable Type

Part Number Type	D	L 1mm Increment	(M) Applicable Bolts	Urethane Only H1 1mm Increment	With Collar H2 (Fixed)
Urethane Only AZXS(Shore A95) AZXH(Shore A90) AZXM(Shore A70) AZXL(Shore A50)	15	15~80 25~80 (With Flanged Collar)	M3 M4	5≤H1<L	5 (M3) 7 (M4)
	20		M4 M5		7 (M4 M5)
	25		M6 M8		8 (M6 M8)
	30				
With Collar Black Oxide AZCS AZCH AZCM AZCL	40	25~150 30~150 (With Flanged Collar)	M10 M12		10 (M10 M12)
	50				
	60				
	80	25~200 40~200 (With Flanged Collar)	M12 M16		10 (M12) 15 (M16)
	100				

When Collar Type is selected, H2 Dimension is fixed.

Example





Collar No.	d	D	H	T	L	h
3	3.5	5.5	5	2	7	7.5
4	4.5	6.5				8.5
4A			7		9	
5	5.5	8				10
6	6.6	9	8		10	12
8	9	11.5				14.5
8A			6		8	
10	11	14	10	3	13	17
12	14	17				20
16	18	22	15	4	19	26

Collars can be ordered separately. ☞P.372

Order Example

Part Number	-	L	-	M	-	H1
AZXMC25	-	20	-	M6		
AZXL50	-	96	-	M10	-	20
AZCM40	-	70	-	M10		

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

8 Days | Express A | 3,00 EUR/piece

A Express Charge of 8,10 EUR for 3 or more identical pieces.

D	€ Unit Price AZXS · AZXH · AZXM · AZXL L ~40	L41~60	L61~80	L81~100	L101~150	L151~200	AZCS · AZCH · AZCM · AZCL L ~40	L41~60	L61~80	L81~100	L101~150	L151~200
15												
20												
25												
30												
40												
50												
60												
80												
100												

Counterbored Urethane Bumpers · Counterbored Urethane & Rubber Collars -Dimension Configurable-

CAD Data

■Collar is selectable to match the counterbored hole size.

■Urethane Bumpers With Counterbore Hole -Configurable-

RoHS



Type		Material	Hardness	Color
Standard Class	Precision Class			
AZFS	-	Ether Polyurethane	Shore A95	Natural Color or Black
AZFH	AZAH		Shore A90	
AZFM	AZAM	Ester Polyurethane	Shore A70	
AZFL	-		Shore A50	
AZFY	-		Shore A30	
AZFHE	-	Antistatic Polyurethane	Shore A90	Gray
AZFME	-		Shore A70	
AZFLE	-		Shore A50	
AZFAN	-	Low Rebound Urethane	Shore A70	

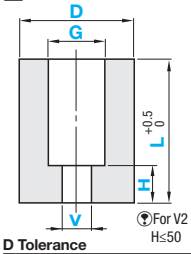
Properties of Low Rebound Urethane P.360

■ Characteristic Values of Antistatic Urethane

Specific Volume Resistivity	$2.1 \times 10^8 \Omega$cm
Surface Resistivity	$4.0 \times 10^8 \Omega$

(Conditions: Temperature 30°C Humidity 60%)
All other properties are equal to that of urethane of the same hardness.

■ Standard Class



For V2 H≤50

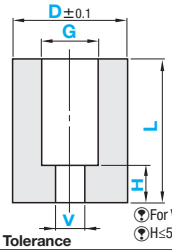
D Tolerance

Dimension	D Tolerance
50 or Less	±0.2
51~60	±0.3
61~100	±0.5

V · H · G Tolerance

Dimension	Tolerance		
	V	H	G
30 or Less	±0.2	±0.2	±0.2
31~90	±0.3	±0.5	±0.3
91~	-	±0.5	-

■ Precision Class



For V2 H≤50

L Tolerance

Dimension	Tolerance
6~100	+0.2 0
101~200	+0.3 0

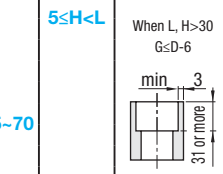
V · H · G Tolerance

Dimension	V Tolerance	H / G Tolerance
2~50	±0.15	±0.1
51~	±0.15	±0.15

The tolerances are verified at 23°C ± 2 and 40~80% humidity.

■Configurable Type

Part Number	D	1mm Increment V	H	G	L	C Color	€ Unit Price AZFS AZFM	AZFH	AZFL	AZFY	AZAH	AZAM	AZFHE	AZFME AZFAN	AZFLE
-Standard Class AZFS(Shore A95) AZFH(Shore A90) AZFM(Shore A70) AZFL(Shore A50) AZFY(Shore A30) AZFAN(Shore A70) -Antistatic, Regular Class AZFHE(Shore A90) AZFME(Shore A70) AZFLE(Shore A50) -Precision Class AZAH(Shore A90) AZAM(Shore A70)	8~15 (1mm Increment)	2~10	3≤H<L	3~90 When L, H≤30 G≤D-4	6~40	N (Natural Color)									
					40~60										
					61~80										
	16~30 (1mm Increment)	2~16			6~40										
					40~60										
					61~80										
	31~45 (1mm Increment)	5~25	5≤H<L		10~40										
					40~60										
					61~80										
					81~100										
					101~150										
	46~60 (1mm Increment)	5~30			25~40										
					40~60										
					61~80										
					81~100										
					101~150										
	61~80 (1mm Increment)	5~70		When L, H>30 G≤D-6	25~40	B (Black)									
					40~60										
					61~80										
					81~100										
					101~150										
					151~200										
	85~100 (5mm Increment)				25~40										
					40~60										
					61~80										
					81~100										
					101~150										
					151~200										



Color is selectable only for ether and ester polyurethane.

Order Example: Part Number AZFS - D D22 - V V5 - H H10 - G G10 - L L38

Days to Ship: 10 Days | Express B | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	15%	30%

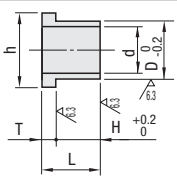
For orders larger than indicated quantity, please request a quotation.

■Counterbored Urethane · Rubber Collars

RoHS



Type	Material	Surface Treatment
AZC	1.1191/C45E	Black Oxide
AZM		Electroless Nickel Plating
AZS	1.4301/X5CrNi18-10	-



Part Number Type	No.	d	D	H	T	L	h	€ Unit Price AZC	AZM	AZS
AZC AZM AZS	3	3.5	5.5	5	2	7	7.5			
	4	4.5	6.5	7		9	8.5			
	4A						10			
	5	5.5	8							
	6	6.6	9	8		10	12			
	8	9	11.5				14.5			
	8A			6		8				
	10	11	14	10	3	13	17			

No.10 is for AZC only.

Order Example: Part Number AZC4A

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 6 Days P.87

Abrasion Resistant / Heat Resistant Counterbored Urethane Bumpers

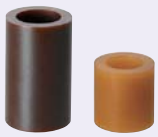
-L Dimension Fixed · Configurable-

CAD Data

■Vulkollan® and Abrasion Resistant Urethane are 6 times and 2.5 times more abrasion-resistant than the standard urethane respectively, and Heat Resistant Urethane is capable to withstand up to 120°C.

■L Dimension Fixed Type

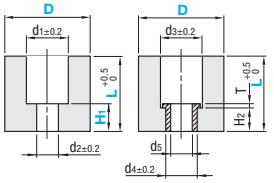
RoHS



Type	Urethane Only	With Collar Black Oxide	Material	Hardness	Color
L Dimension Standard Type	AZEXHK	AZEXHC	High Abrasion Resistant Urethane	Shore A90	Dark Brown
	AZEXMK	AZEXMC		Shore A70	
	AZXHHK	AZXHHC	Heat Resistant Urethane	Shore A90	Brown

L Dimension Configurable Type is now available online.

Urethane Only / With Collar



H1 / H2 Tolerance

H1 / H2	Tolerance
30 or Less	±0.2
31~	±0.5

D Tolerance

D	Tolerance
40 or Less	±0.2

D	Tolerance
50	±0.3
60	
80	±0.4
100	

Hole Diameter of Applicable Screws

Screw Size	Urethane Only d1	Urethane Only d2	With Collar d3	With Collar d4	With Collar d5	T
M3	6	4	8	5.5	3.5	2
M4	8	5	9.5	6.5	4.5	
M5	9.5	6	11	8	5.5	
M6	11	7	13	9	6.6	
M8	14	9	15.5	11.5	9	
M10	18	11	19	14	11	3
M12	20	14	22	17	14	
M16	26	18	28	22	18	4

Part Number Type	D	L Selection	(M) Applicable Screw	Urethane Only H1	With Collar H2	With Collar Applicable Collar No.	€ Unit Price Urethane Only AZEX_K	€ Unit Price Urethane Only AZXHHK	With Flanged Collar € Unit Price Black Oxide AZEX_C	With Flanged Collar € Unit Price Black Oxide AZXHHC
Urethane Only	12	12	M3	5	-	-				
	15	12 15			5	3				
		15 20	M4			4				
AZEXHK(Shore A90) AZEXMK(Shore A70) AZXHHK(Shore A90)	20	20 25		7	7	4A				
		20 25	M5			5				
	25	20 25	M6	8	8	6				
With Collar		20 25	M8		6	8A				
	30	20 25 30	M6	10	8	6				
Black Oxide AZEXHC AZEXMC AZXHHC		25 30 40	M8			8				
	40	30 40	M10	12	10	10				
		30 40 50	M12			12				
	50	30 40	M10	15		10				
		40 50	M12			12				
	60	30 40	M10			10				
		40 50	M12			12				

D12 is not available for Collar Type. For detailed collar dimensions, see below.

Order Example: Part Number - L - M → AZEXHC25 - 20 - M6

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days — Express A 3,00 EUR/piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

■Configurable Type

RoHS

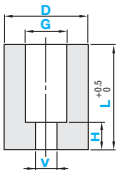


Type	Material	Hardness	Color
ZVULFH	Super Abrasion Resistant Vulkollan®	Shore A92	Beige
ZVULFM		Shore A68	
AZEFH	High Abrasion Resistant Urethane	Shore A90	Dark Brown
AZEFM		Shore A70	
AZFHH	Heat Resistant Urethane	Shore A90	Brown

Vulkollan® is a registered trademark of Bayer AG.

VULKOLLAN THE ULTIMATE ELASTOMER

No change in physical property or characteristics due to aged discoloration.



For V2, H≤50

D Tolerance

Dimension	D Tolerance
50 or Less	±0.2
51~60	±0.3
61~100	±0.5

V · H · G Tolerance

Dimension	Tolerance V	Tolerance H	Tolerance G
30 or Less	±0.2	±0.2	±0.2
31~90	±0.3	±0.5	±0.3
91~	-	±0.5	-

Part Number	D	1mm Increment V	H	G	L	€ Unit Price ZVULFH	ZVULFM	AZEFH AZEFM	AZFHH
ZVULFH (Shore A92) ZVULFM (Shore A68) AZEFH (Shore A90) AZEFM (Shore A70) AZFHH (Shore A90)	8~15 (1mm Increment)	2~10	3≤H<L	3~90 When L, H≤30 G≤D-4	6~40				
					40~60				
					61~80				
	16~30 (1mm Increment)	2~16			6~40				
					40~60				
					61~80				
	31~45 (1mm Increment)	5~25	5≤H<L	min 2 / 30 or less	10~40				
					40~60				
					61~80				
					81~100				
					101~150				
	46~60 (1mm Increment)	5~30		When L, H>30 G≤D-6	25~40				
					40~60				
					61~80				
					81~100				
					101~150				
	61~80 (1mm Increment)	5~70		min 3 / 31 or more	25~40				
					40~60				
					61~80				
					81~100				
					101~150				
					151~200				
	85~100 (5mm Increment)				25~40				
					40~60				
					61~80				
					81~100				
					101~150				
					151~200				

Vulkollan® is available with D≤80 and L≤50.

Order Example: Part Number - D - V - H - G - L → ZVULFH - D22 - V5 - H10 - G10 - L38

Days to Ship: 10 Days — Express B 3,00 EUR/piece — P.88

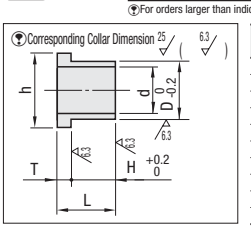
A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount Price (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	15%	30%

For orders larger than indicated quantity, please request a quotation.



Collar No.	d	D	H	T	L	h
3	3.5	5.5	5	2	7	7.5
4	4.5	6.5				8.5
4A			7		9	
5	5.5	8				10
6	6.6	9	8		10	12
8	9	11.5				14.5
8A			6		8	
10	11	14	10	3	13	17
12	14	17				20
16	18	22	15	4	19	26

Collars can be ordered separately. P.372

Rubber Bumpers / Counterbored Rubber Bumpers
-Configurable-

CAD Data

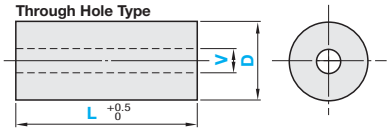
Rubber Bumpers RoHS



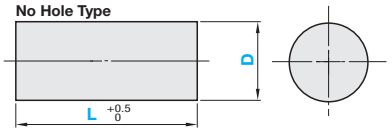
Through Hole Type	No Hole Type	M Material	H Hardness	Color
RBXN	RBCXN	Nitrile Rubber (NBR)	Shore A70	Black
RBXC	RBCXC	Chloroprene Rubber (CR)	Shore A65	Black
RBXU	RBCXU	Low Elasticity Rubber (Hanenaito®GP-35L)	Shore A32	Black
RBXS	RBCXS	Silicon Rubber (SI)	Shore A70	Light Gray
RBXA	RBCXA	Silicon Rubber (SI)	Shore A50	Milky White
RBXF	RBCXF	Fluoro Rubber (FPM)	Shore A80	Black

Hanenaito® is a registered trademark of Naigai Rubber Industry Co., Ltd.
The milky white color of silicone rubber shore A 50 is translucent.

Through Hole Type



No Hole Type



D Tolerance

D	Tolerance
6~40	±0.5
41~60	±0.6

V Tolerance

V	Tolerance
30 or Less	±0.5
31~50	±0.7

Thickness Condition

L	V
L≤30	V≤D−6
L>30	V≤D−10

The tolerances are verified at 23°C ± 2 and 40~80% humidity.

Part Number	1mm Increment			€ Unit Price								
	D	L	V (Through Hole Type)	RBXN · RBCXN · RBXC · RBCXC			RBXU · RBCXU		RBXS · RBCXS · RBXA · RBCXA			RBXF · RBCXF	
				L10~20	L21~30	L31~50	L10~20	L21~30	L10~20	L21~30	L31~50	L10~20	L21~30
Through Hole Type / No Hole Type RBXN RBCXN RBXC RBCXC RBXU RBCXU RBXS RBCXS RBXA RBCXA RBXF RBCXF	6~15	10~50*	2~9										
	16~30		4~24										
	31~45		8~35										
	46~60		10~50										

The thickness of Through Hole Type (D−V)/2 is restricted by L. Refer to the table (thickness condition) in the figure. If V=2, L≤30.
* L ≤ 30 for RBXU · RBCXU · RBXS · RBCXS · RBCXA · RBXF · RBCXF

Order Example: Part Number RBXS - D28 - L30 - V12

Days to Ship: 8 Days — Express A 3,00 EUR/ piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount Price (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

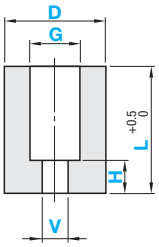
For orders larger than indicated quantity, please request a quotation.

Rubber Bumpers With Counterbore Hole RoHS



Type	M Material	H Hardness	Color
RBZN	Nitrile Rubber (NBR)	Shore A70	Black
RBZC	Chloroprene Rubber (CR)	Shore A65	Black
RBZU	Low Elasticity Rubber (Hanenaito®GP-35L)	Shore A32	Black
RBZS	Silicon Rubber (SI)	Shore A70	Light Gray
RBZA	Silicon Rubber (SI)	Shore A50	Milky White
RBZF	Fluoro Rubber (FPM)	Shore A80	Black
RBZAM	Amber Color Rubber	Shore A45	Amber Color

The milky white color of silicone rubber shore A 50 is translucent.
Counterbored Urethane · Rubber Collars P.372
L Dimension Fixed Type is available online.



D Tolerance

D	Tolerance
40 or Less	±0.5
40~60	±0.7

V · H · G Tolerance

Dimension	Tolerance		
	V	H	G
30 or Less	±0.5	±0.5	±0.5
31~	-	±0.7	±0.6

When L≤30, V≤G−4
When L>30, V≤G−6

Part Number	1mm Increment					€ Unit Price				
	D	V	H	G	L	RBZN RBZC	RBZU	RBZS RBZA	RBZF	RBZAM
RBZN Nitrile Rubber RBZC Chloroprene Rubber RBZU Low Elasticity Rubber RBZS Silicon Rubber (SI) Shore A70 RBZA Silicon Rubber (SI) Shore A50 RBZF Fluoro Rubber (FPM) RBZAM Amber Color Rubber	11~15	3~10	3≤H<L	7~53 (G≤D−4)	6~30					
			5≤H<L	7~54 (G≤D−6)	31~50					
	16~30	5~16			6~30					
					31~50					
	31~45	5~25			10~30					
					31~50					
	46~60	5~30			25~30					
					31~50					

Order Example: Part Number RBZAM - D22 - V5 - H10 - G12 - L38

Days to Ship: 8 Days — Express A 3,00 EUR/ piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount Price (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

NEW

Urethane / Rubbers

-Spherical Tip / Tapered Tip-

Price Reduction
Up to 26%

CAD Data

■Bumpers with spherical and tapered tip end are available in a short delivery time. Hole length is configurable for Through Hole Type.
■Amber color rubber which provides an excellent mechanical strength and abrasion resistance, highly elastic and tensile is added.

■Spherical Tip

RoHS



Through Hole Type	No Hole Type	Material	Hardness	Color
UTRS	CXTRS	Ether Polyurethane	Shore A95	Natural Color
UTRH	CXTRH		Shore A90	
UTRM	CXTRM	Ester Polyurethane	Shore A70	
UTRL	CXTRL		Shore A50	
UBFN	CXBFN	Nitrile Rubber (NBR)	Shore A70	Black
UBFS	CXBFS	Silicon Rubber	Shore A70	Light Gray
UBFU	CXBFU	Low Elasticity Rubber (Hanenaito®GP-35L)	Shore A32	Black
UBFF	CXBFF	Fluoro Rubber	Shore A80	Black

V Tolerance

V	Tolerance
30 or Less	±0.2
31~86	±0.5

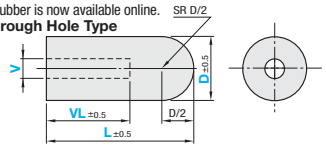
Thickness Condition

L	V
L≤30	V≤D−4
L>30	V≤D−6

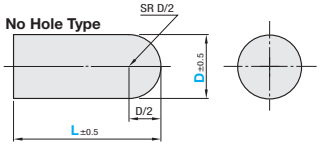
Conditions of L L≥D/2

Hanenaito® is a registered trademark of Naigai Rubber Industry Co., Ltd.
Amber Color Rubber is now available online.

Through Hole Type



No Hole Type



For hole type, through hole will be machined when VL dimension is not specified.
Specification of VL dimension required. Through hole can be provided, but VL through SR and shorter than L can not be specified.

■Urethane Configurable Type

Part Number (x Material Rate)				1mm Increment D	1mm Increment L	1mm Increment Through Hole Type V	1mm Increment Through Hole Type VL	€ Unit Price Through Hole Type L10~20	L21~30	L31~40	L41~50	€ Unit Price No Hole Type L10~20	L21~30	L31~40	L41~50
	Through Hole Type	No Hole Type													
(Shore A95)	UTRS	CXTRS	(x1.4)	6~15	10~50 (L≥D/2)	2~11	5~50 (VL≤L) Except L−D/2≤VL≤L−1								
(Shore A90)	UTRH	CXTRH	(x1.0)	16~20		4~16									
(Shore A70)	UTRM	CXTRM	(x1.2)	21~30		6~26									
(Shore A50)	UTRL	CXTRL	(x1.4)	31~40		6~36									
				41~50		6~46									

The thickness of Through Hole Type (D−V)/2 is restricted by L. Refer to the table (thickness condition) in the figure.

■Rubber Configurable Type

Part Number			1mm Increment D	1mm Increment L	1mm Increment Through Hole Type V	1mm Increment Through Hole Type VL	€ Unit Price Through Hole Type L10~20	L21~30	€ Unit Price No Hole Type L10~20	L21~30
	Through Hole Type	No Hole Type								
(Nitrile Rubber)	UBFN	CXBFN	6~15	10~30 (L≥D/2)	2~11	5~30 (VL≤L) Except L−D/2≤VL≤L−1				
			16~25		7~21					
	Through Hole Type	No Hole Type	6~15		2~11					
(Silicon Rubber)	UBFS	CXBFS	16~25		7~21					
	Through Hole Type	No Hole Type	6~15		2~11					
(Low Elasticity Rubber)	UBFU	CXBFU								
	Through Hole Type	No Hole Type	6~15		2~11					
(Fluoro Rubber)	UBFF	CXBFF								

■Bumpers with tapered tip end are available in a short delivery time. Hole length is configurable for Through Hole Type.

■Tapered Tip

RoHS



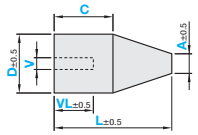
Through Hole Type	No Hole Type	Material	Hardness	Color
UTTS	CXTTS	Ether Polyurethane	Shore A95	Natural Color
UTTH	CXTTH		Shore A90	
UTTM	CXTTM	Ester Polyurethane	Shore A70	
UTTL	CXTTL		Shore A50	
UTBFN	CXTBFN	Nitrile Rubber (NBR)	Shore A70	Black

V Tolerance

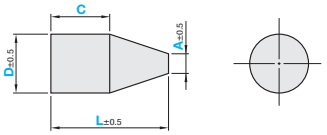
V	Tolerance
30 or Less	±0.2
31~52	±0.5

Highly Abrasion Resistant Urethane and Amber Color Rubber are now available online.

Through Hole Type



No Hole Type



For hole type, through hole will be machined when VL dimension is not specified.

Part Number (x Material Rate)				1mm Increment D	1mm Increment A (A≤D-2)	1mm Increment L	1mm Increment C	1mm Increment Through Hole Type V	1mm Increment Through Hole Type VL	€ Unit Price Through Hole Type L 10~20	L 21~30	€ Unit Price No Hole Type L 10~20	L 21~30
	Through Hole Type	No Hole Type											
(Shore A95)	UTTS	CXTTS	(x1.4)	6~15	2~13	10~30	1~29 (C<L)	2~11 (V≤A-2)	5~30 (VL≤L) Except VL≤L-1				
(Shore A90)	UTTH	CXTTH	(x1.0)	16~30	2~28			2~24 (V≤A-4)					
(Shore A70)	UTTM	CXTTM	(x1.2)	31~45	2~43			2~37 (V≤A-6)					
(Shore A50)	UTTL	CXTTL	(x1.4)	46~60	2~58			2~52 (V≤A-6)					
(Shore A70)	UTBFN	CXTBFN	(x1.08)										

Price and rate have revised according to the price list integration.

Order Example

Part Number	D	L	V	VL
UTRS	D20	L40	V10	VL30
CXBFU	D10	L15		

Part Number	D	A	L	C	V	VL
UTTS	D15	A13	L15	C10	V5	VL10
CXTTH	D20	A14	L30	C15		

Days to Ship

8 Days

The price of Urethane Configurable Type and Tapered Tip Type can be calculated by € Unit Price x Material Rate, listed in the table. (Round down to one Cent.)

(Ex.)

Part Number	D	A	L	C	V	VL
UTTS	D15	A13	L15	C10	V5	VL10

(€ Unit Price) x (Material Rate)
7,90 X 1.4 = 11,06
→ 11,00 EUR

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

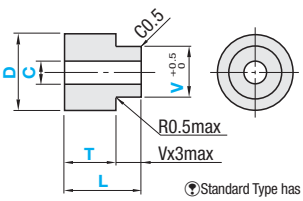
Urethane · Rubber
-Pilot Type-

CAD Data

■Bumpers with pilot tip end are available in a short delivery time.



Standard Type	Configurable Type	M Material	H Hardness	Color
DXSK	DXFS	Ether Polyurethane	Shore A95	Natural Color
DXHK	DXFH		Shore A90	Natural Color
DXMK	DXFM	Ester Polyurethane	Shore A70	Natural Color
DXLK	DXFL		Shore A50	Natural Color
-	RBKN	Nitrile Rubber (NBR)	Shore A70	Black
-	RBKC	Chloroprene Rubber (CR)	Shore A65	Black
-	RBKU	Low Elasticity Rubber	Shore A32	Black
-	RBKS	Silicon Rubber (SI)	Shore A70	Light Gray
-	RBKA		Shore A50	Milky White
-	RBKF	Fluoro Rubber (FPM)	Shore A80	Black



Standard Type has no hole.

The milky white color of silicone rubber shore A 50 is translucent.

T Tolerance

T	Urethane	Rubber
30 or Less	±0.2	±0.3
31~50	±0.3	–

D Tolerance

D	Urethane	Rubber
40 or Less	±0.2	±0.5
40~60	±0.3	±0.7
61~100	±0.4	–

C Tolerance

C	Urethane	Rubber
40 or Less	+0.2 0	+1.0 0
41 or more	+0.3 0	+1.4 0

■Standard Type (No Hole Type)

Part Number Type	D	V Selection	T Selection	L Selection	€ Unit Price DXSK	DXHK	DXMK	DXLK
DXSK (Shore A95) DXHK (Shore A90) DXMK (Shore A70) DXLK (Shore A50)	8	5	3 5	8 10				
			8 10	13 15				
	10	5 8	3 5	9 11 13				
			8 10 15	14 16 18 21 23				
	15	8 10	3 5	11 13 15				
			8 10 15	16 18 20 23 25				
	20	10 15	5 8 10	15 18 20 23 25				
			15 20	25 30 35				
	25	15 20	5 10	15 20 25				
			15 20 25	25 30 35 40				
	30		5 10	15 20 25				
			15 20 25	25 30 35 40				
	40	20 30	5 10	15 20 25				
			15 20 25	25 30 35 40				
	50		5 10	15 20 25				
			15 20 25	25 30 35 40				
	60	30 40	5 10	15 20 25				
			15 20 25	25 30 35 40				

Order Example

Part Number	-	V	-	T	-	L
DXHK20	-	10	-	10	-	18

Days to Ship -Standard Type: 8 Days

Express A 3,00 EUR/ piece

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Standard Type

■Volume Discount (Round down to one Cent.) P87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Urethane Configurable Type (Hole Configurable Type)

Part Number	1mm Increment D	V(V<D)	T	L	C	€ Unit Price DXFS	DXFH	DXFM	DXFL
DXFS (Shore A95) DXFH (Shore A90) DXFM (Shore A70) DXFL (Shore A50)	6~15	3~14	2~30	4~10	0 (No Hole) 2~40				
				11~25					
				26~40					
				40~60					
	16~30	6~29		7~10					
				11~25					
				26~40					
				40~60					
	31~45	10~44	5~40	7~10					
				11~25					
				26~40					
				41~65					
				66~70					
	46~60	15~59	5~50	7~10	0 (No Hole) 10~70				
				11~25					
				26~40					
				41~65					
				66~80					
	61~80	25~79		7~10					
				11~25					
				26~40					
				41~65					
				66~80					
	81~100	35~99	10~50	7~10	0 (No Hole) 20~80				
				11~25					
				26~40					
				41~65					
				66~80					

C≤V−4

Price -Urethane

■Configurable Type ■Volume Discount (Round down to one Cent.) P87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	15%	35%

For orders larger than indicated quantity, please request a quotation.

■Rubber Configurable Type (Hole Configurable Type)

Part Number	1mm Increment D	V (V<D)	T	L	C	€ Unit Price RBKN RBKC	RBKU	RBKS RBKA	RBKF
RBKN Nitrile Rubber (NBR) RBKC Chloroprene Rubber (CR) RBKU Low Elasticity Rubber RBKS (Shore A70) Silicon Rubber (SI) RBKA (Shore A50) Silicon Rubber (SI) RBKF Fluoro Rubber (FPM)	6~15	3~14	2~30	4~10	0 (No Hole) 2~40				
				11~20					
				21~30					
				31~50			✕		✕
	16~30	6~29		7~10					
				11~20					
				21~30					
				31~50			✕		✕
	31~45	10~44	5~30	7~10					
				11~20					
				21~30					
				31~50			✕		✕
	46~60	15~59		7~10	0 (No Hole) 10~50				
				11~20					
				21~30					
				31~50			✕		✕

C≤V−4

L≤30 for RBKU, RBKS and RBKF

Order Example

Part Number	-	D	-	V	-	T	-	L	-	C
DXFL	-	D49	-	V30	-	T6	-	L42	-	C0

Days to Ship -Configurable Type: 8 Days

Price -Rubber

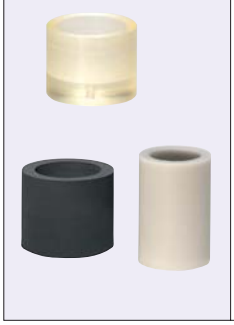
■Configurable Type ■Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

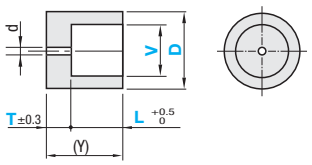
Urethane · Rubber
-Cap Type-

CAD Data



Standard Type	Configurable Type	Material	Hardness	Color
UTCS	UTNS	Ether Polyurethane	Shore A95	Natural Color
UTCH	UTNH		Shore A90	Natural Color
UTCM	UTNM	Ester Polyurethane	Shore A70	Natural Color
UTCL	UTNL		Shore A50	Natural Color
RBCN	RBNN	Nitrile Rubber (NBR)	Shore A70	Black
RBCC	RBNC	Chloroprene Rubber (CR)	Shore A65	Black
RBCU	RBNU	Low Elasticity Rubber	Shore A32	Black
RBCS	RBNS	Silicon Rubber (SI)	Shore A70	Light Gray
RBCA	RBNA		Shore A50	Milky White
RBCF	RBNF	Fluoro Rubber (FPM)	Shore A80	Black

The milky white color of silicone rubber shore A 50 is translucent.



T Tolerance

T	Urethane	Rubber
30 or Less	±0.2	±0.3
31~50	±0.3	–

D Tolerance

D	Urethane	Rubber
40 or Less	±0.2	±0.5
40~60	±0.3	±0.6
61~100	±0.4	–

V Tolerance

V	Urethane	Rubber
2~50	-0.2 -0.3	0 -1.0
51~	-0.2 -0.4	0 -1.2

■Standard Type

Part Number Type	D	V Selection	T Selection	L Selection	d	€ Unit Price UTCS	UTCH	UTCM	UTCL	RBCN RBCC	RBCU	RBCS RBCA	RBCF
UTCS (Shore A95)	6	2	2 3 4 5	4 5 6 8	1								
UTCH (Shore A90)	8	3 4											
UTCM (Shore A70)	9	3 5	2 5 7	4 5 6 10	1.5								
UTCL (Shore A50)	10	4 6	2 3 5 6	4 8 10 12									
RBCN Nitrile Rubber (NBR)	12	6 8		7 8 9 10									
RBCC Chloroprene Rubber (CR)	15	8 10	2 4 7 8	4 6 8 10									
RBCU Low Elasticity Rubber	20	12 16	2 3 5 10	7 10 15 20	2								
RBCS (Shore A70) Silicon Rubber (SI)	25	15 20	5 6 10 12	10 15 25 30									
RBCA (Shore A50) Silicon Rubber (SI)	30	20 25	2 3 5 10	15 20 30									
RBCF Fluoro Rubber (FPM)													

Order Example

Part Number	-	V	-	T	-	L
UTCH8	-	3	-	2	-	4

Days to Ship

-Standard Type (UTC_)

8 Days

Express A | 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

-Standard Type (RBC_)

8 Days

Express A | 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Standard Type

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Urethane Configurable Type

Part Number	D	V	T	L	d	€ Unit Price UTNS	UTNH	UTNM	UTNL
UTNS (Shore A95) UTNH (Shore A90) UTNM (Shore A70) UTNL (Shore A50)	6~15	2~11	2~30	4~10	1				
				11~25					
				26~40					
	16~30	12~26		40~60	1.5				
				7~10					
				11~25					
				26~40					
				40~60					
	31~45	27~41	5~40	7~10					
				11~25					
				26~40					
				41~65					
				66~70					
	46~60	42~56	5~50	7~10	2				
				11~25					
				26~40					
				41~65					
				66~80					
	61~80	57~76		7~10					
				11~25					
				26~40					
				41~65					
				66~80					
	81~100	77~96	10~50	7~10					
				11~25					
				26~40					
				41~65					
				66~80					

(Y)=T+L V≤D−4

Price -Urethane

■Configurable Type

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	15%	35%

For orders larger than indicated quantity, please request a quotation.

■Rubber Configurable Type

Part Number	D	V	T	L	d	€ Unit Price RBNN RBNC	RBNU	RBNS RBNA	RBNF
RBNN Nitrile Rubber (NBR) RBNC Chloroprene Rubber (CR) RBNU Low Elasticity Rubber RBNS (Shore A70) Silicon Rubber (SI) RBNA (Shore A50) Silicon Rubber (SI) RBNF Fluoro Rubber (FPM)	6~15	2~11	2~10	4~10	1				
				11~20					
				21~28					
				29~48			✕		✕
	16~30	12~26		7~10	1.5				
				11~20					
				21~28					
				29~48			✕		✕
	31~45	27~41	5~15	7~10					
				11~20					
				21~28					
				29~45			✕		✕
	46~60	42~56		7~10	2				
				11~20					
				21~28					
				29~45			✕		✕

(Y)=T+L V≤D−4 (Y)≤50

For RBNU, RBNS and RBNF, (Y)≤30

Order Example

Part Number	-	D	-	V	-	T	-	L
RBNN	-	D60	-	V50	-	T5	-	L20

Days to Ship

-Configurable Type

8 Days

■Configurable Type

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

-Rubber

For orders larger than indicated quantity, please request a quotation.

Extra Low Hardness Urethane Bumpers / Sheets

CAD Data

■Urethane sheets with Shore A hardness of 15. Adherence specific to low hardness urethane is reduced.

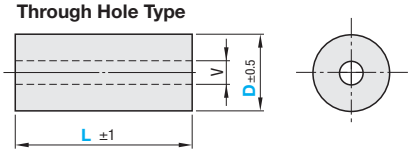
■Super Low Hardness RoHS



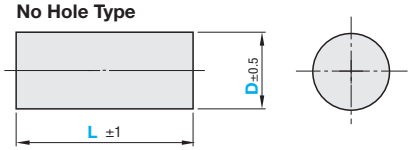
SAXN (Through Hole Type)
SCXN (No Hole Type)

The tolerances are verified at 23 °C±2 and 40~80% humidity. at 40~80% humidity.

Through Hole Type



No Hole Type

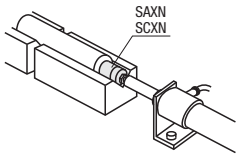


Edges may remain white after cutting.

M Material: Ether Urethane (Black)
H Hardness: Shore A15 (high impact resilience)

Part Number Type	D	L (5mm Increment)	V	Applicable Screw	€ Unit Price L10~20	L25~40	L45~60	L65~80	L85~100	L105~150	L155~200
Through Hole Type SAXN	15	10~200	7	M4							
	20		8.5	M5							
No Hole Type SCXN	25		10	M6							
	30		13	M8							

Example



Order Example

Part Number	-	L
SAXN15	-	10
SCXN30	-	200

Days to Ship 10 Days

Express B 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

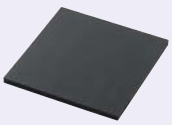
Price

■Volume Discount (Round down to one Cent.) P.87

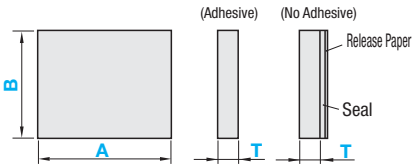
Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Extra Low Hardness Urethane Sheets RoHS



SUTLL (No Adhesive)
SUTLLA (Adhesive)



■Precision Standards

-T Dimension Tolerance

5, 10	15~25	30
±0.4	±0.8	±1.0

-Dimensional tolerances of A and B

200mm or Less	205~250
+3 0	+5 0

The tolerances are verified at 23 °C±2 and 40~80% humidity.
Edges may remain white after cutting.

M Material: Shore A15
H Hardness: Shore A15 (high impact resilience)

Part Number Type	T	5mm Increment A	B
No Adhesive SUTLL / Adhesive SUTLLA	5	10~250	10~250
	10		
	15		
	20		
	25		
	30		

A≥B≥T

Order Example

Part Number	-	A	-	B
SUTLL5	-	250	-	100

Days to Ship 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B
SUTLLA10 - 200 - 150
(€ Unit Price) 32,40 x (Material Rate) 1.2 = Standard Type € Unit Price 38,88 EUR -> it Price 38,80 EUR

Part Number Type	T	A	€ Unit Price B 10~100	105~200	205~250
No Adhesive SUTLL (x1.0) / Adhesive SUTLLA (x1.2)	5	10~100			
		105~200			
		205~250			
	10	10~100			
		105~200			
		205~250			
	15	10~100			
		105~200			
		205~250			
	20	10~100			
		105~200			
		205~250			
( ) Material Rate	25	10~100			
		105~200			
		205~250			
	30	10~100			
		105~200			
		205~250			

■Features of Extra Low Hardness Urethane

- High physical strength that cannot be obtained from conventional soft materials.
- It is MISUMI original material that suppresses self-adhesion, which is the problem of soft material.
- This material has highly resistant against impact, and compress little.
- It has the same properties as ether polyurethane.

■Comparison of Characteristics

Properties	Extra Low Hardness Urethane	Nitrile	Ethylene	Silicon	Fluorine
Impact Resilience	◎	○	○	◎	Δ
Compression Set	◎	◎	○	◎	○
Abrasion Resistance	◎	◎	○	X	◎

◎-Excellent, ○-Good, Δ-Acceptable, X-Not Acceptable

Shock Absorbing Bumpers
-Female Thread · Male Thread-

Price Reduction
Up to 10%

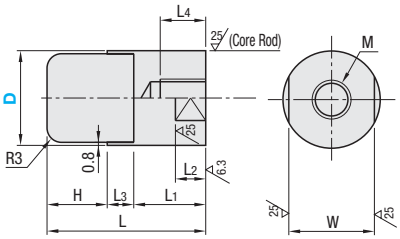
CAD Data

■New Bumpers provided with shock and sound absorbing effect, made of soft shock-absorbing gel. For material properties, refer to P.360

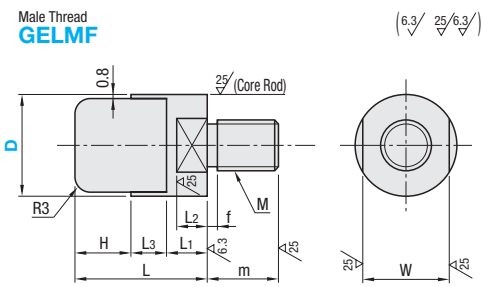
RoHS



Female Thread
GELMR



Male Thread
GELMF



Gel — M Material: Viscoelastic elastomer (gray); H Hardness: Asker F75 (Two-layered; F98 for outer layer)
Core Rod — M Material: 1.4301/X5CrNi18-10

Part Number Type	D	H	L	L1	L2	L3	L4	M	W	€ Unit Price
Female Thread GELMR	12	8	22	11	4	3	6.5	M5x0.8	10	
	16	10	28	14	5	4	9	M6x1.0	14	
	16A		31	17			12	M8x1.25		
	20	13	35	17	6	5	12	M8x1.25	17	
	20A		39	21			15	M10x1.25 (Fine Thread)		
	30	15	44	24	8	5	18	M12x1.75	27	
	30A		46	26			21	M14x1.5 (Fine Thread)		

Part Number Type	D	H	L	L1	L2	L3	M	W	m	f	€ Unit Price
Male Thread GELMF	12	8	16	5	4	3	M5x0.8	10	8	1.5	
	16	10	20	6	5	4	M6x1.0	14	10	2	
	20	13	26	8	6	5	M8x1.25	17	12	2	
	30	15	30	10	8	5	M10x1.5	27	14	2.5	

Order Example — Part Number: **GELMR16A**

Days to Ship — **6 Days** P.87

Price

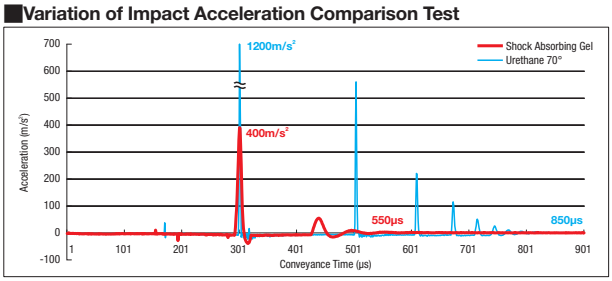
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Precaution for Use
- Do not stick or cut with sharpened objects.
- Do not tear or twist.
- Insert it only from the vertical direction.
- Keep away from fire.
- Do not use detergents for cleaning.
- Replace it when broken.

■Variation of Impact Acceleration Comparison Test



	Max. Impact Acceleration (m/s²)	Convergence Time (µs)
Shock Absorbing Gel	400	550
Urethane 70°	1200	850
Urethane 50°	836	1273
Extra Low Hardness Urethane 15°	450	1660
Low Rebound Urethane	1750	450
Nitrile Rubber	1050	670
Low Rebound Rubber	1580	400

* "Convergence Time" is defined as the time until acceleration falls below 10m/s2.

- From Test Results
Peak acceleration of shock absorbing gel is lower at around 30% of other materials and convergence speed is higher.
(Extra low hardness urethane has a low peak value as well, but takes three times longer to converge.)
This is because the material transmits energy dispersing in multiple directions, while absorbing impact force.
From these characteristics, effects such as impact absorption and noise reduction can be expected.
(Effects differ depending on operation environment.)

- Test Conditions
Measuring method: Measured with accelerometer secured on the hammer dropped on the test materials
Size of test material: ø30, Height 20mm
Measuring instruments:
Hammer: Weight 958g, drop height 255mm
Length from fulcrum to barycenter: 255mm

Equipments:
Acceleration pickup (Bruel & Kjaer Type 4507B001)
Data logger (Keyence NR-500, NR-HA08)
PC, Sensor amplifier (Ono Sokki SR-2200)
Measurement condition: Temperature 18°C, Humidity 40%

■Elasticity of Shock Absorbing Gel
•Shock Absorbing Gel **•Urethane Shore A50**



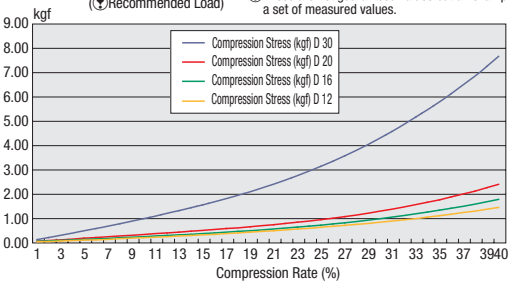
A major characteristic is the three-dimensional slow recovery, the function to recover after compression slowly and in multiple directions.
Pressed as thin as in the picture and recovers to the original shape gradually after being released from pressure. * The double-layer structure of the gel part reduces stickiness.

■Compressive Load Test (40%) Results

D	12	16	20	30
40% Compression Load Average (kgf)	1.4	1.8	2.4	7.7

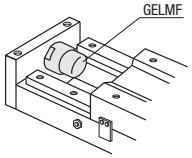
(Recommended Load)

- Test Conditions
Compressed material pieces with static pressure and measured the load at which the pieces were 60% of the original in thickness. Above are the mean values of three measurement results.
These are not guaranteed values but an example of a set of measured values.

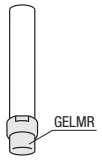


Example

- Bumper



-Shaft Attachment



Shock Absorbing Bumpers
-Plate Type · Holder Type-

■New Bumpers provided with shock and sound absorbing effect, made of soft shock-absorbing gel.
■Long and narrow shape with enlarged pressure contact area more than round type, enhanced shock absorption.

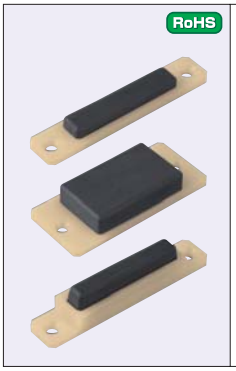
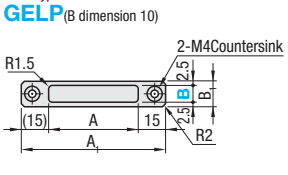
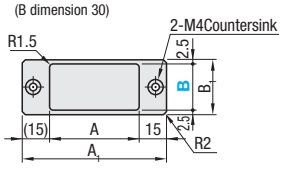


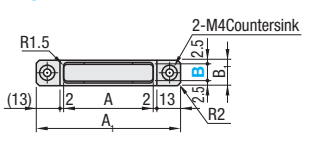
Plate Type
GELP(B dimension 10)



(B dimension 30)



Holder Type
GELH



Gel — M Material: Viscolelastic elastomer (gray)
H Hardness: GELP Asker F85
GELH Asker F75 (lower), Asker F98 (upper)
Plate — M Material: ABS

Part Number		A	H	A1	B1	t	€ Unit Price
Type	B						
GELP Plate Type	10	50	5	80	15	4	
	30		10		35		
GELH Holder Type	10		10		15		

Order Example Part Number **GELP10**

Days to Ship 6 Days P.87

Price

■**Volume Discount** (Round down to one Cent.) P.87

Quantity	1~19	20~49
Discount Rate	€ Unit Price	5%

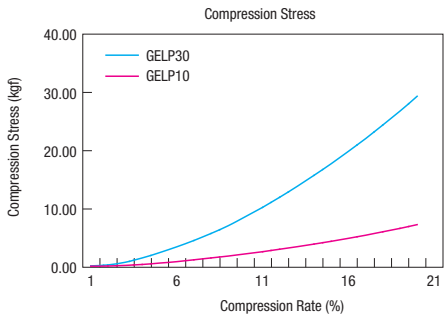
For orders larger than indicated quantity, please request a quotation.

■20% Compressive Load Test Results

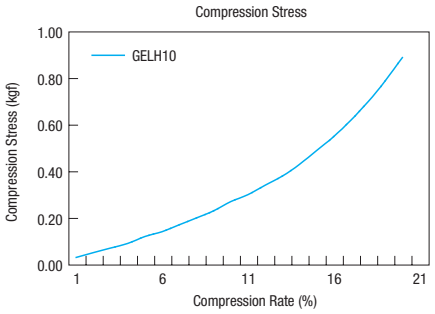
Part Number	GELP10	GELP30	GELH10
20% Compression Load Average (kgf)	7.2	29.2	0.9

- **Test Conditions**
Compressed material pieces with a static load and measured the load at which the exposed gel were 80% of the original thickness. Indicated values are the average from three measurements.
These are not guaranteed values but an example of a set of measured values.

■Compressive Load Test Result (Plate Type)



■Compressive Load Test Result (Holder Type)

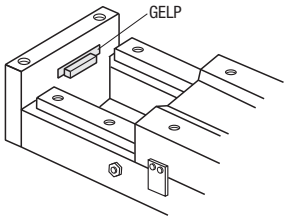


■Precaution for Use

- Do not stick or cut with sharpened objects.
- Do not tear or twist.
- Insert it only from the vertical direction.
- Keep away from fire.
- Do not use detergents for cleaning.
- Replace it when broken.

Example

- **Bumper**



Urethane Sheets
-Square · Band-

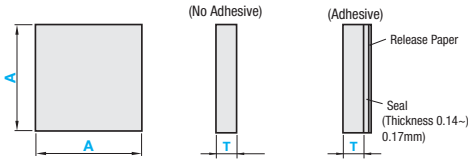
■For Configurable Type and Hole Type, refer to **P.383** ⓖFor Urethane Gaskets, refer to **P.423** For Urethane Blocks, refer to **P.404**

RoHS

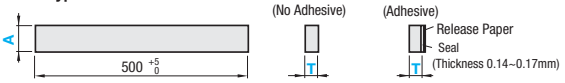


■A Dimension Standard Type

Square Type



Band Type



A Dimension Standard Type		M Material	H Hardness	Color
No Adhesive	Adhesive			
UTSN	UTSNA	Ether Polyurethane	Shore A95	Natural Color
UTHN	UTHNA		Shore A90	
UTM	UTMA	Ester Polyurethane	Shore A70	
UTL	UTLA		Shore A50	

ⓖProperties **P.359**

ⓖFor Adhesive type T4 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.

■Precision Standards

T Tolerance

T	Tolerance
1~4	±0.3
5~10	±0.4
15~30	±0.5

A Tolerance

A	Tolerance
200 or Less	±0.5
201~300	±1.0
301~400	±1.2
401~500	±1.5

■Square Type

Part Number Type	T	A Selection
No Adhesive UTSN / Adhesive UTSNA (Shore A95)	(0.5)	300
	1	
	2	
	3	
	4	
UTHN / UTHNA (Shore A90)	5	
	6	
UTM / UTMA (Shore A70)	8	500
	10	
UTL / UTLA (Shore A50)	15	
	20	
	25	
	30	

ⓖT (0.5) is selectable for UTHN and UTHNA.

■Band Type

Part Number Type	T	A Selection
No Adhesive UTSN / Adhesive UTSNA (Shore A95)	(0.5)	3
	1	5
	2	10
UTHN / UTHNA (Shore A90)	3	20
	4	30
UTM / UTMA (Shore A70)	5	40
	6	50
UTL / UTLA (Shore A50)	8	80
	10	100

ⓖT (0.5) is selectable for UTHN and UTHNA.
ⓖL dimension is 500mm.

Order Example

■A Dimension Standard Type

Part Number	-	A
UTHN8	-	300

Days to Ship

6 Days **P.88**

Price

■Volume Discount (ⓖRound down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19	20~30
Discount Rate	€ Unit Price	5%	10%	18%

ⓖFor orders larger than indicated quantity, please request a quotation.

Square Type (No Adhesive)

Part Number Type	T	A	€ Unit Price UTSN	UTHN	UTM	UTL
No Adhesive UTSN	(0.5)	300				
	1					
	2					
	3					
	4					
	5					
	6					
	8					
	10					
	15					
	20					
UTHN	25					
	30					
	(0.5)	500				
UTM	1					
	2					
UTL	3					
	4					
	5					
	6					
	8					
	10					
	15					
	20					
	25					
	30					

Square Type (Adhesive)

Part Number Type	T	A	€ Unit Price UTSNA	UTHNA	UTMA	UTLA
	(0.5)	300				
	1					
	2					
	3					
	4					
	5					
	6					
	8					
Adhesive UTSNA	10					
	15					
	20					
UTHNA	25					
	30					
	(0.5)	500				
UTMA	1					
	2					
UTLA	3					
	4					
	5					
	6					
	8					
	10					
	15					
	20					
	25					
	30					

Band Type (No Adhesive)

Part Number Type	T	€ Unit Price A 3	5	10	20	30	40	50	80	100
No Adhesive UTSN	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									
No Adhesive UTHN	(0.5)									
	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									
No Adhesive UTM	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									
No Adhesive UTL	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									

Band Type (Adhesive)

Part Number Type	T	€ Unit Price A 3	5	10	20	30	40	50	80	100
Adhesive UTSNA	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									
Adhesive UTHNA	(0.5)									
	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									
Adhesive UTMA	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									
Adhesive UTLA	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									

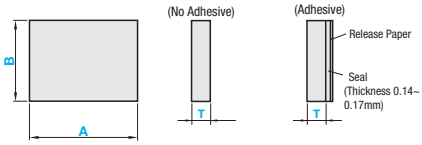
Urethane Sheets
-A · B dimension Configurable Type · Hole Type-

■For Square and Band Type, refer to ☞P.381 ⓨFor Urethane Gaskets, refer to ☞P.423 For Urethane Blocks, refer to ☞P.404

RoHS



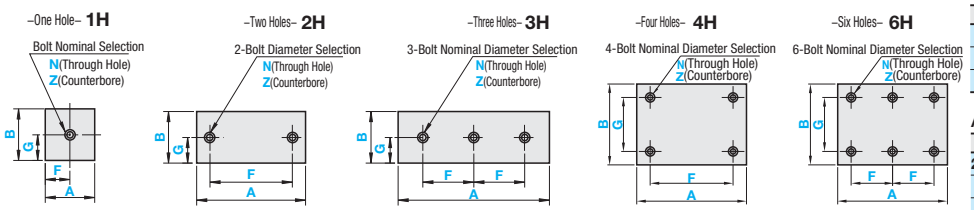
■A · B Dimension Configurable Type
Standard Type



A · B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive			
UTSSN	UTSSNA	Ether Polyurethane	Shore A95	Natural Color
UTSHN	UTSHNA		Shore A90	
UTSM	UTSMA	Ester Polyurethane	Shore A70	
UTSL	UTSLA		Shore A50	
UTSLL	UTSLLA		Shore A30	

ⓨProperties ☞P.359
ⓨFor Adhesive type T4 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.

Hole Type



■Precision Standards

T Tolerance

T	Tolerance
1~4	±0.3
5~10	±0.4
15~30	±0.5

A, B Tolerance

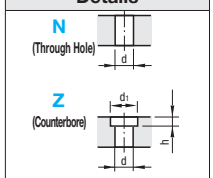
A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~400	±1.2
401~500	±1.5

■A, B Dimension Configurable Type –Standard Type–

Part Number Type			T	1mm Increment A	1mm Increment B
No Adhesive	Adhesive		(0.5)		
UTSSN	UTSSNA	(Shore A95)	1		
UTSHN	UTSHNA	(Shore A90)	2		
UTSM	UTSMA	(Shore A70)	3	10~500	10~500
UTSL	UTSLA	(Shore A50)	4		
UTSLL	UTSLLA	(Shore A30)	5		
			6		
			8		
			10		
			15		
			20		
			25		
			30		

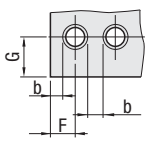
ⓨT (0.5) is selectable for UTSHN and UTSHNA. ⓨA≥B≥T

Hole Machining Details



Bolt Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d_1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

■Machining Limits (distance between holes, thickness between holes and edges)



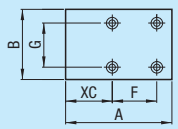
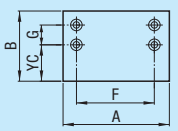
ⓨShould be b≥2.5.

■A · B Dimension Configurable Type –Hole Type–

Part Number Type			Nominal	T	1 mm Increment (A≥B≥T) A	1 mm Increment (A≥B≥T) B	0.5mm Increment F	0.5mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter Z (Counterbore)
No Adhesive	Adhesive			(0.5)						-
				1						-
			1H	2						-
UTSSN	UTSSNA	(Shore A95)		3						-
			2H	4			9~491 (1H, 2H, 4H Type)	5~495 (1H, 2H, 3H Type)	3	-
UTSHN	UTSHNA	(Shore A90)		5					4	-
			3H	6	25~500	25~500			5	-
UTSM	UTSMA	(Shore A70)		8			9~245 (3H - 6H Type)	9~491 (4H, 6H Type)	6	-
UTSL	UTSLA	(Shore A50)	4H	10					8	3
				15					10	3 4
UTSLL	UTSLLA	(Shore A30)	6H	20						4 5 6 8
				25						4 5 6 8
				30						4 5 6 8 10

ⓨT (0.5) is only for UTSHN and UTSHNA.
ⓨDimension F Specification Range: For 1H, d (d_1)/2+2.5 F A–d (d_1) /2–2.5, for 2H, 4H: d (d_1) +5 F A–d (d_1) –5, for 3H - 6H: d (d_1) +5 F A/2–d (d_1)/2–2.5.
ⓨDimension G Specification Range: For 1H · 2H, 3H, d (d_1) /2+2.5≤G≤B–d (d_1) /2–2.5, for 4H · 6H, d (d_1) +5≤G≤B–d (d_1)–5. (d for through hole, d_1 for counterbore)

Alterations Part Number - A - B - F - G - Bolt Nominal - (XC · YC)
UTSM4H25 - 100 - 80 - F60 - G20 - Z5 - YC40

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment ⓨ5≤XC≤486 ⓨ(2H · 4H Type) d (d_1) / 2+2.5≤XC≤A–F–d (d_1)/2-2.5 ⓨ(3H · 6H Type) d (d_1) / 2+2.5≤XC≤A–2F–d (d_1)/2-2.5	YC=1 mm Increment ⓨ5≤YC≤486 ⓨd (d_1)/2+2.5≤YC≤B–G–d (d_1)/2-2.5
Price Adder	4,00	4,00

Order Example

■A, B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
UTSHN8		- 300		- 200						
UTSHN4H8		- 200		- 150		- F140		- G120	-	N5

Days to Ship 6 Days

Price Reduction
Up to 31%

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1	2~5	6~10	11~29
Discount Rate	€ Unit Price	5%	10%	20%

Please request a quotation for orders of 51 or more identical pieces.

Hole Machining Charge

Hole Type	Bolt Nominal	
	N (Through Hole)	Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

(Ex.)

Part Number	A	B	F	G	Bolt Nominal
UTSHN4H10 -	500 -	400 -	F240 -	G160 -	N8

(Standard Type € Unit Price) + (Hole Machining Charge) = Total Price
87,70 (125,30x0.7) + 4,00 = 91,70 EUR

A · B dimension Configurable Type (No Adhesive)

Part Number Type	T	A	€ Unit Price B 10~50	51~100	101~200	201~300	301~400	401~500
No Adhesive UTSHN (x1.0)	0.5	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	1	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	2	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	3	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	4	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
No Adhesive UTSSN (x1.0)	5	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
UTSHN (x0.7)	6	10~50						
		51~100						
		101~200						
		201~300						
UTSM (x1.0)		301~400						
		401~500						
UTSL (x1.0)	8	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
UTSLL (x1.2)	10	10~50						
		51~100						
		101~200						
( ) Material Rate		201~300						
		301~400						
		401~500						
	15	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	20	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	25	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	30	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						

A · B dimension Configurable Type (Adhesive)

Part Number Type	T	A	€ Unit Price B 10~50	51~100	101~200	201~300	301~400	401~500
Adhesive UTSHNA (x1.0)	0.5	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	1	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	2	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	3	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	4	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
Adhesive UTSSNA (x1.0)	5	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
UTSHNA (x0.8)	6	10~50						
		51~100						
		101~200						
		201~300						
UTSMA (x1.0)		301~400						
		401~500						
UTSLA (x1.0)	8	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
UTSLLA (x1.2)	10	10~50						
		51~100						
		101~200						
( ) Material Rate		201~300						
		301~400						
		401~500						
	15	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	20	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	25	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	30	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						

The price of this product is found by multiplying the unit price shown in the table by the material rate.

Highly Abrasion Resistant / Heat Resistant Urethane Sheets
–Vulkollan® · Abrasion Resistant Urethane–

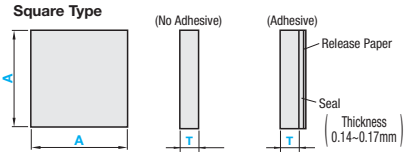
■Vulkollan ® with 6 time-abrasion resistance of the standard urethane, abrasion resistant urethane with 2.5 time-abrasion resistance and urethane sheet with upper temperature limit of 120 degrees are available.
Ⓨ A · B Dimension Configurable Adhesive Type is now available. Ⓨ For heat resistant urethane gasket products, see ☞ P.423



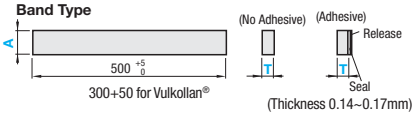
RoHS

■A Dimension Standard Type

Square Type



Band Type



300+50 for Vulkollan®

(Thickness 0.14~0.17mm)

A Dimension Standard Type		A / B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
VULHS	VULHSA	VULHSS	VULHSSA	Super Abrasion Resistant Urethane Vulkollan®	Shore A92	Beige
VULMS	VULMSA	VULMSS	VULMSSA		Shore A68	
UTEXH	UTEXHA	UTEXHS	UTEXHSA	Abrasion Resistant Urethane	Shore A90	Dark Brown
UTEXM	UTEXMA	UTEXMS	UTEXMSA		Shore A70	
UTHHS	UTHHSA	UTHHSS	UTHHSSA	Heat Resistant Urethane	Shore A90	Brown

Ⓨ Properties ☞ P.359

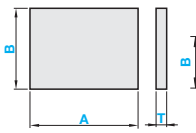
VULKOLLAN is a registered trademark of Bayer AG.

Ⓨ Vulkollan® may experience discoloration with time, but physical property · characteristics remain unchanged.

Ⓨ For Adhesive type T4 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.

■A · B Dimension Configurable Type

Standard Type

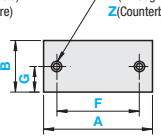


Hole Type

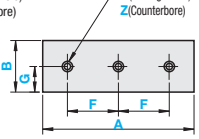
–One Hole– **1H**



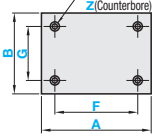
–Two Holes– **2H**



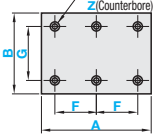
–Three Holes– **3H**



–Four Holes– **4H**



–Six Holes– **6H**



Ⓨ A · B dimension tolerance has changed. Please refer to the precision standard on the right.

■Precision Standards

T Tolerance

T	Tolerance
1~4	±0.3
5~10	±0.4
15~30	±0.5

A · B Tolerance

A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~400	±1.2
401~500	±1.5

■A Dimension Standard Type – Square Type–

Part Number Type			T	A Selection
No Adhesive	Adhesive		(1)	300
			(2)	
VULHS	VULHSA	(Shore A92)	3	
			4	
VULMS	VULMSA	(Shore A68)	5	
			6	
UTEXH	UTEXHA	(Shore A90)	8	
			*10	500
UTEXM	UTEXMA	(Shore A70)	*15	Ⓨ Vulkollan® 300 only
			*20	
UTHHS	UTHHSA	(Shore A90)	*25	
			*30	

Ⓨ T (1) and (2) are selectable for abrasion resistant urethane only,
Ⓨ Vulkollan® is available with * dimensions only.
Ⓨ Vulkollan® (Shore A68) is only available with T=10 or 15.

■A Dimension Standard Type – Band Type–

Part Number Type			T	A Selection
No Adhesive	Adhesive		(1)	3
VULHS	VULHSA	(Shore A92)	(2)	5
			3	10
VULMS	VULMSA	(Shore A68)	4	20
UTEXH	UTEXHA	(Shore A90)	5	30
			6	40
UTEXM	UTEXMA	(Shore A70)	8	50
UTHHS	UTHHSA	(Shore A90)	*10	80
				100

Ⓨ L dimension is 500mm.
Ⓨ Vulkollan® is only available with T=10 and the length is 300mm.

■A · B Dimension Configurable Type Standard Type–

Part Number Type			T	1mm Increment A	1mm Increment B
No Adhesive	Adhesive		(1)	10~500 (Discoloration of Vulkollan® 10~300)	10~500 (Discoloration of Vulkollan® 10~300)
			(2)		
VULHSS	VULHSSA	(Shore A92)	3		
VULMSS	VULMSSA	(Shore A68)	4		
UTEXHS	UTEXHSA	(Shore A90)	5		
UTEXMS	UTEXMSA	(Shore A70)	6		
UTHHSS	UTHHSSA	(Shore A90)	8		
			*10		
			*15		
			*20		
			*25		
			*30		

Ⓨ A≥B≥T
Ⓨ Vulkollan® is available with * dimensions only.
Ⓨ Vulkollan® (Shore A68) is only available with T=10 or 15.

■A / B Dimension Configurable Type –Hole Type–

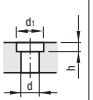
Part Number Type			Nominal	t	1 mm Increment (A≥B≥T) A	1 mm Increment (A≥B≥T) B	0.5mm Increment F	0.5mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter Z (Counterbore)
No Adhesive	Adhesive	(Shore A92)	1H	(1)	25~500 (Vulkollan® 25~300)	25~500 (Vulkollan® 25~300)	9~491 (Vulkollan® 9~291) (1H, 2H, 4H Type)	5~495 (Vulkollan® 5~295) (1H, 2H, 3H Type)		-
				(2)						-
				3						-
				4						-
VULHSS	VULHSSA	(Shore A68)	2H	5					3	-
VULMSS	VULMSSA			6					4	-
UTEXHS	UTEXHSA	(Shore A90)	3H	8					5	-
UTEXMS	UTEXMSA	(Shore A70)	4H	*10			9~245 (Vulkollan® 9~170) (3H - 6H Type)	9~491 (Vulkollan® 9~291) (4H, 6H Type)	6	3
UTHHSS	UTHHSSA	(Shore A90)	6H	*15					8	3 4
				*20					10	4 5 6 8
				*25						4 5 6 8
				*30						4 5 6 8 10
										4 5 6 8 10

Hole Machining Details

N (Through Hole)



Z (Counterbore)



Bolt Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

Ⓨ T (1) and (2) are selectable for abrasion resistant urethane only, Vulkollan® is available with * dimensions only.
(For Shore A68, only available with T=10 or 15.)
Ⓨ Dimension F Specification Range: For 1H, d (d1)/2+2.5 F A–d (d1) /2–2.5, for 2H · 4H: d (d1) +5 F A–d (d1) –5, for 3H · 6H: d (d1) +5 F A/2–d (d1)/2–2.5.
Ⓨ Dimension G Specification Range: For 1H · 2H · 3H, d (d1) /2+2.5≤G≤B–d (d1) /2–2.5, for 4H · 6H, d (d1) +5≤G≤B–d (d1) –5. (d for through hole, d1 for counterbore)

Order Example

■A Dimension Standard Type

Part Number	-	A
VULHS10	-	300
UTHHS10	-	100

■A, B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
VULHSS10	-	300	-	200						
UTEXHS3H5	-	200	-	150	-	F140	-	G120	-	N5

Days to Ship

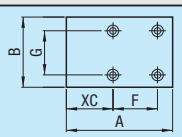
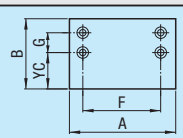
6 Days

- Vulkollan®

8 Days

Alterations

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal	-	(XC · YC)
VULHSS4H25	-	100	-	80	-	F60	-	G20	-	Z5	-	YC40

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment Ⓨ 5≤XC≤486(286 for Vulkollan®) Ⓨ (2H · 4H Type) d (d1) / 2+2.5≤XC≤A–F–d (d1)/2-2.5 Ⓨ (3H · 6H Type) d (d1) / 2+2.5≤XC≤A–2F–d (d1)/2-2.5	YC=1 mm Increment Ⓨ 5≤YC≤486(286 for Vulkollan®) Ⓨ d (d1)/2+2.5≤YC≤B–G–d (d1)/2-2.5
Price Adder	4,00	4,00

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~30
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of adhesive type is found by adding the unit price to the adhesive charge. (Based on A dimension)

(Ex.) Part Number - A : VULHSA10 - 3

(Standard Type € Unit Price) 8,00 + (Adhesive Charge) + 3,50 — € Unit Price of Adhesive Type = 11,50 EUR

Adhesive Charge

A Dimension	Machining Charge
3~10	
20~50	
80, 100	
300	
500	

A Dimension Standard Type -Square Type-

Part Number Type	T	A	€ Unit Price VULHS	VULMS	UTEXH UTEXM	UTHHS
No Adhesive VULHS, VULMS, UTEXH, UTEXM, UTHHS / Adhesive VULHSA, VULMSA, UTEXHA, UTEXMA, UTHHSA	(1)	300				
	(2)					
	3					
	4					
	5					
	6					
	8					
	*10					
	*15					
	*20					
	*25					
	*30					
	(1)	500				
	(2)					
	3					
	4					
	5					
	6					
	8					
	10					
	15					
	20					
	25					
	30					

T (1) and (2) are selectable for abrasion resistant urethane only, Vulkollan® is available with * dimensions only.

A Dimension Standard Type -Band Type-

Part Number Type	T	€ Unit Price A 3	5	10	20	30	40	50	80	100
No Adhesive VULHS / Adhesive VULHSA	10									
No Adhesive VULMS / Adhesive VULMSA	10									
No Adhesive UTEXH UTEXM / Adhesive UTEXHA UTEXMA	1									
	2									
	3									
	4									
	5									
	6									
	8									
	10									
No Adhesive UTHHS / Adhesive UTHHSA	3									
	4									
	5									
	6									
	8									
	10									

L dimension is 500mm.
Length of Band Type Vulkollan® is 300mm.

A · B Dimension Configurable Type

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B : VULMSS10 - 300 - 200

(€ Unit Price) 134,40 x (Material Rate) 1.2 = € Unit Price of Standard Type 161,20 — € Unit Price 161,20 EUR

Part Number Type	T	A	€ Unit Price B 10~100	101~200	201~300	301~400	401~500
No Adhesive UTEXHS (x1.0) / Adhesive UTEXHSA (x1.1)	1	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTEXMS (x1.0) / UTEXMSA (x1.1)	3	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTHHSS (x1.2) / UTHHSSA (x1.3)	4	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
( ) Material Rate	5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	6	10~100					
		101~200					
		201~300					
		301~400					
		401~500					

T(1) and (2) are selectable for abrasion resistant urethane UTEXHS and UTEXMS only.

Part Number Type	T	A	€ Unit Price B 10~100	101~200	201~300	301~400	401~500
No Adhesive UTEXHS (x1.0) / Adhesive UTEXHSA (x1.1)	8	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTEXMS (x1.0) / UTEXMSA (x1.1)	15	15~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTHHSS (x1.2) / UTHHSSA (x1.3)	20	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
( ) Material Rate	25	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					
No Adhesive VULHSS (x1.0) VULMSS (x1.2) / Adhesive VULHSSA (x1.1) VULMSSA (x1.3)	*10	10~100					
		101~200					
		201~300					
	*15	15~100					
		101~200					
		201~300					
	20	20~100					
		101~200					
		201~300					
( ) Material Rate	25	25~100					
		101~200					
		201~300					
	30	30~100					
		101~200					
		201~300					

Vulkollan 68°(VULMSS) is available with * dimensions only.

Hole Machining Charge

Hole Type	Bolt Nominal N (Through Hole)	Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

The price of hole type is found by adding the standard type unit price to the hole machining charge.

(Ex.) Part Number - A - B - F - G - Bolt Nominal : UTHHSS3H5 - 500 - 400 - F240 - G160 - N8

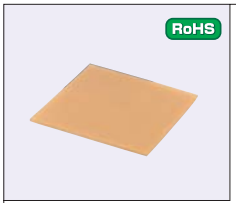
(€ Unit Price) 75,60 x (Material Rate) 1.2 = € Unit Price of Standard Type 90,72 EUR →90,70 EUR

(Standard Type € Unit Price) 90,70 + (Hole Machining Charge) 3,00 = Total Price 93,70 EUR

Urethane Sheets with Oil-Resistant Adhesives

CAD Data

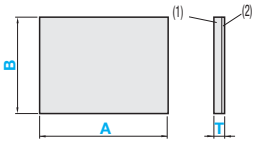
■Rubber sheets with peel-and-stick backing adhesives with good oily surface adhesion.



Type		(1)Material	Hardness	Color	(2) Adhesive Surface
A · B Standard	A · B Configurable				
NTUS	NTUSF	Ether Polyurethane	Shore A95	Natural Color	Special Acrylic Adhesive Material
NTUH	NTUHF		Shore A90		
NTUM	NTUMF	Ester Polyurethane	Shore A70		
NTUL	NTULF		Shore A50		

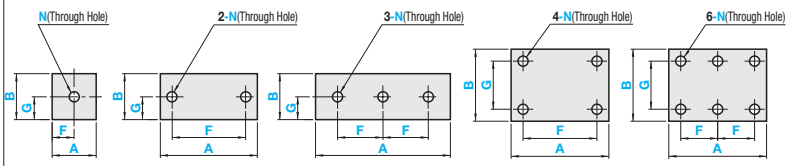
Properties ☞P.359 to the urethane and rubber of the similar hardness.

■A · B Standard Type, A · B Configurable Type –Standard Type–



■A · B Configurable Type –Hole Type–

–1 Hole–1H –2 Hole–2H –3 Hole–3H –4 Hole–4H –6 Hole–6H



For hole types, specify nominal diameter.

■Precision Standards

-T Dimension Tolerance ±0.3 (Including Adhesive Part 80μm)

A · B Tolerance

A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~400	±1.2
401~500	±1.5

■A · B Dimension Standard Type –Standard Type–

Part Number		Selection	
Type	T	A	B
NTUS NTUH NTUM NTUL	1	100 200 300 400 500	100 200 300 400 500
	2		
	3		

■A · B Dimension Configurable Type –Standard Type · Hole Type–

Part Number			1 mm Increment (A≥B)		0.5mm Increment		N
Type	Nominal	T	A	B	F	G	
NTUSF NTUHF NTUMF NTULF	1H 2H 3H 4H 6H	1	10~500	10~500	9~491 (1H · 2H · 4H Type) 9~245 (3H · 6H Type)	9~495 (1H · 2H · 4H Type) 9~491 (3H · 6H Type)	3 4 5 6 8 10
		2					
		3					

Dimension F Specification Range: For 1H: d/2+2.5≤F≤A-d/2-2.5, for 2H · 4H: d+5≤F≤A-d-5, for 3H · 6H: d+5≤F≤A/2-d/2-2.5.

Dimension G Specification Range: For 1H · 2H · 3H: d/2+2.5≤G≤B-d/2-2.5, for 4H · 6H: d+5≤G≤B-d-5.

The A, B upper limits are different in A · B Standard Type and A · B Configurable Type.

Hole Machining Details



Bolt Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12

■Adhesive Strength (180 degree peel strength)

Item		Special Acrylic Type Adhesive	General Acrylic Adhesives (Reference Values)
Pull Force (N)	Ordinary Condition	11	11
	* Oiled Surface	9	3

* Oiled Surface: Salad oil is coated on Stainless Steel plate using absorbent cotton, and measurement is taken after 2 hours.

Testing Method: 180° Peeling Test (25 m thick and 25mm wide PET film bonded to 1.4301/X5CrNi18-10 plate)

Alterations

Part Number - A - B - F - G - N - (XC · YC)

NTUMF4H3 - 100 - 80 - F65 - G40 - N4 - YC30

Order Example

Part Number - A - B - F - G - N

NTUS3 - 300 - 100

NTUH3 - 100 - 100

NTUSF4H2 - 150 - 100 - F140 - G40 - N3

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

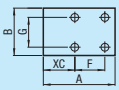
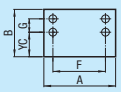
Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B (€ Unit Price) x (Material Rate) = € Unit Price of Standard Type

NTUS1 - 300 - 200 12,40 x 1.3 = € 16,12 -> 16,10 EUR

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤486 (2H · 4H Type) d/2+2.5≤XC≤A–F–d/2–2.5 (3H · 6H Type) d/2+2.5≤XC≤A–2F–d/2–2.5	YC=1 mm Increment 5≤YC≤486 d/2+2.5≤YC≤B–G–d/2–2.5
Price Adder	4,00	4,00

■A · B Dimension Standard Type –Standard Type–

Part Number		A	€ Unit Price				
Type	T		B100	B200	B300	B400	B500
NTUS(x1.3) NTUH(x1.0) NTUM(x1.1) NTUL(x2.0)	1	100					
		200					
		300					
		400					
		500					
	2	100					
		200					
		300					
		400					
		500					
( ) Material Rate	3	100					
		200					
		300					
		400					
		500					

■A · B Dimension Configurable Type –Standard Type · Hole Type–

Part Number		A	€ Unit Price				
Type	T		B				
			10~100	101~200	201~300	301~400	401~500
NTUSF(x1.3) NTUHF(x1.0) NTUMF(x1.1) NTULF(x2.0)	1	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
( ) Material Rate	3	10~100					
		101~200					
		201~300					
		301~400					
		401~500					

Antistatic Urethane Sheets / Low Rebound Urethane Sheets

CAD Data



RoHS

A · B Dimension Configurable Type No Adhesive	M Material	H Hardness	Color
UTSHNE	Antistatic Polyurethane	Shore A90	Gray
UTSME		Shore A70	
UTSLE		Shore A50	
LUTN	Low Rebound Urethane	Shore A70	

Properties of Low Rebound Urethane ☞ P.360

Characteristic Values of Antistatic Urethane

Specific Volume Resistivity	$2.1 \times 10^8 \Omega \cdot cm$
Surface Resistivity	$4.0 \times 10^9 \Omega$

(Conditions: Temperature 30°C Humidity 60%)
All other properties are equal to that of urethane of the same hardness.

Precision Standards

T Tolerance

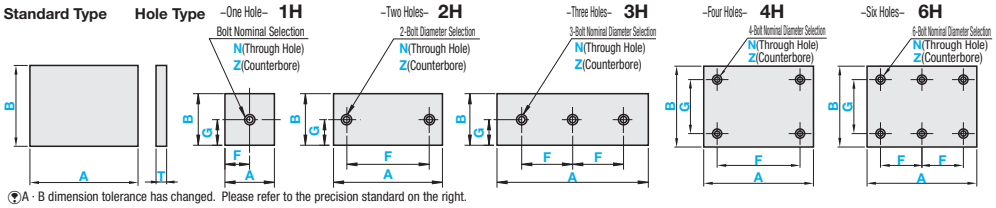
T	Tolerance
1~4	±0.3
5~10	±0.4
15~30	±0.5

A · B Tolerance

A · B	Tolerance
200 or Less	±0.5
201 ~300	±1.0
301 ~400	±1.2
401 ~500	±1.5

A · B Dimension Configurable Type

Standard Type Hole Type –One Hole– 1H –Two Holes– 2H –Three Holes– 3H –Four Holes– 4H –Six Holes– 6H



A · B dimension tolerance has changed. Please refer to the precision standard on the right.

A · B Dimension Configurable Type –Standard Type–

Part Number Type		T	1mm Increment A	1mm Increment B
		1		
UTSHNE	(Antistatic Shore A90)	2		
		3		
UTSME	(Antistatic Shore A70)	4	10~500	10~500
		*5	10~250	10~250
UTSLE	(Antistatic Shore A50)	6	for LUTN	for LUTN
		8		
LUTN	(Low Rebound Shore A70)	*10		
		*15		
		*20		
		*25		
		*30		

T Dimensions of LUTN are * marked sizes only. A≥B≥T

Order Example

A · B Dimension Configurable Type

Part Number - A - B - F - G - Bolt Nominal

UTSHNE8 - 300 - 200

UTSHNE4H8 - 200 - 150 - F140 - G120 - N5

Days to Ship

8 Days — Express A 3,00 EUR/piece ☞ P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.
Express A is not available for LUTN.

Price

Volume Discount (Round down to one Cent.) P.87

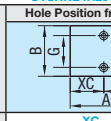
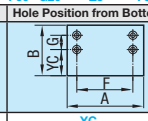
Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number - A - B - F - G - Bolt Nominal - (XC · YC)

UTSHNE4H25 - 100 - 80 - F60 - G20 - Z5 - YC40

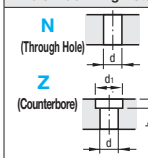
Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤486 (236 for LUTN) (2H · 4H Type) d (d1)/2+2.5≤XC≤A −F−d (d1)/2-2.5 (3H · 6H Type) d (d1)/2+2.5≤XC≤A −2F−d (d1)/2-2.5	YC=1 mm Increment 5≤YC≤486 (236 for LUTN) d (d1)/2+2.5≤YC≤B−G−d (d1)/2-2.5
Price Adder	4,00	4,00

T Dimensions of LUTN are * marked sizes only. A≥B≥T

A · B Dimension Configurable Type –Hole Type–

Part Number Type		Nominal	T	1 mm Increment (A≥B≥T) A	1 mm Increment (A≥B≥T) B	0.5mm Increment F	0.5mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter Z (Counterbore)
		1H	1	25~500 (25~250 for LUTN)	25~500 (25~250 for LUTN)	9~491 (9~241 for LUTN (1H · 2H · 4H Type))	5~495 (5~245 for LUTN (1H · 2H · 3H Type))		-
			2						-
UTSHNE	(Antistatic Shore A90)		3						-
		2H	4					3	-
UTSME	(Antistatic Shore A70)		*5					4	-
			6					5	-
UTSLE	(Antistatic Shore A50)	3H	8			9~245 (9~120 for LUTN (3H · 6H Type))	9~491 (9~241 for LUTN (4H · 6H Type))	6	3
			*10					8	3 4
LUTN	(Low Rebound Shore A70)	4H	*15					10	4 5 6 8
			*20						4 5 6 8
		6H	*25						4 5 6 8 10
			*30						4 5 6 8 10

Hole Machining Details



Bolt Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

Hole Machining Charge

Hole Type	Bolt Nominal N (Through Hole)	Bolt Nominal Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

(Ex.) Part Number - A - B - F - G - Bolt Nominal

UTSHNE4H10 - 500 - 400 - F240 - G160 - N8

(Standard Type € Unit Price) + (Hole Machining Charge) = Total Price
100,20 (125,30x0.8) + 4,00 =104,20 EUR

T Dimensions of LUTN are * marked sizes only.
Dimension F Specification Range: For 1H: d(d1)/2+2.5≤F≤A-d(d1)/2-2.5, for 2H/4H: d(d1)+5≤F≤A-d(d1)-5, for 3H · 6H: d(d1)+5≤F≤A/2-d(d1)/2-2.5.
Dimension G Specification Range: For 1H · 2H · 3H, d (d1) /2+2.5≤G≤B−d (d1) /2−2.5, for 4H · 6H, d (d1) +5≤G≤B−d (d1)−5. (d for through hole, d1 for counterbore)

A · B Dimension Configurable Type

Part Number Type	T	A	€ Unit Price B 10~100	101~200	201~300	301~400	401~500
UTSHNE (x0.8)	1	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTSME (x1.2)	3	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTSLE (x1.2)	4	10~100					
		101~200					
LUTN (x1.3)		201~300					
		301~400					
		401~500					
( ) Material Rate	5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	6	10~100					
		101~200					
		201~300					
		301~400					
		401~500					

Part Number Type	T	A	€ Unit Price B 10~100	101~200	201~300	301~400	401~500
UTSHNE (x0.8)	8	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTSME (x1.2)	15	15~100					
		101~200					
		201~300					
		301~400					
		401~500					
UTSLE (x1.2)	20	20~100					
		101~200					
LUTN (x1.3)		201~300					
		301~400					
		401~500					
( ) Material Rate	25	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B

UTSHNE10 - 500 - 400

(€ Unit Price) x (Material Rate) = € Unit Price of Standard Type
125,30 x 0.8 = 100,24€ Unit Price 100,20 EUR

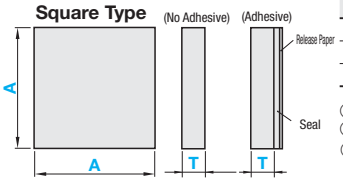
Nitrile Rubber Sheets

■Nitrile Rubber excels in abrasion and oil resistance and is inexpensive. ■Oil-resistant adhesives are available as an alternative.
For Rubber Gaskets, refer to P.425 For Rubber Blocks, refer to P.404



RoHS

■A Dimension Standard Type



A Dimension Standard Type		A · B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
RBNM	RBNMA	RBNMF	RBNMFA	Nitrile Rubber (NBR)	Shore A70	Black
RBTM	RBTMA	RBTMF	RBTMFA		Shore A50	Black
RBNW	RBNWA	RBNWF	RBNWFA		Shore A65	White

Adhesive thickness is 0.02~0.025mm.
For Adhesive Strength Data, refer to (ADTR) P.448
For Oil-resistant Adhesive strength, refer to P.387

■Precision Standards

T Tolerance

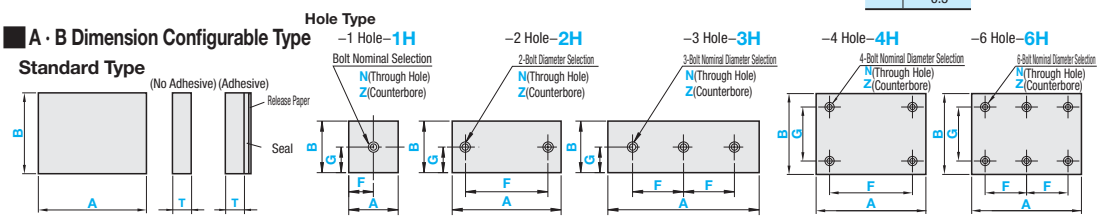
T	Tolerance
0.5	±0.2
1~3	±0.3
5	±0.4
10	±0.6
15~30	+2.0 -0.5

A / B Tolerance

A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~500	±1.5

■A · B Dimension Configurable Type

Hole Type



For Adhesive Type T5 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.
A, B dimension tolerance has changed. Please refer to the precision standard above.

■A Dimension Standard Type –Square Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive		
RBNM	RBNMA	0.5	300 500
RBTM	RBTMA	*1	
*RBNW	*RBNWA	*2	
		*3	
		*5	
		*10	
		15	
		*20	
		*30	

Only * marked T dimensions are available for RBNW and RBNWA.

■A Dimension Standard Type –Band Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive		
RBNM	RBNMA	0.5	3 5 10 20 30 40 50 80 100
RBTM	RBTMA	*1	
*RBNW	*RBNWA	*2	
		*3	
		*5	
		*10	

L dimension is 500mm.
Only * marked T dimensions are available for RBNW and RBNWA.

■A · B Dimension Configurable Type –Standard Type–

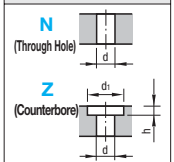
Part Number Type		T	1mm Increment A	1mm Increment B
No Adhesive	Adhesive			
RBNMF	RBNMFA	0.5	10~500	10~500
RBTMF	RBTMFA	*1		
*RBNWF	*RBNWFA	*2		
		*3		
		*5		
		*10		
		15		
		*20		
		*30		

Only * marked T dimensions are available for RBNWF and RBNWFA.

■A · B Dimension Configurable Type –Hole Type–

Part Number Type		Nominal	T	1 mm Increment (A≥B≥T) A	1 mm Increment (A≥B≥T) B	0.5mm Increment F	0.5mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter Z (Counterbore)
No Adhesive	Adhesive								
RBNMF	RBNMFA	1H	0.5	25~500	25~500	9~491 (1H, 2H, 4H Type)	5~495 (1H, 2H, 3H Type)	3	-
RBTMF	RBTMFA	2H	*1						-
*RBNWF	*RBNWFA		*2					4	-
		3H	*3						-
			*5					5	-
			*10					6	3 4
		4H	15			9~245 (3H, 6H Type)	9~491 (4H, 6H Type)	8	4 5 6 8
			*20					10	4 5 6 8
		6H	*30						4 5 6 8 10

Hole Machining Details

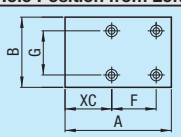
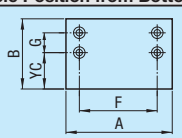


Screw Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

Dimension F Specification Range: For 1H: d(d1)/2+2.5≤F≤A-d(d1)/2-2.5, for 2H, 4H: d(d1)+5≤F≤A-d(d1)-5, for 3H, 6H: d(d1)+5≤F≤A/2-d(d1)/2-2.5.
Dimension G Specification Range: For 1H, 2H, 3H: d(d1)/2+2.5≤G≤B-d(d1)/2-2.5, for 4H, 6H: d(d1)+5≤G≤B-d(d1)-5. (d for through hole, d1 for counterbore)
Only * marked T dimensions are available for RBNWF and RBNWFA.

Alterations

Part Number	A	B	F	G	Bolt Nominal	(XC · YC · KT2)
RBNMF4H5	100	80	F65	G40	N4	YC30
RBNMFA2	250	150				KT2

Alterations	Hole Position from Left	Hole Position from Bottom	Adhesive Type Change
			Changes to Oil-resistant Adhesives.
Code	XC	YC	KT2
Spec.	XC=1 mm Increment 5≤XC≤486 (2H · 4H Type) d(d1) / 2+2.5≤XC≤A-F-d(d1) / 2-2.5 (3H · 6H Type) d(d1) / 2+2.5≤XC≤A-2F-d(d1) / 2-2.5	YC=1 mm Increment 5≤YC≤486 d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5	Not available for No Adhesive Type. Only available for T=1, 2, 3. Band Type A=3 or 5 is not selectable. RBNWA and RBNWFA are not selectable. Ordering Code KT2
Price Adder	4,00	4,00	Refer to the right figure.

■Price of with Oil-resistant Adhesives

KT2 (A dimension)	Machining Charge
10~100	
101~200	
201~300	
301~400	
401~500	

*Alteration Code for NTNR and NTNRF has changed to KT2.

Order Example

A Dimension Standard Type

Part Number	-	A
RBNM5	-	100
RBTMA15	-	500

A · B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
RBNMF10	-	110	-	65						
RBTMF4H20	-	200	-	150	-	F140	-	G100	-	Z5

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number RBNMFA10 - A 500 - B 400

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price
48,20 x 1.3 = 62,66 ➡ 62,60 EUR

Days to Ship: **8 Days** | Express A: 3,00 EUR/piece | P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

A Dimension Standard Type –Square Type–

Part Number		€ Unit Price A	
Type	T	300	500
No Adhesive RBNM (x1.0)	0.5		
RBTM (x1.0)	*1		
*RBNW (x1.7)	*2		
	*3		
Adhesive	*5		
RBNMA (x1.3)	*10		
RBTMA (x1.3)	15		
*RBNWA (x1.9)	*20		
( ) Material Rate	*30		

Only * marked T dimensions are available for RBNW and RBNWA.

A Dimension Standard Type –Band Type–

Part Number		€ Unit Price A								
Type	T	3	5	10	20	30	40	50	80	100
No Adhesive RBNM (x1.0)	0.5									
RBTM (x1.0)	*1									
*RBNW (x1.2)	*2									
Adhesive	*3									
RBNMA (x1.3)	*5									
RBTMA (x1.3)	*10									
*RBNWA (x1.4)										
( ) Material Rate										

Only * marked T dimensions are available for RBNW and RBNWA.

A · B Dimension Configurable Type

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

Part Number		A	€ Unit Price B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive RBNMF (x1.0) RBTMF (x1.0) *RBNWF (x1.4) Adhesive RBNMFA (x1.3) RBTMFA (x1.3) *RBNWFA (x1.5) ( ) Material Rate	0.5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*1	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*3	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					

Part Number		A	€ Unit Price B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive RBNMF (x1.0) RBTMF (x1.0) *RBNWF (x1.4) Adhesive RBNMFA (x1.3) RBTMFA (x1.3) *RBNWFA (x1.5) ( ) Material Rate	*10	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	15	15~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*20	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					

Only * marked T dimensions are available for RBNWF and RBNWFA.
*Yellowing of white rubber
Please note upon application that aging in color is more distinct compared to black rubber.

Hole Machining Charge

Hole Type	Bolt Nominal N (Through Hole)	Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

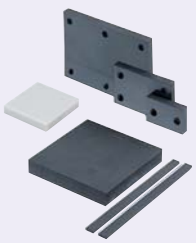
(Ex.) Part Number RBNMF4H10 - A 200 - B 180 - F F160 - G G140 - Bolt Nominal Z3

(Standard Type) + (Hole Selection Price) = (Hole Type)
10,80 + 5,00 = 15,80 EUR

Chloroprene · Non-Staining Chloroprene Rubber Sheets

■Chloroprene Rubber excels in mechanical strength and Alkali resistance. Non-staining chloroprene rubber which minimizes contamination from contacting materials is also available.
For Rubber Gaskets, refer to ☞P.425 For Rubber Blocks, refer to ☞P.404

RoHS

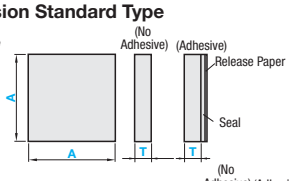


A Dimension Standard Type		A · B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
RBCM	RBCMA	RBCMF	RBCMFA	Chloroprene Rubber (CR)	Shore A65	Black
RBOM	RBOMA	RBOMF	RBOMFA	Non-Staining Chloroprene Rubber (CR)	Shore A60	Gray
RBCW	RBCWA	RBCWF	RBCWFA	Chloroprene Rubber (CR)	Shore A60	White

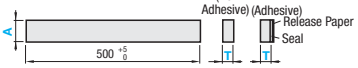
For Adhesive thickness is 0.02~0.025mm.
For Adhesive Strength Data, refer to ☞P448(ADTR)

■A Dimension Standard Type

Square Type

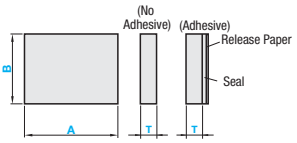


Band Type



■A · B Dimension Configurable Type

Standard Type

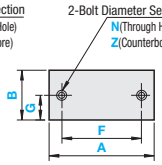


Hole Type

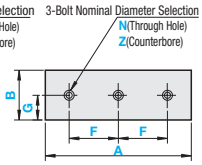
–1 Hole–1H



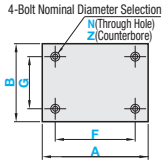
–2 Hole–2H



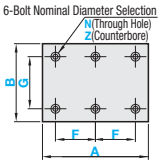
–3 Hole–3H



–4 Hole–4H



–6 Hole–6H



For Adhesive Type T5 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.
A · B dimension tolerance has changed. Please refer to the precision standard on the right.

■Precision Standards

T Tolerance

T	Tolerance
0.5	±0.2
1~3	±0.3
5	±0.4
10	±0.6
15~30	+2.0 -0.5

A · B Tolerance

A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~500	±1.5

■A Dimension Standard Type –Square Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive		
RBCM	RBCMA	1	300
RBOM	RBOMA	2	500
RBCW	RBCWA	3	
		5	
		10	Only **300** is available for T15 or more of **RBOM** and **RBOMA**.
		15	
		20	
		30	

T dimension 15 is not available for RBCW and RBCWA.

■A Dimension Standard Type –Band Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive		
RBCM	RBCMA	1	3
RBOM	RBOMA	2	5
RBCW	RBCWA	3	10
		5	20
		10	30
			40
			50
			80
			100

L dimension is 500mm.

■A · B Dimension Configurable Type –Standard Type–

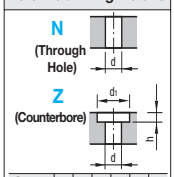
Part Number Type		T	1mm Increment A	1mm Increment B
No Adhesive	Adhesive			
RBCMF	RBCMFA	1	10~500	10~500
RBOMF	RBOMFA	2		
RBCWF	RBCWFA	3		
		5	Only **10~300** is available for T15 or more of **RBOMF** and **RBOMFA**.	Only **10~300** is available for T15 or more of **RBOMF** and **RBOMFA**.
		10		
		15		
		20		
		30		

A≥B≥T
T dimension 15 is not available for RBCWF and RBCWFA.

■A · B Dimension Configurable Type –Hole Type–

Part Number Type		Nominal	T	1 mm Increment (A≥B≥T) A	1 mm Increment (A≥B≥T) B	0.5mm Increment F	0.5mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter Z (Counterbore)
No Adhesive	Adhesive								
RBCMF	RBCMFA	1H	1	25~500	25~500	9~491 (1H·2H·4H Type)	5~495 (1H·2H·3H Type)	3	-
RBOMF	RBOMFA	2H	2					4	-
RBCWF	RBCWFA		3						
		3H	5					5	-
			10	Only **25~300** is available for T15 or more of **RBOMF** and **RBOMFA**.	Only **25~300** is available for T15 or more of **RBOMF** and **RBOMFA**.	9~245 (3H·6H Type)	9~491 (4H·6H Type)	6	3 4
		4H	15					8	4 5 6 8
			20					10	4 5 6 8
		6H	30						4 5 6 8 10

Hole Machining Details



Screw Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

Dimension F Specification Range: For 1H: d(d1)/2+2.5≤F≤A-d(d1)/2-2.5, for 2H · 4H: d(d1)+5≤F≤A-d(d1)-5, for 3H · 6H: d(d1)+5≤F≤A/2-d(d1)/2-2.5.)
For 3H, ·6H: d(d1)
Dimension G Specification Range: For 1H · 2H · 3H: d(d1)/2+2.5≤G≤B-d(d1)/2-2.5, for 4H · 6H: d(d1)+5≤G≤B-d(d1)-5. (d for through hole, d1 for counterbore)

Order Example

■A Dimension Standard Type

Part Number - A

RBCM5 - 100
RBOM10 - 500

■A · B Dimension Configurable Type

Part Number - A - B - F - G - Bolt Nominal

RBCMF10 - 110 - 65
RBCMF4H20 - 200 - 150 - F140 - G100 - Z5

Days to Ship: 8 Days

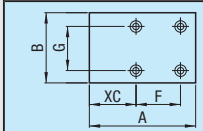
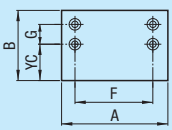
Express A 3,00 EUR/ piece ☞P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Alterations

Part Number - A - B - F - G - Bolt Nominal - (XC · YC)

RBCMF4H5 - 100 - 80 - F65 - G40 - N4 - YC30

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤486 (286 for non-staining chloroprene rubber with T15 or larger) (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2-2.5 (3H · 6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2-2.5	YC=1 mm Increment 5≤YC≤486 (286 for non-staining chloroprene rubber with T15 or larger) d (d1)/2+2.5≤YC≤B–G–d (d1)/2-2.5
Price Adder	4,00	4,00

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B
RBCMFA10 - 500 - 400

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price
48,20 x 1.3 = 62,66 ➡ 62,60 EUR

A Dimension Standard Type -Square Type-

Part Number		€ Unit Price A	
Type	T	300	500
No Adhesive RBCM(x1.0) RBCW(x1.7) Adhesive RBCMA(x1.3) RBCWA(x1.9)	1		
	2		
	3		
	5		
	10		
	15		
	20		
	30		
No Adhesive RBOM(x1.0) Adhesive RBOMA(x1.1) ( ) Material Rate	1		
	2		
	3		
	5		
	10		
	15		
	20		
	30		

A Dimension Standard Type -Band Type-

Part Number		€ Unit Price A								
Type	T	3	5	10	20	30	40	50	80	100
No Adhesive RBCM(x1.0) RBCW(x1.2) Adhesive RBCMA(x1.3) RBCWA(x1.3)	1									
	2									
	3									
	5									
	10									
No Adhesive RBOM(x1.0) Adhesive RBOMA(x1.1) ( ) Material Rate	1									
	2									
	3									
	5									
	10									

T dimension 15 is not available for RBCW and RBCWA.

A · B Dimension Configurable Type

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

Part Number		A	€ Unit Price B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive RBCMF (x1.0) RBCWF (x1.6) Adhesive RBCMFA (x1.3) RBCWFA (x1.7) ( ) Material Rate	1	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	3	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	15	15~100					
		101~200					
		201~300					
		301~400					
		401~500					
	20	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
	30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					

Part Number		A	€ Unit Price B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive RBOMF (x1.0) Adhesive RBOMFA (x1.3) ( ) Material Rate	1	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	3	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	15	15~100					
		101~200					
		201~300					
	20	20~100					
		101~200					
		201~300					
	30	30~100					
		101~200					
		201~300					

T dimension 15 is not available for RBCWF and RBCWFA.
*Yellowing of white rubber
Please note upon application that aging in color is more distinct compared to black rubber.

Hole Machining Charge

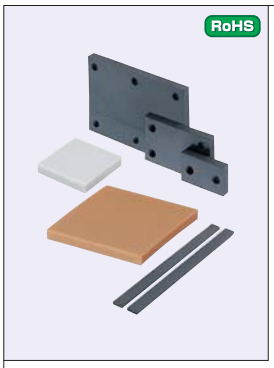
Hole Type	Bolt Nominal N (Through Hole)	Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

(Ex.) Part Number - A - B - F - G - Bolt Nominal
RBCMF4H10 - 200 - 180 - F160 - G140 - Z3

(Standard Type) + (Hole Selection Price) = (Hole Type)
10,80 + 5,00 = 15,80 EUR

Ethylene Rubber Sheets / Butyl Rubber Sheets / Amber Color Rubber Sheets

■Ethylene rubber excels in alkali, ketone and ozone resistance, especially in weather resistance.
■Butyl Rubber excels in weather, chemical and gas permeability resistance. Inferior in oil and flame resistance.
■Amber Color Rubber excels in mechanical strength and abrasion resistance. Its elasticity and tensility help to fit well with work shapes. Can be used as a floor plate in a place requiring air tightness.

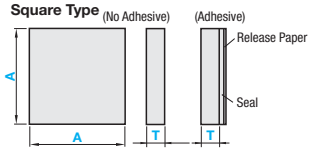


A Dimension Standard Type		A · B Dimension Configurable Type		M Material	H Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
RBPM	RBPMA	RBPMF	RBPMFA	Ethylene Rubber (EPDM)	Shore A65	Black
RBEW	RBEWA	RBEWF	RBEWFA			White
RBRM	RBRMA	RBRMF	RBRMFA	Butyl Rubber (IIR)	Shore A65	Black
RBWM	RBWMA	RBWMF	RBWMFA			White
AMSE	AMSEA	AMSET	AMSETA	Amber Color Rubber	Shore A45	Amber Color

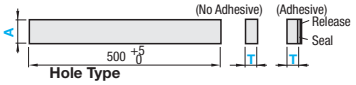
※Adhesive thickness is 0.02~0.025mm.
※For Adhesive Strength Data, refer to ☞P.448 (ADTR)

■A Dimension Standard Type

Square Type



Band Type



Hole Type

■Precision Standards

T Tolerance

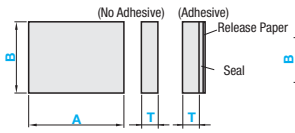
T	Tolerance
0.5	±0.2
1~3	±0.3
5	±0.4
10	±0.6
15~30	-0.5~+2.0

A · B Tolerance

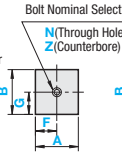
A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~500	±1.5

■A · B Dimension Configurable Type

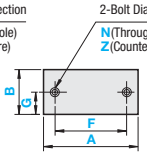
Standard Type



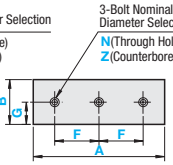
–1 Hole–1H



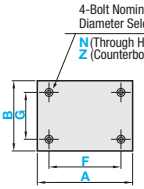
–2 Hole–2H



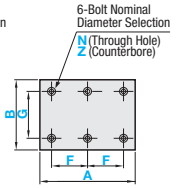
–3 Hole–3H



–4 Hole–4H



–6 Hole–6H



※For Adhesive Type T5 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.
※A · B dimension tolerance has changed. Please refer to the precision standard above.

■A Dimension Standard Type –Square Type–

Part Number			A
Type		T	Selection
No Adhesive	Adhesive	*1	300
RBPM	RBPMA	*2	500
*RBEW	*RBEWA	*3	
RBRM	RBRMA	5	
RBWM	RBWMA	10	
AMSE	AMSEA	15	
		20	
		30	

※Only * marked T dimensions are available for RBEW and RBEWA.
※T15 is not selectable for Butyl Rubber White, T30 is not selectable for Amber Color Rubber.

■A Dimension Standard Type –Band Type–

Part Number			A
Type		T	Selection
No Adhesive	Adhesive	*1	3
RBPM	RBPMA		5
*RBEW	*RBEWA		10
RBRM	RBRMA		20
RBWM	RBWMA		30
AMSE	AMSEA	*2	40
		*3	50
		5	80
		10	100

※L dimension is 500mm. (300mm for White rubber)
※Only * marked T dimensions are available for RBEW and RBEWA.

■A · B Dimension Configurable Type –Standard Type–

Part Number			1mm Increment	
Type		T	A	B
No Adhesive	Adhesive	*1	10~500	10~500
RBPMF	RBPMFA	*2		
*RBEWF	*RBEWFA	*3		
RBRMF	RBRMFA	5		
RBWMF	RBWMFA	10		
AMSET	AMSETA	15		
		20		
		30		

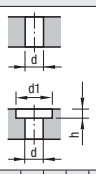
※A≥B≥T
※Only * marked T dimensions are available for RBEWF and RBEWFA.
※T15 is not selectable for Butyl Rubber White, T30 is not selectable for Amber Color Rubber.

■A · B Dimension Configurable Type –Hole Type–

Part Number			1 mm Increment (A≥B≥T)		0.5mm Increment		Bolt Nominal Diameter	
Type		Nominal	T	A	B	F	G	N (Through Hole)	Z (Counterbore)
No Adhesive	Adhesive	1H	1	25~500	25~500	9~491 (1Hm· 2H · 4H Type)	5~495 (1H · 2H · 3H Type)	3	-
RBPMF	RBPMFA	2H	2					4	-
RBEWF	RBEWFA	3H	3					5	-
RBRMF	RBRMFA	4H	5					6	-
RBWMF	RBWMFA	6H	10			9~245 (3H · 6H Type)	9~491 (4H · 6H Type)	8	3 4
AMSET	AMSETA		15					10	4 5 6 8
			20						4 5 6 8
			30						4 5 6 8 10

※Dimension F Specification Range: For 1H: $d(d_1)/2+2.5\leq F\leq A-d(d_1)/2-2.5$, for 2H · 4H: $d(d_1)+5\leq F\leq A-d(d_1)-5$, for 3H · 6H: $d(d_1)+5\leq F\leq A/2-d(d_1)/2-2.5$.)
※Dimension G Specification Range: For 1H · 2H · 3H: $d(d_1)/2+2.5\leq G\leq B-d(d_1)/2-2.5$, for 4H · 6H: $d(d_1)+5\leq G\leq B-d(d_1)-5$. (d for through hole, d_1 for counterbore)
※For RBEWF and RBEWFA, T≤3. ※T15 is not selectable for Butyl Rubber White, T30 is not selectable for Amber Color Rubber.

Hole Machining Details



Screw Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d_1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

Order Example

■A Dimension Standard Type

Part Number	-	A
RBPM5	-	300

■A · B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
RBPMF10	-	110	-	65						
RBPMF4H20	-	200	-	150	-	F140	-	G100	-	Z5

Days to Ship

8 Days

Express A 3,00 EUR/ piece ☞P.88

※A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B

RBPMFA10 - 500 - 400

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price

48,20 x 1.3 = 62,66 ➡ 62,60 EUR

A Dimension Standard Type -Square Type-

Part Number		€ Unit Price	
		A	
Type	T	300	500
No Adhesive RBPM(x1.0) *RBEW(x1.9) RBRM(x1.3) RBWM(x1.4) AMSE(x1.5) Adhesive RBPMA(x1.3) *RBEWA(x2.0) RBRMA(x1.6) RBWMA(x1.5) AMSEA(x1.6) ( ) Material Rate	*1		
	*2		
	*3		
	5		
	10		
	15		
	20		
	30		

Only * marked T dimensions are available for RBEW and RBEWA.

T15 is not selectable for Butyl Rubber White, T30 is not selectable for Amber Color Rubber.

A Dimension Standard Type -Band Type-

Part Number		€ Unit Price								
		A								
Type	T	3	5	10	20	30	40	50	80	100
No Adhesive RBPM(x1.0) *RBEW(x1.3) RBRM(x1.0) RBWM(x1.0) AMSE(x1.7) Adhesive RBPMA(x1.3) *RBEWA(x1.4) RBRMA(x1.2) RBWMA(x1.2) AMSEA(x1.8) ( ) Material Rate	*1									
	*2									
	*3									
	5									
	10									

Only * marked T dimensions are available for RBEW and RBEWA.

A · B Dimension Configurable Type

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

Part Number		A	€ Unit Price B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive RBPMF(x1.0) *RBEWF(x1.6) RBRMF(x1.0) RBWMF(x1.3) AMSET(x1.7) Adhesive RBPMFA(x1.3) *RBEWFA(x1.7) RBRMFA(x1.3) RBWMFA(x1.4) AMSETA(x1.8) ( ) Material Rate	*1	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	*3	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					

T15 is not selectable for Butyl Rubber White, T30 is not selectable for Amber Color Rubber.

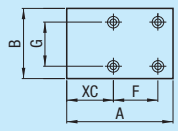
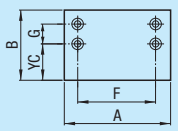
Part Number		A	€ Unit Price B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive RBPMF(x1.0) RBRMF(x1.0) RBWMF(x1.3) AMSET(x1.7) Adhesive RBPMFA(x1.3) RBRMFA(x1.3) RBWMFA(x1.4) AMSETA(x1.8) ( ) Material Rate	10	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
	15	15~100					
		101~200					
		201~300					
		301~400					
		401~500					
	20	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
	30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					

Only * marked T dimensions are available for RBEWF and RBEWFA.

Alterations

Part Number - A - B - F - G - Bolt Nominal - (XC · YC)

RBPMF4H5 - 100 - 80 - F65 - G40 - N4 - YC30

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤486 (286 for non-staining chloroprene rubber with T15 or larger) (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2-2.5 (3H · 6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2-2.5	YC=1 mm Increment 5≤YC≤486 (286 for non-staining chloroprene rubber with T15 or larger) d (d1)/2+2.5≤YC≤B–G–d (d1)/2-2.5
Price Adder	4,00	4,00

Hole Machining Charge

Hole Type	Bolt Nominal	
	N (Through Hole)	Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

(Ex.) Part Number - A - B - F - G - Bolt Nominal

RBPMF4H10 - 200 - 180 - F160 - G140 - Z3

(Standard Type) + (Hole Selection Price) = (Hole Type)

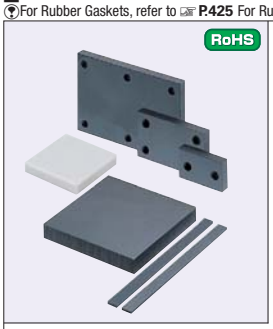
10,80 + 5,00 = 15,80 EUR

*Yellowing of white rubber

Please note upon application that aging in color is more distinct compared to black rubber.

Add. Spec. Fluorine Rubber Sheets

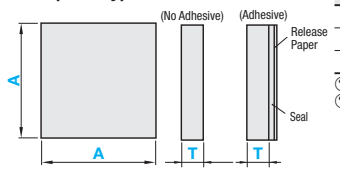
■Fluoro rubber has excellent chemical resistance and the best heat resistance among rubbers. ■Oil-resistant adhesives are available as an alternative.
For Rubber Gaskets, refer to ☞P.425 For Rubber Blocks, refer to ☞P.404



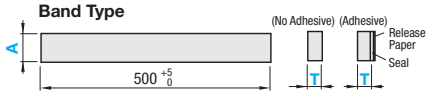
RoHS

■A Dimension Standard Type

Square Type



Band Type



A Dimension Standard Type		A · B Dimension Configurable Type		M Material	H Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
RBFM	RBFMA	RBFMF	RBFMFA	Fluoro Rubber (FPM)	Shore A80	Black
RBLM	RBLMA	RBLMF	RBLMFA	Fluoro Rubber (FPM)	Shore A60	Black
RBFW	RBFWA	RBFWF	RBFWFA	Fluoro Rubber (FPM)	Shore A70	White

Adhesive thickness is 0.02~0.025mm. For Adhesive Strength Data, refer to ☞P.448 (ADTR)
For Oil-resistant Adhesive strength, refer to ☞P.387

■Precision Standards

T Tolerance

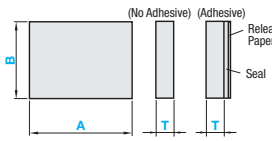
T	Tolerance
0.5	±0.2
1~3	±0.3
5	±0.4
10	±0.6
15~30	-0.5~+2.0

A · B Tolerance

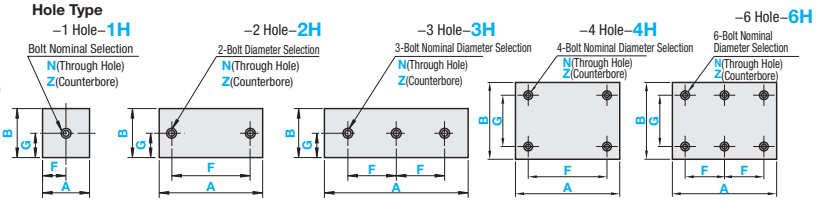
A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~500	±1.5

■A · B Dimension Configurable Type

Standard Type



Hole Type



For Adhesive Type T5 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.
A · B dimension tolerance has changed. Please refer to the precision standard above.

■A Dimension Standard Type –Square Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive	0.5	300
		1	500
RBFM	RBFMA	2	Only
RBLM	RBLMA	3	300
RBFW	RBFWA	5	is available for
		10	T15 or more of
		15	RBFM
(For exceptions in T dimensions, see below.)		20	and
		30	BFMA.

For RBLM and RBLMA, T=15, 20, 30 are not available.
For RBFW and RBFWA, only available in T=1, 2, 3, 5.

■A Dimension Standard Type –Band Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive	0.5	3
			5
RBFM	RBFMA		10
RBLM	RBLMA	1	20
RBFW	RBFWA	2	30
		3	40
		5	50
(For exceptions in T dimensions, see below.)		10	80
			100

For RBFW and RBFWA, T=0.5, 10 are not available.

■A · B Dimension Configurable Type –Standard Type–

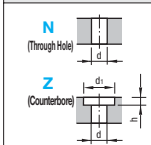
Part Number Type		T	1mm Increment A	1mm Increment B
No Adhesive	Adhesive	0.5	10~500	10~500
		1	Only	Only
RBFMF	RBFMFA	2	10~300	10~300
RBLMF	RBLMFA	3	is available	is available
RBFWF	RBFWFA	5	for T15 or	for T15 or
		10	more of	more of
		15	RBFMF	RBFMF
(For exceptions in T dimensions, see below.)		20	and	and
		30	BFMFA.	BFMFA.

A≥B≥T
For RBLMF and RBLMFA, T=15, 20, 30 are not available.
For RBFWF and RBFWFA, only available in T=1, 2, 3, 5.

■A · B Dimension Configurable Type –Hole Type–

Part Number Type	Nominal	T	1 mm Increment (A≥B≥T) A	B	0.5mm Increment F	G	Bolt Nominal Diameter N (Through Hole)	Z (Counterbore)
No Adhesive Adhesive		0.5	25~500	25~500	9~491 (1H · 2H · 4H Type) 9~245 (3H · 6H Type)	5~495 (1H · 2H · 3H Type) 9~491 (4H · 6H Type)	3 4 5 6 8 10	- - - - 3 4
RBFMF RBFMFA	1H	1						
RBLMF RBLMFA	2H	2						
RBFWF RBFWFA	3H	3						
	4H	5						
	6H	10						
		15			9~291 (1H · 2H · 4H Type) 9~145 (3H · 6H Type)	5~295 (1H · 2H · 3H Type) 9~291 (4H · 6H Type)		5 6 8 10
(For exceptions in T dimensions, see below.)		20						
		30						

Hole Machining Details

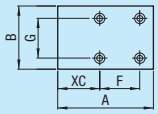
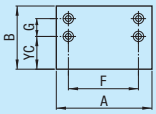


Bolt Nom.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

For RBLMF and RBLMFA, T=15, 20, 30 are not available. For RBFWF and RBFWFA, only available in T=1, 2, 3, 5.
Dimension F Specification Range: For 1H: d(d1)/2+2.5≤F≤A-d(d1)/2-2.5, for 2H, 4H: d(d1)+5≤F≤A-d(d1)-5, for 3H·6H: d(d1)+5≤F≤A/2-d(d1)/2-2.5.
Dimension G Specification Range: For 1H · 2H·3H: d(d1)/2+2.5≤G≤B-d(d1)/2-2.5, for 4H · 6H: d(d1)+5≤G≤B-d(d1)-5. (d for through hole, d1 for counterbore)

Alterations

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal	-	(XC / YC / KT2)
RBFMF4H5	-	100	-	80	-	F65	-	G40	-	N4	-	YC30
RBFMFA2	-	250	-	150							-	KT2

Alterations	Hole Position from Left	Hole Position from Bottom	Adhesive Type Change
			Changes to Oil-resistant Adhesives.
Code	XC	YC	KT2
Spec.	XC=1 mm Increment 5≤XC≤486 (2H · 4H Type) d(d1)/2+2.5≤XC≤A-F-d(d1)/2-2.5 (3H · 6H Type) d(d1)/ 2+2.5≤XC≤A-2F-d(d1)/2-2.5	YC=1 mm Increment 5≤YC≤486 d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5	Not available for No Adhesive Type. Only available for T=1, 2, 3. Band Type A=3 or 5 is not selectable. Not selectable for RBFWA and RBFWFA. Ordering Code KT2
Price Adder	4,00	4,00	Refer to the right figure.

■Price of with Oil-resistant Adhesives

KT2 (A dimension)	Machining Charge
10~100	
101~200	
201~300	
301~400	
401~500	

*Alteration Code for NTNF and NTNFF has changed to KT2.

Price Reduction
Up to 40%

CAD Data

Order Example

A Dimension Standard Type

Part Number	-	A
RBFM5	-	100

A · B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
RBFMF10	-	110	-	65						
RBFMF4H20	-	200	-	150	-	F140	-	G100	-	Z5

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1	2~9	10~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of this product is found by multiplying the unit price shown in the table by the material rate. (Round down to one cent.)

(Ex.) Part Number - A - B
RBLMF10 - 500 - 400

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price
491,50 x 1.1 = 540,65 € ➡ 540,60 EUR

Days to Ship

8 Days | Express A | 3,00 EUR/ piece | P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

A Dimension Standard Type -Square Type-

Part Number		€ Unit Price A	
Type	T	300	500
No Adhesive RBFM (x1.0)	0.5		
RBLM (x1.1)	1		
RBFW (x2.5)	2		
	3		
Adhesive	5		
RBFMA (x1.1)	10		
RBLMA (x1.2)	15		
RBFWA (x2.8)	20		
( ) Material Rate	30		

For RBLM and RBLMA, T=15, 20, 30 are not available.
For RBFW and RBFWA, only available in T=1, 2, 3, 5.

A Dimension Standard Type -Band Type-

Part Number		€ Unit Price A								
Type	T	3	5	10	20	30	40	50	80	100
No Adhesive RBFM (x1.0)	0.5									
RBLM (x1.1)	1									
RBFW (x2.5)	2									
Adhesive	3									
RBFMA (x1.1)	5									
RBLMA (x1.2)	10									
RBFWA (x2.7)										
( ) Material Rate										

For RBFW and RBFWA, T=0.5, 10 are not available.

A · B Dimension Configurable Type

Part Number		A	€ Unit Price B					
Type	T		10~50	51~100	101~200	201~300	301~400	401~500
No Adhesive RBFMF (x1.0)	0.5	10~50						
RBLMF (x1.1)		51~100						
RBFWF (x2.5)		101~200						
Adhesive RBFMFA (x1.1)		201~300						
RBLMFA (x1.2)		301~400						
RBFWFA (x2.7)		401~500						
( ) Material Rate	1	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	2	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	3	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						
	5	10~50						
		51~100						
		101~200						
		201~300						
		301~400						
		401~500						

For RBLMF and RBLMFA, T=15, 20, 30 are not available.
For RBFWF and RBFWFA, only available in T=1, 2, 3, 5.

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

Part Number		A	€ Unit Price B					
Type	T		10~50	51~100	101~200	201~300	301~400	401~500
No Adhesive RBFMF (x1.0)	10	10~50						
RBLMF (x1.1)		51~100						
Adhesive RBFMFA (x1.1)		101~200						
RBLMFA (x1.2)		201~300						
( ) Material Rate		301~400						
		401~500						
	15	15~50						
		51~100						
		101~200						
		201~300						
	20	20~50						
		51~100						
		101~200						
		201~300						
	30	30~50						
		51~100						
		101~200						
		201~300						

*Yellowing of white rubber
Please note upon application that aging in color is more distinct compared to black rubber.

Hole Machining Charge

Hole Type	Bolt Nominal N (Through Hole)	Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

(Ex.) Part Number - A - B - F - G - Bolt Nominal
RBFMF4H10 - 200 - 180 - F160 - G140 - Z3

(Standard Type) + (Hole Selection Price) = (Hole Type)
124,50 + 5,00 = 129,50 EUR

Silicon Rubber Sheets / High Strength Silicon Rubber Sheets

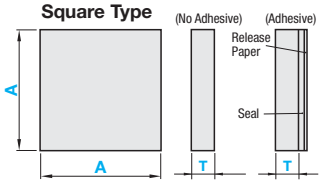
■Silicon rubber excels in heat, low temperature and weather resistance. Compliant with Food Sanitation Act, Ordinance of the Ministry of Health and Welfare No. 85.
■High Strength Silicon Rubber has 3~5 times more tear strength than the ordinary silicon rubber which is inferior in mechanical strength. ☞For Rubber Gaskets, refer to ☞P.425 For Rubber Blocks, refer to ☞P.404



RoHS

■A Dimension Standard Type

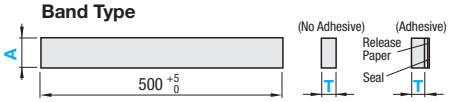
Square Type



A Dimension Standard Type		A · B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
RBSM	RBSMA	RBSMF	RBSMFA	Silicon Rubber (SI)	Shore A70	Light Gray
RBAM	RBAMA	RBAMF	RBAMFA	Silicon Rubber (SI)	Shore A50	Milky White
RBHSM	RBHSMA	RBHSMF	RBHSMFA	High Strength Silicon Rubber (SI)	Shore A50	Ivory

☞Adhesive thickness is 0.02~0.025mm.
☞For Adhesive Strength Data, refer to ☞P448 (ADTS)
☞The milky white color of silicone rubber shore A 50 is translucent.

Band Type



■Precision Standards

T Tolerance

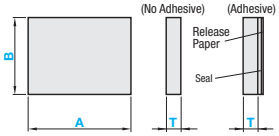
T	Tolerance
0.5	±0.2
1~3	±0.3
5	±0.4
10	±0.6
15~30	-0.5~+2.0

A · B Tolerance

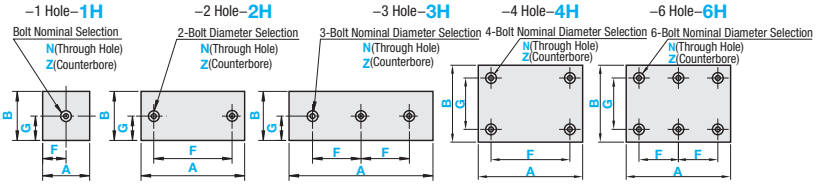
A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~500	±1.5

■A · B Dimension Configurable Type

Standard Type



Hole Type



☞For Adhesive Type T5 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.
☞A · B dimension tolerance has changed. Please refer to the precision standard above.

■A Dimension Standard Type –Square Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive		
RBSM	RBSMA	0.5	300
RBAM	RBAMA	*1	
*RBHSM	*RBHSMA	*2	
		*3	
		*5	
		*10	500
		15	
		20	
		30	

☞* Only those * marked are available for T dimension of RBHSM · RBHSMA.

■A Dimension Standard Type –Band Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive		
RBSM	RBSMA	0.5	3
RBAM	RBAMA		5
*RBHSM	*RBHSMA	*1	10
		*2	20
		*3	30
		*5	40
		*10	50
			80
			100

☞* Only those * marked are available for T dimension of RBHSM · RBHSMA. ☞L dimension is 500mm.

■A · B Dimension Configurable Type –Standard Type–

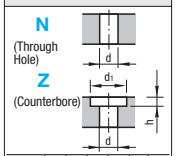
Part Number Type		T	1mm Increment A	1mm Increment B
No Adhesive	Adhesive			
RBSMF	RBSMFA	0.5	10~500	10~500
RBAMF	RBAMFA	*1		
*RBHSMF	*RBHSMFA	*2		
		*3		
		*5		
		*10		
		15		
		20		
		30		

☞* Only those * marked are available for T dimension of RBHSMF · RBHSMFA. ☞A≥B≥T

■A · B Dimension Configurable Type –Hole Type–

Part Number Type		Nominal	T	1 mm Increment (A≥B≥T) A	1 mm Increment (A≥B≥T) B	0.5mm Increment F	0.5mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter Z (Counterbore)
No Adhesive	Adhesive	1H	0.5	25~500	25~500	9~491 (1H · 2H · 4H Type)	5~495 (1H · 2H · 3H Type)	3	-
RBSMF	RBSMFA	2H	*1					4	-
RBAMF	RBAMFA		*2					5	-
*RBHSMF	*RBHSMFA	3H	*3					6	-
			*5			9~245 (3H · 6H Type)	9~491 (4H · 6H Type)	8	3 4
		4H	*10					10	4 5 6 8
			15						4 5 6 8
		6H	20						4 5 6 8 10
			30						

Hole Machining Details



Bolt Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

☞* Only those * marked are available for T dimension of RBHSMF, RBHSMFA.
☞Dimension F Specification Range: For 1H: d(d1)/2+2.5≤F≤A-d(d1)/2-2.5, for 2H · 4H: d(d1)+5≤F≤A-d(d1)-5, for 3H, 6H: d(d1)+5≤F≤A/2-d(d1)/2-2.5.
☞Dimension G Specification Range: For 1H · 2H · 3H: d(d1)/2+2.5≤G≤B-d(d1)/2-2.5, for 4H · 6H: d(d1)+5≤G≤B-d(d1)-5. (d for through hole, d1 for counterbore)

Order Example

■A Dimension Standard Type

Part Number	-	A
RBSMA15	-	300

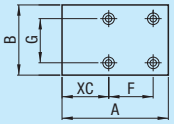
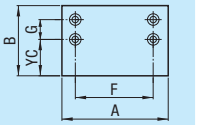
■A · B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
RBSMF10	-	110	-	65						
RBHSMFA4H5	-	200	-	150	-	F140	-	G100	-	N5

Days to Ship: 8 Days — Express A: 3,00 EUR/piece ☞P.88
☞A Express Charge of 8,10 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal	-	(XC · YC)
RBAMF4H5	-	100	-	80	-	F65	-	G40	-	N4	-	YC30

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment ☞5≤XC≤486 ☞(2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2-2.5 ☞(3H · 6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2-2.5	YC=1 mm Increment E5≤YC≤486 Ed (d1)/2+2.5≤YC≤B–G–d (d1)/2-2.5
Price Adder	4,00	4,00

Price Reduction
Up to 33%

CAD Data

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1	2~9	10~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

A Dimension Standard Type –Square Type–

Part Number		€ Unit Price	
		A	
Type	T	300	500
No Adhesive RBSM(x1.0) RBAM(x1.0)	0.5		
	1		
	2		
	3		
Adhesive RBSMA(x1.4) RBAMA(x1.4)	5		
	10		
	15		
	20		
( ) Material Rate	30		
No Adhesive RBHSM(x1.0)	1		
	2		
Adhesive RBHSMA(x1.2)	3		
	5		
( ) Material Rate	10		

A Dimension Standard Type –Band Type–

Part Number		€ Unit Price								
		A								
Type	T	3	5	10	20	30	40	50	80	100
No Adhesive RBSM(x1.0) RBAM(x1.0)	0.5									
	1									
	2									
Adhesive RBSMA(x1.4) RBAMA(x1.4)	3									
	5									
( ) Material Rate	10									
No Adhesive RBHSM(x1.0)	1									
	2									
Adhesive RBHSMA(x1.2)	3									
	5									
( ) Material Rate	10									

A · B Dimension Configurable Type

Part Number			A	€ Unit Price B					
Type		T		10~50	51~100	101~200	201~300	301~400	401~500
No Adhesive RBSMF (x1.0) RBAMF (x1.0)		0.5	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
		1	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
		2	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
		3	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
Adhesive RBSMFA (x1.3) RBAMFA (x1.3)		5	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
		10	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
( ) Material Rate		15	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
		20	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						
		30	10~50						
			51~100						
			101~200						
			201~300						
			301~400						
			401~500						

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

Part Number			A	€ Unit Price B				
Type		T		10~100	101~200	201~300	301~400	401~500
No Adhesive RBHSMF (x1.0)		1	10~100					
			101~200					
			201~300					
			301~400					
			401~500					
		2	10~100					
			101~200					
			201~300					
			301~400					
			401~500					
Adhesive RBHSMFA (x1.2)		3	10~100					
			101~200					
			201~300					
			301~400					
			401~500					
		5	10~100					
			101~200					
			201~300					
			301~400					
( ) Material Rate			401~500					
		10	10~100					
			101~200					
			201~300					
			301~400					
			401~500					

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number [RBSMFA10] - A [100] - B [100] (€ Unit Price) 15,00 x (Material Rate) 1.3 = Standard Type € Unit Price 19,50 EUR

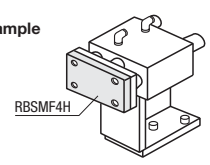
Hole Machining Charge

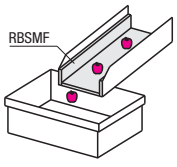
Hole Type	Bolt Nominal N (Through Hole)	Bolt Nominal Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

(Ex.) Part Number [RBSMF4H10] - A [200] - B [180] - F [F160] - G [G140] - Bolt Nominal [Z3]

(Standard Type) + (Hole Selection Price) = (Hole Type)
30,00 + 5,00 = 35,00 EUR

Example





Features of High Strength Silicon Rubber

Excels in tear strength in comparison with general silicon rubber.

Comparison of Tear Strength	(N/mm)
Silicon Rubber (Shore A70)	7
Silicon Rubber (Shore A50)	10
High Strength Silicon Rubber (Shore A50)	32
Nitrile Rubber (Shore A70)	20

JIS K6252

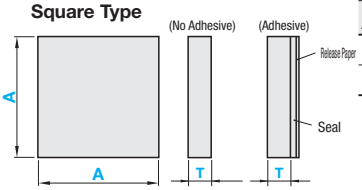
Low Elasticity Rubber Sheets
-Hanenaito®-

■Hanenaito® excels in shock and vibration resistance and absorbs energy without rebound. Best suited for receivers for work. For property details, refer to P.360

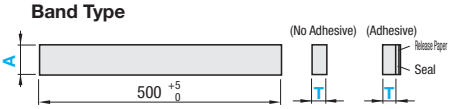


■A Dimension Standard Type

Square Type



Band Type



A Dimension Standard Type		A · B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
UNSE	UNSEA	UNSET	UNSETA	Low Elasticity Rubber (Hanenaito® GP-35L)	Shore A32	Black
UNLE	UNLEA	UNLET	UNLETA	Low Elasticity Rubber (Hanenaito® GP-60L)	Shore A57	Black

Hanenaito® is a registered trademark of Naigai Rubber Industry Co., Ltd.
Adhesive thickness is 0.02~0.025mm.
Has slightly more stickiness.

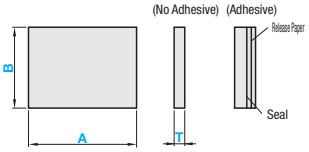
■Precision Standards

T Tolerance	
T	Tolerance
1~3	±0.3
5, 10	±0.4
15~30	±0.5

A · B Tolerance	
A · B	Tolerance
200 or Less	±0.5
201~300	±1.0
301~500	±1.5

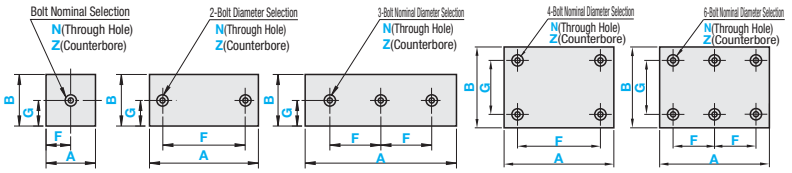
■A · B Dimension Configurable Type

Standard Type



Hole Type

–1 Hole–1H –2 Hole–2H –3 Hole–3H –4 Hole–4H –6 Hole–6H



For Adhesive Type T5 or more, the adhesive tape may tear from the body. Please use it as temporary fixing, or in combination with bolt fixing.
A · B dimension tolerance has changed. Please refer to the precision standard above.

■A Dimension Standard Type –Square Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive	15	250
UNSE	UNSEA	20	
UNLE	UNLEA	30	

■A Dimension Standard Type –Band Type–

Part Number Type		T	A Selection
No Adhesive	Adhesive	1	3
			5
		2	10
			20
UNSE	UNSEA	3	30
			40
UNLE	UNLEA	5	50
			80
		10	100

L dimension is 500mm.

■A · B Dimension Configurable Type –Standard Type–

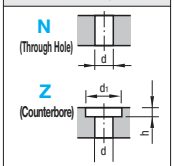
Part Number Type		T	1mm Increment A	1mm Increment B
No Adhesive		1	10~350	10~350
UNSET		2		
UNLET		3		
		5		
		10		
Adhesive		15	10~250	10~250
UNSETA		20		
UNLETA		30		

A≥B≥T

■A · B Dimension Configurable Type –Hole Type–

Part Number Type	Nominal	T	1 mm Increment (A≥B≥T) A	B	0.5mm Increment F	G	Bolt Nominal Diameter N (Through Hole)	Z (Counterbore)
No Adhesive	1H	1	25~350	25~350	9~341 (1H · 2H · 4H Type)	5~345 (1H · 2H · 3H Type)	3	-
UNSET		2						-
UNLET	2H	3					4	-
		5			9~170 (3H - 6H Type)	9~341 (4H · 6H Type)	5	-
	3H	10					6	3 4
Adhesive							8	4 5 6 8
UNSETA	4H	15	25~250	25~250	9~241 (1H · 2H · 4H Type)	5~245 (1H · 2H · 3H Type)	10	4 5 6 8
UNLETA		20			9~120 (3H - 6H Type)	9~241 (4H · 6H Type)		4 5 6 8 10
	6H	30						

Hole Machining Details



Bolt Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12
d1	6.5	8	9.5	11	14	17.5
h	3.5	4.5	5.5	6.5	9	11

Dimension F Specification Range: For 1H: d(d1)/2+2.5≤F≤A-d(d1)/2-2.5, for 2H · 4H: d(d1)+5≤F≤A-d(d1)-5, for 3H · 6H: d(d1)+5≤F≤A/2-d(d1)/2-2.5.)
Dimension G Specification Range: For 1H · 2H, 3H: d(d1)/2+2.5≤G≤B-d(d1)/2-2.5, for 4H · 6H: d(d1)+5≤G≤B-d(d1)-5. (d for through hole, d1 for counterbore)

Order Example

■A Dimension Standard Type

Part Number	-	A
UNSE10	-	100

■A · B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
UNSET10	-	110	-	65						
UNSET4H20	-	200	-	150	-	F140	-	G100	-	Z5

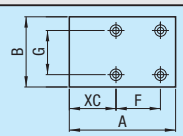
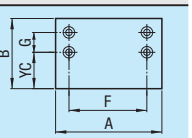
Days to Ship

8 Days | Express A | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal	-	(XC · YC)
UNSET4H5	-	100	-	80	-	F75	-	G40	-	N4	-	YC30

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤336 (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2-2.5 (3H · 6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2-2.5	YC=1 mm Increment 5≤YC≤336 d (d1)/2+2.5≤YC≤B–G–d (d1)/2-2.5
Price Adder	4,00	4,00

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

A Dimension Standard Type –Square Type–

Part Number Type	T	€ Unit Price A 250
No Adhesive UNSE(x1.0) Adhesive UNSEA(x1.1)	15	
	20	
	30	
No Adhesive UNLE(x1.0) Adhesive UNLEA(x1.1)	15	
	20	
	30	

A Dimension Standard Type –Band Type–

Part Number Type	T	€ Unit Price A 3	5	10	20	30	40	50	80	100
No Adhesive UNSE(x1.0) Adhesive UNSEA(x1.1)	1									
	2									
	3									
	5									
	10									
No Adhesive UNLE(x1.0) Adhesive UNLEA(x1.1)	1									
	2									
	3									
	5									
	10									

A · B Dimension Configurable Type

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B
UNSETA 1 - 200 - 200

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price
16,50 X 1.1 = 18,15 ➡ 18,10 EUR

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

Part Number Type	T	A	€ Unit Price B 10~50	51~100	101~150	151~200	201~250	251~300	301~350
No Adhesive UNSET (x1.0) Adhesive UNSETA (x1.1) ( ) Material Rate	1	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	2	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	3	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	5	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	10	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	15	15~50							
		51~100							
		101~150							
		151~200							
		201~250							
	20	20~50							
		51~100							
		101~150							
		151~200							
		201~250							
	30	30~50							
		51~100							
		101~150							
		151~200							
		201~250							

Part Number Type	T	A	€ Unit Price B 10~50	51~100	101~150	151~200	201~250	251~300	301~350
No Adhesive UNLET (x1.0) Adhesive UNLETA (x1.1) ( ) Material Rate	1	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	2	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	3	10~50							
		51~100							
		101~150							
		151~200							
		201~250							
		251~300							
		301~350							
	5	10~50							
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		301~350							
	15	15~50							
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		151~200							
		201~250							
	20	20~50							
		51~100							
		101~150							
		151~200							
		201~250							
	30	30~50							
		51~100							
		101~150							
		151~200							
		201~250							

Hole Machining Charge

Hole Type	Bolt Nominal N (Through Hole)	Z (Counterbore)
1H		
2H		
3H		
4H		
6H		

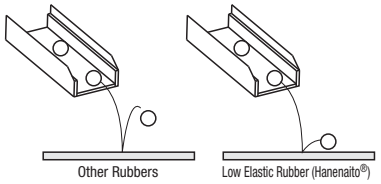
(Ex.)

Part Number	A	B	F	G	Bolt Nominal
UNSET4H10	- 200	- 180	- F160	- G140	- Z3

(Standard Type) + (Hole Selection Price) = (Hole Type)

76,20 + 5,00 = 81,20 EUR

Example



TPE Sheets / TPE Washers & Bumpers

■Low particle generating, extra-low outgas TPE sheet. Superior in ozone resistance and recommended for use near ionizer and in clean rooms.

■TPE Sheets



RoHS

A Dimension Standard Type		A · B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
TPES	TPESA	TPESS	TPESSA	Olefin Type TPE (Thermoplastic Elastomer)	Shore A65	Gray

■Precision Standards

T Tolerance

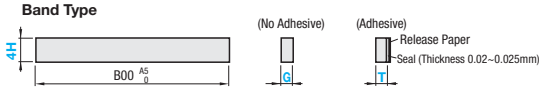
T	Tolerance
1~5	±0.3

A · B Tolerance

A · B	Tolerance
200 or Less	±0.5
201~300	±1.0

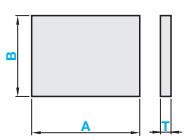
■A Dimension Standard Type

Band Type

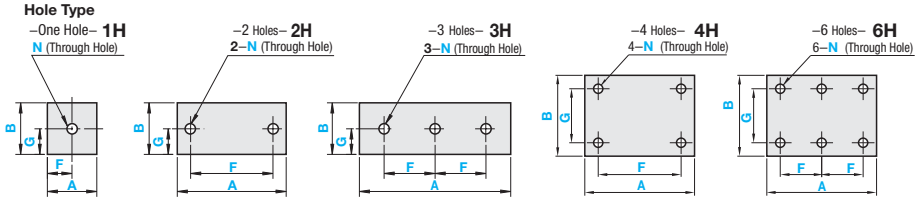


■A · B Dimension Configurable Type

Standard Type



Hole Type



Dimension Tolerance of A and B have changed. See precision standards below.

■A Dimension Standard Type –Band Type–

Part Number Type	T	A Selection
No Adhesive TPES / Adhesive TPESA	1	3 5 10 20 30 40 50 80 100
	3	
	5	

L dimension is 300mm.

■A · B Dimension Configurable Type –Standard Type–

Part Number Type	T	1mm Increment A	1mm Increment B
No Adhesive TPESS / Adhesive TPESSA	1	10~300	10~300
	3		
	5		

A≥B≥T

■A · B Dimension Configurable Type –Hole Type–

Part Number Type	Nominal	T	1 mm Increment (A≥B≥T) A	B	0.5mm Increment F	G	Bolt Nominal Diameter N (Through Hole)
No Adhesive TPESS / Adhesive TPESSA	1H 2H 3H 4H 6H	1 3 5	25~300	25~300	9~291 (1H · 2H · 4H Type) 9~145 (3H · 6H Type)	5~295 (1H · 2H · 3H Type) 9~291 (4H · 6H Type)	3 4 5 6 8 10

Hole Machining Details

N (Through Hole)



Screw Nominal	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	12

Dimension F Specification Range: For 1H, d/2+2.5≤F≤A–d/2–2.5; for 2H · 4H, d+5≤F≤A–d–5; for 3H, 6H, d+5≤F≤A/2-d/2*2.5.
Dimension G Specification Range: For 1H · 2H, 3H, d/2+2.5≤G≤B-d/2-2.5, for 4H · 6H: d+5≤G≤B-d-5.

Order Example

■A Dimension Standard Type

Part Number	-	A
TPES3	-	30
TPES5	-	100

■A · B Dimension Configurable Type

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
TPESS3	-	300	-	200						
TPESS3H3	-	200	-	150	-	F140	-	G120	-	N5

Days to Ship

8 Days | Express A | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Hole Machining Charge

Hole Type	Bolt Nominal N (Through Hole)
1H	
2H	
3H	
4H	
6H	

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

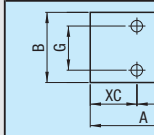
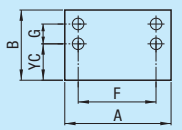
(Ex.)

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal
TPESS4H5	-	300	-	200	-	F200	-	G100	-	N8

(Standard Type € Unit Price) + (Hole Machining Charge) = Total Price
19,30 + 4,00 = 23,30 EUR

Alterations

Part Number	-	A	-	B	-	F	-	G	-	Bolt Nominal	-	(XC · YC)
TPESS4H5	-	100	-	80	-	F60	-	G20	-	N5	-	YC40

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤286 (2H · 4H Type) d/2+2.5≤XC≤A–F–d/2–2.5 (3H · 6H Type) d/2+2.5≤XC≤A–2F–d/2–2.5	YC=1 mm Increment 5≤YC≤286 d/2+2.5≤YC≤B–G–d/2–2.5
Price Adder	4,00	4,00

■A Dimension Standard Type –Band Type–

Part Number Type	T	€ Unit Price A 3	5	10	20	30	40	50	80	100
No Adhesive TPES	1									
	3									
	5									
Adhesive TPESA	1									
	3									
	5									

■A · B Dimension Configurable Type

Part Number Type	T	A	€ Unit Price B 10~100	101~200	201~300
No Adhesive TPESS	1	10~100			
		101~200			
		201~300			
Adhesive TPESSA (x1.1)	3	10~100			
		101~200			
		201~300			
( ) Material Rate	5	10~100			
		101~200			
		201~300			

Price Reduction
Up to 42%

CAD Data

■Low particle generating, low-outgas TPE washers and bumpers. Superior in ozone resistance and recommended for use near ionizer and in clean rooms.

■TPE Washers · Bumpers



RoHS

Washers		Configurable Type	Cushion Type	M Material	H Hardness	Color
No Adhesive	Adhesive					
WTPE	WTPEA	FWTPEA	RBXTP	Olefin Type TPE	Shore A65	Gray

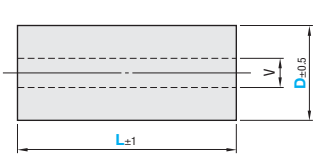
D Tolerance

D	Tolerance
6~40	±0.5
41~60	±0.6
61~100	±0.7

V Tolerance

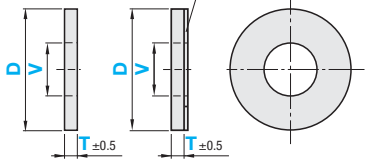
Material	Tolerance
Low Elasticity Rubber	±0.5
Others	+0.5 0

■Bumpers



■Washers

(No Adhesive) (Adhesive) Adhesive (thickness 0.02 - 0.025mm)



■TPE Washers Standard Type (No Adhesive · Adhesive)

Part Number Type	D	V	T	€ Unit Price WTPE	€ Unit Price WTPEA
No Adhesive WTPE	6	2	1 3		
	8	2 3 4	1 3		
	10	3 4 5 6	1 3 5		
	12	4 5 6 8	1 3 5		
	15	4 5 6 8 10	1 3 5		
Adhesive WTPEA	20	5 6 8 10 12	3 5		
	25	5 6 8 10 12 16 20	3 5		
	30	5 6 8 10 12 16 20	3 5		
	35	8 10 12 16 20 25	5		
	40	8 10 12 16 20 25 30	5		
	50	8 10 12 16 20 25 30	5		
	60	12 16 20 25 30 40	5		

■TPE Washers Configurable Type

Part Number Type	1mm Increment D	V	T	€ Unit Price FWTPEA
FWTPEA	6~15	0 (No Hole) 2~39 (V≤D−6)	1	
	16~30			
	31~45			
	46~60	0 (No Hole) 10~70 (V≤D−6)	3 5	
	61~80			
	81~100	0 (No Hole) 20~80 (V≤D−6)		

When V = 0, there is no hole.

■TPE Bumper Type

Part Number Type	D	L 1mm Increment	V	Applicable Bolts	€ Unit Price RBXTP L10~20	L21~30	L31~40	L41~50
Through Hole Type RBXTP	15	10~50	7	M4				
	20		10	M6				
	30		16	M10				

Order Example

■Standard Type

Part Number	-	V	-	T
WTPE20	-	10	-	5

Part Number	-	L
RBXTP20	-	30

■Configurable Type

Part Number	-	D	-	V	-	T
FWTPEA	-	D19	-	V3	-	T5

Days to Ship

■Standard Type: 8 Days

■Configurable Type: 10 Days — Express B — 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

[Measuring Method]

Particle Counters KR−12A Made by Rion Co. Ltd.
Sample Volume : 0.05CF
Measuring Time : every 2 mins. 30 minutes
Sample Size : 2x10cm



- Outgas Test Results

Measuring Method	GCMS	GCMS	GCMS	GCMS
Outgas	Acetaldehyde	t-Trimethylpentene	Dimethylheptane	Xylene
60°C 60min.	Below detection limit	Below detection limit	Below detection limit	Below detection limit
Detection Limit	0.01μg/g	0.01μg/g	0.01μg/g	0.01μg/g

- Dust Test Results Unit: P/CF

	0min	10min	20min	30min
TPE	40	140	60	180
EPDM65°	100	27260	112400	-
CR65°	100	4360	9920	14060
Fluorine 80°	780	540	80	220
Urethane 90°	40	6860	720	360

■Features of TPE

TPO (Thermo Plastic Olefin): A soft segment EPDM is finely-dispersed in a hard segment PP (Polypropylene).
Low-density (1 or less) and weight-saving Thermoplastic Elastomer.
Excels in electrical properties (more than thousandfold of specific volume resistivity compared to NBR rubbers) which is a feature of Olefin Type.
Excels in chemical resistance to acids or alkalis.
High fluidity excels molding works, low particle and low outgas properties are effective for recycling.

Metal-Plated Urethane Sheets

■Metal-Plated Urethane Sheets are available with short lead time.

CAD Data



Type	Type	Material	Hardness	Color
A / B Dimension Standard Type	UTPFS	Ether Polyurethane	Shore A95	Natural Color
	UTPFH		Shore A90	
	UTPFM	Ester Polyurethane	Shore A70	
	UTPFL		Shore A50	
A Dimension Configurable Type	UTPFSA	Ether Polyurethane	Shore A95	Natural Color
	UTPFHA		Shore A90	
	UTPFMA	Ester Polyurethane	Shore A70	
	UTPFLA		Shore A50	

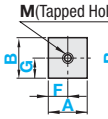
Properties P.358

Material: Plates: 1.4301/X5CrNi18-10

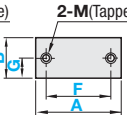
Standard and Corrugated Type are available online.

Metal Plate Female Thread Hole Type

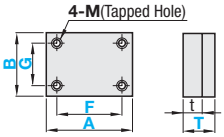
–1 Hole–1H



–2 Holes–2H



–4 Holes–4H



Precision Standards

T Tolerance

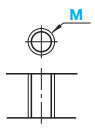
T	Tolerance
10, 15	±0.2

A · B Tolerance

A · B	Tolerance
50 or Less	±0.3
51~100	±0.5

■Metal Plate Female Thread Hole Type

Part Number Type	Nominal	T	A Standard Type	A 1mm Increment	B Selection	Plate Hole Position 1mm Increment F	Plate Hole Position 1mm Increment G	Female Thread Hole M	t (Plate Thickness)
Flat Type A / B Dimension Standard: UTPFS, UTPFH, UTPFM, UTPFL A Dimension Configurable: UTPFSA, UTPFHA, UTPFMA, UTPFLA	1H, 2H, 4H	10	10, 20, 50	10~100	10, 20, 30, 50	5~80	4~42	3, 4, 5, 6, 8, 10	6
		15	100						10

Hole Type	Female Thread Hole (Coarse)
Code	M
Shape	

Order Example

Part Number	A	B	F	G	M
UTPFSA2H10	20	30	F10	G15	M4

Days to Ship

■A · B Standard: 8 Days

■A Dimension Configurable Type: 10 Days

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

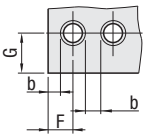
The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number: UTPFL10 - A: 10 - B: 10

(€ Unit Price) x (Material Rate) = € Unit Price of Standard Type

20,80 x 1.2 = 24,90 EUR

■Machining Limits (distance between holes, thickness between holes and edges)



b≥2

■A · B Standard ■Flat Type

Part Number Type	T	B	€ Unit Price A 10	A 20	A 50	A 100
UTPFS (x1.0) UTPFH (x0.9) UTPFM (x1.0) UTPFL (x1.1)	10	10				
		20				
		30				
		50				
	15	10				
		20				
		30				
		50				

■A Dimension Configurable Type ■Flat Type

Part Number Type	T	B	€ Unit Price A 10~25	A 26~50	A 51~75	A 76~100
UTPFSA (x1.0) UTPFHA (x0.9) UTPFMA (x1.0) UTPFLA (x1.1)	10	10				
		20				
		30				
		50				
	15	10				
		20				
		30				
		50				

■Tap Hole Machining Charge

Hole Type	Female Thread Hole M
1H	
2H	
4H	

The price of Hole Type is found by adding the standard type unit price to the hole machining charge.

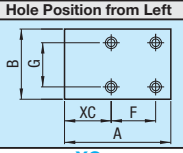
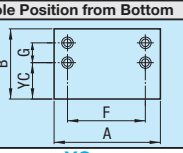
(Ex.) Part Number: UTPFSA2H10 - A: 20 - B: 50 - F: F10 - G: G15 - M: M4

(Standard Type € Unit Price) + (Hole Machining Charge) = Total Price

27,40 + 7,50 = 34,90 EUR

Alterations

Part Number: UTPFSA4H10 - A: 20 - B: 30 - F: F10 - G: G15 - M: M4 - (XC / YC): YC10

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment For machining limits, see above.	YC=1 mm Increment For machining limits, see above.
Price Adder	4,00	4,00

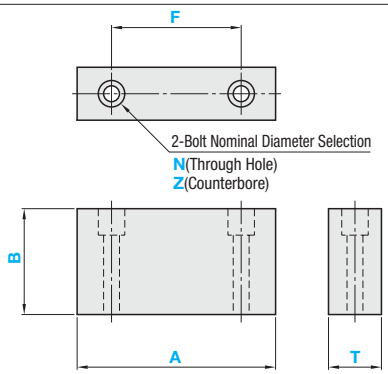
Urethane · Rubber Blocks

CAD Data



Type	Material	Hardness	Color
BUTSN	Ether Polyurethane	Shore A95	Natural Color
BUTHN		Shore A90	Natural Color
BUTM	Ester Polyurethane	Shore A70	Natural Color
BUTL		Shore A50	Natural Color
BRBNM	Nitrile Rubber	Shore A70	Black
BRBCM	Chloroprene Rubber	Shore A65	Black
BRBFM	Fluoro Rubber	Shore A80	Black
BRBSM	Silicon Rubber	Shore A70	Light Gray
BRBAM	Silicon Rubber	Shore A50	Milky White
BUNSE	Low Elasticity Rubber	Shore A32	Black

<Machining Limits>
5≤T−d(d1)
d(d1)+5≤F≤A-d(d1)-5

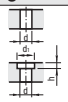


Part Number Type	1mm Increment A	B	T	F	Bolt Nominal Diameter N (Through Hole) - Z (Counterbore Hole)
BUTSN (Urethane A95) BUTHN (Urethane A90) BUTM (Urethane A70) BUTL (Urethane A50) BRBNM (Nitrile Rubber) BRBCM (Chloroprene Rubber) BRBFM (Fluoro Rubber) BRBSM (Silicon Rubber A70) BRBAM (Silicon Rubber A50) BUNSE (Low Elasticity Rubber)	25~150	25~100	6~30	9~141 (when N=0, F=0)	0 3 4 5 6 8 10 12 (When B<30) 0 5 6 8 10 12 (When 30≤B<50) 0 10 12 (When 50≤B) (When No Hole) N=0

Hole Machining Details

N (Through Hole)

Z (Counterbore)



Screw Nominal	3	4	5	5.5	6	6.5	8	9	10	11	12	14
d	3.5	4.5		5.5		6.5	9		12		14	
d1	6.5	8		9.5		11	14		17.5		20.5	
h	3.5	4.5		5.5		6.5	9		11		14	

Part Number Type	A	B	T	€ Unit Price BUTSN BUTM BUTL	BUTHN	BRBNM BRBCM	BRBFM	BRBSM BRBAM	BUNSE
BUTSN BUTHN BUTM BUTL BRBNM BRBCM BRBFM BRBSM BRBAM BUNSE	25~50	25~40	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		41~60	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		61~80	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		81~100	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
	51~100	25~40	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		41~60	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		61~80	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		81~100	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
	101~150	25~40	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		41~60	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		61~80	6~10						
			11~15						
			16~20						
			21~25						
			26~30						
		81~100	6~10						
			11~15						
			16~20						
			21~25						
			26~30						

Type	Material	Tolerance
BUTSN BUTHN	Ether Type Polyurethane	T Dimension: 6~9 ±0.3; 10 or more ±0.5
BUTM BUTL	Ester Type Polyurethane	A · B Dimension Tolerance: 30mm or less ±0.5; 31~50 ±0.7; 51 or more ±0.8
BRBNM	Nitrile Rubber	
BRBCM	Chloroprene Rubber	T Dimension: 6~9 ±0.5; 10 or more ±0.8
BRBFM	Fluoro Rubber	
BRBSM	Silicon Rubber	
BRBAM	Silicon Rubber	A · B Dimension Tolerance: 30mm or less ±0.8; 31~50 ±1.0; 51 or more ±1.5
BUNSE	Low Elasticity Rubber	

Order Example

Part Number	-	A	-	B	-	T	-	F	-	Bolt Nominal Diameter
BUTSN	-	A100	-	B100	-	T21	-	F53	-	N12
BUNSE	-	A150	-	B50	-	T7	-	F0	-	N0

Days to Ship

8 Days

Price

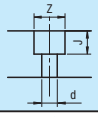
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

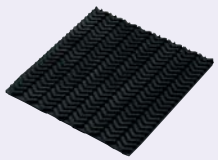
Part Number	-	A	-	B	-	T	-	F	-	Bolt Nominal Diameter	-	(ZC)
BUTSN	-	A100	-	B100	-	T30	-	F53	-	Z10	- ZC -	Z17.5 - J16

Alteration	Counterbore Hole Detailed Size
	
Code	ZC
Spec.	Changes the dimensions of Counterbore Hole. Ordering Code ZC-Z17.5-J15 Z, J=0.5mm Increment Z-d≥4 B-J≥2
Price Adder	3,00

Anti-Skid Rubber Sheets
-Hyper V® -

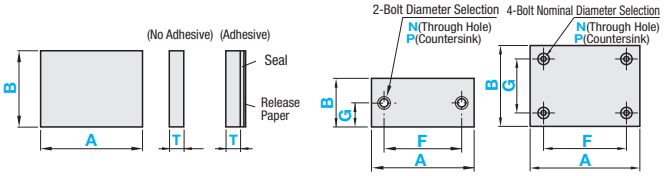
■Strong grip even on an oil applied work is ensured by its material property and special shape. Most suitable for work chuck.

■Anti-Skid Rubber Sheets RoHS

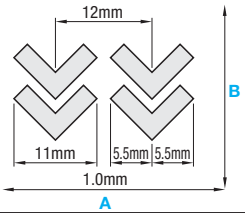


	No Adhesive	Adhesive	Material	Hardness	Color
V Pattern Width 11mm	STHVS	STHVSA	Nitrile rubber equivalent (Hyper V® Oil Resistant Type)	Shore A60	Black

Hyper V® is a trademark of Nisshin Rubber Co.



V Pattern Width 11mm Type



■ Accuracy Standards
-T Dimension Tolerance ±0.5
-Dimensional tolerances of A and B

200mm or Less	300mm or less
±0.5	±1.0

The sheet can be cut at a desired dimension regardless of the pattern.
V Pattern Width 22mm Type is now available online.

■A · B Dimension Configurable Type

Part Number		1mm Increment	
Type	T	A	B
STHVS STHVSA	4	10~300	10~300

■Hole Type

Part Number			1mm Increment				Bolt Nominal Diameter	
Type	Nominal	T	A	B	F	G	N (Through Hole)	P(Countersink)
STHVS STHVSA	2H 4H	4	10~300	10~300	5~295	5~295	3 · 4 · 5	3

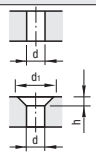
Dimension F Specification Range: d(d1)+5≤F≤A-d(d1)-5, Dimension G Specification Range: for 2H: d(d1)/2+2.5≤G≤B-d(d1)/2-2.5, for 4H: d(d1)+5≤G≤B-d(d1)-5.

■A · B Dimension Configurable Type

Part Number		1mm Increment Unit		€ Unit Price B		
Type	T	A	B	10~100	101~200	201~300
STHVS	4	10~100	10~300			
		101~200				
		201~300				
STHVSA		10~100	10~300			
		101~200				
		201~300				

Hole Machining Details

N (Through Hole)
P (Countersink)



Screw Nominal	3	4	5
d	3.5	4.5	5.5
d1	7.5	-	-
h	2	-	-

Order Example

■A · B Dimension Configurable Type

Part Number	-	A	-	B
STHVS4	-	250	-	100

■Hole Type

Part Number	-	A	-	B	-	F	-	G	-	N
STHVS4H4	-	250	-	200	-	F200	-	G150	-	N5

Days to Ship 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Hole Machining Charge

Hole Type	Hole Selection N (Through Hole)	Hole Selection P (Countersink)
2H		
4H		

Part Number	-	A	-	B	-	F	-	G	-	N
STHVS4H4	-	250	-	200	-	F200	-	G150	-	N5

(Standard Type) + (Hole Selection Price) = (Hole Type)

27,50 + 6,00 = 33,50 EUR

Hyper V®Features

Its ability of slip prevention especially on oily surface. Rubber sheet which is used for shoe sole has been developed for industrial use.

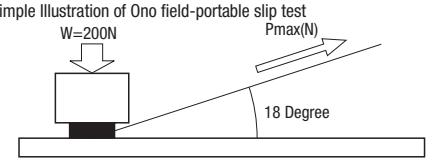
■Measurement of Coefficient of Slip Resistance (Ono Field-Portable Slip Test)

Condition	Coefficient of Slip Resistance (C. S. R')	
	Hyper V Sheet V11 Type	Rubber Plain Sheet
Dry	0.98	0.76
Wet (Water)	0.84	0.42
Wet (Glycerin)	0.44	0.03

The above values are not guaranteed values but a measured values.

- Measurement of Coefficient of Slip Resistance (Ono Field-Portable Slip Test)
Measure Max. tensile load (N) = Pmax by pulling a test specimen of 5mm thickness with applying 200N load on a stainless sheet of 50mm x 60mm.
A test result is shown as C.S.R' = Pmax/W.
Recommended as a rubber mat or a chucking material for workpiece that is slippery by cutting oil.

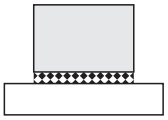
Simple Illustration of Ono field-portable slip test



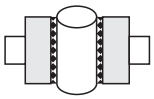
The test result shows that V11 Type begins moving by the force of 88N, and Plain Sheet begins moving by 6N with glycerin coating. It proves that Hyper V has an excellent slip resistance property.

Example

As a rubber mat



Grip an oil adherent work piece which does not easily chuck.



Nonskid Rubber Sheets / Silicon Gel Sheets

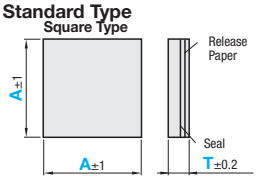
■Nonskid rubber sheets with embossed surface that have same function as adhesive discs.

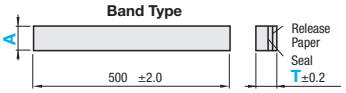
■Nonskid Rubber Sheets RoHS



■A Dimension Standard Type

STPES



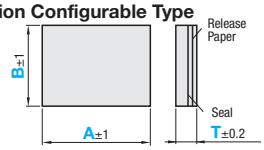


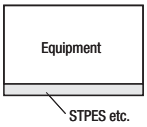
Example

t can be used as nonskid stopper pasted on the backside of equipments.

■A · B Dimension Configurable Type

STPESF





Adhesive thickness is 0.02~0.025mm.

M Material: Copolymerized Foam of Acrylic - Urethane - Rubber

■A Dimension Standard Type –Square Type–

Part Number		A Selection	€ Unit Price
Type	T		
STPES	1	300	
		500	

■A Dimension Standard Type –Band Type–

L Dimension is 500mm.

Part Number		A	€ Unit Price						
			A						
Type	T		10	20	30	40	50	80	100
STPES	1	10 · 20 30 · 40 50 · 80 100							

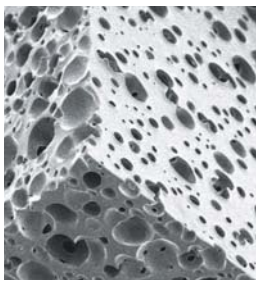
■A · B Dimension Configurable Type

Part Number		1mm Increment Unit		€ Unit Price				
				B				
Type	T	A	B	10~100	101~200	201~300	301~400	401~500
STPESF	1	10~100	10~500					
		101~200						
		201~300						
		301~400						
		401~500						

A≥B

■Features

Its finely embossed surface functions like a suction cup.



Order Example

■A Dimension Standard Type

Part Number	-	A
STPES1	-	300
STPES1	-	20

■A · B Dimension Configurable Type

Part Number	-	A	-	B
STPESF1	-	485	-	323

Days to Ship: 8 Days

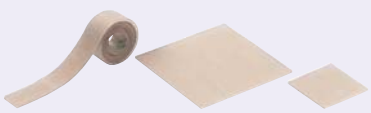
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Silicon Gel Sheets RoHS

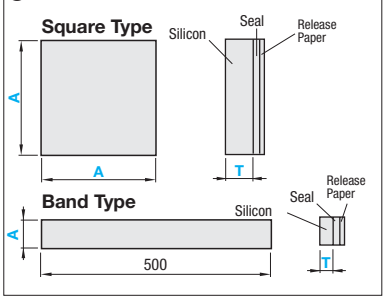


Part Number		M Material	H Hardness (Penetration)	Color
Type				
Square Type	Band Type			
GELS	GELT	Silicone	55	Milky White

Operation Temperature Range: –40~100°C

The values of hardness are reference values.

Penetration: JIS K2207 P.358



Part Number		A Selection	€ Unit Price			
			A			
Type	T		10	20	50	100
GELS (Square Type)	1	50 100				
	2					
	3					
GELT (Band Type)	1	10 20				
	2					
	3					

Silicone is an artificial compound made from silicon.

It can be cut with adhesive side up with a utility knife, etc.

Gel surface has an antistick treatment applied.

Reference: Adhesive Strength (180 Degree Peeling Strength) 14.5N/25mm Width (When affixed to 1.4301/X5CrNi18-10)

As pressure sensitive adhesive is used, be sure to apply sufficient pressure so that the joint sections may firmly adhere to each other.

75μm PET film is used as base material.

Oil may ooze out to the backing paper.

Features of Silicone P.436

Order Example

Part Number	-	A
GELS1	-	50

Days to Ship: 6 Days

P.88

Price

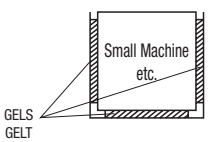
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example

Can be used as vibration control materials and cushioning materials.



Low Friction Rubber Sheets

–Nitrile Rubber Sheets · Silicon Rubber Sheets–

■Resin sheets and tapes with high sliding property and are slippery to the touch. Suitable for use on portions that tend to stick to work, such as jaws.

RoHS



A Dimension Standard Type		A · B Dimension Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
LRBNM	LRBNMA	LRBNMF	LRBNMFA	Low Friction Nitrile Rubber	Shore A70	Black
LRBSM	LRBSMA	LRBSMF	LRBSMFA	Low Friction Silicon Rubber	Shore A70	Light Gray
LRBAM	LRBAMA	LRBAMF	LRBAMFA	Low Friction Silicon Rubber	Shore A50	Milky White

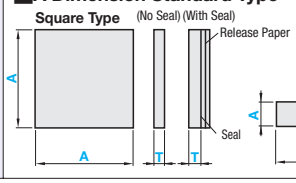
Adhesive thickness is 0.02~0.025mm.

■Precision Standards

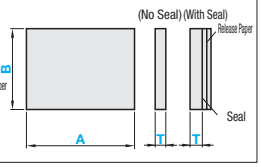
- T Dimension Tolerance ±0.2
- Dimension Tolerance of A and B

200mm or Less	201~300	301~500
±1.0	±1.5	±2.0

■A Dimension Standard Type



■A · B Dimension Configurable Type



The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B
LRBSMFA0.5 - 300 - 200

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price
23,60 x 1.2 = 28,32 ➡ 28,30 EUR

■A Dimension Standard Type –Square Type–

Part Number		A Selection	€ Unit Price	
			LRBNM LRBNMA	LRBSM / LRBSMA LRBAM / LRBAMA
Type	T			
No Adhesive LRBNM (x1.0) LRBSM (x1.0) LRBAM (x1.0)	0.5	300		
Adhesive LRBNMA (x1.2) LRBSMA (x1.2) LRBAMA (x1.2)	0.5	500		

■A Dimension Standard Type –Band Type–

Part Number		A Selection	€ Unit Price								
			A								
Type	T		3	5	10	20	30	40	50	80	100
No Adhesive LRBNM (x1.0) Adhesive LRBNMA (x1.2)	0.5	3 5 10 20 30 40 50 80 100									
No Adhesive LRBSM (x1.0) LRBAM (x1.0) Adhesive LRBSMA (x1.2) LRBAMA (x1.2)	0.5	3 5 10 20 30 40 50 80 100									

■A · B Dimension Configurable Type

Part Number		1mm Increment	
Type	T	A	B
LRBNMF LRBSMF LRBAMF LRBNMFA LRBSMFA LRBAMFA	0.5	10~500	10~500

A≥B

■A · B Dimension Configurable Type

Part Number		A	€ Unit Price				
			B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive LRBNMF (x1.0) Adhesive LRBNMFA (x1.2)	0.5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
No Adhesive LRBSMF (x1.0) LRBAMF (x1.0) Adhesive LRBSMFA (x1.2) LRBAMFA (x1.2)	0.5	10~100					
		101~200					
		201~300					
		301~400					
		401~500					

Order Example

■A Dimension Standard Type

Part Number - A
LRBNM0.5 - 300
LRBAMA0.5 - 100

■A · B Dimension Configurable Type

Part Number - A - B
LRBNMF0.5 - 395 - 201

Days to Ship

8 Days

Express A 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

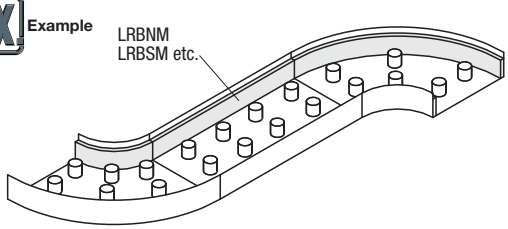
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example



Can be used to prevent curved parts of a conveyor from sticking with work piece.

■Features of Low Friction Rubber Sheets

Chemical resistance data P.358

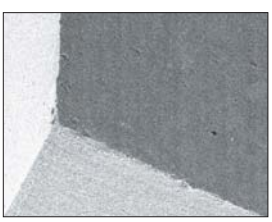
By making only one side of rubber surface coarse, the friction is reduced without changing other properties of the material.
It can be used on the surface of a sliding plate, robotic chuck and etc.

■Comparison of Dynamic Friction Coefficient

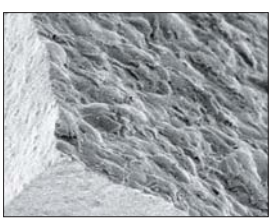
	Nitrile Rubber	Silicon Rubber (Shore A70)	Silicon Rubber (Shore A50)
Low Friction	1.22	0.48	0.3
Regular	3.32	-	-

Measuring Method: JIS K7125

* Silicon rubber is not measurable because it is self-viscous.



Regular

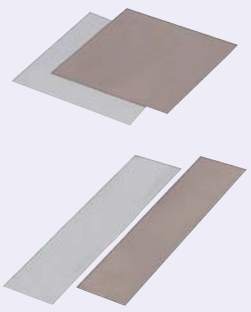


Low Friction

Resin Sheets · Fluororesin Tapes (Dust-proof, General Purpose)
–Fluororesin · Ultra High-Molecular-Weight Polyethylene–

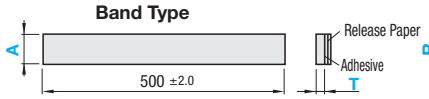
■Resin sheets and tapes with high sliding property and are slippery to the touch. Suitable for enhancing the sliding of work.

■Resin Sheets RoHS

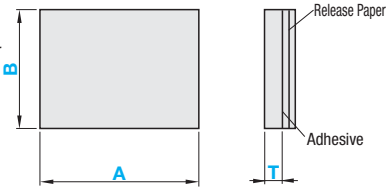


A Dimension Standard Type	A · B Standard	Material	Adhesive
PTFETT	PTFETS	Fluorine Resin	Silicon Type
ULTT	ULTS	Ultra High-Molecular-Weight Polyethylene	Acrylic

■A Dimension Standard Band Type



■A · B Standard



■Precision Standards

-T Dimension Tolerance: ±0.02

-Dimensional tolerances of A and B

200mm or Less	300	400, 500
±1.0	±1.5	±2.0

■A Dimension Standard Band Type

Part Number		A	€ Unit Price								
Type	T	Selection	A3	A5	A10	A20	A30	A40	A50	A80	A100
PTFETT	0.23	3 · 5 · 10 · 20 · 30									
ULTT	0.12	40 · 50 · 80 · 100									

(?)L dimension is 500mm.

■A · B Standard

Part Number		A	B	€ Unit Price				
Type	T	Selection	Selection	B100	B200	B300	B400	B500
PTFETS	0.23	100	100					
		200	200					
		300	300					
		400	400					
		500	500					
ULTS	0.12	100						
		200						
		300						
		400						
		500						

Order Example: Part Number - A - B
PTFETT0.23 - 30
ULTT0.12 - 5
PTFETS0.23 - 100 - 100
ULTS0.12 - 500 - 100

Days to Ship: 8 Days
Express A 3,00 EUR/ piece P.88
(?)A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount ((?)Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

■Features of Fluorine - Ultra High-Molecular-Weight Polyethylene

- Fluorine Resin

Low friction coefficient, and excellent chemical resistance and heat resistance.

- Ultra High-Molecular-Weight Polyethylene

Although its friction coefficient and heat resistance is inferior to that of fluororesin, the price is relatively cheap. And it is excellent in durability.

■Comparison of Dynamic Friction Coefficient

Fluorine Resin	0.08
Ultra High-Molecular-Weight Polyethylene	0.14
Nitrile Rubber	3.32

(?)JIS K 7125

■Characteristic Values

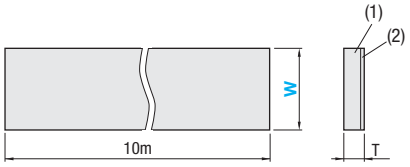
Material	Pull Force (N/25mm Width)	Tensile Strength (N/25mm Width)	Elongation %	Heat °C	Chemical Resistance					
					Oil	Water	Acid	Alkali	Ether	Ketone
Fluorine Resin	12	184	350	180	◎	◎	◎	◎	○	○
Ultra High-Molecular-Weight Polyethylene	10	93	300	100	○	◎	○	◎	○	○

◎-Excellent ○-Good △-Acceptable X-Not Acceptable

■Fluororesin Tapes (Dust-proof, General Purpose) RoHS



PTFET



	Material
(1)	Fluororesin Film
(2)	Adhesives (Silicon Type)

(?)For Ultra High-Molecular-Weight Polyethylene, refer to P. 1-1066 Slide Tapes (NLTP).

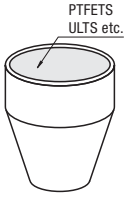
Part Number		W (mm)	T (mm)	(1) Fluorine Film Thickness	Adhesive Strength (N/25mm Wide)	Tensile Strength (N/25mm Wide)	Elongation %	Dielectric Breakdown KV	W13		W25		W50	
Type	No.								€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
									1~9	10~	1~9	10~	1~9	10~
PTFET	1	13	0.08	0.05	6.13	49.0	200	4.5						
	2	25	0.13	0.08	9.32	56.4	250	7.5						
	3	50	0.18	0.13	10.79	122.6	340	8.2						
	4		0.23	0.18	11.52	149.6	360	9.0						

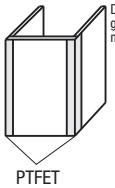
Order Example: Part Number - W
PTFET2 - 13

Days to Ship: 6 Days P87

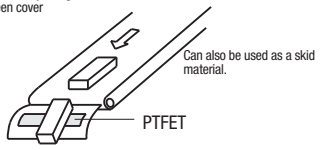
Example

Can be used inside hoppers etc.





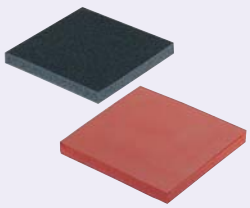
Dust-proof effect by filling gaps between cover materials.



Urethane Sponge Sheets / Rubber Sponge Sheets

For Sponge Gaskets, refer to P.425 For Sponge Tapes, refer to P.419

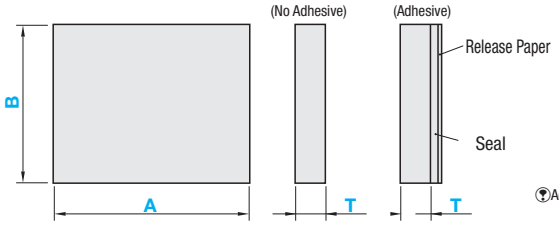
RoHS



Standard Type		Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
SGNN	SGNS	SGNNF	SGNSF	Polyurethane Sponge	Less than Asker C1	Black
-	-	SGNC	SGNCA	Chloroprene Rubber Sponge	Asker C25	Black
-	-	SGNW	SGNWA	Chloroprene Rubber Sponge	Asker C25	White
-	-	SGNP	SGNPA	EPDM Sponge	ASKER 80	Black
-	-	SGNB	SGNBA	NBR Sponge	ASKER C30	Black
SISP	SISA	SGNA	SGNAA	Silicon Rubber Sponge	Asker C35* (Asker C22)	Orange
-	-	SGNL	SGNLA	Silicon Rubber Sponge	Asker C15	Orange
-	-	SGNF	SGNFA	Fluoro Rubber Sponge	Asker C35	Black

SGNW · SGNWA might discolor by aging.

* Values in ( ) are applicable to Selectable Type of silicon sponge.



Precision Standards

Polyurethane Sponge		Others	
A · B	Tolerance	A · B	Tolerance
390 or Less	±2	190 or Less	±1.5
400~790	±2.5	200~390	±2
800	±3	400 or More	±3

Adhesive thickness is 0.02~0.025mm.

Standard Type

Part Number		T Tolerance	Selection	
Type	T		A	B
SGNN SGNS	10	±1	100	100
	30	±2	200	400
	50	±3	500	800
SISP SISA	3	±0.5	100	100
	5	±1	250	
	10			

Configurable Type

Part Number	10mm Increment		T Selection	T Tolerance
	A	B		
SGNC SGNW SGNP SGNB SGNCA SGNWA SGNPA	20~500	20~500	3 5	±0.5
			8 10 15 20 25	±1
SGNBA			30	±1.5
SGNA SGNL SGNF SGNAA SGNLA SGNFA	20~500	20~500	2 3 5	±0.5
			10	±1.5
SGNNF SGNSF	10~500	10~500	10	±1
			30	±2
			50	±3

Order Example

Standard Type

Part Number	-	A	-	B
SGNN10	-	100	-	100
SISP10	-	250	-	100

Configurable Type A≥B

Part Number	-	A	-	B	-	T
SGNCA	-	320	-	220	-	10

Days to Ship

Standard Type

- SGNN · SGNS: 8 Days — Express A 3,00 EUR/ piece — P.88
  - A Express Charge of 8,10 EUR for 3 or more identical pieces.
- SISP · SISA: 6 Days — P.87

Configurable Type

8 Days — Express A 3,00 EUR/ piece — P.88

- A Express Charge of 8,10 EUR for 3 or more identical pieces.
- Express Serviceis not available for SGNA · SGNAA · SGNC · SGNCA · SGNP and SGNPA.

Characteristics of Sponges

Item	Unit	Polyurethane Sponge	Chloroprene Rubbers Sponge	EPDM Sponge	NBR Sponge	Silicon Rubber Sponge			Fluoro Rubber Sponge
						Hs35	Hs22	Hs15	
Apparent Density	g/cm³	0.022	0.18	0.13	0.21	0.35~0.37	0.35~0.37	0.3	0.45
Air Bubble	–	Continuous Air Bubble	Independent Air Bubble	Independent Air Bubble	Independent Air Bubble	Independent Air Bubble			Independent Air Bubble
Tensile Strength	Mpa {kgf/cm²}	≥0.076 {≥0.77}	0.9 {9}	0.5 {5}	0.8 {8}	1.6~1.8 {16~18}	0.7 {7}	1 {10}	2.7 {27}
Elongation	%	≥120	170	200	200	200~250		250	280
25% Compression Load	Mpa {kgf/cm²}	–	$5.3x10^{-2}$ {0.54}	$3.1x10^{-2}$ {0.32}	$6.5x10^{-2}$ {0.66}	–(*1)		8	–(*1)
Continuous Use Temperature *2	°C	–10~70	–35~130	–40~130	–10~140	–70~200			–20~230
Abrasion Resistance		◎	○	○	◎	Δ			◎
Anti-Aging		○	◎	◎	○	◎			◎
Water Resistance		Δ	○	○	○	○			◎
Chemical Resistance	Oil (Gasoline)	○	○	X	◎	Δ			◎
	Acid	X ~ Δ	○	X ~ ○	X ~ ○	Δ ~ ○			◎
	Alkali	X	◎	○	○	◎			Δ ~ ○
	Organic Solvent	X	X ~ Δ	X	X ~ Δ	X			X ~ ○

For Adhesive Type, the adhesion strength decreases under high temperature (at approx. 80°C or more).

* 1 Compression Set ‹40% During Compression› (100°C/24h) 71%

* 2 The temperature of continuous use is the temperature where long-term use does not cause a sharp decline in quality.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Standard Type

Part Number Type	T	A	€ Unit Price B SGNN 100	SGNN 400	SGNN 800	SGNS 100	SGNS 400	SGNS 800
SGNN SGNS	10	100						
		200						
		500						
	30	100						
		200						
		500						
	50	100						
		200						
		500						

Part Number Type	T	A	€ Unit Price B SISP 100	SISA 100
SISP SISA	3	100		
		250		
	5	100		
		250		
	10	100		
		250		

SISP and SISA are double side coated.

Configurable Type

Part Number	T	A	€ Unit Price B 10~100	110~200	210~300	310~400	410~500
No Adhesive SGNNF (x1.0) Adhesive SGNSF (x1.1)	10	10~100					
		110~200					
		210~300					
		310~400					
		410~500					
	30	10~100					
		110~200					
		210~300					
		310~400					
		410~500					
	50	10~100					
		110~200					
		210~300					
		310~400					
		410~500					

Configurable Type

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number [SGNCA] - A [200] - B [150] - T [10] (€ Unit Price) 6,70 x (Material Rate) 1.1 = Standard Type € Unit Price 7,37 EUR → 7,30 EUR

Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~400	410~500
No Adhesive SGNC (x1.0) SGNW (x1.5) SGNP (x0.9) SGNB (x1.3) Adhesive SGNCA (x1.1) SGNWA (x1.6) SGNPA (x1.0) SGNBA (x1.4) ( ) Material Rate	3	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	8	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	15	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	20	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	25	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	30	20~100					
		110~200					
		210~300					
		310~400					
		410~500					

Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~400	410~500
No Adhesive SGNA (x1.0) SGNL (x1.2) Adhesive SGNAA (x1.1) SGNLA (x1.3) ( ) Material Rate SGNL and SGNLA are single side coated.	2	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	3	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
No Adhesive SGNF (x1.0) Adhesive SGNFA (x1.1) ( ) Material Rate	2	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	3	20~100					
		110~200					
		210~300					
		310~400					
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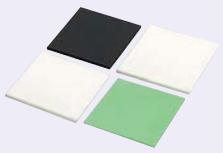
		210~300					
		310~400					
		410~500					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					

Low Elasticity · Antistatic Low Rebound · Low Strain Sponge Sheets

Reduced Delivery Time

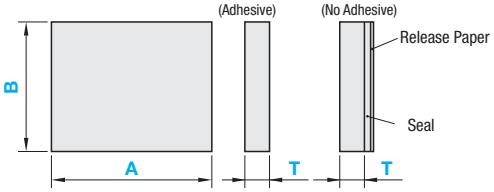
■3rd day shipping is available for High Performance Sponge.



No Adhesive	Adhesive	Material	Hardness	Color
SUNSET	SUNSETA	Low Elasticity Rubber Sponge (Hanenaito® Sponge)	Asker C25	Black
SPTA	-	Antistatic Low Rebound Sponge	Asker C27	White
SNPG	-	Low Strain Sponge (Silicone Foam)	Asker C15	Green (T 3mm) White (T 6mm)

※Adhesive thickness is 0.02~0.025mm.

※Hanenaito® is a registered trademark of Naigai Rubber Industry Co., Ltd. ※The values of hardness are reference values.



■Precision Standards

T Dimension Tolerance

T	Tolerance
3, 5	±0.5
6~20	±1.0

A · B Dimension Tolerance

A · B	Tolerance
190 or Less	±1.5
200~390	±2.0
400 or More	±3.0

Part Number	10mm Increment A	10mm Increment B	T Selection
SUNSET SUNSETA	20~500	20~350	3 5 8 10
SPTA	20~500	20~500	5 10 15 20
SNPG	20~500	20~300	3 6

※A≥B

Order Example: Part Number SUNSET - A 500 - B 350 - T 10

Days to Ship: 8 Days

Price

■Volume Discount (※Round down to one Cent.) R87

Quantity	1~19	20~34	35~49	50~100
Discount Rate	€ Unit Price	5%	10%	18%

※For orders larger than indicated quantity, please request a quotation.

※The price of SUNSETA is the price of SUNSET shown in the table multiplied by material rate. (Round down to ten Cent.)

(Ex.) Part Number SUNSETA - A 100 - B 50 - T 3

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price

8,80 x 1.2 = 10,56 EUR → 10,50 EUR

Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~350
No Adhesive SUNSET (x1.0)	3	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
	5	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
Adhesive SUNSETA (x1.2)	8	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
( ) Material Rate	10	20~100				
		110~200				
		210~300				
		310~400				
		410~500				

Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~400	410~500
SPTA	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	15	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	20	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
SNPG	3 (Green)	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	6 (White)	20~100					
		110~200					
		210~300					
		310~400					
		410~500					

■Features

■Low Elasticity Rubber Sponge (Hanenaito® Sponge)

- It is Low Elasticity rubber (Hanenaito®) foam.
- It excels in shock absorption.
- Lightweight with specific gravity at 0.3.

■Antistatic Low Rebound Sponge

- It is bridge foam of styrene-type elastomer.
- Excels in shock absorption and antistatic.
  (Specific Volume Resistivity: $4x10^{10}$)

■Low Strain Sponge (Silicone Foam)

- It is a silicone foam.
- The material resists crushing, even after repetitive impact absorption.
- Usable in a very wide temperature range –40°C~150°C.

※Peel off the protective film on the surface before use.

※For Adhesive Type, the adhesion strength decreases under high temperature (at approx. 80°C or more).
※The temperature of continuous use is the temperature at which long-term use does not cause a sharp decline in quality.
※Compression Set JIS K6262
※Values in the table to the right are for reference and not guaranteed.

■Characteristics of Sponges

Item	Unit	Low Elasticity Rubber Sponge	Antistatic Low Rebound Sponge	Low Strain Sponge
Apparent Density	g/cm³	0.3	0.097	0.26
Air Bubble	-	Independent Air Bubble	Independent Air Bubble	Independent Air Bubble
Tensile Strength	Mpa {kgf/cm2}	0.9 {9}	0.9 {9}	0.32 {3.2}
Elongation	%	480	210	73
25% Compression Set	%	62	5.1	0.2
Temperature of Continuous Use	°C	20~60	10~50	-40~150
Abrasion Resistance		0	0	Δ
Anti-Aging		Δ	Δ	00
Water Resistance		Δ	00	00
Chemical Resistance	Oil (Gasoline)	X	X	X
	Acid	X	0	00
	Alkali	X	0	00
	Organic Solvent	X	X	X

EPT Sealer® Sponge

■EPT SEALER®, a semi-closed cell foam can be compressed at a small stress, and changes its structure to open cell by compression. Provides superior sealing effects against air and fluids.

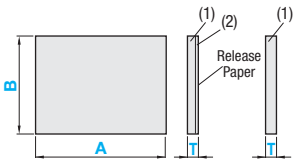


RoHS

EPA(Adhesive Type)
EPAN(No Adhesive Type)

※A≥B

	Material
(1)	EPDM Foam (EPT SEALER®)
(2)	Adhesive with Unwoven Cloth Base Material



※Adhesive thickness is 0.16mm.

※EPT Sealer® is a registered trademark of Nitto Denko Corporation.

■**Precision Standards**

T Dimension Tolerance

t	Tolerance
3~10	±1.0
15~25	±2.0
30	±2.5

A · B Dimension Tolerance

A · B	Tolerance
20	±2.0
30~50	±2.5
60~140	±3.5
150~290	±6.5
300~500	±9.0

Part Number	10mm Increment		T Selection
	A	B	
EPA EPAN	20~500	20~400	3 5 8 10 15 20 25 30

Order Example

Part Number	-	A	-	B	-	T
EPA	-	100	-	80	-	8
EPAN	-	150	-	100	-	10

Days to Ship 8 Days

Price

■**Volume Discount** (※Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

※For orders larger than indicated quantity, please request a quotation.

※The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number - A - B - T : EPAN - 150 - 100 - 10

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price

2,30 x 0.9 = 2,07 EUR → 2,00 EUR

Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~400
EPA (x1.0) EPAN (x0.9)	3	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
	5	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
	8	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
	10	20~100				
		110~200				
		210~300				
		310~400				
		410~500				

Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~400
EPA (x1.0) EPAN (x0.9)	15	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
	20	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
	25	20~100				
		110~200				
		210~300				
		310~400				
		410~500				
	30	20~100				
		110~200				
		210~300				
		310~400				
		410~500				

■**Features of EPA · EPAN**

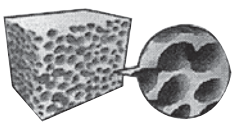
This product is made of a semi–closed cell foam, available for compression in the condition of low stress. After compression, it can be made into independent air bubble.
This product is a high performance sealer that has the capability of filling gaps to shut out heat, water and sound.

■**Characteristic Values**

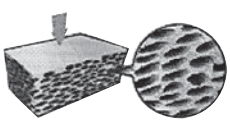
※Testing method conforms to JIS K 6767.

Measurement Item		Unit	EPA · EPAN
Specific Gravity		-	0.095
Tensile Strength		kg/cm²	0.90
Elongation		%	430
Compression Hardness	25%	kg/cm²	0.02
	50%		0.05
Air Bubble		-	Semi–closed Cell

-Semi–closed Cell Structure



Before Compression



After Compression

Compression Rate (%)	EPA · EPAN
50	X
60	Δ
70	○
80	○

○ : No leakage of water after 30mins.
Δ : Leakage of water is seen within 30mins.
X : Leakage of water is seen within 10mins.

Felt Sheets

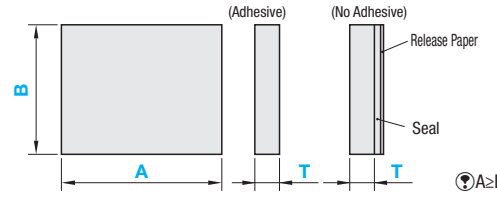
■Felt materials of a wide variety (with or without adhesive backings) are available by the unit of 10mm. Most suitable for cushion/liquid application/grind material.

■Felt Sheets RoHS



No Adhesive	Adhesive	Material	Density (g/cm3)	Color	Allowable Temperature
FELP	FELPA	Polyester Felt	0.2 (0.18 for 5.5mm)	White	0~120°C
FELPET	FELPETA	Polyester Felt (with Binder)	0.32	Gray	0~80°C
FELH	FELHA	Polyamide Felt	0.2 (0.27 for 1mm)	White	-50~250°C
FELWL	FELWLA	Sheep Wool Felt (Rayon, PET blended)	0.25	Ivory	-10~60°C
FELW	FELWA	Sheep Wool Felt	0.6		

Adhesive thickness is 0.02~0.025mm.



A≥B

-Dimensional tolerances of A and B

20~200	210~400	410~1000
±2	±4	±6

Part Number	T Selection	10mm Increment A	10mm Increment B
FELP FELPA	1 3 5.5	20~1000	20~950
FELPET FELPETA	5	20~500	20~500
FELH FELHA	1 4 6		
FELWL FELWLA	2 5		
FELW FELWA	10		

Order Example

Part Number	-	A	-	B
FELP3	-	500	-	350

Days to Ship: 8 Days

Price

■Volume Discount Price (Round down to one Cent.) P.87

Quantity	1~4	5~19	20~49
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

The price of this product is found by multiplying the unit price shown in the table by the material rate.

Part Number	-	A	-	B	(€ Unit Price)	x	(Material Rate)	=	Standard Type € Unit Price
FELPA3	-	600	-	600		x	1.3	=	➡24,40 EUR

Part Number Type	T	A (10mm Increment)	€ Unit Price B (10mm Increment) 20~200	210~400	410~600	610~800	810~950
No Adhesive FELP Adhesive FELPA (x1.3) (Material Rate)	1	20~200					
		210~400					
		410~600					
		610~800					
		810~1000					
	3	20~200					
		210~400					
		410~600					
		610~800					
		810~1000					
	5.5	20~200					
		210~400					
		410~600					
		610~800					
		810~1000					

Part Number Type	T	A (10mm Increment)	€ Unit Price B (10mm Increment) 20~100	110~200	210~300	310~400	410~500
No Adhesive FELPET Adhesive FELPETA (x1.2)	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
No Adhesive FELH Adhesive FELHA (x1.1) (Material Rate)	1	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	4	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	6	20~100					
		110~200					
		210~300					
		310~400					
		410~500					

Part Number Type	T	A (10mm Increment)	€ Unit Price B (10mm Increment) 20~100	110~200	210~300	310~400	410~500
No Adhesive FELWL Adhesive FELWLA (x1.1) (Material Rate)	2	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
No Adhesive FELW Adhesive FELWA (x1.1) (Material Rate)	2	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					

Felt Bumpers
-Washers · Bumpers-

CAD Data

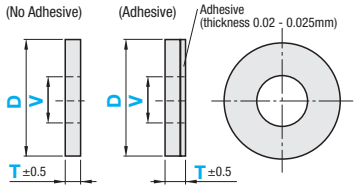
■Offers the felt, employed for lubricating sheets or air-tightening gaskets, formed with washer or bumper shape.

■**Felt Bumpers** RoHS



Type	No Adhesive	Adhesive	M Material	Density (g/cm³)	Color	Allowable Temperature
Washer	WFEP	WFEPA	Polyester Felt	0.2	White	0~120°C
	WFEH	WFEHA	Polyamide Felt			-50~250°C
Cushion	BFEL	BFELA	Polyester Felt	Refer to the following.		-10~60°C

Allowable temperature for adhesive is 0~80°C.



L	Density (g/cm³)
10	0.12
20	0.08
30	0.07

■**Washers**

Part Number Type	D	V Selection	T Selection	€ Unit Price WFEP	WFEPA	WFEH	WFEHA
No Adhesive	8	0 3	3 (WFEP / WFEPA)				
WFEP WFEH	10	0 4					
	12	0 4 6					
Adhesive	15	0 4 6 8					
WFEPA WFEHA	20	0 6 8 10 12	4 (WFEH / WFEHA)				
(x1.1)	25	0 6 8 10 12 16 20					
( ) Material Rate	30	0 6 8 10 12 16 20					

* T dimension for Polyester Felt is 3mm, for Polyamide Felt is 4mm.

■**Bumpers**(L dimensions indicate the length of felt base materials. The values are for reference only.)

Part Number Type	D	L Selection	V	€ Unit Price L10	L20	L30
No Adhesive BFEL	20	10 20 30	0			
Adhesive BFELA (x1.1)			10			
( ) Material Rate	30	10 20 30	0			
			10			

This product, especially L dimension 20 and 30, may deform in the silhouette during delivery.

Order Example

Part Number	-	V	-	T
WFEP10	-	4	-	3

Part Number	-	L	-	V
BFEL20	-	10	-	10

Days to Ship: 8 Days

Price

■**Volume Discount Price** (Round down to one Cent.) P87

Quantity	1~4	5~19	20~49
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Characteristics of Felt

1. Excellent in weather resistance.
   (Affected by alkaline solution)
2. Excellent in oil absorbability.
   It has the property of soaking up oil by capillary action.
3. Excellent in oil retention capacity.
   It can absorb up to approx. 80% of its total volume.
4. Has good polishing characteristics.
   Provides high polishing characteristics as it precipitates foreign materials within its tissue.

■Characteristics of Materials

Material	Details of Material	Application Example
Polyester Felt (Sheet)	Felt made of 100% polyester Soft with Density of 0.18~0.2. General-purpose Product	Applicable to general purpose use as oil · water absorption, cushion, etc.
Polyester Felt (With Binder)	PET : PET binder (bonding material) = 9 : 1 Fibers bonded together by the binder provides high morphological stability.	Protection material and bumper for portions exposed to high impact.
Polyamide Felt	Felt made of 100% polyamide Excellent Heat / Flame Resistances UL Std. Test V–0	Heat-resistant · flame retardant bumpers
Sheep Wool Felt (Rayon/PET)	A blend of 60 % sheep wool and 40% PET. JIS–R25W2 Standard product, excellent in oil/water retention ability	Cushion material · Liquid application (oiling) · Spacer
Sheep Wool Felt	Felt made of 100% sheep wool Gives less damage to mating materials.	For buffing
Polyester Felt (Bumper type)	Density may vary depending on L dimensions.	Oil application to work piece

*The usage examples above are references not guaranteed.

Heat Insulation Sponge
–Polyimide Foam–

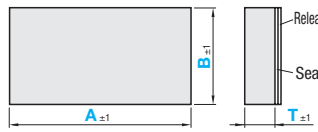
■Polyimide foam whose heat resistance is up to 400°C. Can be also used as heat-resistant sound insulators.

■Heat Insulation Sponge
–Polyimide Foam–

RoHS



Type	Material	Color	Allowable Temperature
	Aromatic polyimide foam No Adhesive	Light Beige	Body: 400°C
	Body: Aromatic polyimide foam Adhesive: Heat resistant adhesive	Light Beige	Body: 400°C Adhesive material: 200°C



■Adhesive Strength of Heat Resistant Adhesive
900gf/20mm width (Result of 180° peeling test of the material adhered to 1.4301)

Part Number		A · B (A≥B)	
Type	T Selection	A	B
	10 20	100 200 300 500 800 1000	100 200 300 500 800 1000

Order Example: Part Number - A - B
- 200 - 100

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P87

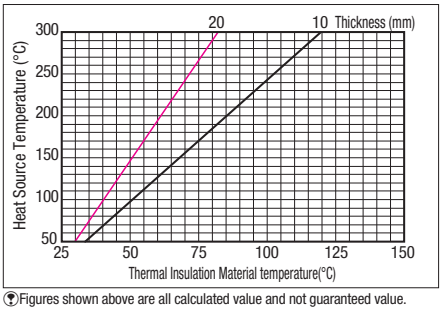
Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number		€ Unit Price					
		A (A≥B) / B					
Type	T		100	200	300	500	800	1000
(No Adhesive) (x1.0)	10	100						
		200						
		300						
		500						
		800						
		1000						
(Adhesive) (x1.1) ( ) Material Rate	20	100						
		200						
		300						
		500						
		800						
		1000						

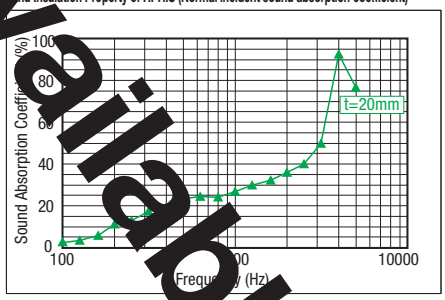
Not Available

- HPRIS Surface Temperature at 20°C Room Temperature



Figures shown above are all calculated value and not guaranteed value.

- Sound Insulation Property of HPRIS (Normal incident sound absorption coefficient)



Compliant to JIS A1405-2
Frequency: 100~5000Hz
Test material density: 4.14kg/m³

■General Characteristics
- Made of polyimide foam, best in heat resistance as engineering plastic.
- Excels in heat, fire, environment resistance and low outgas. Provides high performance as a thermal insulator and soundproof material under high temperature.
- Polyimide sheets and washers are made by using heat insulation sponge compressed to 2mm.

■Main Features
- High heat resistance with glass transition temperature of 400°C.
- Excels in heat insulation. (Avoid using sheets as heat insulators as they are made by compressed sponge.)
- Flexible workability: easily cut by utility knives.
- Self-extinguishable and flame-resistant
- Extremely low gas discharge
- Possesses superior quality of aromatic polyimide, such as resistance to radiation and ultraviolet, electrical isolation and chemical resistance.

■Cautions
- As a characteristic of polyimide, reaction to compression is weak. Avoid as much as possible use in compressed state to maintain heat resistance quality.
- Allowable temperature limit for adhesive is 200°C. In higher operating temperature, use adhesive as temporary joint.
  (Apply supplementary attachment method such as nipping)
- Export Permit from your governmental organization may be required for exporting Polyimide products.

■Characteristics

- Thermal / Electrical Characteristics

Item		Unit	Characteristic Values		Testing Method
Expansion Ratio		Times	330~270	10	
Apparent Density		kg/m³	4~5	135	ASTM D 3574 (Test A)
Tg		°C	400	401	DSC Analysis
Thermal Decomposition Temp. (5%)		°C	540	569	TGA Analysis
Brittle Temperature		°C	<-150	<-150	
Thermal Conductivity		W/m-K	0.045	0.044	ASTM C 518
Combustibility		-	-	V–0	
Limited Oxygen Index		%	50	49	ASTM D 2863
Outgas	TML	%	1.01	0.94	ASTM E 595
	CVCM		0.04	0.01	
	WVR		0.72	0.81	
Dielectric Constant (1MHz)		-	1	1.25	Impedance Analyzer
Dissipation Factor (1MHz)		-	0.0001	0.0025	

- Mechanical Characteristics

Item	Unit	Characteristic Values		Testing Method
Tensile Strength	Mpa	0.05	1.3	ASTM D 3574 (Test E)
Modulus of Elongation	Mpa	0.17	11.5	ASTM D 3574 (Test E)
Elongation	%	28	23	ASTM D 3574 (Test E)
Flexural Modulus	Mpa	-	18.6	

- Chemical Resistance

Chemical			Testing Method
10% Sulfuric Acid	○	○	Room temperature, soaked for 24 hours
10% Hydrochloric Acid	○	○	
Acetone	○	○	
Methylene Chloride	○	○	
NMP	○	○	
DMA	○	○	

* ○: No appearance change or swelling

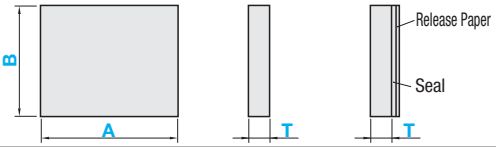
Heat Insulation Polyimide Sheets · Heat Insulation Polyimide Washers

■Heat Insulation Polyimide Sheets RoHS

–Polyimide Foam–



Type		Material	Color	Hardness	Allowable Temperature
No Adhesive		Aromatic polyimide foam	Light Beige	Asker C62	Body: 400°C
Adhesive					Body: 400°C Adhesive material: 200°C



Part Number			1mm Increment	
Type		T	A	B
No Adhesive	Adhesive	2	10~500	10~500

Order Example: Part Number - A - B → - 200 - 100

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number		A	€ Unit Price B				
Type	T		10~100	101~200	201~300	301~400	401~500
No Adhesive	2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					
Adhesive	2	10~100					
		101~200					
		201~300					
		301~400					
		401~500					

■Heat Insulation Polyimide Washers

–Polyimide Foam–

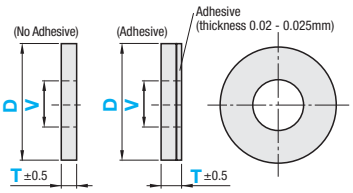
RoHS



Standard Type		Configurable Type		Material	Hardness	Color
No Adhesive	Adhesive	No Adhesive	Adhesive			
WSPOL	WSPOLA	WSPOLF	WSPOLFA	Polyimide Foam	ASKER C62	Light Beige

D · V Tolerance

D / V	Tolerance
10~40	±1.0
41~60	±1.5
61~100	±2.0



■Standard Type

Part Number		V Selection	T Selection	€ Unit Price	
Type	D				
WSPOL WSPOLA	6	2	2		
	8	2 3 4			
	10	3 4 5 6			
	12	4 5 6 8			
	15	4 5 6 8 10			
	20	5 6 8 10 12			
	25	5 6 8 10 12 16 20			
	30	5 6 8 10 12 16 20			
	35	8 10 12 16 20 25			
	40	8 10 12 16 20 25 30			
	50	8 10 12 16 20 25 30			
	60	12 16 20 25 30 40			

Order Example

■Standard Type: Part Number - V - T → - 6 - 2

■Configurable Type: Part Number - D - V → - D12 - V6

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

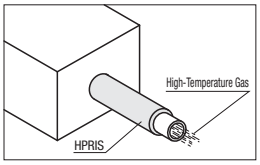
Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

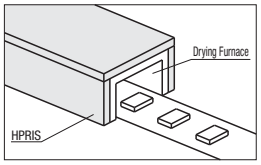
For orders larger than indicated quantity, please request a quotation.

■Configurable Type

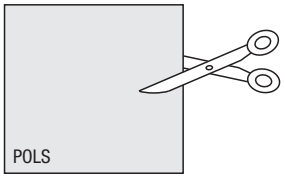
Part Number			D	V	€ Unit Price				
Type	T	T Tolerance	1mm Increment	1mm Increment	D10~20	D21~40	D41~60	D61~80	D81~100
WSPOLF WSPOLFA	2	±0.5	10~100	5~80 (No Hole: V=0) When D≤40, D-V≥5					

Example





Can be cut as desired with scissors.

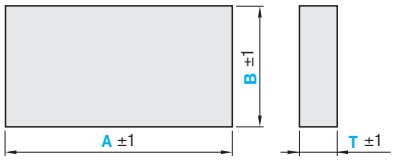


Heat Insulation Sheets / Heat Insulation Tapes

Heat Insulation Sheets RoHS

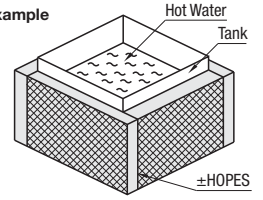


HOPES
(Regular Type)



Material: Body: High Density Polyethylene
Surface: Polyethylene
Adhesive Part: Acrylic Adhesives

Example



Heat Insulation Tapes RoHS

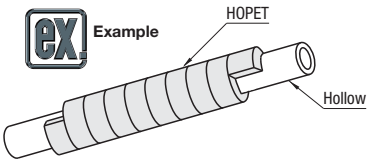


HOPET



Material: Body: Heat Resistance Polyethylene
Adhesive Part: Acrylic Adhesives

Example



When pipe diameter is small, tape both ends with adhesives.

- Peel off backing paper to adhere it to an object.
  Be sure to clean any oil or dust off the affixed surface.
- Can be cut with a utility knife. Cut with the adhesive side up.
- Adhesive Strength (90 Degree Peeling Strength): 19.6N/25mm Width (When affixed to 1.4301/X5CrNi18-10)

Part Number Type	T	A Selection	B Selection	€ Unit Price B100	B200	B300	B400	B500
HOPES	15	100	100					
		200	200					
		400	300					
	30	100	400					
		200						
		400	500					

Order Example Part Number - A - B
HOPES15 - 100 - 200

Days to Ship 8 Days — Express A 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	T (mm)	W (mm) Selection	L (M) Selection	€ Unit Price L5	L10	L15	L20
HOPET	3	30	5				
		50					
		100					
	5	30	10				
		50					
		100	15				
	10	30	20				
		50					
		100					

L dimension is in meters.

Order Example Part Number - W - L
HOPET3 - 100 - 5

Days to Ship 8 Days — Express A 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

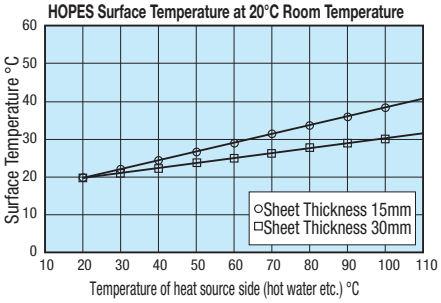
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

HOPES Surface Temperature at 20°C Room Temperature

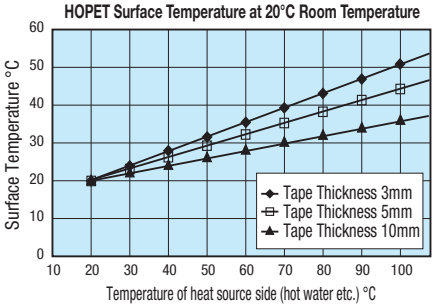


Characteristic Values of HOPES and HOPET

Item	Unit	HOPES	HOPET
Allowable Temperature	°C	105	105
Thermal Conductivity	W/mK	0.03	0.03
Water Absorption Ratio	mg/cm²	0.1	0.1
Surface Density	kg/m²	0.39	0.30*
Color	-	White	Gray

* When T=3

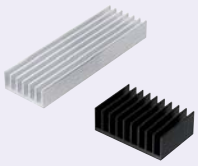
HOPET Surface Temperature at 20°C Room Temperature



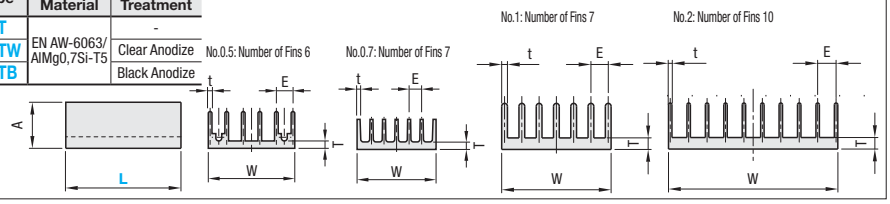
Heatsinks / Heat Radiation Gel Sheets

CAD Data

■Heatsink RoHS



Type	Material	Surface Treatment
HEAT	EN AW-6063/ AlMg0,7Si-T5	-
HEATW		Clear Anodize
HEATB		Black Anodize



Part Number Type	No.	L 1mm Increment	W	A	E	T	t	Number of Fins
HEAT HEATW HEATB	0.5	50~500	23.5	10	4.5	2	1	6
	0.7		31.5	12	5	3	1.2	7
	1		47.5	20	7.5	5	2.5	7
	2		73.5	25	8		1.5	10

	€ Unit Price														
	HEAT					HEATW					HEATB				
No.	50~100	101~200	201~300	301~400	401~500	50~100	101~200	201~300	301~400	401~500	50~100	101~200	201~300	301~400	401~500
0.5															
0.7															
1															
2															

Order Example: Part Number - L → HEAT 1 - 200

Days to Ship: HEAT 8 Days; HEATW / HEATB 10 Days

Price

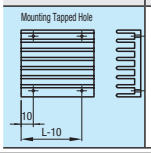
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

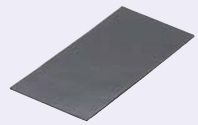
For orders larger than indicated quantity, please request a quotation.

Alterations: Part Number - L - TP → HEAT 1 - 200 - TP

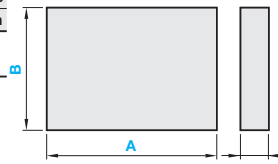
⊗Alterations are not applicable to No.0.5 - No.0.7.

Alteration	Code (No. of Holes)	Spec.	Price Adder
	TP	Adds tapped holes (M3 (Coarse Thread)) between the fins.	10,00

■Heat Radiation Gel Sheets RoHS



Type	Material	Hardness Penetration
HTCH (High Thermal Conduction)	Silicone	50



■Accuracy Standards

- Dimension Tolerance of A and B

50mm or Less	51~100	101~200	201 or More
±0.5	±1.0	±1.5	±2.0

Penetration: JIS K2207 P.358

■How to Use

(1) Peel off single side of backing paper slowly.
(2) Paste it on the heat-generating part carefully so that air bubbles don't get trapped in. Then peel off the rest of the backing paper.
(3) Paste it carefully so that air bubbles don't get in between the heat radiation gel and heat-generating part.

* HTRE (Electromagnetic Wave Absorption) is now available on our website.

Part Number Type	T	1mm Increment A	B
HTCH	0.5	10~350	10~350
	1		
	2		

A≥B

Order Example: Part Number - A - B → HTCH0.5 - 300 - 190

Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

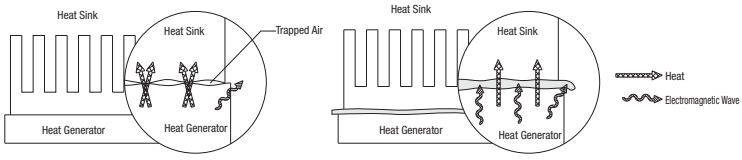
Quantity	1~9	10~14	15	16~25
Discount Rate	€ Unit Price	5%	10%	18%
Days to Ship	Price List			+10 days

For orders larger than indicated quantity, please request a quotation.

Part Number Type	T	A	€ Unit Price B 10~100	101~200	201~300	301~350
HTCH	0.5	10~100				
		101~200				
		201~300				
		301~350				
	1	10~100				
		101~200				
		201~300				
		301~350				
	2	10~100				
		101~200				
		201~300				
		301~350				

Example

Can be used between heat sinks, internal parts of computers (CPU, boards and etc.) or heat-generating sources such as power supply parts and heat sinks or enclosures.



■Features

-With excellent flexibility and adhesiveness, it can closely adhere to concave or convex surface without trapping air.
-Excels in electric insulation and flame resistance.
-With low temperature dependency, it is suitable for use in wide temperature range –40°C~200°C (–40° C~150°C for HTRE).

Item	Unit	HTCH
Thermal Conductivity (Hot Wire Method)	W/m-K	2.1
Appearance	-	Gray
Specific Gravity	-	2.8
Hardness	Penetration: 1/10mm	50
Volume Resistivity	• Ω cm	$5.7x10^{12}$
Tensile Strength	Mpa	0.12
Elongation	%	220
Compression Set	%	92
Dielectric Breakdown Strength	kV/mm	7.2
Content of Low-Molecule Siloxane∑D4~D10	ppm	300 or Less
Flame Resistance	-	V-0
Normal Temperature Range	°C	-40~200
Magnetic Permeability (Magnetic Loss)	<1GHz>	-

Sponge Tapes

■Sponge Tapes of 500mm, 100mm or 2000mm long.



RoHS

Type	Material	Hardness	Color
SGNPTA	EPDM Sponge	Asker C8	Black
SGNATA	Silicon Rubber Sponge	Asker C35	Orange
EPATA	EPDM Foam (EPT SEALER®)	Less than Asker C1	Black

- A Dimension Tolerance

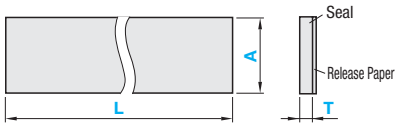
SGNPTA SGNATA	±1.5
EPATA	±2.5

- L Dimension Tolerance

	500	1000
SGNPTA SGNATA	±3	±5

EPATA

500, 1000	1500, 2000
+14 - 6	+15 - 8



It is delivered in a roll. Characteristic Data P.409

Part Number		T	Selection	
Type	T	Tolerance	A	L
SGNPTA SGNATA	3	±0.5	10 15 20 30 50	500 1000
	5			
	10			
EPATA	3	±1.0	10 15 20 30 50	500 1000 1500 2000
	5			
	10			

Order Example

Part Number	-	A	-	L
SGNPTA3	-	10	-	1000

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number		A	€ Unit Price							
			SGNPTA		SGNATA		EPATA			
Type	T		L500	L1000	L500	L1000	L500	L1000	L1500	L2000
SGNPTA SGNATA EPATA	3	10								
		15								
		20								
		30								
		50								
	5	10								
		15								
		20								
		30								
		50								
	10	10								
		15								
		20								
		30								
		50								

■Features of EPATA

This product is made of a semi–closed cell foam, available for compression in the condition of low stress. After compression, it can be made into independent air bubble. This product is a high performance sealer that has the capability of filling gaps to shut out heat, water and sound.

■Characteristic Values

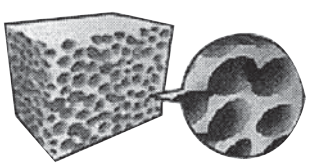
Testing method conforms to JIS K 6767.

Measurement Item		Unit	EPATA
Specific Gravity		-	0.095
Tensile Strength		kg/cm²	0.90
Elongation		%	430
Compression Hardness	25%	kg/cm²	0.02
	50%		0.05
Air Bubble		-	Semi–closed Cell

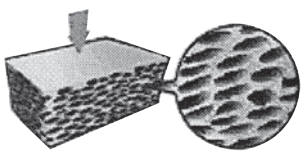
Compression Rate (%)	EPATA
50	X
60	Δ
70	○
80	○

O: No leakage of water after 30mins.
Δ: Leakage of water is seen within 30mins.
X: Leakage of water is seen within 10mins.

-Semi–closed Cell Structure (EPATA)



Before Compression

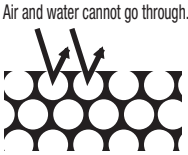


After Compression

■Features of Open Cell Type (SGNPTA · SGNATA)

Bubbles are separated from each other, so air and water cannot pass through the material. It also excels in shock absorption.

Air and water cannot go through.



Round Cord - Sealing Elastomer · Round Rubber String Ring

NEW

A new type gasket of flexible gel material, which is adaptable to a variety of uses gasket filling up gaps.

Round Cord - Sealing Elastomer

RoHS

Type	Material	Hardness	Color
RBGEL	Viscoelastic Elastomer	Asker F65	Light Yellow



- Operation Temperature Range -10~70°C
- Gel surface is coated with fluoride powder to prevent sticking.
- It is delivered in a roll.
- Can be used by cutting the strings from overhead with a cutter knife.

Part Number Type	D	L (mm)
RBGEL (Viscoelastic Elastomer)	2	500
	5	1000
	10	1500

Order Example — Part Number: RBGEL5 - L: 500

Days to Ship: 6 Days P.88

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~19	20~49
Discount Rate	€ Unit Price	10%	15%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	L (mm)	€ Unit Price L 500	L 1000	L 1500
RBGEL	2	500			
	5	1000			
	10	1500			

Viscoelastic Elastomer

Viscoelastic elastomer is an extremely soft gel which has an Asker F hardness.
Superior in mechanical strength and excellent in durability.
A major characteristic is the three-dimensional slow recovery, the function to recover after compression slowly and in multiple directions. It is adaptable to a variety of use, including gaskets for sealing.

Elasticity of Viscoelastic Elastomer

A very soft and elastic material, as shown in the picture (Elongation Rate: more than 2,000%).
Due to its excellent shape flexibility, it easily conforms to complex shapes. Cutting surface has self-adhesion.







Comparison of Characteristic Values

Item	Viscoelastic Elastomer	Nitrile Rubber	Silicon Rubber
Specific Gravity	0.9	1.6	1.2
Hardness	65 (Asker F)	70 (Shore A)	50 (Shore A)
Tensile Strength (Mpa)	0.17	12.7	8.8
Elongation (%)	>2000	370	330
Maximum Operation Temperature	70	90	200
Low Temp. Resistance	-10	-10	-70

Comparison of Chemical Resistance

	Viscoelastic Elastomer	Nitrile Rubber	Silicon Rubber
Gasoline Light Oil	X	○	Δ–○
Water	○	○	Δ
Strong Acid	○	○	Δ
Strong Alkali	00	○	○
Ether	X	X–Δ	Δ

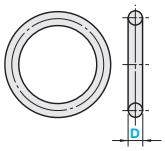
Do not use in places where there may be splashes of solvent.

Round Rubber String Ring Type



RoHS

Type	Material	Hardness	Color
RBWNR	Nitrile Rubber (NBR)	Shore A70	Black
RBWSR	Silicon Rubber (SI)	Shore A53	Milky White
RBWFR	Fluoro Rubber (FPM)	Shore A76	Black





Vulcanized bonded product

Rubber string is cut at a desired length and makes it to ring by vulcanized bonding. Bonded part is polished by sandpaper.

Most suitable for use as general-purpose gasket.

- Not compliant with JIS Standard O ring.
- Avoid using as a belt.

Part Number Type	D	1mm Increment L (Unfolded Length)
RBWNR (Nitrile) RBWSR (Silicon) RBWFR (Fluorine)	2	300~4000
	3	
	4	
	5	
	10	

Precision Standards

L Dimension Tolerance

1000mm or less	2000mm or less	3000mm or less	4000mm or less
0	0	0	0
-1.0	-2.0	-3.0	-4.0

Part Number Type	D	D Dimension Tolerance	€ Unit Price L (Expanded length) 1mm Increment 300~600	601~1000	1001~1300	1301~1600	1601~2000	2001~2300	2301~2600	2601~3000	3001~3300	3301~3600	3601~4000
RBWNR Nitrile Rubber	2	±0.2											
	3	±0.3											
	4	±0.4											
	5												
	10	±0.6											
RBWSR Silicon Rubber	2	±0.1											
	3												
	4												
	5	±0.15											
	10	±0.3											
RBWFR Fluoro Rubber	2	±0.2											
	3												
	4												
	5	±0.3											
	10	±0.5											

Order Example — Part Number: RBWNR2 - L: 525; RBWFR10 - L: 3301

Days to Ship: 10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~19	20~49
Discount Rate	€ Unit Price	10%	15%

For orders larger than indicated quantity, please request a quotation.

NEW

Round String · Square String

-Rubber / Rubber Sponge-

Price Reduction
Up to 52%

■Rubber strings for various applications such as gap gasket. Standard by the meter is added.

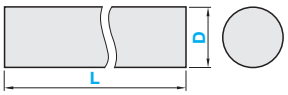
■Round String · Square String



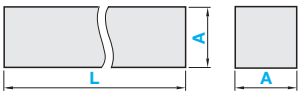
RoHS

Round	Square	Material	Hardness	Color
RBWN	RBKWN	Nitrile Rubber (NBR)	Shore A66	Black
RBWS	RBKWS	Silicon Rubber (SI)	Shore A50	Milky White
RBWF	-	Fluoro Rubber (FPM)	Shore A69	Black
RBWCS	RBKWCS	Chloroprene Rubber Sponge	Asker C20	
RBWSS	RBKWSS	Silicon Rubber Sponge	Asker C25	Orange
RBWFS	-	Fluoro Rubber Sponge	Asker C35	Black

Round



Square



■Precision Standards

L Dimension Tolerance

L	Tolerance
200 or Less	±1.5
201~400	±2.0
401 or More	±3.5

■Round

Part Number Type	D	1mm Increment L	L (Meter)
RBWN (Nitrile) RBWS (Silicon) RBWF (Fluorine)	2 3 4 5 6 7 8 9 10 12 15	20~999	1 3 5 10

■Square

Part Number Type	D	1mm Increment L	L (Meter)
RBKWN (Nitrile) RBKWS (Silicon)	5 6 8 10 12 15	20~999	1 3 5 10

■Round String (Sponge Type)

Part Number Type	D	L (Meter)
RBWCS (Chloroprene Sponge) RBWSS (Silicon Sponge) RBWFS (Fluoro Sponge)	3 4 5 6 7 8 9 10 12 15	1 3 5 10

■Square String (Sponge Type)

Part Number Type	D	L (Meter)
RBKWCS (Chloroprene Sponge) RBKWSS (Silicon Sponge)	5 6 8 10 12 15	1 3 5 10

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~19	20~49
Discount Rate	€ Unit Price	10%	15%

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	L
RBWN2	-	250
RBKWN15	-	1M

Days to Ship: 8 Days

The price of this product is found by multiplying the unit price shown in the table by the material rate.

(Ex.) Part Number RBWS2 - L 250 (€ Unit Price) x (Material Rate) x 1.5 = Standard Type € Unit Price 6,60 EUR

■Round

Part Number Type	D	D Dimension Tolerance	€ Unit Price L 1mm Increment 20~100	101~200	201~300	301~600	601~800	801~999	Selection (meter) 1M	3M	5M	10M
RBWN (x1.0) Nitrile	2 3	±0.35										
RBWS (x1.5) Silicon	4 5 6	±0.5										
RBWF Fluorine	7 8 9	±0.5										
D2~4: (x3.0) D5~8: (x5.0) D9~15: (x7.0)	10	±0.8										
( ) Material Rate	12 15	±1.0										

Material Rate for RBWF may vary depending on D dimensions.

■Square

Part Number Type	A	A Dimension Tolerance	€ Unit Price L 1mm Increment 20~100	101~200	201~300	301~600	601~800	801~999	Selection (meter) 1M	3M	5M	10M
RBKWN(x1.0) Nitrile	5 6	±0.5										
RBKWS(x1.5) Silicon	8 10	±0.8										
( ) Material Rate	12 15	±1.0										

■Round String (Sponge Type)

Part Number Type	D	D Dimension Tolerance	€ Unit Price L Selection (Meter) 1M	3M	5M	10M
RBWCS(x1.0) Chloroprene Sponge	3 4 5	±1.0				
RBWSS(x1.5) Silicon Sponge	6 7 8	±1.0				
RBWFS Fluoro Sponge (x1.7)	9	±1.0				
( ) Material Rate	10 12 15	±2.0				

■Square String (Sponge Type)

Part Number Type	D	D Dimension Tolerance	€ Unit Price L Selection (Meter) 1M	3M	5M	10M
RBKWCS(x1.0) Chloroprene Sponge	5 6	±1.0				
RBKWSS(x1.5) Silicon Sponge	8 10	±1.0				
( ) Material Rate	12 15	±2.0				

Fluoro Rubber Spongeis selectable only from D=5, 6, 8 or 10.
Fluoro Sponge Price has been revised due to the price list integration.

Round Dome Ropes · Trapezoidal Dome Ropes
-Rubber / Rubber Sponge-

■Can be used for gaskets on door openings in order to enhance air-tightness or preventing twists.

■Round Dome Ropes · Trapezoidal Dome Ropes



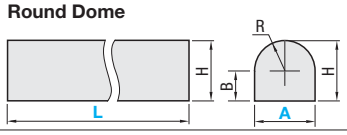
RoHS

Round Dome	Trapezoidal Dome	Material	Hardness	Color
KMHN	KYHN	Nitrile Rubber (NBR)	Shore A70	Black
KMHS	KYHS	Silicon Rubber (SI)		Red Brown
KMHF	KYHF	Fluoro Rubber (FPM)		Black
KMHNS	-	Chloroprene Rubber Sponge	Asker C20	Black
KMHSS	-	Silicon Rubber Sponge	Asker C25	Orange

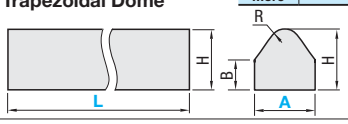
■Precision Standards
L Dimension Tolerance

L	Tolerance
200 or Less	±1.5
201~400	±2.0
401 or More	±3.5

Round Dome



Trapezoidal Dome



■ Round Dome

Part Number Type	A	1mm Increment L	L (Meter)
KMHN (Nitrile)	8	20~999	1
	10		3
KMHS (Silicon)	12		5
KMHF (Fluorine)	15		10
	16		

■ Trapezoidal Dome

Part Number Type	A	1mm Increment L	L (Meter)
KYHN (Nitrile)	8	20~999	1
	10		3
KYHS (Silicon)	12		5
KYHF (Fluorine)	16		10
	20		

■ Round Dome (Sponge Type)

Part Number Type	A	L (Meter)
	10	1
KMHNS (Chloroprene Sponge)	15	3
KMHSS (Silicon Sponge)	15	5
	20	10

■ Round Dome

Part Number Type	A	A Dimension Tolerance	B	H	R	€ Unit Price L 1mm Increment 20~100	101~200	201~300	301~600	601~800	801~999	Selection (meter) 1M	3M	5M	10M
KMHN(x1.0) Nitrile	8	±0.2	4	8	4										
	10		5	10	5										
KMHS(x1.5) Silicon	12		6	12	6										
KMHF(P) Fluorine	15		7.5	15	7.5										
( ) Material Rate	16		8	16	8										

(P)Material Rate for Fluoro Rubber KMHF: When A=8, 10 or 12, (x4.0). When A=15 or 16, (x5.0).

■ Trapezoidal Dome

Part Number Type	A	A Dimension Tolerance	B	H	R	€ Unit Price L 1mm Increment 20~100	101~200	201~300	301~600	601~800	801~999	Selection (meter) 1M	3M	5M	10M
KYHN(x1.0) Nitrile	8	±0.2	4	8	2.8										
	10		5	10	2.8										
KYHS(x1.5) Silicon	12		6	12	3										
KYHF(P) Fluorine	16		8	16	4										
( ) Material Rate	20		10	20	5										

(P)Material Rate for Fluoro Rubber KYHF: When A=8, 10 or 12, (x4.0). When A=16 or 20, (x5.0).

■ Round Dome Sponge

Part Number Type	A	A Dimension Tolerance	B	H	R	€ Unit Price L Selection (Meter) 1M	3M	5M	10M
KMHNS(x1.0) Chloroprene Sponge	10	±1.0	5	10	5				
	15		2.5	10	7.5				
KMHSS(x1.5) Silicon Sponge	15		7.5	15	7.5				
( ) Material Rate	20		10	20	10				

Days to Ship: 8 Days

Order Example

Part Number	-	L
KMHN8	-	250
KMHNS15	-	10M

Price

■Volume Discount (P)Round down to one Cent.) P.87

Quantity	1~4	5~19	20~49
Discount Rate	€ Unit Price	10%	15%

(P)For orders larger than indicated quantity, please request a quotation.

(P)The price of this product is found by multiplying the unit price shown in the table by the material rate.

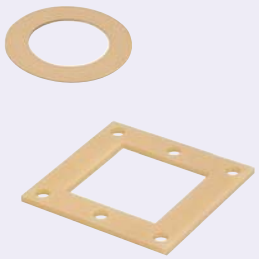
(Ex.) Part Number KMHS8 - L 20

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price
x 1.5 = 8,40 EUR

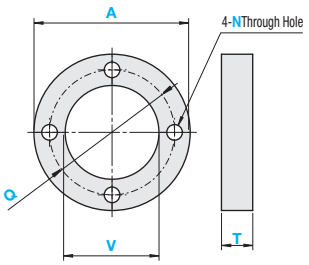
Urethane Gaskets

■Product name has changed from Urethane Products. Heat resistant urethane is added to material variation. For other rubber and sponge products, see ☞P.425

RoHS



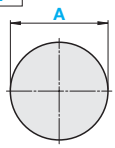
Type	Material	Hardness	Color
FUS	Ether Type Polyurethane	Shore A95	Natural Color
FUH		Shore A90	Natural Color
FUM	Ester Type Polyurethane	Shore A70	Natural Color
FUL		Shore A50	Natural Color
FUTH	Heat Resistant Urethane	Shore A90	Brown



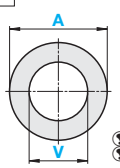
Select a shape from below.

Shape Selection

A

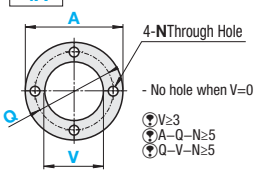


1A



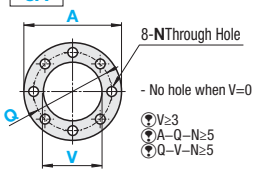
V≥3
A–V≥4

4A



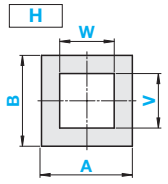
- No hole when V=0
V≥3
A–Q–N≥5
Q–V–N≥5

8A



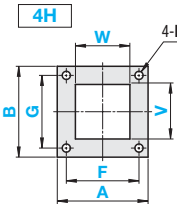
- No hole when V=0
V≥3
A–Q–N≥5
Q–V–N≥5

H



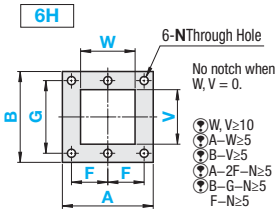
No notch when W, V = 0.
W, V≥10
A–W≥5
B–V≥5

4H



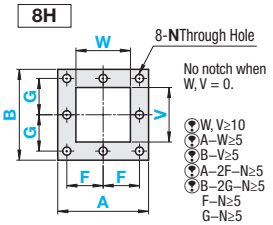
No notch when W, V = 0.
W, V≥10
A–W≥5
B–V≥5
A–F–N≥5
B–G–N≥5

6H



No notch when W, V = 0.
W, V≥10
A–W≥5
B–V≥5
A–2F–N≥5
B–G–N≥5
F–N≥5

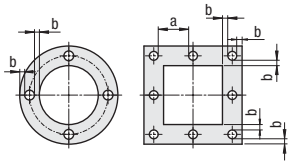
8H



No notch when W, V = 0.
W, V≥10
A–W≥5
B–V≥5
A–2F–N≥5
B–2G–N≥5
F–N≥5
G–N≥5

<Machining Limits>

a≥5
b≥2.5



■Precision Standards

T Dimension	1~4	5~10	15~30
	±0.3	±0.4	±0.5

Dimension Tolerance of A · B and V	200mm or Less	201~300	301~400	401~500
	±0.5	±1.0	±1.2	±1.5

A · B dimension tolerance has changed. Please refer to the precision standard.

Part Number			1 mm Increment (A≥B≥T)		W	V	F	G	Q	0.5mm Increment
Type	Shape Selection	T	A	B						N
FUS (Urethane A95) FUH (Urethane A90) FUM (Urethane A70) FUL (Urethane A50) FUTH (Heat Resisting Urethane A90)	A 1A 4A 8A H 4H 6H 8H	1 8 2 10 3 15 4 20 5 25 6 30	25~500 (When T=30, A≥30)	25~500 (When T=30, B≥30)	0.5mm Increment < Refer to Machining Limits and Condition Formula >					3~30

Order Example

Part Number	Type	Shape	T		A		B		W		V		F		G		Q		N
	FUH	4A	5	-	A400			-		-	V200			-		-	Q300	-	N11

Alterations

Part Number	Type	Shape	T		A		B		W		V		F		G		Q		N		(SC · WSC · ZC)
	FUTH	4H	30	-	A300	-	B200	-	W200	-	V100	-	F250	-	G150				N11	-	ZC-Z18-J20

Days to Ship 8 Days

Alterations	1-Flat	2-Flat	Counterbore Hole
			
Code	SC	WSC	ZC
Spec.	Adds One Flat. Applicable to Shape A and 1A. Ordering Code SC100 = 1mm Increment Shape A: A/2≤SC<A–2 Shape 1A: A/2+V/2+2.5<SC<A–2	Adds Two Flats. Applicable to Shape A and 1A. Ordering Code WSC100 WSC = 1mm Increment Shape A: A/2≤WSC<A–4 Shape 1A: V+5<WSC<A–4	Changes N (Through Hole) to Counterbore Hole. Ordering Code ZC-Z17.5-J15 Z, J = 0.5mm Increment Z–N≥4 T–J≥2
Price Adder	2,00	4,00	3,00

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

Volume Discount is applicable to body price only.
For orders larger than indicated quantity, please request a quotation.

<Price Calculation Method>
For the price of urethane gaskets, add machining charge shown below to the price in the list.

Shape Machining Charge

Shape Code	Price	Shape Code	Price
A		H	
1A		4H	
4A		6H	
8A		8H	

Examples of Price Calculation
(1): For Round Shape (considering A=B)
Urethane Rubber Shore A90
FUH1A3–A300–V200(Find the price for T3, A300, B300.)
Body Price 27,90 EUR x 0.7= 19,53 ➡ 19,50
EUR (Round down to ten Cent.)
Shape Machining Charge 1,00 EUR
Total 20,50 EUR

(2): For Square Shape
Heat Resistant Urethane
FUTH4H3-A300-B200-W200-V100-F250-G150-N11
(Find the price for T3, A300, B200.)
Body Price 20,40 EUR x 1.3= 26,52 ➡ 26,50EUR
(Round down to ten Cent.)
Shape Machining Charge 5,00 EUR
Total 31,50 EUR

Part No. Type	T	A	€ Unit Price B 25~100	101~200	201~300	301~400	401~500
Urethane FUS Shore A95 (x1.0)	1	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
FUH Shore A90 (x0.7)	2	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
FUM Shore A70 (x1.0) FUL Shore A50 (x1.0)	3	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Heat Resistant Urethane	4	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
FUTH Shore A90 (x1.3)	5	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
( ) Material Rate	6	25~100					
		101~200					
		201~300					
		301~400					
		401~500					

Part Number Type	T	A	€ Unit Price B 25~100	101~200	201~300	301~400	401~500
Urethane FUS Shore A95 (x1.0)	8	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
FUH Shore A90 (x0.7)	10	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
FUM Shore A70 (x1.0) FUL Shore A50 (x1.0)	15	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Heat Resistant Urethane	20	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
FUTH Shore A90 (x1.3)	25	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
( ) Material Rate	30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					

Material Properties

- Ether Polyurethane
  Excels in mechanical strength. Low heat resistance and chemical resistance. Highly resistant to water and suitable for outdoor use. Has high impact resilience.

- Ester Polyurethane
  Excels in mechanical strength. Low heat resistance and chemical resistance. Superior in oil resistance with mechanical strength 30% - 100% greater than Ether Polyurethane. Has low impact resilience.

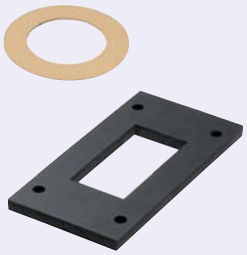
- Heat Resisting Urethane
  This product has overcome the weakness of conventional urethanes, poor endurance against heat. Withstands use in high temperature up to 120°C, while general urethane can withstand up to only 70°C.

	Water Resistance	Oil	Chemical	Heat
Ether Polyurethane	○		X	X 70°C
Ester Polyurethane		○	X	X 70°C
Heat Resistant Urethane	○		X	0 120°C

Rubber · Sponge Gaskets

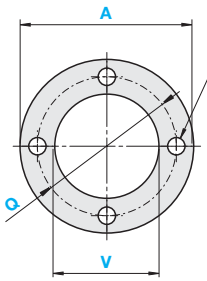
■Product name has changed from rubber · sponge products.

RoHS



Type	Material	Hardness	Color
FRN	Nitrile Rubber (NBR)	Shore A70	Black
FRC	Chloroprene Rubber (CR)	Shore A65	Black
FRCAN	Amber Color Rubber	Shore A45	Amber Color
FRSM	Silicon Rubber	Shore A70	Light Gray
FRAM	Silicon Rubber	Shore A50	Milky White
FRFF	Fluoro Rubber (FPM)	Shore A80	Black
FSNC	Chloroprene Rubbers Sponge	Asker C25	Black
FSNF	Fluoro Rubber Sponge	Asker C35	Black
FSNA	Silicon Rubber Sponge	Asker C35	Orange
FREP	Ethylene Rubber (EPDM)	Shore A65	Black

※Sponge Hardness ASKER–C



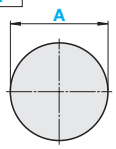
※Information on Polyamide Form and TPE is available online.

※The milky white color of silicone rubber shore A 50 is translucent.

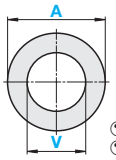
Select a shape from below.

Shape Selection

A

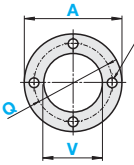


1A



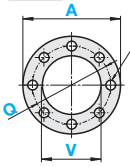
※V≥3
※A–V≥4

4A



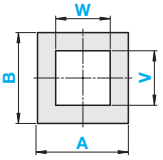
- No hole when V=0
※V≥3
※A–Q–N≥5
※Q–V–N≥5

8A



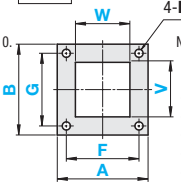
- No hole when V=0
※V≥3
※A–Q–N≥5
※Q–V–N≥5

H



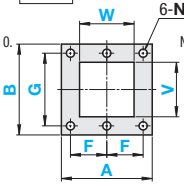
No notch when W, V = 0.
※W, V≥10
※A–W≥5
※B–V≥5

4H



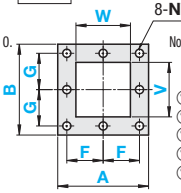
No notch when W, V = 0.
※W, V≥10
※A–W≥5
※B–V≥5
※A–F–N≥5
※B–G–N≥5

6H



No notch when W, V = 0.
※W, V≥10
※A–W≥5
※B–V≥5
※A–2F–N≥5
※B–G–N≥5
F–N≥5

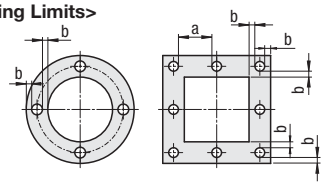
8H



No notch when W, V = 0.
※W, V≥10
※A–W≥5
※B–V≥5
※A–2F–N≥5
※B–2G–N≥5
F–N≥5
G–N≥5

<Machining Limits>

a≥5
b≥2.5



■Precision Standards

Rubber

T Dimension	1~3	5	10	15~30
	±0.3	±0.4	±0.6	+2.0 -0.5

Dimension Tolerance of A, B and V	200mm or Less	201~300	301~500
	±0.5	±1.0	±1.5

Sponge

T Dimension	3, 5	10
	±0.3	±1.5

A, B Dimension Tolerance	190mm or Less	191~390	391 or More
	±1.5	±2	±3

※A, B dimension tolerance has changed. Please refer to the precision standard.

Part Number				1 mm Increment (A≥B≥T)							0.5mm Increment
Type		Shape Selection	T Rubber	T Sponge	A	B	W	V	F	G	Q	N
FRN	(Nitrile Rubber)	A	1		25~500 (When T=30, A≥30)	25~500 (When T=30, B≥30)	0.5mm Increment < Refer to Machining Limits and Condition Formula>					3~30
FRC	(Chloroprene Rubber)	1A	2									
FRFF	(Fluoro Rubber)	4A	3	3								
FRSM	(Silicon A70)	8A										
FRAM	(Silicon A50)		5									
FRCAN	(Amber color rubber)	H	10	5								
FSNC	(Chloroprene Rubber Sponge)	4H	15									
FSNF	(Fluoro Rubber Sponge)	6H		10								
FSNA	(Silicon Rubber Sponge)	8H	20									
FREP	(EPDM A65)		30									

※For FRFF (fluoro rubber) with T dimension 15-30 and FRTPAE(TPE), maximum value for A and B is 300.

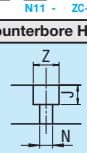
Alterations

Part Number: Type | Shape | T - A - B - W - V - F - G - Q - N - (SC · WSC · ZC)
FRN 4H 30 - A300 - B200 - W200 - V100 - F250 - G150 - N11 - ZC-Z18-J20

Order Example

Part Number: Type | Shape | T - A - B - W - V - F - G - Q - N
FRN 4H 3 - A300 - B200 - W200 - V100 - F250 - G150 - N11

Days to Ship 8 Days

Alterations	1-Flat	2-Flat	Counterbore Hole
			
Code	SC	WSC	ZC
Spec.	Adds One Flat. Applicable to Shape A and Shape 1A. Ordering Code SC100 = 1mm Increment Shape A: A/2≤SC<A–2 Shape 1A: A/2+V/2+2.5<SC<A–2	Adds Two Flats. Applicable to Shape A and Shape 1A. Ordering Code WSC100 WSC = 1mm Increment Shape A: A/2≤WSC<A–4 Shape 1A: V+5<WSC<A–4	Changes N (Through Hole) to Counterbore Hole. Ordering Code ZC-Z17.5-J15 Z, J = 0.5mm Increment Z–N≥4T–J≥2
Price Adder	2,00	4,00	3,00

Price

Volume Discount (Round down to one Cent.) **P87**

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

※Volume Discount is applicable to body price only.
※For orders larger than indicated quantity, please request a quotation.

<Price Calculation Method>
For the price of rubber / sponge gaskets, add shape machining charge to the price in the list.

Shape Machining Charge

Shape Code	Price	Shape Code	Price
A		H	
1A		4H	
4A		6H	
8A		8H	

Examples of Price Calculation
(1): For Round Shape (considering A=B)
Nitrile Rubber
FRTPE1A3–A300–V200 (Find the price for T3, A300, B300.)

€ Unit Price	8,80 EUR
Shape Machining Charge	1,00 EUR
Total	9,80 EUR

(2): For Square Shape
Ethylene Rubber
FREP4H3-A300-B200-W200-V100-F250-G150-N11
(Find the price for T3, A300, B200.)

€ Unit Price	6,10 EURx1.2=7,32 EUR→7,30 EUR (Round down to ten Cent.)
Shape Machining Charge	5,00 EUR
Total	12,30 EUR

Nitrile Rubber, Chloroprene Rubber, Silicon Rubber

Part Number Type	T	A	€ Unit Price B 25~100	101~200	201~300	301~400	401~500
Nitrile Rubber FRN	1	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Chloroprene Rubber FRC	3	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Amber Color Rubber FRCAN (x1.6)	5	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	15	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Ethylene Rubber FREP (x1.2) (Material Rate)	20	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					
Silicon Rubber FRSM Shore A70	1	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	3	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Silicon Rubber FRAM Shore A50	10	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	15	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	20	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	30	30~100					
		101~200					
		201~300					
		301~400					
		401~500					

Fluoro Rubber

Part Number Type	T	A	€ Unit Price B 25~100	101~200	201~300	301~400	401~500
Fluoro Rubber FRFF	1	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	2	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	3	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	15	25~100					
		101~200					
		201~300					
	20	25~100					
		101~200					
		201~300					
	30	30~100					
		101~200					
		201~300					

Chloroprene Rubber Sponge · Fluoro Rubber Sponge · Silicon Rubber Sponge · Polyimide Foam

Part Number Type	T	A	€ Unit Price B 25~100	101~200	201~300	301~400	401~500
Chloroprene Rubbers Sponge FSNC	3	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Fluoro Rubber Sponge FSNF	3	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
Silicon Rubber Sponge FSNA	3	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	25~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	25~100					
		101~200					
		201~300					
		301~400					
		401~500					

Antivibration / Soundproof / Protection / Antistatic / Brushes

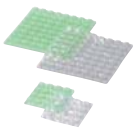
Antivibration/ Sound Proofing Materials



Price Reduction
Up to 23%

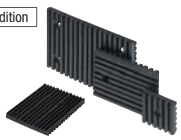

Product Name	Electroconductive/Chloroprene Antivibration Rubbers	Antivibration Rubber Mounts	-Both Ends Male Thread Stopper Type-
Page	431·432	433·434	435







Antivibration Gels-Male Thread/Plate Stopper Type-	Antivibration Gel Bushings	Antivibration Gel Sheets	Antivibration Gel-Rubber Covered Type-	Wire Rope Isolators
436	436	437	437	438

Addition


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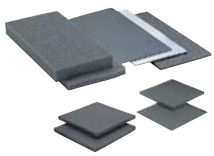
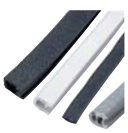


Antivibration Pads	RUBLOC® (For Low Frequency)	Sound Proofing Materials
439	440	441~444

Protective Materials



NEW

NEW


Product Name	Trims	Trim Seals	Trims Compact	Resin Trims
Page	445	446	447	447

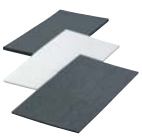
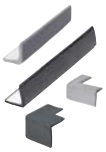





NEW


Moment Adhesives for Rubber	Adhesive for Urethane	Double Sided Adhesive Tape for Rubbers	Electroconductive Rubber Feet	Rubber Feet Receiver Cups
448	448	448	449	450

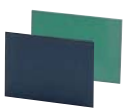


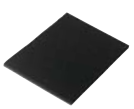





Sponge Tape	Rubber Bumpers	Shock Absorbing Form	Safety Protection Materials	-Large Corner Covers-	-D Type Rubber Bumpers-
451	452	452	453	454	454

Antistatic Measures



Product Name	Antistatic Rubber Sheets	-High Conductive Type-	Earth Plates	Antistatic Sponge Sheets
Page	455	456	456	457



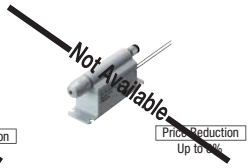
Antistatic Sponge Sheets
458



Ionizers-DC Fan Type, Medium Size-
459



-DC Fan Type, Compact-
460



-Blow Type-
461



Nozzle Attachment Tubes
462



Nozzle Attachments
462



Neutralization Brushes
463



Copper Foil Tape
463



Neutralization Tapes
463

Brush



Channel Brush
465



Attachment
465

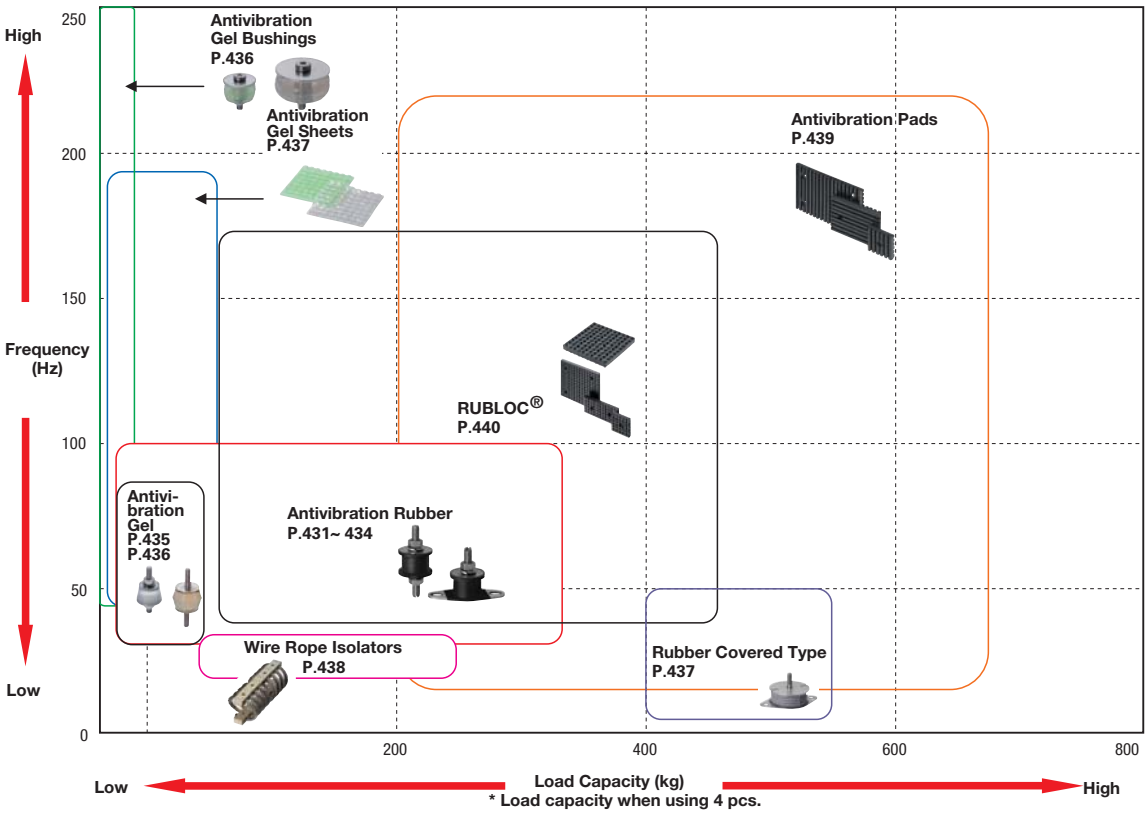


Roll Brush
466

Antivibration Materials Selection Method

-Vibration Transmissibility Data-

■Antivibration Material Selection Chart



*1 Vary depending on volume and nominal. Refer to load information of each product.
*2 Vary depending on volume, nominal and load weight. Refer to vibration transmissibility data for each product.

■Vibration Control Material

Antivibration Gel Sheet · Antivibration Pads (P.437 · 439 · 440) Antivibration Gel · Antivibration Rubber (P.435~436 · 431~434) Selection Methods

Select the anti-vibration material by referring to the table above, and then determine the nominal by referring vibration transmissibility data of each product.

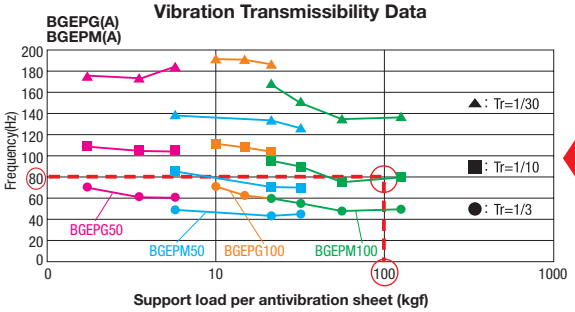
■Vibration Transmissibility Data

Antivibration effects of antivibration material (Tr=vibration transmissibility) depend on load and characteristic frequency of supported object (natural frequency). Graphs on each page have been generated by calculating the expected antivibration effects from the support load per vibration control material and the frequency of the supported object.
Select the optimal vibration control materials according to the following instruction.

1. Find out the support load for each vibration control material=_____(kgf).
   Evaluate the frequency=_____(Hz) of the subject of antivibration
(Frequency=Number of Vibration per Second
When motor speed is 4800rpm, 4800(rpm)/60(s)=80(Hz))

2. By plotting the value 1 on the graph, useable antivibration material type and vibration transmissibility can be found.

Ex. Support Load for Each Vibration Control Material=100(kgf)
Frequency of Antivibration Object = 80(Hz)
When BGEPM is selected, the vibration transfer rate will approximately be $\frac{1}{10}$



More antivibration effects can be expected from smaller Tr (vibration transmissibility) values

Tr=1/30 means to suppress the vibration to 1/30
Tr=1/3 means to suppress the vibration to 1/3

Features of Sound Proofing Materials · Vibration Absorption Materials

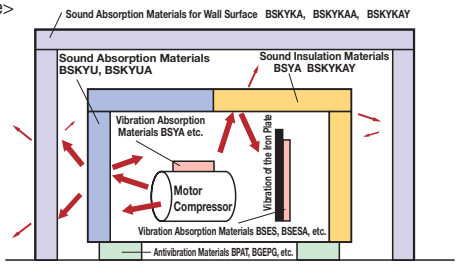
General Information

Sound proofing parts and vibration absorption parts are roughly divided to the following 3 types.

Sound Insulation Material	Reflects the sound. Changes the vibration frequency to decrease the sound generation.	BSYA (**P.444**)	BSKYKAY (**P.444**)	FBSYA (**P.442**)
Sound Absorption Material	Absorbs sounds. Internal friction converts "sound energy" into "thermal energy".	BS140F (**P.444**) BSKYU (**P.444**) BSKYKAA (**P.444**) FBSKYKA (**P.442**)	BS4F (**P.444**) BSKYUA (**P.444**) BSKYKAY (**P.444**) FBSKYKAA (**P.442**)	BS2F (**P.444**) BSKYKA (**P.444**) FBSKYU (**P.442**) FBSKYKAY (**P.442**)
Vibration Absorption Material	Reduces sound levels by converting "vibration energy" into "thermal energy"	BSES_(**P.444**) BSKYKAA (**P.444**)	BSESA_(**P.444**) BSKYKAY (**P.444**)	BSYA (**P.444**) FBSES (**P.442**)

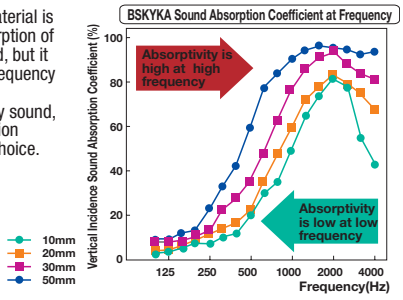
Sound Proofing Materials

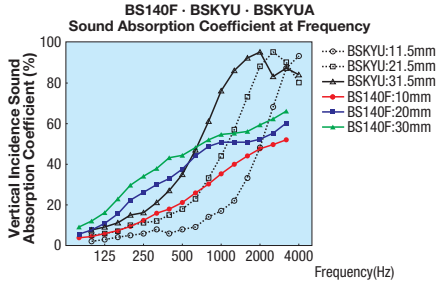
<Example>

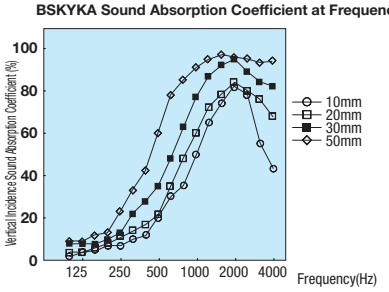


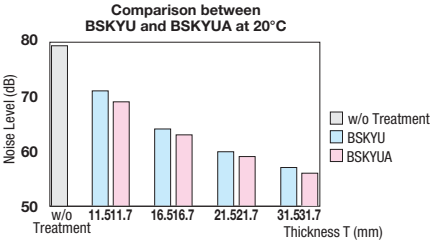
Selection Example BSKYKA P.444

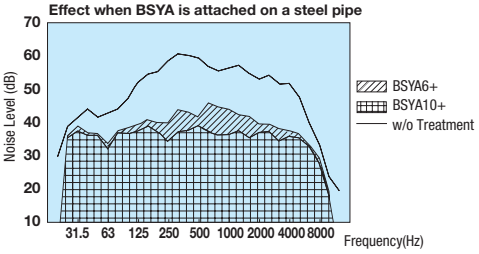
Sound absorption material is suitable for the absorption of high frequency sound, but it cannot absorb low frequency sound.
For the low frequency sound, the vibration absorption material is a better choice.

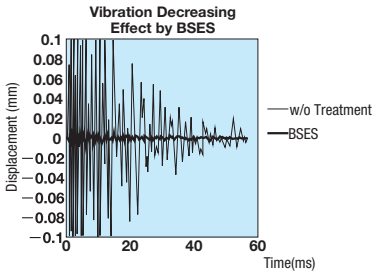




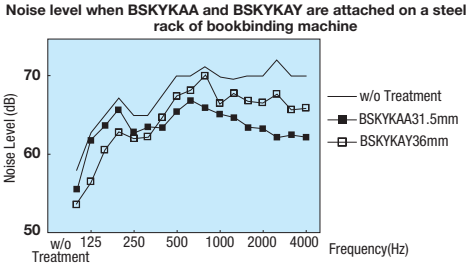








Excitation when struck with 20g iron ball against the iron plate (12.5x250x1.5mm) covered with BSES (12.5x225x1.5mm).



Antivibration Rubber Mounts -Stainless Steel Studs (Conductive Rubber · Neoprene Rubber)-
-Both Ends Male Thread Stopper Type/Male Thread · Plate Stopper Type-

CAD Data

■The problem of antivibration rubber, susceptibility to insulation has been solved by the high electroconductive rubber with volume resistivity value of $10^3\Omega$ • cm.
■Slots on ends and long mounting holes for ease of attachment.

RoHS

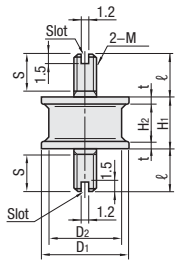


■Both Ends Male Thread Stopper Type

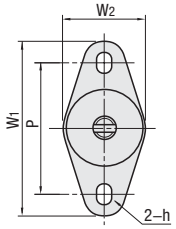
Type	Material: Body	Material: Metal Fitting	H Hardness	A Accessory
DBGOMA	Conductive Nitrile Rubber	1.4301/ X5CrNi18-10	Shore A60	Nut, Spring Washer 2 Pcs. Each
EBGOMA	Chloroprene Rubber			

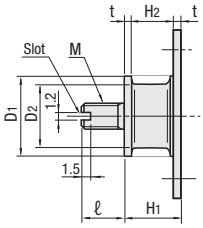
■Male Thread, Plate Stopper Type

Type	Material: Body	Material: Metal Fitting	H Hardness	A Accessory
DBGOMP	Conductive Nitrile Rubber	1.4301/ X5CrNi18-10	Shore A60	Nut, Spring Washer 1 Pc. Each
EBGOMP	Chloroprene Rubber			



*Slots are added to prevent rotation when tightening. Hold it with a flathead screwdriver etc.





Part Number Type	Part Number Nominal	D1	D2	H1	H2	t	ℓ	S	M (Coarse Thread)	W1 x W2	h	P	Allowable Load N {kgf}	Working Load N {kgf}	Spring Constant N/mm {kgf/cm}	X Direction Allowable Load N {kgf}	Rigidity Ratio kx/kz
-Both Ends Male Thread- DBGOMA EBGOMA	12160	12	10	16	12.0	2.0	13	11	5	-	-	-	110{11}	30~78{3~8}	41{42}	25{2.5}	0.2
	15150	15	12	15	11.0		16	12					160{16}	59~130{6~13}	74{75}	34{3.4}	0.2
	20150	20	15					13	6	49x20	6.5x8.5 Slotted Hole	36	280{29}	98~191{10~19}	130{130}	69{7}	0.15
	20200			20	16.0					56x25		42	180{18}	59~98{6~10}	78{80}	49{5}	0.19
-Male Thread, Plate- DBGOMP EBGOMP	25180	25	20	18	13.4	2.3	20	16		62x30		48	490{50}	112~250{11~25}	200{200}	98 {10}	0.16
	30180	30	25	18	13.4		23	20	8	76x40	9x11 Slotted Hole	60	890{91}	226~450{23~46}	310{310}	170{17}	0.16
	40250	40	34	25	20.4		33	25					1810{185}	196~930{20~95}	340{340}	360{37}	0.17

Selection Methods, Mounting Methods, Properties, Cautions P.429

Order Example

Part Number
DBGOMA15150

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~24	25~49
Discount Rate	€ Unit Price	5%

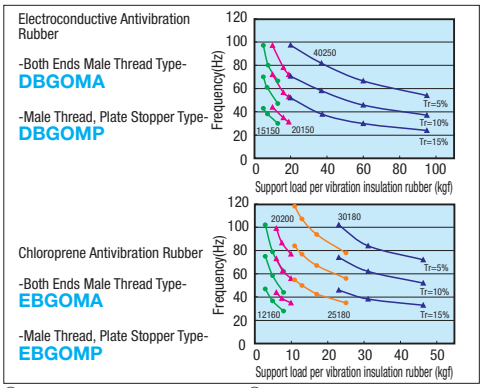
For orders larger than indicated quantity, please request a quotation.

Part Number Type	Part Number Nominal	€ Unit Price DBGOMA	EBGOMA	DBGOMP	EBGOMP
-Both Ends Male Thread- DBGOMA EBGOMA	12160				
	15150				
	20150				
	20200				
-Male Thread, Plate- DBGOMP EBGOMP	25180				
	30180				
	40250				

■Features

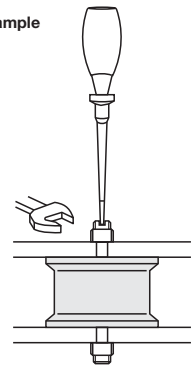
[DBGOMA · DBGOMP · DBGONA · DBGONP]
· The problem of antivibration rubber, susceptibility to insulation has been solved by the high electroconductive rubber with volume resistivity value of $10^3\Omega$ • cm.
[1.4301/X5CrNi18-10 · EBGOMP · EBGONA · EBGONP]
· High quality product made of chloroprene rubber with high quality.
[Common]
· Mounting studs are made of 1.4301/X5CrNiMo18-10, and the tips are slotted. Mounting holes on flanges are also slotted for ease of mounting.

■Vibration Transmissibility Data



Values in the graph are nominal for each type. The above values are not guaranteed values but an example of measured values.

Example



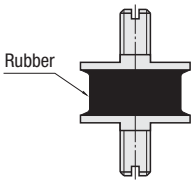
Tightening is possible by holding the threaded tip.

■Electroconductive Rubber Characteristics

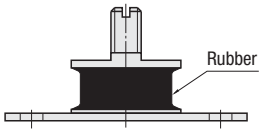
Item	Unit	Value
Specific Gravity	-	1.31
Hardness	Shore A	60
Elongation	%	545
Tensile Strength	MPa	11.8
Specific Volume Resistivity	Ω • cm	$8x10^3$

Measuring Method: JIS K 6301
The above values are not guaranteed values but an example of measured values.

Section View
Both Ends Male Thread Stopper Type



Male Thread, Plate Stopper Type



Antivibration Rubber Mounts -Stainless Steel Studs (Conductive Rubber · Neoprene Rubber)-

-Female Thread · Male Thread Stopper Type/Female Thread · Plate Stopper Type-

CAD Data

■The problem of antivibration rubber, susceptibility to insulation has been solved by the high electroconductive rubber with volume resistivity value of $10^3\Omega$ • cm.
■Slots on ends and long mounting holes for ease of attachment.

RoHS

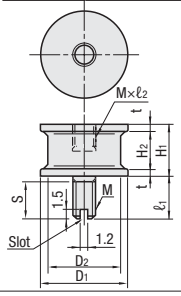


■Female Thread, Male Thread Stopper Type

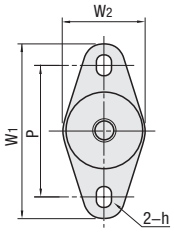
Type	Material: Body	Material: Metal Fitting	Hardness	Accessory
DBGONA	Conductive Nitrile Rubber	1.4301/ X5CrNi18-10	Shore A60	Nut, Spring Washer 1 Pc. Each
EBGONA	Chloroprene Rubber			

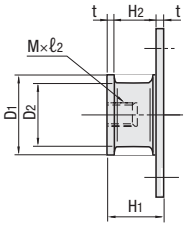
■Female Thread, Plate Stopper Type

Type	Material: Body	Material: Metal Fitting	Hardness
DBGONP	Conductive Nitrile Rubber	1.4301/ X5CrNi18-10	Shore A60
EBGONP	Chloroprene Rubber		



*Slots are added to prevent rotation when tightening. Hold it with a flathead screwdriver etc.





Part Number Type	Part Number Nominal	D1	D2	H1	H2	t	ℓ1	S	M (Coarse Thread)	ℓ2	W1 x W2	h	P	Allowable Load N {kgf}	Standard Load N {kgf}	Spring Constant N/mm {kgf/cm}	X Direction Allowable Load N {kgf}	Rigidity Ratio kx/kz
-Female Thread, Male Thread- DBGONA EBGONA	12160	12	10	16	12.0	2.0	13	11	5	4.5	-	-	-	110{11}	30~78{3~8}	62{63}	25{2.5}	0.2
	15150	15	12	15	11.0		16	12						160{16}	59~130{6~13}	110{110}	34{3.5}	0.24
	20150	20	15					13	6	5	49x20	6.5x8.5 Slotted Hole	36	280{29}	98~160{10~16}	180{180}	69{7}	0.18
	20200			20	16.0									180{18}	59~98{6~10}	88{90}	49{5}	0.22
-Female Thread, Plate- DBGONP EBGONP	25180	25	20	18	13.4		20	16		6	56x25		42	580{59}	147~280{15~29}	220{220}	98 {10}	0.19
	30180	30	25	18	13.4	2.3	23	20	8	7.2	62x30		48	1700{170}	415~830{43~85}	610{620}	250{25}	0.16
	40250	40	34	25	20.4		33	25			76x40	9x11 Slotted Hole	60	1420{145}	363~700{37~71}	340{350}	340{35}	0.23

Order Example

Part Number
DBGONA15150

Days to Ship: 6 Days P.87

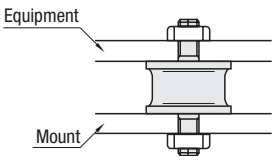
Price

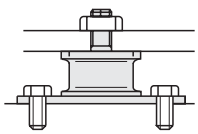
■Volume Discount (Round down to one Cent.) P.87

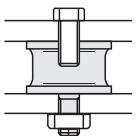
Quantity	1~24	25~49
Discount Rate	€ Unit Price	5%

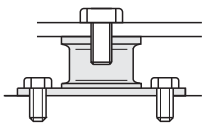
For orders larger than indicated quantity, please request a quotation.

Example









Selection Methods, Mounting Methods, Properties, Cautions P.429

Part Number Type	Part Number Nominal	€ Unit Price DBGONA	EBGONA	DBGONP	EBGONP
-Female Thread, Male Thread- DBGONA EBGONA -Female Thread, Plate- DBGONP EBGONP	12160				
	15150				
	20150				
	20200				
	25180				
	30180				
	40250				

■Vibration Transmissibility Data

Electroconductive Antivibration Rubber

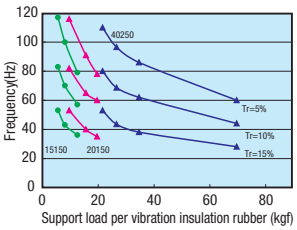
-Female Thread · Male Thread Stopper Type- DBGONA

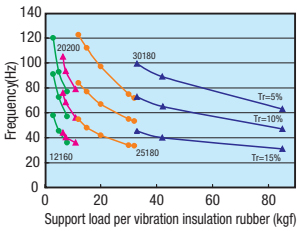
-Female Thread · Plate Stopper Type– DBGONP

Chloroprene Antivibration Rubber

-Female Thread · Male Thread Stopper Type- EBGONA

-Female Thread · Plate Stopper Type- EBGONP

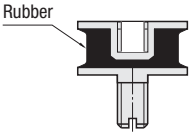




Values in the graph are nominal for each type. The above values are not guaranteed values but an example of measured values.

Section View

Female Thread-Male Thread Stopper Type



Female Thread, Plate Stopper Type



Antivibration Rubber Mounts

-Both Ends Male Thread Stopper Type / Male Thread · Plate Stopper Type-

Price Reduction
Up to 23%

CAD Data

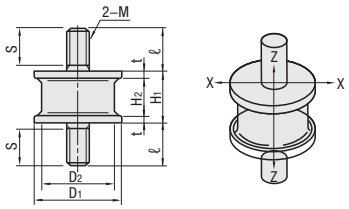
■Takes up little space for installation. For types with slotted studs even easier to install, see P.431 · 432

RoHS



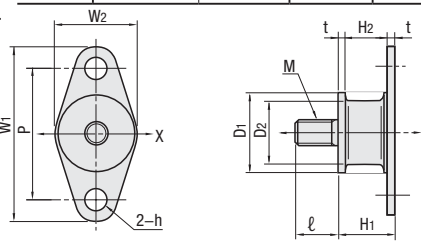
■Both Ends Male Thread Stopper Type

Type	Material: Body	Material: Metal Fitting	Hardness	Accessory
BGOMA	Natural Rubber	Steel (Trivalent Chromate)	Shore A60	Nut, Spring Washer 2 Pcs. Each
BGOMAC	Chloroprene Rubber			
BGOMAS	Natural Rubber	1.4301/ X5CrNi18-10		
BGOMAL		Steel (Trivalent Chromate)	Shore A45	



■Male Thread, Plate Stopper Type

Type	Material: Body	Material: Metal Fitting	Hardness	Accessory
BGOMP	Natural Rubber	Steel (Trivalent Chromate)	Shore A60	Nut, Spring Washer 1 Pc. Each
BGOMPC	Chloroprene Rubber			
BGOMPL	Natural Rubber		Shore A45	



Part Number Type	Part Number Nominal	D1	D2	H1	H2	t	ℓ	S	M (Coarse Thread)	W1xW2	h	P	€ Unit Price BGOMA	BGOMAC	BGOMAS	BGOMP	BGOMPC	BGOMAL	BGOMPL
(Shore A60) -Both Ends Male Thread- BGOMA BGOMAC BGOMAS -Male Thread, Plate- BGOMP BGOMPC	12160	12	10	16	12.0	2.0	12	11	5	-	-	-							
	15150	15	12	15	11.0		15	12											
	20150	20	15					13	6	49x20	7	36							
	20200			20	16.0														
	25180	25	20	18	13.4	2.3	18	16		56x25		42							
	25270			27	22.4														
(Shore A45) -Both Ends Male Thread- BGOMAL -Male Thread, Plate- BGOMPL	30180	30	25	18	13.4		24	20	8	62x30		48							
	30260			26	21.4														
	35260	35	30							69x35	9	53							
	40250	40	34	25	20.4		30	25		76x40		60							

Nominal	Shore A60 BGOMA BGOMAC BGOMAS BGOMP BGOMPC: Z Direction Allowable Load N {kgf}	Z Direction Standard Load N {kgf}	Z Direction Spring Constant N/mm {kgf/cm}	X Direction Allowable Load N {kgf}	Rigidity Ratio kx/kz	Shore A45 BGOMAL BGOMPL: Z Direction Allowable Load N {kgf}	Z Direction Standard Load N {kgf}	Z Direction Spring Constant N/mm {kgf/cm}	X Direction Allowable Load N {kgf}	Rigidity Ratio kx/kz
12160	110{11}	30~78{3~8}	41{42}	25{2.5}	0.20	65{6.6}	18~47{1.8~4.8}	25 {25}	15{1.5}	0.20
15150	160{16}	59~130{6~13}	74{75}	34{3.5}	0.20	94{9.6}	35~76{3.5~7.8}	44 {45}	21{2.1}	0.20
20150	280{29}	98~160{10~16}	130{130}	69{7}	0.15	170{17}	59~94{6~9.6}	76 {78}	41{4.2}	0.15
20200	180{18}	59~98{6~10}	78{80}	49{5}	0.19	110{11}	35~59{3.5~6}	47 {48}	29{3}	0.19
25180	490{50}	128~250{13~25}	200{200}	98{10}	0.16	290{30}	76~150{7.7~15}	120 {120}	59{6}	0.16
25270	310{32}	88~160{9~16}	93{95}	59{6}	0.20	190{19}	53~94{5.4~9.6}	56 {57}	35{3.6}	0.20
30180	890{91}	226~450{23~46}	310{320}	170{17}	0.16	535{55}	138~270{14~28}	190 {192}	100{10}	0.16
30260	610{62}	147~300{15~31}	140{145}	120{12}	0.19	365{37}	93~183{9.5~19}	86 {87}	70{7}	0.19
35260	980{100}	245~490{25~50}	240{240}	250{25}	0.17	590{60}	147~290{15~30}	140 {140}	150{15}	0.17
40250	1810{185}	363~930{37~95}	340{350}	360{37}	0.17	1100{110}	218~560{22~57}	210 {210}	220{22}	0.17

Order Example — Part Number: BGOMA15150

Days to Ship: 6 Days P.87

Price

Spring constant in X direction is calculated by (spring constant in Z direction x rigidity ratio).
Selection Methods, Mounting Methods, Properties, Cautions P.429 · 435

■Volume Discount (Round down to one Cent.) P.87

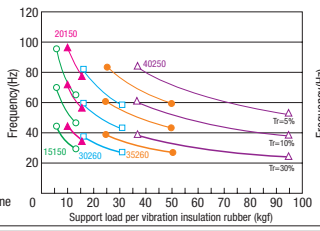
Quantity	1~4	5~9	10~49	50~100
Discount Rate	€ Unit Price	10%	15%	20%

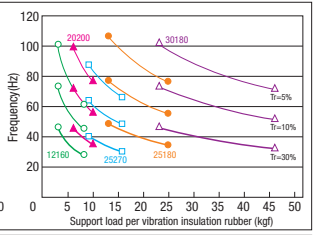
For orders larger than indicated quantity, please request a quotation.

■Antivibration Rubber Mounts

(Shore A60)
-Both Ends Male Thread Type-
BGOMA
BGOMAC
BGOMAS
-Male Thread · Plate Type-
BGOMP
BGOMPC

The two graphs on the left and right are for different products.
Refer to both graphs when load capacity of one antivibration rubber is 50kgf or less.

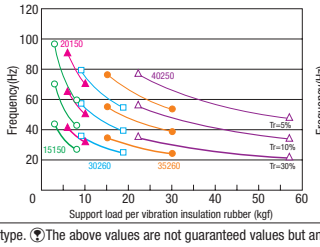


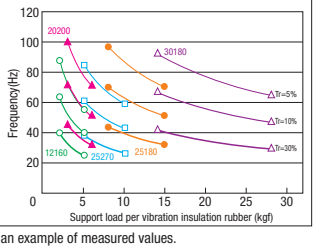


■Antivibration Rubber Mounts

(Shore A45)
-Both Ends Male Thread Type-
BGOMAL
-Male Thread · Plate Type-
BGOMPL

The two graphs on the left and right are for different products.
Refer to both graphs when load capacity of one antivibration rubber is 30kgf or less.

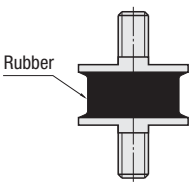




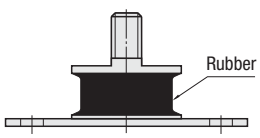
Values in the graph are nominal for each type. The above values are not guaranteed values but an example of measured values.

Section View

Both Ends Male Thread Stopper Type



Male Thread, Plate Stopper Type



Antivibration Rubber Mounts

-Female Thread · Male Thread Stopper Type / Female Thread · Plate Stopper Type-

Price Reduction
Up to 17%

CAD Data

■Takes up little space for installation. For types with slotted studs even easier to install, see **P.431 · 432**

RoHS

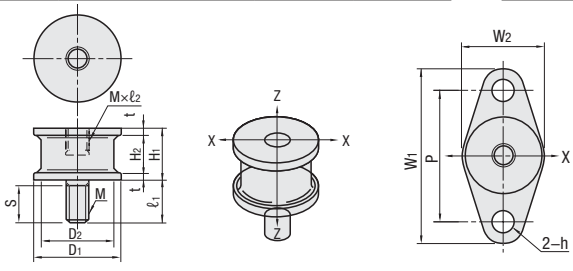


■Female Thread-Male Thread Stopper Type

Type	Material: Body	Material: Metal Fitting	H Hardness	A Accessory
BGONA	Natural Rubber	Steel (Trivalent Chromate)	Shore A60	Nut, Spring Washer 1 Pc. Each

■Female Thread, Plate Stopper Type

Type	Material: Body	Material: Metal Fitting	H Hardness
BGONP	Natural Rubber	Steel (Trivalent Chromate)	Shore A60



Part Number: Type	Part Number: Nominal	D1	D2	H1	H2	t	ℓ1	S	M (Coarse Thread)	ℓ2	W1xW2	h	P	Z Direction: Allowable Load N {kgf}	Z Direction: Standard Load N {kgf}	Z Direction: Spring Constant N/mm {kgf/cm}	X Direction Allowable Load N {kgf}	Rigidity Ratio kx/kz	€ Unit Price: BGONA	€ Unit Price: BGONP
(Shore A60) -Female Thread · Male Thread- BGONA -Female Thread, Plate- BGONP	12160	12	10	16	12.0	2.0	12	11	5	4.5	-	-	-	110{11}	30~78{3~8}	62{63}	25{2.5}	0.20		
	15150	15	12	15	11.0		15	12						160{16}	59~130{6~13}	110{110}	34{3.5}	0.24		
	20150	20	15					13	6	5	49x20		36	280{29}	98~160{10~16}	180{180}	69{7}	0.18		
	20200			20	16.0									180{18}	59~98{6~10}	88{90}	49{5}	0.22		
	25180	25	20	18	13.4		18	16		6	56x25	7	42	580{59}	147~280{15~29}	220{220}	98{10}	0.19		
	25270			27	22.4									310{32}	88~160{9~16}	110{110}	59{6}	0.22		
	30180	30	25	18	13.4	2.3	24	20	8	7.2	62x30		48	1700{170}	415~830{43~85}	610{620}	250{25}	0.15		
	30260			26	21.4									760{77}	196~370{20~38}	180{180}	150{15}	0.22		
	35260	35	30								69x35	9	53	1100{110}	275~550{28~56}	250{260}	260{27}	0.24		
	40250	40	34	25	20.4		30	25			76x40		60	1420{145}	363~700{37~71}	340{350}	320{33}	0.23		

Order Example

Part Number
BGONA15150

Days to Ship

6 Days P.87

Price

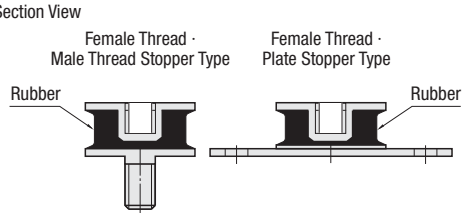
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~49	50~100
Discount Rate	€ Unit Price	10%	15%	20%

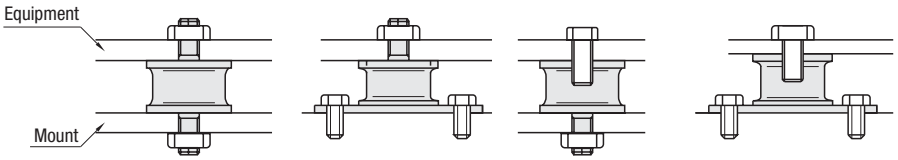
For orders larger than indicated quantity, please request a quotation.

Spring constant in X direction is calculated by (spring constant in Z direction x rigidity ratio).
Selection Methods, Mounting Methods, Properties, Cautions P.429 · 435

Section View



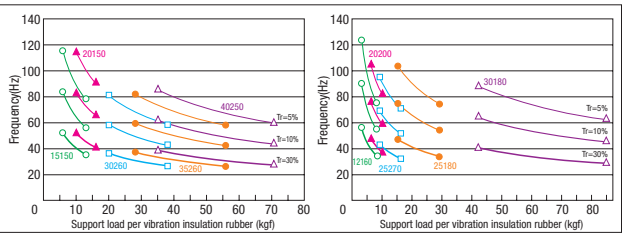
Example



■Antivibration Rubber Mounts

(Shore A60)
-Female Thread · Male Thread Stopper Type-
BGONA
-Female Thread · Plate Stopper Type-
BGONP

The two graphs on the left and right are for different products.
Refer to both graphs when load capacity of one antivibration rubber is 50kgf or less.



Values in the graph are nominal for each type. The above values are not guaranteed values but an example of measured values.

Washers with Antivibration Gel -Stainless Steel Studs-

-Both Ends Male Thread Stopper Type-

CAD Data

■Silicone vibration absorber with longer fatigue life than rubber products. Suitable for light load and micro-vibration.

■Washers with Antivibration Gel

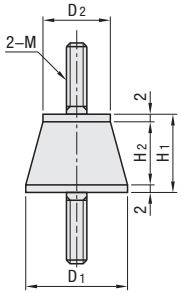
RoHS



Slots are added to prevent rotation when tightening. Hold it with a flathead screwdriver etc.
Ⓨ Slot is not available for Ultra-Light Type.

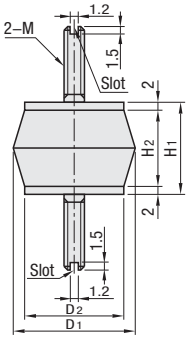
–Ultra-Light Type–

BGELA(Standard Type)
SBGELA(Lower Thread Short Type)
WBGELA(Short Type)
TBGELA(Upper Thread Short Type)



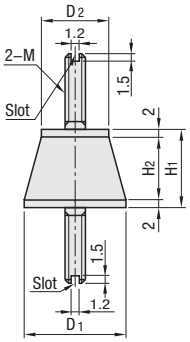
–Lightweight Type–

BGELM(Standard Type)
SBGELM(Lower Thread Short Type)
WBGELM(Short Type)



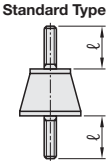
–Medium Load Type–

BGELH(Standard Type)
SBGELH(Lower Thread Short Type)
WBGELH(Short Type)
TBGELH(Upper Thread Short Type)

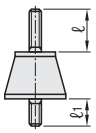


Male Thread Dimension

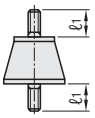
Standard Type



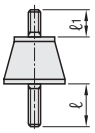
Lower Thread Short Type



Short Type



Upper Thread Short Type



Ⓜ Material:
Body : Silicone
Attaching Portion: 1.4301/X5CrNi18-10
Ⓐ Accessory:
Hexagon Nut: 1.4301/X5CrNi18-10
Equivalentsher: 1.4301/X5CrNi18-10
Equivalent 2 p

Type	Part Number Type		Part Number Nominal	D1	D2	H1	H2	ℓ	ℓ1	M (Coarse Thread)	Working Load N {kgf}	Spring Constant N/mm {kgf/mm} ±20%	Ⓨ Hardness Asker C	Ⓨ Hardness Penetration	Frequency Used Hz	Main Body Color	€ Unit Price
Ultra-Light	BGELA	WBGELA	006	18	12	13	9	15	10	4	4.9~7.84 {0.5~0.8}	6.17 {0.63}	-	64.7	23~	(1) Milky White	
	SBGELA	TBGELA	014	25	20	18	14	20	14	6	7.84~19.6 {0.8~2.0}	9.31 {0.95}	-	60.7	20~	(2) Milky White	
Light-weight	BGELM SBGELM	WBGELM	030	30	24	22	18	18	14	6	19.6~34.3 {2.0~3.5}	13.13 {1.34}	19.7	32.0	17~	(3) Milky White	
			050								34.3~63.7 {3.5~5.5}	21.75 {2.22}	29.8	-	16~	(4) Light Green	
			070							8	63.7~88.2 {5.5~8.5}	33.71 {3.44}	38.0	-	16~	(5) Light Orange	
			071*														
			100							6	88.2~122.5 {8.5~12.5}	46.74 {4.77}	44.3	-	16~	(6) Light Blue	
			101*							8							
Medium Load	BGELH	WBGELH	150	35	28	25	21	17	12	6	122.5~245.1 {12.5~25.0}	56.2 {5.74}	52.5	-	14~	(7) Milky White	
	SBGELH	TBGELH	151*							8							

Ⓨ Hardness: Listed values are not guaranteed values but an example of measured values. Ⓨ Penetration: JIS K2207, Asker C: JIS S6050 Refer to **P.358** kgf=Nx0.101972
Ⓨ*Nominal 071, 101, 151 are applicable to BGELM and BGELH only.

Order Example Part Number **BGELM030**

Days to Ship **6 Days** P.87

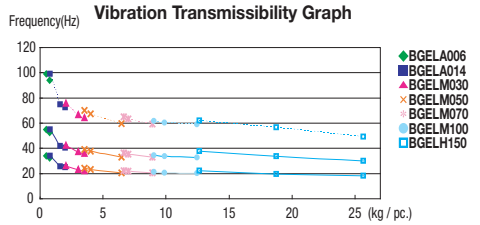
Price

■Volume Discount (Ⓨ Round down to one Cent.) P.87

Quantity	1~4	5~9	10~49	50~200
Discount Rate	€ Unit Price	10%	15%	20%

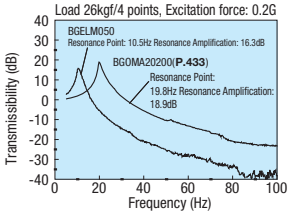
Ⓨ For orders larger than indicated quantity, please request a quotation.

Vibration Transmissibility Graph



Comparison of Antivibration Properties

Load 26kgf/4 points, Excitation force: 0.2G



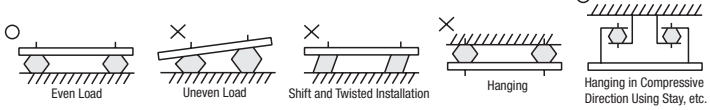
Ⓨ Resonance frequency is set relatively low and possible to dampen lower frequency vibrations.

■Features of Antivibration Gel Bushings and Antivibration Gels

- It is effective in vibration absorption of small vibrations of light load, which can't be controlled with vibration insulation rubber mounts.
- Excels in durability.
- There is no secondary or tertiary resonance that interferes with antivibration effects.

■How to Mount

- Attach so that load is applied evenly.
- Antivibration Gels can be used only on perpendicular loads.
- Shifted or twisted installation drastically lowers performance and durability.
- Do not use in tension.



■Properties

Material	Weather Resistance	Water Resistance	Oil Resistance	Ozone Resistance	Operating Temp. Range
Silicone	◯	◯	△	◯	–40~200°C
Natural Rubber	△	△	X	X	–30~ 60°C
Chloroprene Rubber	◯	△	◯	◯	–20~ 70°C

◎=Excellent ◯=Good △=Acceptable X=Poor
Ⓨ Silicone is an artificial compound made from Silicon.

■Cautions

- The height becomes lower due to being compressed when loaded.
- Do not remove the rubber burrs around the studs as the burrs prevent separations of studs and antivibration materials.
- Antivibration Gel/Rubber are designed to be used in compression.

Washers with Antivibration Gel -Stainless Steel Studs-

-Male Thread Stud · Flange Mount Type / Antivibration Gel Bushings-

CAD Data

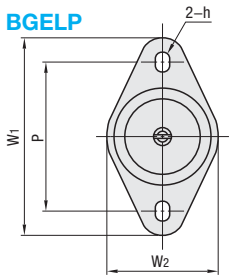
■Silicone vibration absorber with longer fatigue life than rubber products. Suitable for light load and micro-vibration.

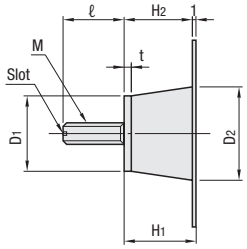
■Male Thread · Plate Stopper Type

RoHS



BGELP





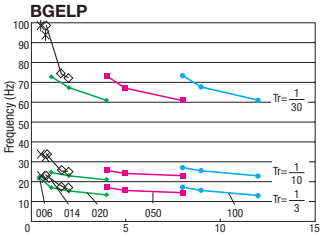
Slots are added to prevent rotation when tightening. Hold it with a flathead screwdriver etc.
(?)Slot is not available for 006, 014

M Material:
Body : Silicone
Attaching Portion: 1.4301/X5CrNi18-10
A Accessory:
Hexagon Nut: 1.4301/X5CrNi18-10
Spring Washer: 1.4301/X5CrNi18-10
1 pc. each

Part Number Type	Nominal	D1	D2	H1	H2	t	ℓ	M (Coarse Thread)	W1xW2	h	P
BGELP	006	12	18	12	11	2	15	4	40x24	Ø4	30
	014	20	25	17	16	2	20	6	52x32	Ø6	40
	020	24	30	22	21	2	18	6	60x36	4.2 x 6 Slotted Hole	46
	050										
	100										

■Vibration Transmissibility Data

BGELP



(?)Values in the graph are nominal for each type.
(?)The above values are not guaranteed values but an example of measured values.

Part Number Type	Nominal	Working Load N {kgf}	Spring Constant N/mm {kgf/mm} ±20%	(?)Hardness Asker C	(?)Hardness Penetration	Frequency Used Hz	Main Body Color	€ Unit Price
BGELP	006	0.49~7.84 {0.50~0.80}	6.17 {0.63}	-	64.7	23~	(1) Milky White	
	014	7.84~19.60 {0.80~2.00}	9.31 {0.95}	-	60.7	20~	(2) Milky White	
	020	12.25~31.85 {1.25~3.25}	10.68 {1.09}	-	44.0	22~	(3) Light Green	
	050	31.85~73.50 {3.25~7.50}	20.67 {2.11}	25.3	-	19~	(4) Light Orange	
	100	73.50~122.50 {7.50~12.50}	40.18 {4.10}	44.5	-	17~	(5) Light Blue	

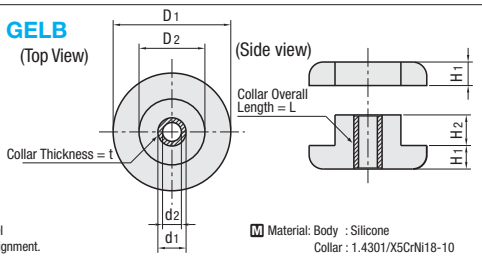
(?)Hardness: Listed values are not guaranteed values but an example of measured values. (?)Penetration: JIS K2207, Asker C: JIS S6050 Refer to P.358 kgf=Nx0.101972

■Antivibration Gel Bushings

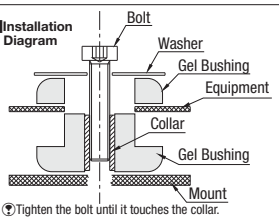
RoHS



GELB



■Installation Diagram



(?)Tighten the bolt until it touches the collar.

■Features:

The penetrating bolt of Antivibration Gel Bushing can minimize horizontal misalignment.

M Material: Body : Silicone
Collar : 1.4301/X5CrNi18-10

A Accessory: Washer, low head bolt: 1.4301/X5CrNi18-10
Hexagon Nut: 1.4301/X5CrNi18-10 Equivalent

Part Number Type	Nominal	D1	D2	d1	d2	H1	H2	L	t	Working Load N {kgf}	Spring Constant N/mm {kgf/mm} ±20%	Hardness Asker C	Hardness Penetration	Used Frequency Hz	Included Washer O.D.	Included Bolt Size	Main Body Color	€ Unit Price
GELB	1101	11	7	4	3	3	3.5	6	0.5	0.49~1.77 {0.05~0.18}	10.59 {1.08}	-	80	When 0.05kg 90~ When 0.18kg 60~	Ø12	M3x15	Milky White	
	1401	14	9	5	3	4	4	7	1	1.18~6.08 {0.12~0.62}	26.18 {2.67}	-	50	When 0.12kg 95~ When 0.62kg 50~	Ø15	M3x15	Milky White	
	1402									6.08~9.81 {0.62~1.00}	56.68 {5.78}	30	-	When 0.62kg 70~ When 1.00kg 55~			Light Green	
	2501	25	14	6	4	5	6.5	11	1	When 1.00kg 55~	86.59 {8.83}	30	-	When 1.00kg 70~ When 3.75kg 35~	Ø25	M4x20	Milky White	
	2502									36.77~78.45 {3.75~8.00}	170.15 {17.35}	50	-	When 3.75kg 40~ When 8.00kg 25~			Light Green	

(?)Recommended frequency varies depending on the condition of load. (?)Penetration: JIS K2207, Asker C: JIS S6050 Refer to P.358 kgf=Nx0.101972

Order Example
Part Number
BGELP006
GELB1101

6 Days P87

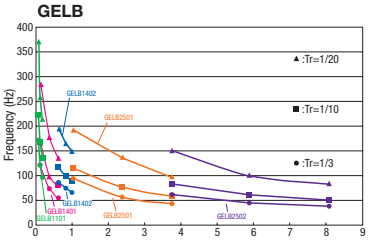
■Volume Discount (?)Round down to one Cent.) P87

Quantity	1~4	5~9	10~49	50~200
Discount Rate	€ Unit Price	10%	15%	20%

(?)For orders larger than indicated quantity, please request a quotation.

■Vibration Transmissibility Data

GELB



(?)Values in the graph are nominal for each type.
(?)The above values are not guaranteed values but an example of measured values.

Example

■Features of Antivibration Gel Bushings and Antivibration Gels

-Effective for light loads and minute vibrations that are difficult for antivibration rubbers to absorb.
-Excels in durability.
-There are no secondary and tertiary resonances that hinder the antivibration effects.

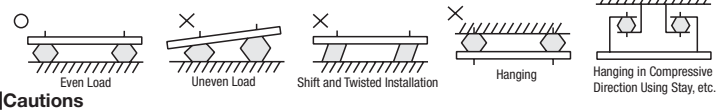
■Properties

Material	Weather Resistance	Water Resistance	Oil Resistance	Ozone Resistance	Operating Temp. Range
Silicone	◯	◯	△	◯	–40~200°C
Natural Rubber	△	△	X	X	–30~ 60°C
Chloroprene Rubber	◯	△	◯	◯	–20~ 70°C

◎=Excellent ◯=Good △=Acceptable X=Poor
(?)Silicone is an artificial compound made from Silicon.

■How to Mount

-Attach so that load is applied evenly.
-Antivibration Gel products are to be used for vertically oriented loads only. Install BGELP and BGELA bushings with the small diameter ends facing up.
-Shifted or twisted installation drastically lowers performance and durability
-Do not use in tension.



■Cautions

- When loaded, gel sheet is compressed to be lower than catalog height.
- Do not remove the rubber burrs around the studs as the burrs prevent separations of studs and antivibration materials.
- Antivibration Gel/Rubber are designed to be used in compression.

Washers with Antivibration Gel

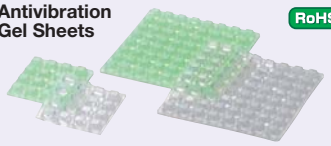
-Sheets / Rubber Covered Type-

CAD Data

■Silicone vibration absorber with longer fatigue life than rubber products. Suitable for light load and micro-vibration.

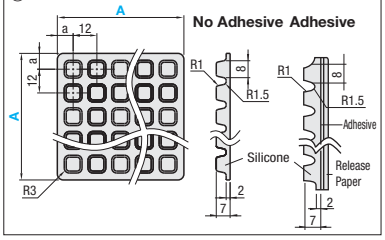
■Antivibration Gel Sheets

RoHS



Type		M Material		H Hardness	
No Adhesive	Adhesive	No Adhesive	Adhesive	Asker C	Penetration
BGEPG	BGEPGA	Silicone	Silicone	–	55
BGEPM	BGEPMA			30	–

Ⓣ The values of hardness are reference values.



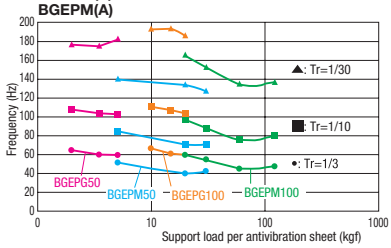
Type		A	a	Proper Load N{kgf}	Deflection Property N/mm {kgf/mm}	Applied Frequency Hz	Protrusions	Color	€ Unit Price	
No Adhesive	Adhesive								No Adhesive	Adhesive
BGEPG	BGEPGA	50	7	19.6~49{2~5}	22{2.25}	40~	4x4 =16 Pcs.	Milky White		
BGEPM	BGEPMA			49~294{5~30}	93{9.5}			Light Green		
BGEPG	BGEPGA	100	8	98~196{10~20}	98{10}		8x8 =64 Pcs.	Milky White		
BGEPM	BGEPMA			196~1225{10~125}	431{44}			Light Green		

kgf=N×0.101972

Ⓣ Can be cut with a utility knife between protrusions.
Ⓣ Adhesive Type has an operating temperature between −40~100°C.
Ⓣ Reference: Adhesive Strength (180 Degree Peeling Strength) 14.5N/25mm Width (When affixed to 1.4301/X5CrNi18-10)
Ⓣ As pressure sensitive adhesive is used, be sure to apply sufficient pressure so that the joint sections may firmly adhere to each other.
Ⓣ Adhesive Type uses 75μm PET film base material.
Ⓣ Oil may ooze out to the release paper.

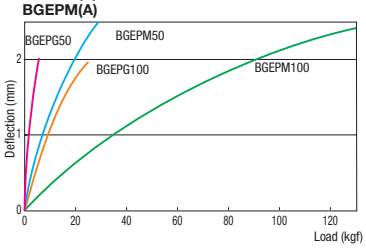
Vibration Transmissibility Data

BGEPG (A)
BGEPM(A)



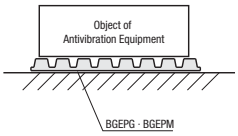
Deflection Data

BGEPG (A)
BGEPM(A)

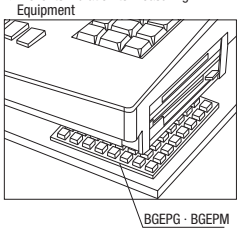


Ⓣ Values in the graph are nominal for each type. Ⓣ The above values are not guaranteed values but an example of measured values.

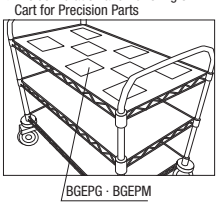
Example



● Prevents Vibration to Measuring Equipment



● Avoids Vibration and Buffering of Cart for Precision Parts



Order Example Part Number **BGEPG50**

Days to Ship **6 Days** P.87

Price

■Volume Discount (Ⓣ Round down to one Cent.) P.87

Quantity	1~4	5~9	10~49	50~200
Discount Rate	€ Unit Price	10%	15%	20%

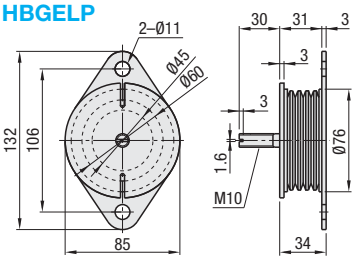
Ⓣ For orders larger than indicated quantity, please request a quotation.

■Antivibration Gel Rubber Covered Type

RoHS



HBGELP



M Material:
Body: Silicone
Coating: EPDM Synthetic Rubber(EPDM)
Attaching Portion: 1.4301/X5CrNi18-10
A Accessory:
Hexagon Nut: 1.4301/X5CrNi18-10
Spring Washer: 1.4301/X5CrNi18-10
1 pc. each

Part Number		Working Load N{kgf}	Frequency Used Hz	€ Unit Price
Type	Nominal			
HBGELP	300	245.1~343.2 {25.0~35.0}	13~	

kgf=N×0.101972

Order Example Part Number **HBGELP300**

Days to Ship **6 Days** P.87

Price

■Volume Discount (Ⓣ Round down to one Cent.) P.87

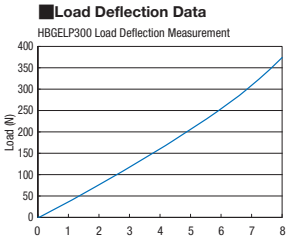
Quantity	1~4	5~9	10~49	50~200
Discount Rate	€ Unit Price	10%	15%	20%

Ⓣ For orders larger than indicated quantity, please request a quotation.

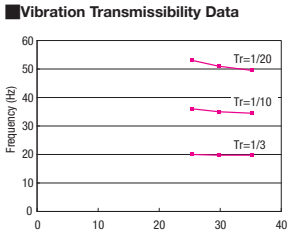
■Features

- Low frequency vibration absorbing gel with working load limit of 25~35 kgf (when 1pc. is used) and lowest usable frequency of 13Hz.
- The main silicone gel body is ethylene rubber covered, and has good environmental resistance. Outdoor use is possible

■Load Deflection Data



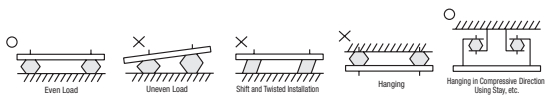
■Vibration Transmissibility Data



Ⓣ Values in the graph are nominal for each type. Ⓣ The above values are not guaranteed values but an example of measured values.

■How to Mount

- Attach so that load is applied evenly.
- Antivibration Gels can be used only on perpendicular loads.
- Shifted or twisted installation drastically lowers performance and durability.
- Do not use in tension.



■Cautions

- The height becomes lower due to being compressed when loaded.
- Do not remove the rubber burrs around the studs as the burrs prevent separations of studs and antivibration materials.
- Antivibration Gel/Rubber are designed to be used in compression.

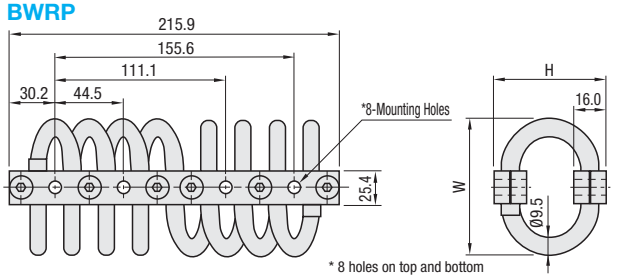
Wire Rope Isolators

CAD Data

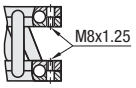
■Superior in corrosion, chemical resistance and heat resistance to anti-vibration parts made of rubber. Vibration control for low frequencies is possible. Compliant with RoHS.



BWRP



•M Hole Dimension
·Female Thread Hole



Material:
Wire: SUS300
Bracket: EN AW-6061-T6 (Clear Anodize)
Screw: Carbon steel
Tube: Polyolefin

Part Number Type	No.	H	W	Mass (kg)	Working Load N{kgf}	Spring Constant N/mm{kgf/mm}	Used Frequency Hz	€ Unit Price
BWRP	1220M	71	84	1.1	800~1500{81.6~153.1}	222{22.6}	12~	
	1240M	76	105	1.2	500~1000{51~102}	148{15.1}	12~	
	1260M	89	108	1.3	350~700{35.7~71.4}	118{12.0}	12~	
	1280M	108	140	1.5	200~400{20.4~40.8}	56{5.7}	12~	

Order Example | Part Number: BWRP1220M | Days to Ship: 6 Days P.87 | Price

■Volume Discount (Round down to one Cent.) P.87

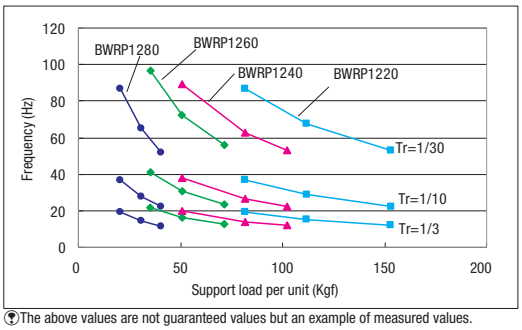
Quantity	1~3	4~7	8~11	12~19
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quality, please request a quotation.

■Features of Wire Rope Isolators

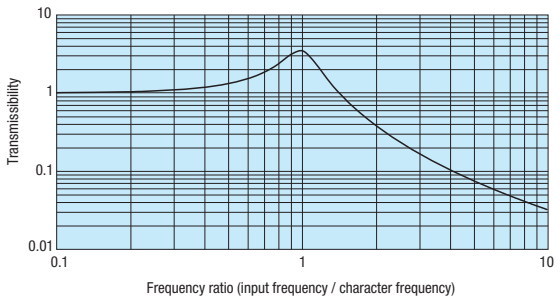
· Vibration/shock absorber that converts vibration into heat energy using friction and deflection of wire ropes.
· Made of all metal components, it is more resistant to corrosion, environment and chemicals than other anti-vibration parts (gel, rubber) and usable in a broader operating temperature (–100°C~260°C).
· Vibration insulation effect is expected from low frequency as low as 12Hz, to which it is difficult for rubber to respond to.
· Excellent in vibration reduction, with resonance magnification low at 3.5 (see vibration characteristic chart).
· Superior in impact resistance, which does not belong to other anti-vibration parts. Best for use for protection of transportable equipments (see vibration transmissibility chart).

■Vibration Transmissibility Data



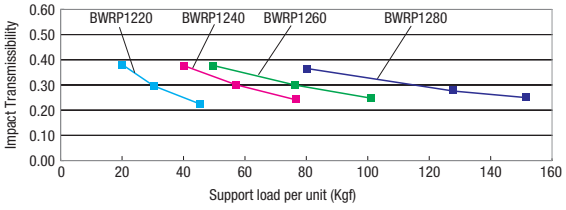
The above values are not guaranteed values but an example of measured values.

■Vibration Characteristics



The above values are not guaranteed values but an example of measured values.

■Impact Transmissibility

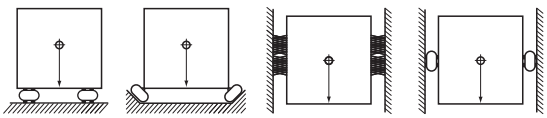


The above values are not guaranteed values but an example of measured values.

[Shock Parameters]
·The figure shows the impact transmissibility under a half-sine with a peak acceleration of 150m/S² and a pulse duration of 11ms.
·Under above condition, 60-75% of impact is expected to be absorbed.

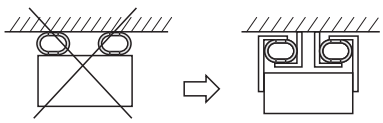
■Mounting Orientation

● In Compression ● 45° Inclined ● In Shear ● In Roll



■Hanging Mount

·This product is not suitable for hanging mount. Please mount in compression.



Example



As vibration isolator for electronic cabinets.



Recommended for vibration countermeasures for precision parts hand trucks.

Antivibration Pads

-Non-contaminating Rubber Type / Natural Rubber Type / RUBLOC® (For Low Frequency)-

■Economical natural rubber type has been added to the lineup of Heavy Load Antivibration Pads.

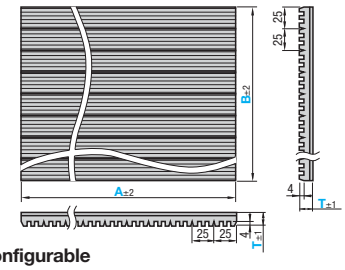
■Antivibration Pads

RoHS



■A · B Standard

BPAT
BPAS
BPTG



A · B Standard	A · B Configurable	M Material	H Hardness
BPAT	BPATF	Non-contaminating Chloroprene Rubber	Shore A70
BPAS	BPASF		Shore A50
BPTG	-	Natural Rubber	Shore A50

(?)Color may come off a little depending on circumstances.

■Features of Non-Staining Chloroprene Rubber

General rubbers may contaminate the contact materials with their cross-linker or oil.
Non-staining chloroprene rubber is uniquely compounded so that it minimizes such damages.
The general properties are the same as those of ordinary chloroprene rubber.

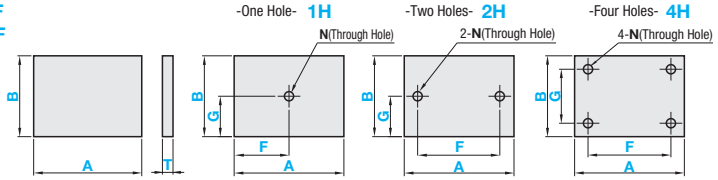
■A · B Configurable

Standard Type

BPATF
BPASF

Hole Type (Through Hole)

-One Hole- 1H -Two Holes- 2H -Four Holes- 4H



(?)G, F Dimension Tolerance: ±1

■A · B Standard

Part Number Type	T	A	B	Applicable Load N {kgf} BPAT	Applicable Load N {kgf} BPAS · BPTG	Deflection Property N/mm {kgf/mm} BPAT	Deflection Property N/mm {kgf/mm} BPAS · BPTG	€ Unit Price BPAT	€ Unit Price BPAS	€ Unit Price BPTG
BPAT BPAS BPTG	10	50	50	613~1275{63~130}	355~613{36~63}	1095{112}	488{50}			
			150	1839~3825{188~390}	1066~1839{109~188}	3284{335}	1465{149}			
			300	3677~7649{375~780}	2133~3677{218~375}	6567{670}	2930{299}			
		100	100	2452~5099{250~520}	1422~2452{145~250}	4378{446}	1953{199}			
			200	4903~10199{500~1040}	2844~4903{290~500}	8756{893}	3906{398}			
			300	7355~15298{750~1560}	4266~7355{435~750}	13134{1339}	5859{597}			
		150	150	5516~11474{563~1170}	3199~5516{326~563}	9851{1004}	4394{448}			
		200	200	9807~20398{1000~2080}	5688~9807{580~1000}	17512{1786}	7812{797}			
		300	300	22065~45895{2250~4680}	12798~22065{1305~2250}	39402{4018}	17577{1792}			
	20	50	50	529~1872{54~191}	294~882{30~90}	451{46}	196{20}			
			150	1588~5615{162~573}	882~2646{90~270}	1352{138}	588{60}			
			300	3175~11231{324~1146}	1764~5292{180~540}	2705{276}	1176{120}			
		100	100	2117~7487{216~764}	1176~3528{120~360}	1803{184}	784{80}			
			200	4234~14974{432~1528}	2352~7056{240~720}	3606{368}	1568{160}			
			300	6350~22462{648~2292}	3528~10584{360~1080}	5410{552}	2352{240}			
		150	150	4763~16846{486~1719}	2646~7938{270~810}	4057{414}	1764{180}			
		200	200	8467~29949{864~3056}	4704~14112{480~1440}	7213{736}	3136{320}			
		300	300	19051~67385{1944~6876}	10584~31752{1080~3240}	16229{1656}	7056{720}			

(?)It can be cut with a utility knife at 25mm increments. (?)Do not overlap 2 pcs. or more. kgf=Nx0.101972

■A · B Configurable –Standard Type–

Part Number Type	T	25mm Increment (A≥B) A	25mm Increment (A≥B) B
BPATF BPASF	10	25~400	25~300
	20		

–Hole Type–

Part Number Type	Nominal	T	25mm Increment (A≥B) A	25mm Increment (A≥B) B	1mm Increment F	1mm Increment G	Hole Dia. 1mm Increment N
BPATF BPASF	1H 2H 4H	10 20	25~400	25~300	5~395	5~295	5~20

Type	T	Allowable Load N {kgf}/cm²	Deflection Property N/mm {kgf/mm}/cm²
BPATF	10	50{5.2}	44{4.5}
	20	75{7.6}	17.6{1.8}
BPASF	10	24{2.5}	20{2.0}
	20	35{3.6}	7.8{0.8}

(?)Dimension F Specification Range: For 1H, N/2+2.5≤F≤A–N/2–2.5, for 2H and 4H, N+5≤F≤A–N–5.
(?)Dimension G Specification Range: For 1H and 2H, N/2+2.5≤G≤B–N/2–2.5; for 4H, N+5≤G≤B–N–5.

(?)The price of this product is found by multiplying the € Unit Price by Material Rate.

(Ex.) Part Number - A - B

BPASF10 - 250 - 100

(€ Unit Price) x (Material Rate) = Standard Type € Unit Price
8,00 x 1.2 = 9,60€ Unit Pricerice 9,60 EUR

(?)The price of Hole Type is found by adding the Standard Type € Unit Price to the Hole Machining Charge.

Price

■Hole machining charge

Type	Price
1H	
2H	
4H	

■Volume Discount (?)Round down to one Cent.) P87

Quantity	1~4	5~7	8~49	50~199
Discount Rate	€ Unit Price	5%	10%	15%

(?)For orders larger than indicated quantity, please request a quotation.

(Ex.) Part Number - A - B - F - G - N

BPATF2H10 - 175 - 100 - F40 - G30 - N8

(Standard Type € Unit Price) + (Hole Selection Price) = (Hole Type € Unit Price)
7,30 + 2,00 = 9,30 EUR

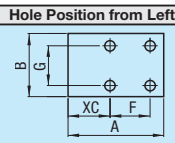
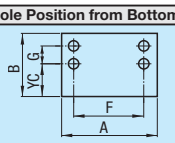
Alterations

Only applicable to A, B Configurable Hole Type.

Part Number - A - B - F - G - N - (XC · YC)

BPATF2H10 - 175 - 100 - F40 - G30 - N8 - XC30

Part Number Type	T	A	€ Unit Price B 25~50	75~100	125~150	175~200	225~250	275~300
BPATF (x1.0) BPASF (x1.2) ( ) Material Rate	10	25~ 50						
		75~ 100						
		125~ 150						
		175~ 200						
		225~ 250						
		275~ 300						
		325~ 350						
		375~ 400						
	20	25~ 50						
		75~ 100						
		125~ 150						
		175~ 200						
		225~ 250						
		275~ 300						
		325~ 350						
		375~ 400						

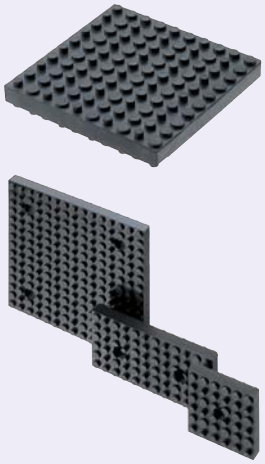
Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment (?)5≤XC≤385 (?)N/2+2.5≤XC≤A–F–N/2–2.5 (?)Applicable to 2H and 4H Type only.	YC=1 mm Increment (?)5≤YC≤285 (?)N/2+2.5≤YC≤B–G–N/2–2.5 (?)Applicable to 4H Type only.
Price Adder	4,00	4,00

(?)Order Example, Days to Ship and Price Next Page

RUBLOC® is the registered trademark of Rubloc Imexin.

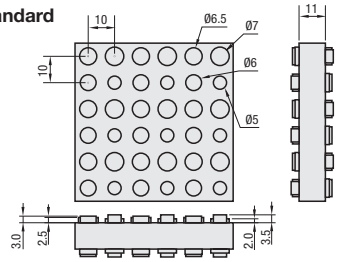
Antivibration Pad RUBLOC®

RoHS



A · B Standard

RUBLOC



A · B Standard	A · B Configurable	M Material	H Hardness
RUBLOC	RUBLOCF	Chloroprene Rubber (CR)	Shore A40

Features

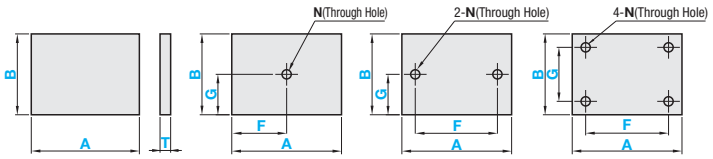
Four types of protrusions with different diameters and heights, the protrusion types are staggered.
·As vibration passes diagonally through the pad, high antivibration effect is achieved.

A, B Configurable

Standard Type
RUBLOCF

Hole Type (Through Hole) G · F Dimension Tolerance: ±1

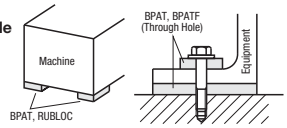
-One Hole- 1H -Two Holes- 2H -Four Holes- 4H



A · B Standard

Part Number Type	T	A	B	Applicable Load N {kgf}	Deflection Property N/mm {kgf/mm}	€ Unit Price
RUBLOC	18	60	60	250~1000{25~102}	120{12}	
		120	120	1000~4000{102~408}	250{25}	
		180	180	2500~8800{255~897}	900{92}	
		240	240	4100~16000{418~1632}	1500{153}	

Example



A · B Configurable

–Standard Type–

Part Number Type	T	60mm Increment (A≥B) A	B
RUBLOCF	18	60~240	60~240

–Hole Type–

Part Number Type	Nominal	T	60mm Increment (A≥B) A	B	1mm Increment F	G	Hole Dia. 1mm Increment N
RUBLOCF	1H 2H 4H	18	60~240	60~240	5~235	5~235	5~20

Type	Allowable Load N {kgf}/cm²	Deflection Property N/mm {kgf/mm}/cm²
RUBLOCF	10 {1}	4 {0.4}

Dimension F Specification Range: For 1H, N/2+2.5≤F≤A–N/2–2.5, for 2H and 4H, N+5≤F≤A–N–5.
Dimension G Specification Range: For 1H and 2H, N/2+2.5≤G≤B–N/2–2.5; for 4H, N+5≤G≤B–N–5.
The price of Hole Type is found by adding the Standard Type € Unit Price to the Hole Machining Charge.

(Ex.) Part Number - A - B - F - G - N
RUBLOCF2H18 - 240 - 60 - F100 - G30 - N5

(Standard Type € Unit Price) + (Hole Selection Price) = (Hole Type € Unit Price)
60,80 + 2,00 = 62,80 EUR

Order Example

A · B Standard

Part Number	-	A	-	B
BPAT10	-	50	-	150
RUBLOC18	-	60	-	60

A, B Configurable

Part Number	-	A	-	B	-	F	-	G	-	N
BPATF10	-	150	-	100						
BPASF4H10	-	200	-	125	-	F30	-	G20	-	N6
RUBLOCF18	-	240	-	60						
RUBLOCF2H18	-	240	-	180	-	F100	-	G100	-	N10

Alterations

Only applicable to A, B Configurable Hole Type.

Part Number - A - B - F - G - N - (XC · YC)
RUBLOCF2H18 - 240 - 180 - F80 - G40 - N8 - XC50

Days to Ship

A · B Standard
6 Days P.87

A · B Configurable
8 Days Express A 3,00 EUR/ piece
P.88
A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

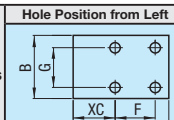
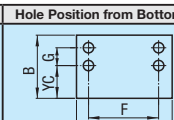
Quantity	1~4	5~7	8~49	50~199
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

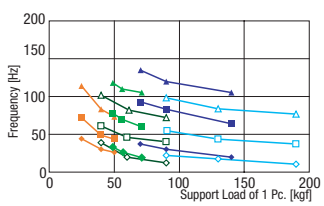
Part Number Type	T	A	€ Unit Price B 60	120	180	240
RUBLOCF	18	60				
		120				
		180				
		240				

Hole machining charge

Type	Price
1H	
2H	
4H	

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤225 N/2+2.5≤XC≤A–F–N/2–2.5 Applicable to 2H and 4H Type only.	YC=1 mm Increment 5≤YC≤225 N/2+2.5≤YC≤B–G–N/2–2.5 Applicable to 4H Type only.
Price Adder	4,00	4,00

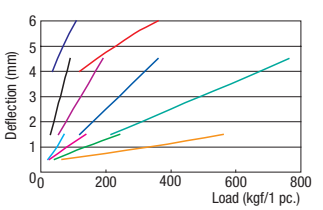
Vibration Transmissibility Data



RUBLOC, BPAT10, BPAS10, BPAT20, BPAS20 Load and Frequency

RUBLOC18-60-60 Tr=1/30
RUBLOC18-60-60 Tr=1/10
RUBLOC18-60-60 Tr=1/3
BPAS10-50-50 Tr=1/30
BPAS10-50-50 Tr=1/10
BPAS10-50-50 Tr=1/3
BPAT10-50-50 Tr=1/30
BPAT10-50-50 Tr=1/10
BPAT10-50-50 Tr=1/3
BPAS20-50-50 Tr=1/30
BPAS20-50-50 Tr=1/10
BPAS20-50-50 Tr=1/3
BPAT20-50-50 Tr=1/30
BPAT20-50-50 Tr=1/10
BPAT20-50-50 Tr=1/3

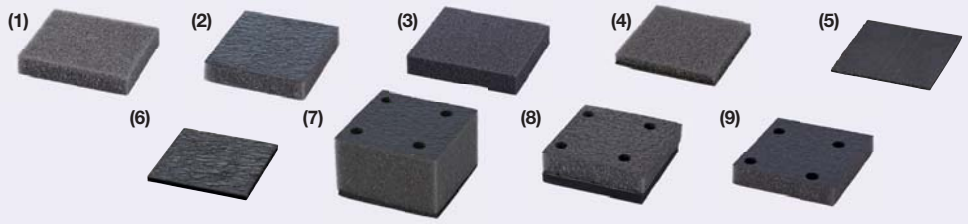
Load Deflection Data



RUBLOC18-60-60
BPAS10-50-50
RUBLOC18-120-120
BPAT10-50-50
BPAS10-100-100
BPAT10-100-100
BPAT20-50-50
BPAT20-100-100
BPAS20-50-50
BPAS20-100-100

Sound Proofing Materials (A · B Dimension Configurable)

■Standard sound proofing sponges combined with various adhesives and vibration control materials can be specified in 1mm increments.

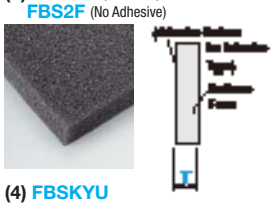


RoHS

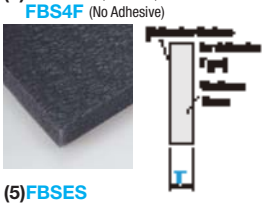
No.	Type		Effects	Ⓜ Material
	Adhesive	No Adhesive		
(1)	FBS2FS	FBS2F	Sound Absorption	Urethane Foam
(2)	FBS4FS	FBS4F		Urethane Foam
(3)	FBS140FS	FBS140F	Vibration Control · Sound Absorption	Urethane Foam
(4)	FBSKYU			Urethane Foam + Vinyl acetate
(5)	FBSES		Vibration Control	Vinyl acetate
(6)	FBSYA		Vibration Control · Sound Insulation	Butyl rubber (Surface: Polyethylene)
(7)	FBSKYKAA		Vibration Control · Sound Absorption	Urethane Foam + Vinyl acetate (Surface: Urethane Coating)
(8)	FBSKYKAY		Vibration Control · Sound Absorption · Sound Proofing	Urethane Foam + Butyl rubber (Surface: Urethane Coating)
(9)	FBSKYKA		Sound Absorption	Urethane Foam (Surface: Urethane Coating)

Adhesive Part Ⓜ Material: Acrylic Adhesive

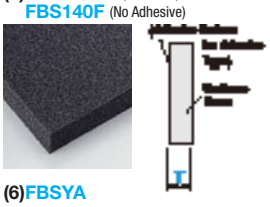
(1)FBS2FS (Adhesive) FBS2F (No Adhesive)



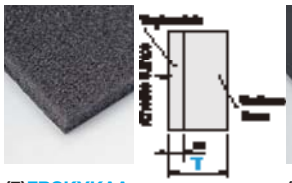
(2)FBS4FS (Adhesive) FBS4F (No Adhesive)



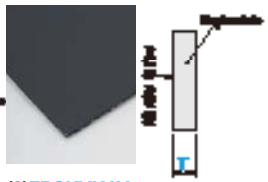
(3)FBS140FS (Adhesive) FBS140F (No Adhesive)



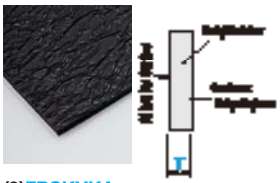
(4) FBSKYU



(5)FBSES



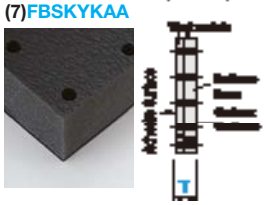
(6)FBSYA



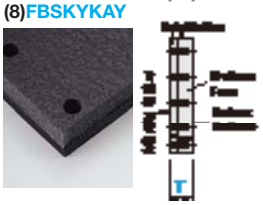
(1)~(6)



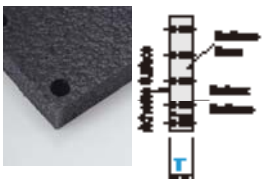
(7)FBSKYKAA



(8)FBSKYKAY



(9)FBSKYKA



(7)~(9)



Part Number Type		T	5mm Increment (A≥B) A	B	Recommended Usage Temp. (C°)	Heat Resistance Temp. (C°)	Min. Bend Radius (mm)	Surface Density (kg/m²)
(1)	FBS2FS(Adhesive) FBS2F(Adhesive)	10 20 30	50~1000	50~500	0~30	70	-	0.75*5
(2)	FBS4FS(Adhesive) FBS4F(Adhesive)				0~30	70	-	0.69*5
(3)	FBS140FS(Adhesive) FBS140F(Adhesive)				0~30	70	-	4.2 *5
(4)	FBSKYU	6.5 11.5 16.5 21.5 31.5	50~1000	50~800	0~30	70	200 *1	3.20*1
(5)	FBSES	1.5	50~1000	50~800	0~30		100	2.7
(6)	FBSYA	3 6 10	50~800	50~500	0~130	130	5 *2	12.00*2
(7)	FBSKYKAA	31.5	50~1000	50~800	0~30	70	Affix on Flat Surface *3	3.45
(8)	FBSKYKAY	16 26 36	50~800	50~500	0~70			12.75*4
(9)	FBSKYKA	10 20 30 50	50~1000	50~1000	0~70			0.75*5

- All are made of incombustible material.
- Peel off the backing paper (1cm grid printed) to adhere to objects.
- Be sure to clean any oil or dust off the affixed surface.
- Can be cut with a utility knife. Cut with the adhesive surface upside.
- Adhesive Strength (90 Degree Peeling Strength): 19.6N/25mm Width (When affixed to 1.4301/X5CrNi18-10)
- BSYA expands and contracts by 3% or less.
- BSKYKA · BSKYKAA · BSKYKAY are covered with exterior skin so that they can be wiped clean and are highly durable.

*1. When T=21.5
*2. When T=6
*3. It can be bent, but the adhesive strength becomes weaker.
*4. When T=36
*5. When T=30

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~49	50~100
Discount Rate	€ Unit Price	10%	15%	20%

For orders larger than indicated quality, please request a quotation.

Part Number Type	T	A (A≥B)	€ Unit Price B 50~100	105~200	205~300	305~400	405~500	505~600	605~700	705~800
(1) FBS2F(No Adhesive) FBS2FS(Adhesive)	10	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
(2) FBS4F(No Adhesive) FBS4FS(Adhesive)	20	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
Price Multiplier (No seal x0.9)	30	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
(3) FBS140F(No Adhesive) FBS140FS(Adhesive)	10	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
Price Multiplier (No seal x0.9)	20	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
	30	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
(4) FBSKYU	6.5	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
	11.5	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
	16.5	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
	21.5	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
	31.5	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
(5) FBSES	1.5	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
(6) FBSYA	3	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
	6	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
	10	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
(7) FBSKYKAA	31.5	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
		805 ~ 1000								
(8) FBSKYKAY	16	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
	26	50 ~ 300								
		305 ~ 500								
		505 ~ 800								
	36	50 ~ 300								
		305 ~ 500								
		505 ~ 800								

Part Number Type	T	A	€ Unit Price B 50~200	205~400	405~600	605~800	805~1000
(9) FBSKYKA	10	50~400					
		405~700					
		705~1000					
	20	50~400					
		405~700					
		705~1000					
	30	50~400					
		405~700					
		705~1000					
	50	50~400					
		405~700					
		705~1000					

Order Example

Part Number	–	A	–	B
FBSKYU16.5	–	255	–	105

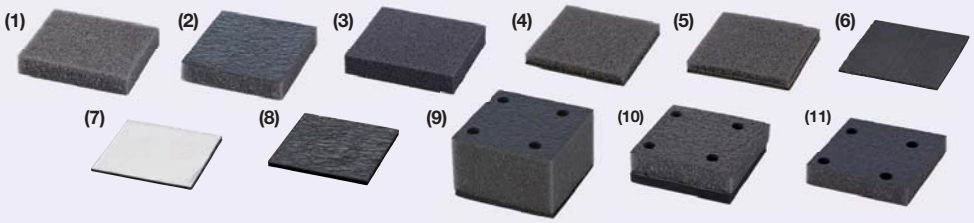
Days to Ship: 8 Days

Express A: 5,00 EUR/ piece

P.88

Sound Proofing Materials (A · B Dimension Configurable)

■Standard sound proofing sponges combined with various adhesives and vibration control materials.



RoHS

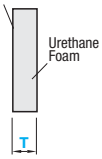
No.	Type		Effects	Material
	Adhesive	No Adhesive		
(1)	BS2FS	BS2F	Sound Absorption	Urethane Foam
(2)	BS4FS	BS4F		Urethane Foam
(3)	BS140FS	BS140F	Vibration Control · Sound Absorption	Urethane Foam
(4)	BSKYU			Urethane Foam + Vinyl acetate
(5)	BSKYUA		Strong Vibration Control · Sound Absorption	Urethane Foam + Vinyl acetate + Aluminum
(6)	BSES BSESB(Belt Shaped)		Vibration Control	Vinyl acetate
(7)	BSESA BSESAB(Belt Shaped)		Strong Vibration Control	Vinyl acetate + Aluminum
(8)	BSYA		Vibration Control · Sound Insulation	Butyl Rubber (Surface: Polyethylene)
(9)	BSKYKAA		Vibration Control · Sound Absorption	Urethane Foam + Vinyl acetate (Surface: Urethane coating)
(10)	BSKYKAY		Vibration Control · Sound Absorption · Sound Proofing	Urethane Foam + Butyl rubber (Surface: Urethane coating)
(11)	BSKYKA		Sound Absorption	Urethane Foam (Surface: Urethane coating)

Adhesive Part M Material: Acrylic Adhesive

(1)BS2FS(Adhesive) **BS2F**(No Adhesive)



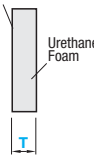
(Adhesive Surface for Adhesive Type)



(2)BS4FS(Adhesive) **BS4F**(No Adhesive)



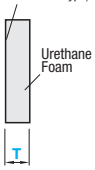
(Adhesive Surface for Adhesive Type)



(3)BS140FS(Adhesive) **BS140F**(No Adhesive)

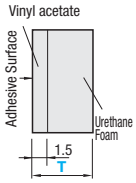


(Adhesive Surface for Adhesive Type)



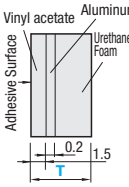
(4)BSKYU





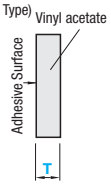
(5)BSKYUA





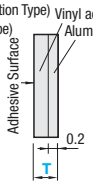
(6)BSES(A · B Selection Type) **BSESB**(Band Type)





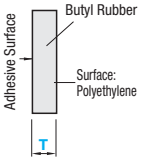
(7)BSESA(A · B Selection Type) **BSESAB**(Band Type)



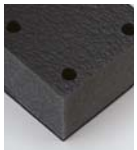


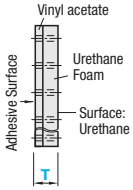
(8)BSYA





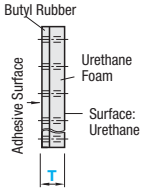
(9)BSKYKAA





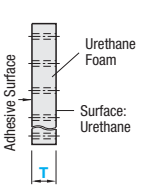
(10)BSKYKAY



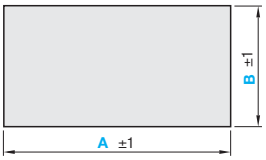


(11)BSKYKA

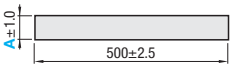




(1)~(8) A/B Selection Type



Band Type((6)·(7))



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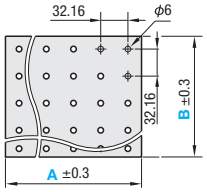


Part Number Type	T	A	B	Recommended Usage Temperature (C°)	Heat Resistance Temperature (C°)	Minimum Bend Radius (mm)	Surface Density (kg/m²)
(1) BS2FS(Adhesive) BS2F(No Adhesive)	10 20 30	A · B Standard	A · B Standard	0~30	70	-	0.75*5
(2) BS4FS(Adhesive) BS4F(No Adhesive)	10 20 30	100 400 800 *1000	100 200 300 400	0~30	70	-	0.69*5
(3) BS140FS(Adhesive) BS140F(No Adhesive)	10 20 30	* marked sizes are for (1)(2)(3)(4)(6)(9) only	500 *600 *700 *800	0~30	70	-	4.2*5
(4) BSKYU	6.5 11.5 16.5 21.5 31.5		* marked sizes are for (4)(6)(9) only	0~30	70	200*1	3.20*1
(5) BSKYUA	6.7 11.7 16.7 21.7 31.7			0~70	70	Affix on Flat Surface*3	3.74*2
(6) BSES BSESB(Band Type)	1.5	Band Type	Band Type	0~30	70	100	2.7
(7) BSESA BSESAB(Band Type)	1.7	20 30 40 50 80 100	500	0~70	70	Affix on Flat Surface*3	3.24
(8) BSYA	3 6 10			0~130	130	5*4	12.00*4
(9) BSKYKAA	31.5			0~30	70	Affix on Flat Surface*3	3.45
(10) BSKYKAY	16 26 36			0~70	70	Affix on Flat Surface*3	12.75*5
(11) BSKYKA	10 20 30 50			0~70	70	Affix on Flat Surface*3	0.75*6

- All are made of incombustible material.
- Peel off backing paper to adhere it to an object.
- Be sure to clean any oil or dust off the affixed surface.
- Can be cut with a utility knife. Cut with the adhesive surface upside.
- Adhesive Strength (90 Degree Peeling Strength): 19.6N/25mm Width (When affixed to 1.4301/X5CrNi18-10)
- BSYA expands and contracts by 3% or less.
- BSKYKA, BSKYKAA, BSKYKAY are covered with exterior skin so that they can be wiped clean and are highly durable.

*1. When T=21.5
*2. When T=6
*3. It can be bent, but the adhesive strength becomes weaker.
*4. When T=36
*5. When T=30

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~49	50~100
Discount Rate	€ Unit Price	10%	15%	20%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	T	A	€ Unit Price B 100	200	300	400	500
(1)BS2F(No Adhesive) BS2FS(Adhesive)	10	100					
		400					
		800					
		1000					
(2)BS4F(No Adhesive) BS4FS(Adhesive)	20	100					
		400					
		800					
		1000					
Price Multiplier (No seal x0.9)	30	100					
		400					
		800					
		1000					
(3)BS140F(No Adhesive) BS140FS(Adhesive)	10	100					
		400					
		800					
		1000					
Price Multiplier (No Adhesive x0.9)	20	100					
		400					
		800					
		1000					
	30	100					
		400					
		800					
		1000					
(5) BSKYUA	6.7	100					
		400					
		800					
	11.7	100					
		400					
		800					
	16.7	100					
		400					
		800					
	21.7	100					
		400					
		800					
	31.7	100					
		400					
		800					
(7) BSESA	1.7	100					
		400					
		800					
(8) BSYA	3	100					
		400					
		800					
	6	100					
		400					
		800					
	10	100					
		400					
		800					
(10) BSKYKAY	16	100					
		400					
		800					
	26	100					
		400					
		800					
	36	100					
		400					
		800					

Part Number Type	T	A	€ Unit Price B 100	200	300	400	500	600	700	800
(4)BSKYU	6.5	100								
		400								
		800								
		1000								
	11.5	100								
		400								
		800								
		1000								
	16.5	100								
		400								
		800								
		1000								
	21.5	100								
		400								
		800								
		1000								
	31.5	100								
		400								
		800								
		1000								
(6)BSES	1.5	100								
		400								
		800								
		1000								
(9)BSKYKAA	31.5	100								
		400								
		800								
		1000								

Part Number Type	T	A	€ Unit Price B 400	500	800	1000
(11)BSKYKA	10	400				
		800				
		1000				
	20	400				
		800				
		1000				
	30	400				
		800				
		1000				
	50	400				
		800				
		1000				

■Band Type

Part Number Type	T	€ Unit Price A 20	30	40	50	80	100
(6)BSESB	1.5						
(7)BSESAB	1.7						

Order Example

Part Number	–	A	–	B
BSKYU16.5	–	100	–	200
BSESB1.5	–	20		

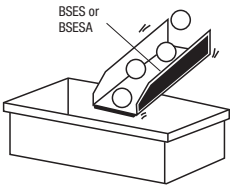
Days to Ship

8 Days

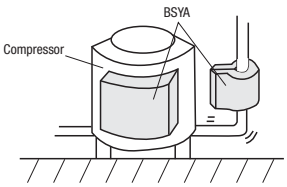
Express A | 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.
Express A applicable only to (11)BSKYKA

Example



· Vibration control is effective when used in narrow spaces or affixed on the back of vibrating trays.
· Can be used on the back of a vibrating case that comes in contact with moving parts.



· Vibration control is effective when pasted directly on the vibrating pipe and compressor.
· It can be attached on a curved surface.

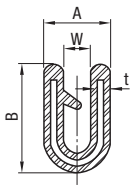
Trims

CAD Data

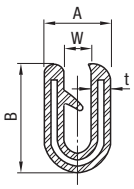
■Trims are available in 1m increment. Please note that ordering 5 pieces of L=75 delivers 5 rolls of 75 meter type.



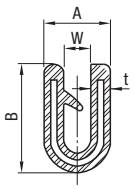
TRAT



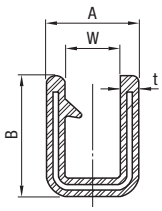
TRBT



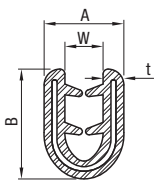
TRCT



TRDT



TRCS



* TRDT3.2 is the same shape as TRDC

Color Samples

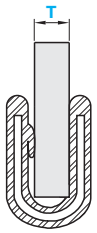
W (White)	
B (Black)	
G (Gray)	

Pattern Samples

3 (Fine Thread)	
6 (Wave)	

Ordering Code

(Applicable Plate Thickness)

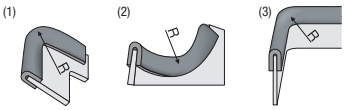


■Material Properties

Item	TPE	Silicon Rubber
Specific Gravity	0.95	1.2
Heat Resistance	+135°C	+170°C
Low Temp. Resistance	–60°C	–60°C
Compression Set	15~25%	16%

TPE does not produce dioxin when it is burned.

■Bending Direction



■Features

Because of the fingers in the channel, it does not require adhesives to install.

Type	Material	
	Body	Core Rod
TR_T	Thermoplastic Elastomer (TPE)	Aluminum
TRCS	Silicon Rubber	1.0330/DC01

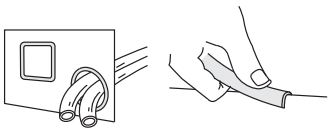
Part Number		Color–Pattern	L Dimension Configurable	A	B	W	t	Minimum Bending Radius mm			Applicable Plate Thickness	€ Unit Price 1m
Type	T							Direction (1)	Direction (2)	Direction (3)	(Range of T)	
TRAT	0.4	B-3 B-5	1~75 (1m Increment)	5.4	9.7	0.4	1.9	30	30	20	0.3~0.8	
	0.8				9.8	0.8					0.7~1.2	
	1.6				10	1.6					1.2~1.6	
	2.4			6.2	9.5	2.4					2.0~2.4	
TRBT	0.8	W-1B-3 W-5B-5		6.4	11.3	0.8	2.3	40	40	20	0.6~1.2	
	1.6			7.4	11.1	1.6					1.2~2.0	
	2.4			8.2	11.0	2.4		30			2.0~3.0	
	3.2			9.0	10.6	3.6					2.6~3.2	
TRCT	1.6	W-1B-3 W-5B-5		6.0	14.5	1.6	2.2	30	30	20	1.2~2.4	
	3.2			7.6	14.0	3.2				30	2.4~4.0	
	4.8			9.2	13.3	4.8					4.0~5.0	
	6.4			10.8	12.7	6.4					5.5~6.4	
TRDT	3.2	W-3B-3 W-5B-5		7.8	19.0	3.2	2.3	50	50	30	2.3~4.0	
	6.4			11.0	17.5	6.4		40			6.0~7.0	
	8.0			12.6	16.7	8.0					7.0~8.5	
	9.5			14.1	15.9	9.5				50	9.0~9.5	
	12.7			17.3	14.6	12.7					12.0~12.7	
TRCS	3.2	G-6 B-6		9.6	13.2	4.6	2.5	50	50	50	1.0~3.2	

L Dimension is specified in 1mm increment. Minimum bending radius value is for reference only. Individual product performance may vary. Use it for reference only.

Order Example

Part Number	-	Color–Pattern	-	L
TRCT3.2	-	B-3	-	L6

Example



Days to Ship

8 Days

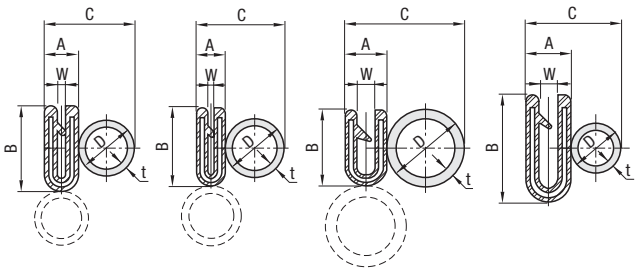
Trim Seals

CAD Data

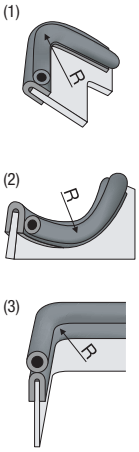
■Trim Seals are available in 1m increment. Please note that ordering 5 pieces of L=75 delivers 5 rolls of 75 meter type.



TRSAT **TRSBT** **TRSCT** **TRSDT**



■Bending Direction



Pattern Samples

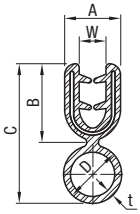
TRS_T



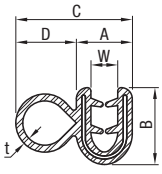
TRS_SB
TRS_SG



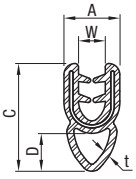
TRSASB(Black) **TRSASG**(Gray)



TRSBSB(Black) **TRSBSG**(Gray)

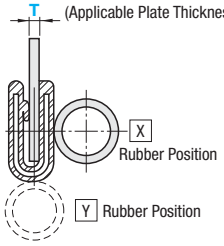


TRSCSB(Black) **TRSCSG**(Gray)



Ordering Code

T (Applicable Plate Thickness)



Type	Material			Color
	Body	Rubber Part	Core Rod	
TRS_T	Thermoplastic Elastomer (TPE)	EPDM	Aluminum	Black
TRS_SB	Silicon Rubber	Silicon Rubber	1.0330/DC01	Black
TRS_SG	Silicon Rubber	Silicon Rubber	1.0330/DC01	Gray

Part Number		Rubber Position	L Dimension Configurable	A	B	C	W	D	t	Minimum Bending Radius mm			Applicable Plate Thickness (Range of T)	€ Unit Price 1m
Type	T									Direction (1)	Direction (2)	Direction (3)		
TRSAT	1.6	X (Real Line) Y (Dotted Line)	1~75 (1m Increment)	6.0	14.5	15.4	1.6	9.5	1.3	30	30	20	1.2~2.4	
	3.2			7.6	14.0	17.0	3.2					30	2.4~4.0	
	4.8			9.2	13.3	18.6	4.8						4.0~5.0	
	6.4			10.8	12.7	20.2	6.4						5.5~6.4	
TRSBT	1.6			6.0	14.5	17.0	1.6	11.1	1.5	30	30	50	1.2~2.4	
	3.2			7.6	14.0	18.6	3.2						2.4~4.0	
	4.8			9.2	13.3	20.2	4.8						4.0~5.0	
	6.4			10.8	12.7	21.8	6.4						5.5~6.4	
TRSCT	1.6			6.0	14.5	21.7	1.6	15.9	2.0	60	60	70	1.2~2.4	
	3.2			7.6	14.0	23.3	3.2						2.4~4.0	
	4.8			9.2	13.3	24.9	4.8						4.0~5.0	
	6.4			10.8	12.7	26.5	6.4						5.5~6.4	
TRSDT	1.6	X(Real Line)		5.4	10.0	12.3	1.6	7.0	1.3	30	30	-	1.2~1.6	
TRSASB TRSASG	3.2	-		9.6	13.2	24.0	4.6	10.0	1.2	95	170	50	1.0~3.2	
TRSBSB TRSBSG	3.2			9.6	13.2	20.0	4.6	10.4	1.2	50	50	-	1.0~3.2	
TRSCSB TRSCSG	3.2			9.6	12.0	18.5	4.6	6.5	1.2	50	90	35	1.0~3.2	

※L Dimension is specified in 1mm increment.
※Minimum bending radius value is for reference only. Individual product performance may vary. (Applicable to both rubber positions X and Y.)

Order Example

Part Number	-	Rubber Position	-	L
TRSCT1.6	-	X	-	L15
TRSCSB3.2			-	L58

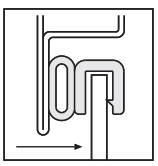
Example

Days to Ship

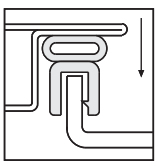
8 Days | Express A | 8,00 EUR/ piece

P.88

※A Express Charge of 21,60 EUR for 3 or more identical pieces.
※Not applicable to TRS_T.



Rubber Position X



Rubber Position Y

※Best when rubber outer diameter dimension is compressed to 40~60% of the standard dimension.

Trims Compact / Resin Trims

CAD Data

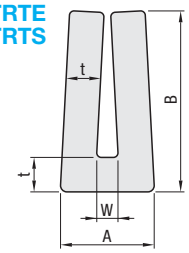
■Compact trims with no internal metal strip are easy to cut and bend as needed. New "U" type that does not produce corners against the sheet metal is added.

■Trim Compacts Rectangular Type/U Type

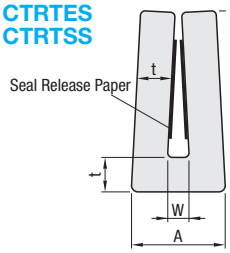


RoHS

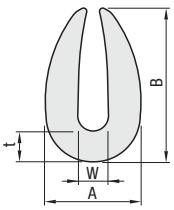
CTRTE
CTRTS



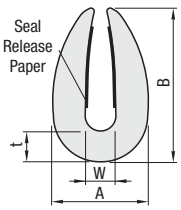
CTRTES
CTRTSS



CTRTU



CTRTUS

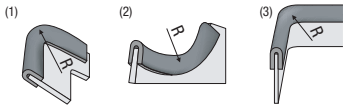


Type		Cross Section	Ⓜ Material	Color
No Tape	With Tape			
CTRTE	CTRTES	Rectangular Type	EPDM	Black
CTRTS	CTRTSS		Silicon Rubber	Gray
CTRTU	CTRTUS	U Type	EPDM	Black

■Material Properties

Item	EPDM	Silicon Rubber
Specific Gravity	1.2	1.2
Heat Resistance	120°C	170°C
Low Temp. Resistance	-40°C	-60°C
Compression Set	16%	27%

■Bending Direction



Ⓥ Adhesive tape **P.448** ADTR (EPDM) and/ADTS (Silicon) are used.

Trim Compact is available in 1m increments. Please note that ordering 5 pieces of L=75 delivers 5 rolls of 75 meter type.

Part Number Type	T	L 1m Increment	A	B	W	t	Minimum Bending Radius mm Direction (1)	Direction (2)	Direction (3)	Applicable Plate Thickness	€ Unit Price (1m) No Tape	With Tape
Ethylene Rubber Rectangular	1.6	1~75 (1m Increment) * With Adhesive Tape) *1~2	5.2	10	1.4	1.9	R70	R50	R30	1.0~1.6		
CTRTE	2.3		6	10	2.2	1.9			R40	2.0~2.3		
CTRTES(w/Adhesive Tape)	3.2		6.9	10	3.1	1.9				3.0~3.2		
Silicon Rubber Rectangular	1.6		5.2	10	1.4	1.9			R30	1.0~1.6		
CTRTS	2.3		6	10	2.2	1.9			R40	2.0~2.3		
CTRTSS(w/Adhesive Tape)	3.2		6.9	10	3.1	1.9				3.0~3.2		
Ethylene Rubber U Type	0.8		4	6	1	1.4	R30	R30	R30	1.0~1.6		
CTRTU	1.6		4.4	7	1.4	1.4				2.0~2.3		
CTRTUS(w/Adhesive Tape)	2.3		5.3	8	2.1	1.5				3.0~3.2		

Order Example: Part Number CTRTE1.6 - L L32 — Days to Ship: 8 Days — Price: € euros

■Volume Discount (Ⓥ Round down to one Cent.) **P.87**

Quantity	1~10	11~15
Discount Rate	€ Unit Price	5%

Ⓥ For orders larger than indicated quantity, please request a quotation.

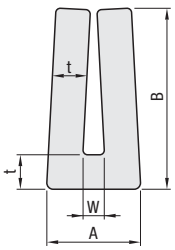
■Translucent resin trims blend well with painted sheet metal and stainless steel surfaces.

■Resin Trims

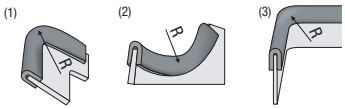


RoHS

Type	Ⓜ Material
PTRTN	Nylon 6



■Bending Direction



Part Number Type	No.	L 1mm Increment	A	B	W	t	Minimum Bending Radius mm Direction (1)	Direction (2)	Direction (3)	Applicable Plate Thickness
PTRTN	1	10~2000	3.3	5	1.3	1	R150	R300	R200	1.0~1.1
	2		3.7	5	1.7	1				1.2~1.5
	3		4.4	5	2.4	1				1.6~2.2
	4		5.3	5	3.3	1				2.3~3.2

Order Example: Part Number PTRTN1 - L - 200 — Days to Ship: 8 Days — Price: € euros

■Volume Discount (Ⓥ Round down to one Cent.) **P.87**

Quantity	1~10	11~15
Discount Rate	€ Unit Price	5%

Ⓥ For orders larger than indicated quantity, please request a quotation.

Part Number Type	T	€ Unit Price Specify L in 1mm Increment 10~200	201~400	401~600	601~800	801~1000	1001~1200	1201~1400	1401~1600	1601~1800	1801~2000
PTRTN	1										
	2										
	3										
	4										

Moment Adhesives for Rubber

CAD Data

■Moment Adhesives for Rubber

RoHS



Part Number Type	No.	Applicable Rubber Materials	Volume	Initial Hardening Time	Main Components	€ Unit Price
	R	Nitrile · Chloroprene · Ethylene · Butyl · Fluorine	20g	10 seconds	α-cyanoacrylate	
	S	Silicon	100g	12 hours	Silicon	

(?)Please note that BONDS (Adhesives for Silicon) takes long initial hardening time.

Order Example | Part Number | Days to Ship | 8 Days | Price

■Volume Discount ((?)Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19
Discount Rate	€ Unit Price	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

■Adhesive Strength Data

Base material and JIS SUS board are adhered and measured by 180° peeling test.

Adhesive Strength

Unit: N/25mm width

Conditions	Nitrile	Chloroprene	Ethylene	Butyl	Fluorine	Silicon
Room Temperaturex20 min	40	40	80	70	45	1 or less
Room Temperature x 72 min	50	50	80	70	50	20
80°C x 48 hours	40	40	80	70	50	40

-Features of BONDR
- Adheres rubber, iron and stainless steel instantly. (Except silicon and urethane)
  Possible to adhere rubbers.
- Viscosity is adjusted to decrease the dripping of adhesives.
- Included nozzle for application (nozzle tip size: 0.5~0.6mm) allows application to details.

■Adhesive for Urethane

RoHS



■Adhesive for Urethane

Part Number	Volume		Color	Mixing Ratio	Initial [illegible] Time	Useable Duration	Main Components	€ Unit Price
	Main Component	100g	Clear	1:1		Minutes	Epoxy	
	Hardener	100g	Light Yellow		(Room Temp. 20°C Assumed)		Amine / Polythiol	

Mix well in a container at 1:1 ratio.
Please read the included instructions thoroughly.
Use within 6 minutes of mixing the main component and the hardener.

■Adhesive Strength: 180 Degree Delamination Strength Test

URTB (to urethane adhesive)

Cure Condition		Delamination Strength (N/25mm Width)
Temperature	Time	
Room Temp. (23°C)	20 Minutes	1 or less
	72 Hours	20
80°C	48 Hours	40

Order Example | Part Number

Days to Ship | 8 Days | Express A | 8,00 EUR/ piece | P.88

(?)A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~4	5~9	10~	20~29
Discount Rate	€ Unit Price	5%	10%	15%

(?)For orders larger than indicated quantity, please request a quotation.

■Double Sided Adhesive Tape for Rubbers

RoHS



Part Number: Standard Type	Heat Resistant Type	Conductive Type	Oil Resistant Type	W	Applicable Rubbers	Base Material	Main Components	€ Unit Price: Standard Type	Heat Resistant Type	Conductive Type	Oil Resistant Type
ADTR	-	LADTR	PLADTR	20	Nitrile · Chloroprene · Ethylene · Butyl · Fluorine	Non-woven Polyester Fabric	Acrylic Adhesive				
				50							
ADTS	HADTS	-	-	20	Silicon	Standard: Polyester Film Heat Resistant: Polyimide Film	Silicon Adhesive				
				50							

(?)LADTR are in 5m rolls, others are in 10m rolls.
(?)For ADTS, only the side with the white release paper (silicon bond surface) is applicable to bond to silicon rubber.
(?)Double sided adhesive seals and adhesives for urethane, rubber, and sponge are also available as web page listed products.

Days to Ship | 8 Days

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

- Adhesive Test Data

180 Degree Delamination Strength Test: Bond 1mm thick, 25mm wide rubber sheet to a 1.4301/X5CrNi18-10 plate and measured.
Delamination strength force is expressed as adhesive load (N).

Unit: N/25mm width

Conditions	Standard Type: ADTR: Nitrile	Chloroprene	Ethylene	Butyl	Fluorine	ADTS: Silicon	Heat Resistant Type: HADTS: Silicon	Conductive Type: LADTR: Nitrile	Chloroprene	Ethylene	Butyl	Oil Resistant Type: PLADTR
Room Temperaturex20 min	60	60	60	60	60	13	3	6	6	6	6	Refer to P.387
Room Temperature x 72 min	80	80	80	80	80	15	9	9	9	9	9	
80°C x 48 hours	70	70	70	70	70	15	10	13	14	12	12	

(?)Adhesive strength data are not guaranteed values, but examples of measured values.

Not Available

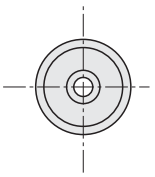
Electroconductive Rubber Feet

■Highly conductive rubber feet are excellent for static electricity prone desktop equipment.

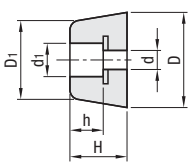
■Electroconductive Rubber Feet RoHS



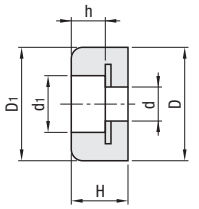
ECRK

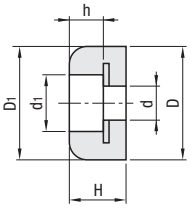


※Below is the shape for No.10.



※Below is the shape for No.3617.





Ⓜ Material: Body: Conductive NBR
Washer : 1.4301/X5CrNi18-10

■Characteristic Values

Item	Unit	Value
Specific Gravity	-	1.35
Hardness	Shore A	65
Elongation	%	500
Tensile Strength	MPa	8.1
Specific Volume Resistivity	Ω · cm	100

※Measuring Method: JIS K 6301
※The above values are not guaranteed values but an example of measured values.

■Features
· Highly conductive rubber feet made of rubber with a Specific Volume Conductivity of 10^2Ω · cm.
· Excellent for static sensitive applications such as desktop assembly of electronic components and PC boards.

Part Number		H	h	D	D1	d	d1	Allowable Load (N)	1 Pack Contains	€ Unit Price	Volume discount price
Type	No.									1~4 Pkgs.	5 Pkgs. or More
ECRK	10	5	3	10	10	3	5	98	24		
	15	8	5	15	14	3	6	147	16		
	16	10	5	16	14	3	6	147	12		
	18	11	7	18	15	4	7	147	12		
	20	12	7	20	16	4	7	196	12		
	24	10	5	24	19	4	9	196	4		
	26	15	10	26	20	4	10	294	4		
	30	19	10	30	24	4	14	294	4		
	3225	25	9	32	28	5	14	490	4		
	3617	17	9	36	36	6	17	147	4		

Order Example — Part Number: ECRK15

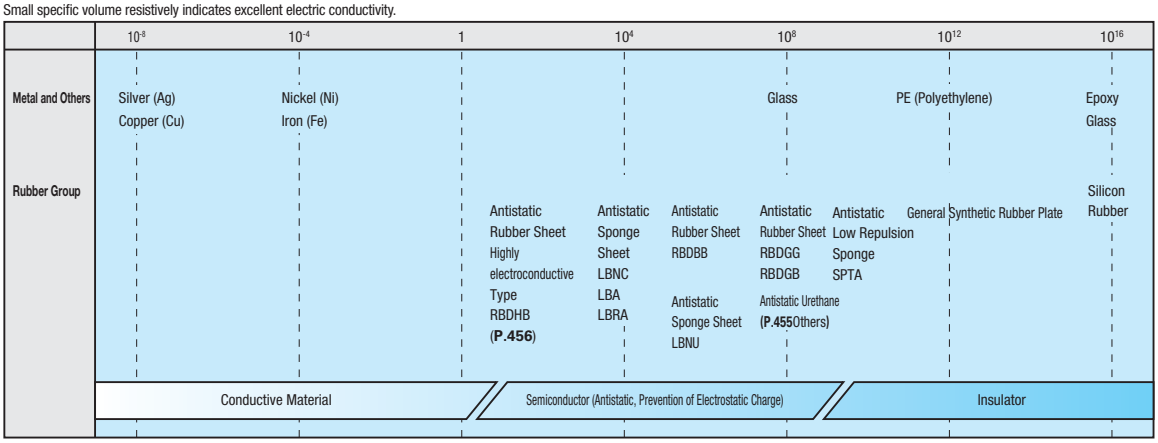
Days to Ship: 6 Days P.87

■Specific Volume Resistivity (Ω · cm)

Antistatic Urethane	$2.1x10^8$
Antistatic Rubber Sheets (RBDBB)	$2.0x10^5$
Antistatic Rubber Sheets (RBDGG)	$6.86x10^8$
Antistatic Rubber Sheets (RBDGB)	$1.73x10^8$
Antistatic Sponge Sheets (LBNU)	$5.0x10^5$
Antistatic Sponge Sheets (LBNC)	$4.0x10^4$
Antistatic Sponge Sheets (LBA,LBRA)	$1.0x10^4$
Antistatic Low Repulsion Sponge (SPTA)	$4.0x10^{10}$

■Specific Volume Resistivity and Conductivity of Antistatic Urethane · Rubber and Sponge

"Specific Volume Resistivity" is a property that represents an electrical resistance value per unit.
The larger the value, the higher the resistance, and vise versa.
Small specific volume resistively indicates excellent electric conductivity.



Rubber Feet Receiver Cups

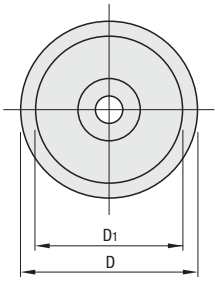
CAD Data

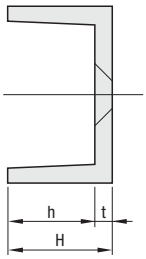
■Use these rubber cups to fix rubber feet locations.

■Rubber Feet Receiver Cups RoHS



GOMAA





M Material: Glass containing ABS resin

Part Number Type	No.	D	D1	H	h	t	Applicable Flathead Screw	Allowable Load (N)	Compatible Rubber Feet No.	€ Unit Price
GOMAA	10	14	10	6.5	4	2.5	M3	98	10	
	15	21	15	9.3	6.8			196	15	
	18	23.5	17.5	12.3	9.3	3	M4	245	18	
	24	29.5	23.5	12.5	9	3.5	M5	294	24	
	30	35.5	29.5	21	17.5			392	30	

Order Example

Part Number
GOMAA10

Days to Ship

6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~19	20~39	40~50
Discount Rate	€ Unit Price	5%	8%	10%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number - (SET)
GOMAA10 - SET

8 Days

Use when the cups cannot be screw mounted.

	Anti-slip Pads	Code	Spec.	Price Adder
Alteration	Adds glued-on pads on the bottom of Receiver Cups for anti-slip purpose. M Material Polymer foam of acrylic and urethane rubber	SET	 *Screw holes will be blinded.	1,00

Example



Sponge Tape



RoHS

Type	Material	Hardness	Color
SGNPTA	EPDM Sponge	Asker C8	Black
SGNATA	Silicon Rubber Sponge	Asker C35	Orange
EPATA	EPDM Foam (EPT Sealer®)	(Less than Asker C1)	Black

- A Dimensio Tolerance

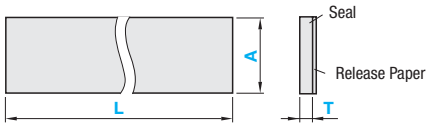
SGNPTA	±1.5
SGNATA	±2.5
EPATA	

- L Dimensio Tolerance

	500	1000
SGNPTA / SGNATA	±3	±5

EPATA

500 · 1000	1500 · 2000
+14 -6	+15 -8



Delivered in rolls. Characteristic Data P.409

Part Number Type	T	T Tolerance	Selection A	Selection L
SGNPTA SGNATA	3	±0.5	10 15 20 30 50	500 1000
	5			
	10			
EPATA	3	±1.0	10 15 20 30 50	500 1000 1500 2000
	5			
	10			

Order Example

Part Number	-	A	-	L
SGNPTA3	-	10	-	1000

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	T	A	€ Unit Price SGNPTA L500	SGNPTA L1000	SGNATA L500	SGNATA L1000	EPATA L500	EPATA L1000	EPATA L1500	EPATA L2000
SGNPTA SGNATA EPATA	3	10								
		15								
		20								
		30								
		50								
	5	10								
		15								
		20								
		30								
		50								
	10	10								
		15								
		20								
		30								
		50								

EPATA Characteristics

This product is of semi-closed foam and can be compressed with little resistance. The foam becomes of closed-cell after being compressed. It is a highly functional sealant for gap filling and insulating from heat, water, and sounds.

Characteristic Values

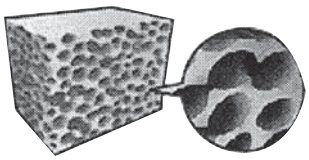
Test method conforms to JIS K 6767.

Measurement Item		Unit	EPATA
Specific Gravity		-	0.095
Tensile Strength		kg/cm²	0.90
Elongation		%	430
Compressed Hardness	25%	kg/cm²	0.02
	50%		0.05
Foam Type		-	Semi-closed Cell

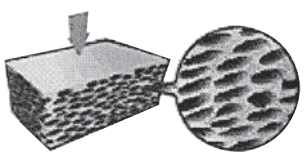
Compression Ratio (%)	EPATA
50	X
60	Δ
70	○
80	○

○: No leak after 30 min.
Δ: Leakage after 30 min.
X: Leakage in 10 min. or less

· Semi-closed Foam Type (EPATA_)



Before Compression

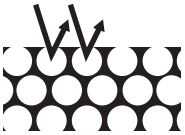


After Compression

Characteristics for Closed-cell Type (SGNPTA · SGNATA)

Air and water do not permeate the material since it is of closed-cell structure. Shock absorbing performance is also good.

Air and water cannot go through.



Rubber Cushion · Shock Absorbing Foam

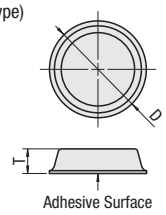
■Shock absorbing rubber bumpers · feet on sheets.

■Rubber Bumpers

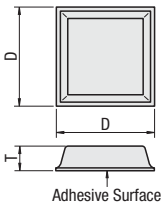
RoHS



BMPM(Round Type)



BMPK(Square Type)



℗12 pcs. per package ℗It may be divided into several sheets.

Ⓜ Material: Body: Polyurethane Adhesives: Acrylic Type

Part Number Type	No.	D	T	€ Unit Price
BMPM	5312	12.7	3.6	
	1005	19	5	
BMPK	5008	12.7	3	
	1037	15	5	

Order Example

Part Number
BMPM5312
BMPK1037

Days to Ship: **6 Days** P.87

Price

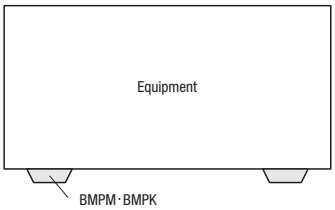
■Volume Discount (℗Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19
Discount Rate	€ Unit Price	5%	10%

℗For orders larger than indicated quantity, please request a quotation.

Example

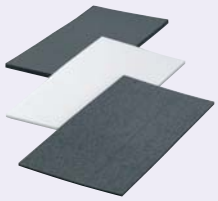
It can be used as door stoppers, simple rubber feet and etc.



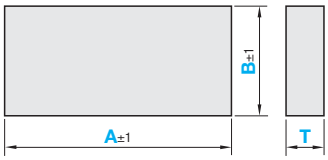
■Co-polymerized Acrylic · Urethane · and Rubber for sound and vibration dampening. Suitable for work accumulators.

■Shock Absorbing Form

RoHS



Type	Ⓜ Material Body	Adhesive Part	Color
PRGCS	Co-polymerized Acrylic · Urethane and Rubber	Acrylic Adhesive Adhesive	Black
PRGCW			White



℗Adhesive backed. Peel off the separator paper for use. Clean the mating surface free of oil and dust

℗Can be cut with a utility knife. Cut with the adhesive side up. Remove the protective film from the surface before use.

■Properties

Item	PRGCS	PRGCW
Density	0.32g/cm³	
Tensile Strength	4.5kg/cm²	
Elongation	250%	
Rebound Rate	0.1% or less	

■Features

- Excellent sound dampening and vibration absorbing characteristics.
- Flexible material can be pasted on curved surfaces with ease.
- Lightweight material can be applied on large panel areas.
- Best suited for human body protection. Can be pasted in multi-layers where more protection is needed.

℗Adhesive Strength (90° delamination test): 19.6N/25mm width (on 1.4301/X5CrNi18-10)

Part Number Type	T	A Selection	B Selection	€ Unit Price B100	B200	B300	B400	B500
PRGCS PRGCW	3	100	100 200 300 400 500					
		400						
		800						
	5	100						
		400						
		800						
	10	100						
		400						
		800						

Order Example

Part Number	-	A	-	B
PRGCS3	-	100	-	200

Days to Ship: **8 Days**

Price

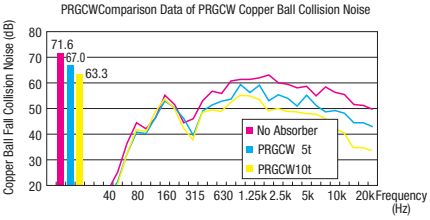
■Volume Discount (℗Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~199
Discount Rate	€ Unit Price	5%	10%	18%

℗For orders larger than indicated quantity, please request a quotation.

Steel Ball Impact Sound Level Test

PRGCWComparison Data of PRGCW Copper Ball Collision Noise



Item	No absorbing material	PRGCW5	PRGCW10
Colliding Sound (dB)	71.6	67	63.3
Sound Pressure	-	40% reduced sound pressure	60% reduced sound pressure

* A steel ball (20Ø · 36g) is dropped on a wooden base from a 55cm height, and the sound pressure level is measured with a microphone at a distance of 50m, positioned 50cm above the ground.

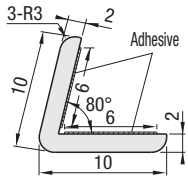
Safety Protection Materials
-Corner Covers-

■Adhesion to rubbers remain stable as a special adhesive which follows rubbers is used.

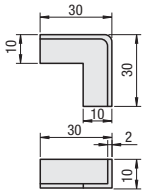
■Corner Covers 10mm Width Type RoHS



PRGLSS (Rubber Type Black)



For Corners
PRGLFCS (Rubber Type Black)



Ⓜ Material: Body: EPDM
Adhesive: Acrylic Adhesives
Ⓗ Hardness: Shore A60

Ⓟ Can be affixed on angled sections of 90°. Ⓟ Adhesive is applied on the inside surface.

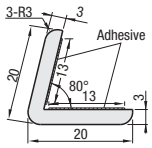
Part Number / Type	L Selection	Weight (g)	€ Unit Price
PRGLSS	100	3	
	500	15	
	1000	30	
	1500	45	
	2000	60	

Part Number	€ Unit Price
PRGLFCS	

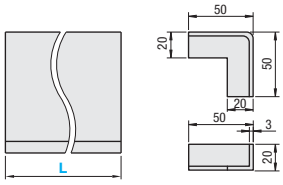
■Corner Covers 20mm Width Type RoHS



PRGLS (Rubber Type Black)
PRGLF (Soft Type)
PRGLFG (Soft Type, Light Gray)



For Corners
PRGLFC (Soft Type)
PRGLFCG (Soft Type, Light Gray)



Ⓟ Can be affixed on angled sections of 90°.
Ⓟ Adhesive is applied on the inside surface.

Part Number	Ⓜ Material: Body	Ⓜ Material: Adhesive Part	Ⓗ Hardness
PRGLS	EPDM	Acrylic Adhesive	Shore A60
PRGLF · PRGLFG · PRGLFC · PRGLFCG	EPDM Foam		Shore A20

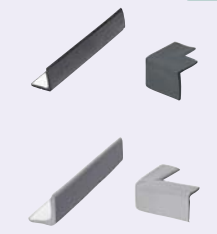
Part Number / Type	L Selection	Weight (g)	€ Unit Price
PRGLS	100	14	
	500	70	
	1000	140	
	1500	210	
	2000	280	

Part Number / Type	L Selection	Weight (g)	€ Unit Price
PRGLF PRGLFG	100	10	
	500	50	
	1000	100	
	1500	150	
	2000	200	

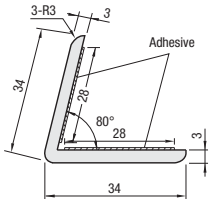
Part Number	€ Unit Price
PRGLFC PRGLFCG	

■Corner covers of 34mm have been added.

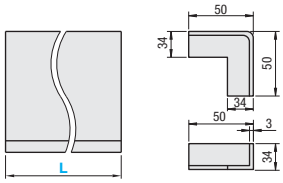
■Corner Covers 34mm Width Type RoHS



PRGLM (Rubber Type Black)
PRGLMG (Rubber Type Light Gray)



For Corners
PRGLMC (Rubber Type Black)
PRGLMCG (Rubber Type Light Gray)



Ⓜ Material: Body: EPDM
Adhesive: Acrylic Adhesives
Ⓗ Hardness: Shore A60

Ⓟ Can be affixed on angled sections of 90°.
Ⓟ Adhesive is applied on the inside surface.

Part Number / Type	L Selection	Weight (g)	€ Unit Price
PRGLM PRGLMG	100	30	
	500	150	
	1000	300	
	1500	450	
	2000	600	

Part Number	€ Unit Price
PRGLMC PRGLMCG	

Order Example

Part Number	-	L
PRGLSS	-	100
PRGLS	-	100
PRGLM	-	100

Days to Ship

8 Days | Express A | 3,00 EUR/ piece P.88

Ⓟ A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Ⓟ Round down to one Cent.) P.87

Quantity	1~4	5~19	20~39	40~49
Discount Rate	€ Unit Price	5%	10%	15%

Ⓟ For orders larger than indicated quantity, please request a quotation.

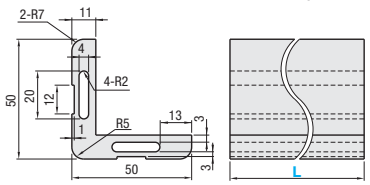
■Large Corner Covers 50mm

RoHS

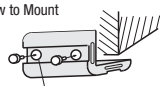


PRGLL -L Dimension Tolerance

100	500	1000
±1	±3	±4

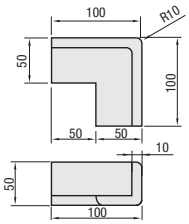


How to Mount



Drill a hole and fix with a bolt or the like.

PRGLLC (For Corner Angle)



Can be cut with a utility knife.
Properties: See the Ethylene Rubber on **P.358**

M Material: EPDM
H Hardness: Shore A60

Part Number Type	L Selection	Weight (g)	€ Unit Price
PRGLL	100	98	
	500	490	
	1000	980	
	1500	1470	
	2000	1960	

Part Number	€ Unit Price
PRGLLC	

Example

Order Example: Part Number PRGLL - L 100

Days to Ship: 8 Days — Express A 3,00 EUR/piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

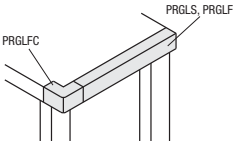
Price

Volume Discount (Round down to one Cent.) **P.87**

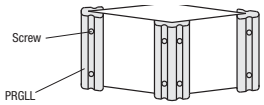
Quantity	1~4	5~19	20~39	40~49
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

-Table corner



-For use as safety bumper on equipment and pillars.



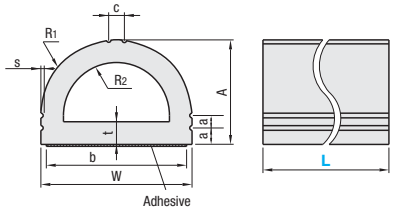
■Stripe is added to D Type Rubber Bumpers. Effective for caution and protection.

■D Type Rubber Bumpers

RoHS



PRGDS (Compact)
PRGDSY (Compact, Stripe)
PRGDM (Standard)
PRGDMG (Standard, Lt. Gray)
PRGDMY (Standard, Stripe)



M Material:
Body : EPDM
Adhesive: Acrylic Adhesives
H Hardness: Shore A60

Stripe type is made of yellow ethylene rubber and acrylic polyol resin enamel coating is applied.

Part Number Type	L Selection (mm)	A	W	R1	R2	t	a	b	c	s	Weight (g)	€ Unit Price PRGDS (Black) PRGDM (Black) PRGDMG (Gray)	€ Unit Price PRGDSY (Stripe) PRGDMY (Stripe)
Compact Type PRGDS (Black) PRGDSY (Stripe)	100	14	20	R10	R 7	3	2	18	2	0.3	19		
	500										95		
	1000										190		
	1500										285		
	2000										380		
Standard Type PRGDM (Black) PRGDMG (Gray) PRGDMY (Stripe)	100	20	30	R15	R11	4	3	28	4	0.4	44		
	500										220		
	1000										440		
	1500										660		
	2000										880		

Adhesive backed. Peel off the separator paper for use. Clean the mating surface free of oil and dust
Can be cut with a utility knife. Adhesive Strength (180° delamination test): 16N/20mm width (on 1.4301/X5CrNi18-10) Properties: See the Ethylene Rubber on **P.358**

Order Example: Part Number PRGDSY - L 100

Days to Ship: 8 Days — Express A 3,00 EUR/piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

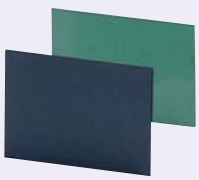
Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~4	5~19	20~39	40~49
Discount Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Antistatic Rubber Sheets

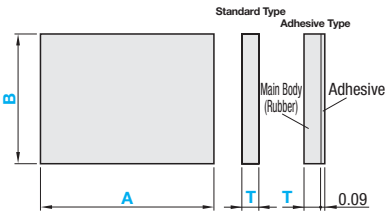
■Antistatic rubber sheet made from conductive rubber with specific volume resistivity value of 10^5~10^8Ω・cm. Adhesive is also electroconductive.



RoHS

Type		Material	Color		Adhesive Part (Adhesive Type)
Standard Type	Adhesive Type		Front	Back	
RBDBB	RBDBBT	Chloroprene Synthetic Rubber	Black		Conductive Adhesives
RBDGG	RBDGGT	Nitrile Synthetic Rubber	Green		
RBDGB	RBDGBT		Green	Black	

Black side of RBDGBT is adhesive surface.



A≥B

■Accuracy Standards

- T Dimension Tolerance

T	1	2	3
	±0.2	±0.25	±0.3

- Dimension Tolerance of A and B

A, B	50~100	100~300	300~500	500~1000	1000~
	±0.5	±1	±2.5	±5	±10

■Standard Type

Part Number	10mm Increment		Selection
	A	B	T
RBDBB・RBDBBT	50~5000	50~1000	1 2 3
RBDGG・RBDGGT			1 2
RBDGB・RBDGBT			2

Order Example

■Standard Type

Part Number	-	A	-	B	-	T
RBDBB	-	2000	-	1000	-	2

Days to Ship: 8 Days

Express A: 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

■Properties

Item	Unit	RBDBB	RBDGG	RBDGB
Specific Gravity	-	1.35	1.32	1.34
Hardness	Shore A	70		
Elongation	%	380	670	460
Tensile Strength	MPa	10.2	11.1	9.6
Tearing Strength	N/mm	30	34	36
Specific Volume Resistivity	Ω・cm	$2.0x10^5$	$6.86x10^8$	$1.73x10^8$

Testing Method: JIS K 6301

The above values are not guaranteed values but an example of measured values.

■Conductive Adhesive Data

Item	Unit	Value	
Thickness	mm	0.09	
		(Aluminum Base Material: 0.03)	
*Adhesive Strength	gf/20mm	Stainless	1150
		ABS	1350
		PP	1200
Retaining Force	H (70°C 1Kg)	24<	
Resistance	Ω・cm	10^2	

*180°Peel Adhesive Strength23°Cx1H (gf/20mm)

The above values are not guaranteed values but an example of measured values.

■Standard Type

Part Number	T	A (10mm Increment)	€ Unit Price B(10mm Increment) 50~500	510~1000
RBDBB	1	50~500		
		510~1000		
		1010~1500		
		1510~2000		
		2010~2500		
		2510~3000		
		3010~3500		
		3510~4000		
		4010~4500		
		4510~5000		
	2	50~500		
		510~1000		
		1010~1500		
		1510~2000		
		2010~2500		
		2510~3000		
		3010~3500		
		3510~4000		
		4010~4500		
		4510~5000		
	3	50~500		
		510~1000		
		1010~1500		
		1510~2000		
		2010~2500		
		2510~3000		
		3010~3500		
		3510~4000		
		4010~4500		
		4510~5000		
RBDBBT	1	50~500		
		510~1000		
	2	50~500		
		510~1000		
	3	50~500		
		510~1000		

Part Number	T	A (10mm Increment)	€ Unit Price B(10mm Increment) 50~500	510~1000
RBDGG	1	50~500		
		510~1000		
		1010~1500		
		1510~2000		
		2010~2500		
		2510~3000		
		3010~3500		
		3510~4000		
		4010~4500		
		4510~5000		
	2	50~500		
		510~1000		
		1010~1500		
		1510~2000		
		2010~2500		
		2510~3000		
		3010~3500		
		3510~4000		
		4010~4500		
		4510~5000		
RBDGB	2	50~500		
		510~1000		
		1010~1500		
		1510~2000		
		2010~2500		
		2510~3000		
		3010~3500		
		3510~4000		
		4010~4500		
		4510~5000		
RBDGGT	1	50~500		
		510~1000		
	2	50~500		
		510~1000		
RBDGBT	2	50~500		
		510~1000		

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Antistatic Rubber Sheets·Earth Plates

-High Conductive Type-

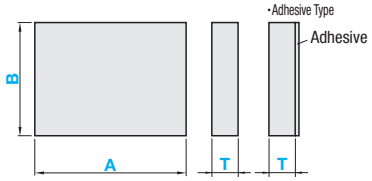
■- Highly conductive rubber sheet with specific volume resistivity value of $10^2\Omega \cdot cm$. Adhesive is also highly electroconductive. Available in 1mm increment.

■Antistatic Rubber Sheets -High Conductive Type-

RoHS



RBDHB
RBDHBT(Adhesive Type)



Ⓨ A≥B

Ⓜ Material: Body: Conductive NBR
Adhesive Part: Conductive Adhesives
Ⓨ Available in 1mm increment.

Part Number		1mm Increment (A≥B)	
Type	T	A	B
RBDHB RBDHBT	2	10~900	10~900

■Accuracy Standards

•T Dimension Tolerance

±0.3	

•A · B Dimension Tolerance

200mm or Less	201~300	301~500	501~900
±0.5	±1	±1.5	±2.5

Order Example

Part Number	-	A	-	B
RBDHB2	-	200	-	100

Days to Ship: 8 Days

Express A 5,00 EUR/piece

P.88

Ⓨ A Express Charge of 13,50 EUR for 3 or more identical pieces.

■Features

- Highly electroconductive rubber sheet made from conductive rubber with specific volume resistivity value of $10^2\Omega \cdot cm$.
- Suitable for use on electronic components and resin components assembly tables.

■Characteristic Values

Item	Unit	Value
Specific Gravity	-	1.35
Hardness	Shore A	65
Elongation	%	500
Tensile Strength	MPa	8.1
Specific Volume Resistivity	Ω·cm	100

Ⓨ Measuring Method: JIS K 6301
Ⓨ The above values are not guaranteed values but an example of measured values.

■Characteristics of Electroconductive Adhesive (Common to RBDHBT and RBDE)

Item	Unit	Value	
Thickness	mm	0.11	
		Base Material Thickness	0.07
*Adhesive Strength	gf/20mm		720
Electric Resistance of Surface	Ω	0.35	

*180°Peel Adhesive Strength 23°Cx1H (gf/20mm)
Ⓨ The above values are not guaranteed values but an example of measured values.

Part Number		A (1mm Increment)	€ Unit Price B(1mm Increment)								
Type	T		10~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900
RBDHB	2	10~100									
		101~200									
		201~300									
		301~400									
		401~500									
		501~600									
		601~700									
		701~800									
		801~900									
RBDHBT	2	10~100									
		101~200									
		201~300									
		301~400									
		401~500									
		501~600									
		601~700									
		701~800									
		801~900									

Price

■Volume Discount (Ⓨ Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

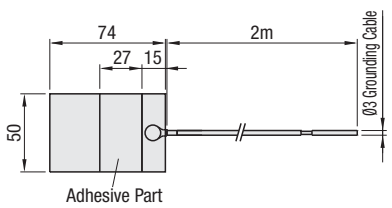
Ⓨ For orders larger than indicated quantity, please request a quotation.

■Earth Plates

RoHS



RBDE

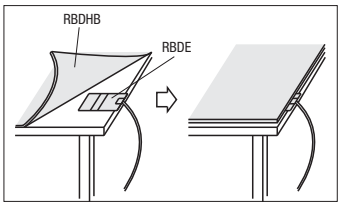


Ⓜ Material: Board : 1.4301/X5CrNi18-10
Wire : Copper Wire
Adhesive Part: Conductive Adhesives

Part Number	€ Unit Price	Volume Discount
	Qty. 1~9	10 pcs. or More
RBDE		

Example

- Sandwich the stainless steel grounding plate between an anti-static rubber mat and the work bench.
- Secure ground connection by connecting the tip of the grounding cable to the grounding terminal etc.



Order Example

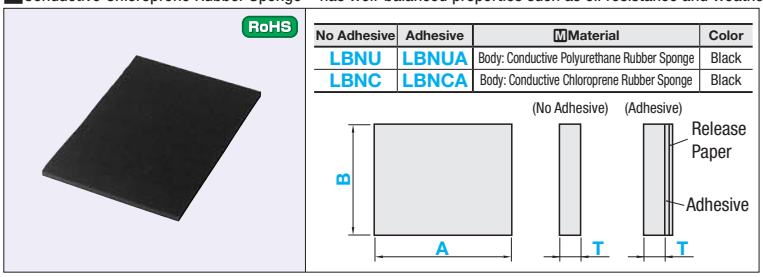
Part Number
RBDE

Days to Ship: 6 Days P.87

Antistatic Sponge Sheets

- Polyurethane Rubber Sponge·Chloroprene Rubber Sponge-

■Conductive Polyurethane Sponge····excels in shock-absorbing properties.
■Conductive Chloroprene Rubber Sponge····has well-balanced properties such as oil resistance and weather resistance.



No Adhesive	Adhesive	Material	Color
LBNU	LBNUA	Body: Conductive Polyurethane Rubber Sponge	Black
LBNC	LBNCA	Body: Conductive Chloroprene Rubber Sponge	Black

Part Number	10mm Increment A	10mm Increment B	T Selection
Polyurethane Rubber Sponge			
LBNU (No Adhesive)			(3)
LBNUA (Adhesive)			5
	20~500	20~500	10
Chloroprene Rubber Sponge			15
LBNC (No Adhesive)			20
LBNCA (Adhesive)			

(?)A≥B
(?)T3 is for LBNC, LBNCA only

Order Example Part Number - A - B - T
LBNC - 200 - 100 - 5

Days to Ship 8 Days

Price euros

■**Volume Discount** (?)Round down to one Cent.) P87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

■Conductive Sponge Characteristics

-LBNU (LBNUA)
Made of polyurethane, it excels in shock-absorbing properties. Moreover, compression residual distortion is small.
- LBNC (LBNCA)
Similar with chloroprene rubber sponge, this material has well-balanced properties such as oil resistance and weather resistance. It excels in general physical properties, and is suitable for a wide range of general industrial applications.

Measurement Item		Testing Method	Unit	LBNU (A)	LBNC (A)	LBA (A)	LBRA (A)
Specific Volume Resistivity		SRIS 2301	Ω・cm	$5x10^5$	$4x10^4$	$1.0x10^4$ or Less	$1.0x10^4$ or Less
Surface Resistivity		ASTM D 257	Ω	$1x10^6$	$9x10^4$	$1.0x10^4$ or Less	$3.0x10^4$ or Less
Density		JIS K 6767	g/cm^3	0.08	0.19	0.068	0.030
Hardness		SRIS 0101	Asker C	<5	15	45	22
Tensile Strength		JIS K 6767	kg/cm^2	1.4	5.0	8.0	3.7
Elongation		JIS K 6767	%	150	150	63	66
Tear Strength		JIS K 6767	kg/cm	0.6	5.2	3.0	1.6
Compression Strength	(25%)	JIS K 6767	kg/cm^2	0.1	0.8	2.0	0.8
	(10%)	JIS K 9514	kg/cm^2	0.1	0.7	1.6	0.6
Compression Set (25%)		JIS K 6767	%	2	20	2.8	2.4
Dimension Change Under Heat		JIS K 6767	%	-2.0	-2.0	-0.8	-0.6

(?)Anti-static Charge Low Rebound Sponges (SPTA) are listed on **P.411**

■Accuracy Standards

LBNU / LBNUA
- T Dimension Tolerance

T	5	10~20
	±0.5	±1.5

- Dimension Tolerance of A and B

A・B	200mm or Less	201~300	301~500
	±1.5	±2.0	±3.0

LBNC / LBNCA
- T Dimension Tolerance

T	3, 5	10~20
	±0.5	±1.5

- Dimension Tolerance of A and B

A・B	200mm or Less	201~300	301~500
	±1.5	±2.0	±3.0

LBA / LBAA
- T Dimension Tolerance

T	3	5~15	20, 30	40
	±0.3	±0.5	±0.8	±1.0

- Dimension Tolerance of A and B
±0.1 (However, A and B dimension tolerance of T40 is ±0.5)

LBRA / LBRAA
- T Dimension Tolerance

T	1	3	5, 10	20
	±0.2	±0.3	±0.5	±0.8

- Dimension Tolerance of A and B
±0.5 (However, A and B dimension tolerance of T20 is ±1.0)

Part Number	T	A	€ Unit Price LBNU · LBNUA B20~100	B110~200	B210~300	B310~400	B410~500	LBNC · LBNCA B20~100	B110~200	B210~300	B310~400	B410~500
	3	20~100										
		110~200										
		210~300										
		310~400										
		410~500										
	5	20~100										
Polyurethane Rubber Sponge		110~200										
LBNU (No Adhesive)		210~300										
		310~400										
LBNUA (Adhesive)		410~500										
	10	20~100										
		110~200										
Chloroprene Rubber Sponge		210~300										
		310~400										
LBNC (No Adhesive)		410~500										
	15	20~100										
LBNCA (Adhesive)		110~200										
		210~300										
		310~400										
		410~500										
	20	20~100										
		110~200										
		210~300										
		310~400										
		410~500										

■**Adhesive Charge**

A Dimension	Charge
20~100	
110~200	
210~300	
310~400	
410~500	

(?)For the Adhesive Backed Type prices, add A Dim. corresponding additional charges on the left table to the Standard prices shown on the main price lists above.

(Ex.) Part Number - A - B - T
LBNCA - 200 - 100 - 5

(Standard Type € Unit Price) + (Adhesive Charge) = Adhesive Type Charge
4,70 + 6,50 = 11,20 EUR

Antistatic Sponge Sheets

-Polyethylene Foam-

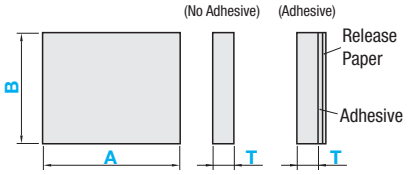
■LBA (LBAA) • • • has high conductivity using special conductive carbon black.

■LBRA (LBRAA) • • • more flexible than LBA and suited for use as wrapping or cushioning material for products. As its foaming agent is nitrogen gas, LBRA does not have any harmful effect by gas contamination.



RoHS

No Adhesive	Adhesive	Material
LBA	LBAA	Body: Conductive Polyethylene Foam
LBRA	LBRAA	



Accuracy Standards Left Page

Part Number	10mm Increment		T	
	A	B	LBA · LBAA	LBRA · LBRAA
No Adhesive LBA LBRA Adhesive LBAA LBRAA	20~800 (A500 or less for Adhesive Type)	20~500	3 5 10 15 20 30 40	1 3 5 10 20

A≥B

Only T20 or less for Adhesive Type.

- LBA (LBAA)
LBA has high conductivity using special conductive carbon black and it is made up of uniform and tiny open cells. Carbon is completely compounded with polyethylene so that it neither crumble nor bonds, can be extensively used for wrapping materials of various IC products.
- LBRA (LBRAA)
LBRA is more flexible than LBA and suited for use as wrapping or cushioning material for products that require static protection. As its foaming agent is nitrogen gas, LBRA does not have any harmful effect on precision products by gas contamination.

Order Example

Part Number	A	B	T
LBRA	600	200	1
LBAA	300	200	5

Days to Ship 8 Days

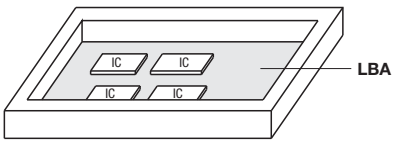
Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example



Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~400	410~500
No Adhesive LBA	3	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
Adhesive LBAA (A500 or less T3~20 A20~500)	15	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	20	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	30	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	40	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					

Part Number	T	A	€ Unit Price B 20~100	110~200	210~300	310~400	410~500
No Adhesive LBRA	1	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	3	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
Adhesive LBRAA (A500 or less for Adhesive Type)	5	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	10	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					
	20	20~100					
		110~200					
		210~300					
		310~400					
		410~500					
		510~600					
		610~700					
		710~800					

■Adhesive Charge

A Dimension	Charge
20~100	
110~200	
210~300	
310~400	
410~500	

For the Adhesive Backed Type prices, add A Dim. corresponding additional charges on the left table to the Standard prices shown on the main price lists above.

(Ex.)

Part Number	A	B	T
LBAA	500	100	3

(Standard Type € Unit Price) + (Adhesive Charge) = Adhesive Type Charge

1,80 + 9,50 = 11,30 EUR

Ionizers
-Medium Size DC Fan Type-

Price Reduction
4% Max.

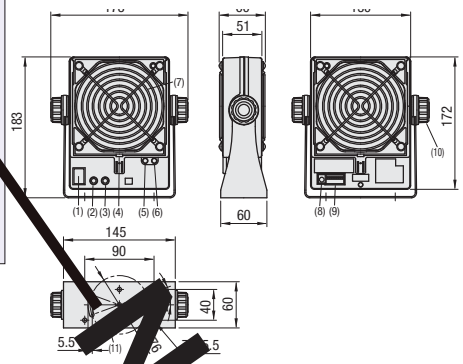
CAD Data

■Extra high speed neutralization is realized by 8 electrode pins and large air volume.

RoHS

■Medium Size DC Fan Type





Part Name
(1) Power Switch
(2) Error Indicator
(3) Cleaning Lamp
(4) Fan Guard Stopper
(5) Air Volume Controller
(6) Ion Balance Controller
(7) Fan Guard
(8) Power Connector (For AC Adapter)
(9) Terminal Block
(10) Angle Adjuster Knob
(11) Stand

■Ionizer-Medium Size DC Fan Type Specifications

Ionizing Method	DC Corona Discharge
Discharge Electrode Pin	Tungsten
Fan Speed	Non-step Variable
Maximum Air Volume	3.68m³/min
Wind Velocity	1.3~4.6m/Sec (Measured Distance 300mm)
Alarm Display	Cleaning, Fan Error, Fan Guard Open, Shutdown by High Pressure
Terminal Block	DC24V Input, DC24V Output (Connectable in series up to 5 units)
	Cleaning indicator (includes high pressure alarm), Buzzer Output (DC24V)
	Error indicator (includes fan guard open alarm), Earth
Ozone Generation Amount	0.02ppm or Less
Environment	0~40°C, 80% RH or less (However with no dew condensation)
Power Input	DC24V (Dedicated AC Adaptor or Terminal Block)
Consumption Current	550mA
Mass	Approx. 900g

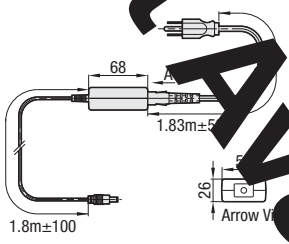
M Material: Body Case : ABS
Stand : 1.4301/X5CrNi18-10
Fan Guards : 1.4301/X5CrNi18-10

AC adaptors are not included. Please purchase optional .

■Fan Type Dedicated AC Adapter

RoHS





Input Voltage	AC100~240V 50/60Hz
Output Voltage	DC24V
Volume	ENZR-B can drive up to two.
Mass	Approx. 270g

Part Number	€ Unit Price	Volume Discount	
	Qty. 1	2	3~5
(Medium Size DC Fan Type)			
(AC Adapter for Fan Type)			

Order Example

Part Number

Samples are available for free consignments. For details, P.460

Days to Ship: 6 Days P.87

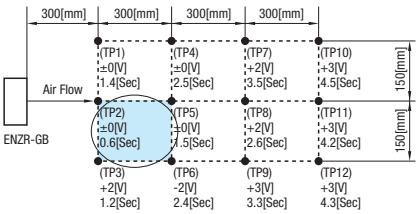
Price: Quantities larger than shown on the price list are separately quoted.

Example

■Super High Speed Neutralization

0.6 second of super high speed neutralization is realized by 8 electrode pins and large air volume. (On conditions below)

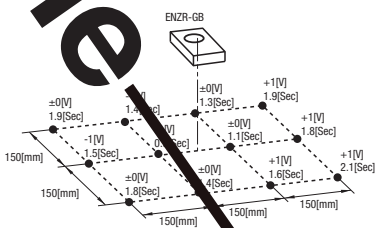
■Ion Balance/Neutralization Property



Conditions: Charge Plate Monitor Use
(150mmx150mm, 20pF)
Top Ion Balance
Bottom ±1000V~±100V
Air Volume Max.

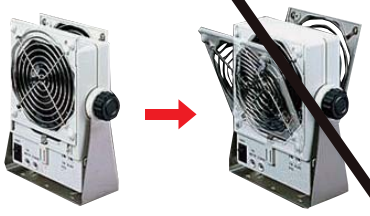
■Wide Range of Neutralization Area

Covers the area equivalent to 3 pieces of IC tray when installed as below.



■Reduced Maintenance

Fan guard can be removed by one-touch sliding.
Easy access to the electrode pin reduces maintenance processes.



■Applicable to ultra-small electric devices.

Maximizing the range of wind velocity realized slight wind and high speed neutralization.

Neutralization Property Data by Wind Velocity

Wind Velocity	Neutralization Time
Max. 4.6m/sec	0.6 sec
Min. 1.3m/sec	1.8 sec

Measured Distance 300mm

■Display Panel

Confirms the operating condition easily.
Informs the content of the abnormal status instantly.



Normal State | Fan Error | Abnormal High Pressure | Cleaning Indicator: On | Fan Guard Removed

Not Available

Ionizers
-DC Fan Type, Compact-

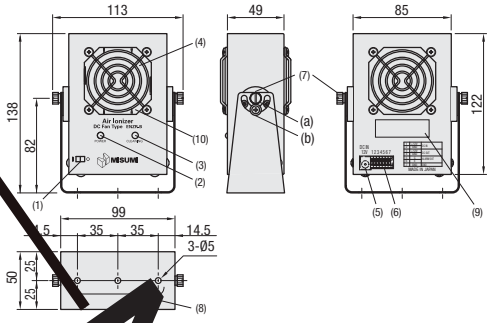
Price Reduction
8% Max.

CAD Data

■Direct-current fan-built-in ionizer. Air supply is not required.
■The extra small design makes it easy to mount the ionizer anywhere desired such as on the table and in manufacturing equipments.

■Compact DC Fan Type RoHS





Part Name
(1) Power Switch
(2) Power Lamp
(3) Cleaning Lamp
(4) Ionizing Fan
(5) Power Supply Connector (Input)
(6) Terminal Block
(7) Angle Adjuster Knob
(temporary joint by a, fix by b)
(8) Mounting Holes
(9) PL Label
(10) Electrode Pin

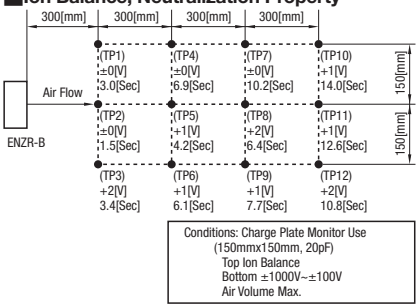
AC adaptors are not included. Please purchase optional .

■Ionizer-Compact DC Fan Type Specifications

Ionizing Method	DC Corona Discharge
Discharge Electrode Pin	Tungsten
Air Volume	0.65m³/min
Wind Velocity	1.31mm/Sec (Measured Distance 300mm)
Alarm Output	Cleaning Indicator, Shutdown by High Pressure Red front panel LED lights
Terminal Block	DC24V Input, DC24V Output, Alarm Output, Grounding
Ozone Generation Amount	0.02ppm or Less (Measured Distance 300mm)
Environment	0~40°C, 80% RH or less (However with no dew condensation)
Power Input	DC24V (Dedicated AC Adaptor or Terminal Block)
Consumption Current	220mA
Mass	Approx. 510g
Recommended Cable	Vinyl coated PVC Cable 0.5mmS~0.75mmS up to ten connected

Material: Body Case : EN AW-5052/AlMg2,5 (Melanin Baking Finish)
Stand : 1.0330/DC01 (Melanin Baking Finish)
Fan Guards : 1.4301/X5CrNi18-10

■Ion Balance, Neutralization Property



Conditions: Charge Plate Monitor Use
(150mmx150mm, 20pF)
Top Ion Balance
Bottom ±1000V~±100V
Air Volume Max.

Part Number	€ Unit Price	Volume Discount	
	Qty. 1	2	3~5
(Compact DC Fan Type) AC Adaptors are not included.			

Order Example

Part Number

Samples are available for free consignments. See below for details.

Days to Ship 6 Days P.87

Quantities larger than shown on the price list are separately quoted.

■Features
· Prevents reverse charge
Single high voltage transformer generates both positive and negative high voltages. Concerns for reverse charging possibility associated with a failed transformer with the conventional ionizers are eliminated.
· Ion balance is stabilized and electrical field shielding by the grounded fan guard assure safe neutralization for electronic components applications.
A cleaning lamp that indicates the proper time for cleaning is equipped.

■Ionizer Free Consignment Sample Service

MISUMI provides a free sample consignment service catered for various customer needs.

Features: Selectable Consignment Types
Rental Plan A: Rent a new unit, purchase the unit after testing. → A new unit is consigned.

Consignment Order → Test → OK → Invoiced for the purchase.
Test → NG → Product Returnable

A process of "Install the test unit" → Test → Remove → Purchase new → Install again" is eliminated by this system.
Product can be returned if adequate results could not be confirmed due to the installation conditions, etc.
If the consigned new product is returned in unreasonably soiled conditions, we may ask the consignee to purchase the unit.

Consignment Ordering Method: Add -N after the product name.

Order Example | Part Number | Days to Ship 6 Days P.88

Rental Plan B: Rent a "Rental Only" unit, return after testing and purchase a new unit. → A "Rental Only" unit is consigned.
This is a rental plan designed for consignees who want to test first in applications that can possibly scratch or soil the product.
Consignment Ordering Method: Add -R after the product name.

Order Example | Part Number | Days to Ship 6 Days

Orders are accepted till 17:00. Shipped the next business day. (Excludes Sat./Sun./Holidays)

Days to Ship 6 Days

Features: Static Charge Sensor consignment (Ordering Model:)
Consignment of Static Charge Sensor capable of measuring the neutralization results. The results can be quantitatively evaluated.
These are for Rental only. Please see the details on our web page.
Orders are accepted till 17:00. Shipped the next business day. (Excludes Sat./Sun./Holidays)

* 10 day rental period. MISUMI staff will FAX an inquiry to the customer regarding the intent to buy or return on the 10th rental day.
* The return shipping charge to be paid by the customer. (Retain a copy of shipping bill of lading)

Not Available

Ionizers
-Blow Type-

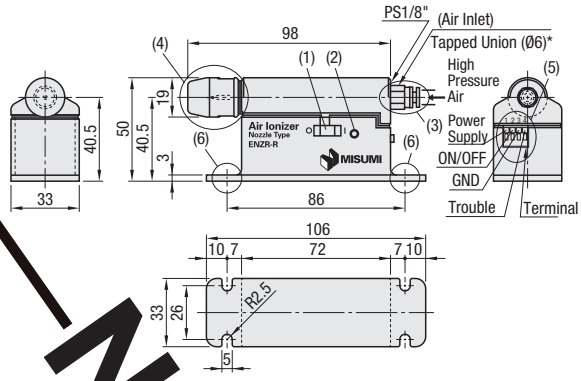
Price Reduction
8% Max.

CAD Data

■Can be installed in narrow places inside of equipments because of the compactness. Use with the attachment on the right page.

■Blow Type RoHS





*Ø6 air tube can be installed.

Part Name
(1) Power Switch
(2) Operation-Warning Lamp
(3) Air inlet
(4) Ion Generator (metal cap)
(5) Terminal Block
(6) Mounting Holes

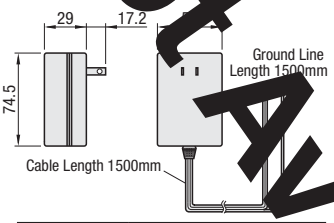
※Specificati… …nting holes have changed.
※Cap (4) ca… …emoved and replaced by an optional nozzle attachment.
※AC adaptors are n… …d. Please purchase optional .

■Ionizer Blow Type Specifications

Ionizing Method	High Frequency Corona Discharge
Recommended Air Pressure	0.1~0.4MPa
Air Consumption	55~155L/min (ANR)
Alarm Output	Dirty Electrode, High Voltage Halted, Strain Relief Removed Panel LED Red ON
Terminal Block	DC24V Input, Ionizer ON/OFF, Grounding, Alarm Output
Ozone Generation Amount	0.02ppm or Less (300mm)
Environment	0~40°C, 80% RH or less (However with no dew condensation)
Power Input	DC24V
Consumption Current	110mA
Mass	Approx. 150g

■Nozzle Type Dedicated AC Adapter RoHS





Input Voltage	AC100V~240V 50/60HZ
Output Voltage	DC24V
Mass	Approx. 160g

Part Number	€ Unit Price Qty. 1	Volume Discount 2	Volume Discount 3~5
(Blow Type)			
(AC Adapter for Blow Type)			

Order Example — Part Number

※Samples are available for free consignments. For details, **P.460**

Days to Ship — 6 Days P.87

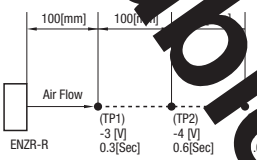
Price — Quantities larger than shown on the price list are separately quoted.

Example

■Terminal Block Connection

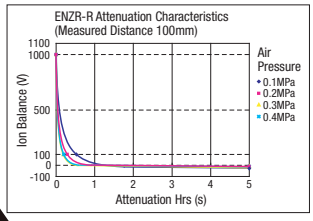
Number	Name	Note
1	Power Input	DC24V±10% Connect the switching power or AC adapter. For AC adapter, connect the white-black line.
2	Neutralization ON/OFF	Stop terminal number (2) and shortened (3) and neutralization.
3	Ground Terminal	Always connect to ground. For AC adapter, connect the black line.
4	Alarm Output	Photo Coupler Open Collector Output Max. ratings for photo coupler 100mA, 24V (10mA, 24V is recommended) Neutralization Halted, Dirty Electrode, Strain Relief Removed, Abnormal Discharge: Alarm is output.

■Ion Balance Neutralization Property



Cautions: Measured values are not guaranteed va… but an example of measured values.

Conditions: Charge Plate Monitor Use
(150mmx150mm, 20pF)
Top Ion Balance
Bottom ±1000V~±100V
Air Pressure 0.2MPa

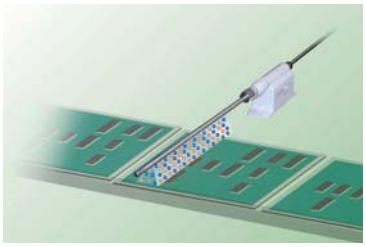


Conditions: Charge Plate Monitor Use
(150mmx150mm, 20pF)

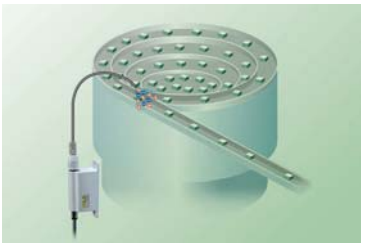
■Features

- When the operating lamp is red, it indicates electrode pin stain or high voltage circuit abnormality, so external output is possible.
- With High Frequency AC Type, high speed neutralization is possible.
- For its compact design, it can be installed in narrow places inside various kinds of equipment.
- Air consumption is little and the running cost is low.

Nozzle Attachments Bar Type



Nozzle Attachment Tubes



■Ionizer free sample consignment service guide

Misumi provides a Sample Consignment Program as per customer requests.
P.460 page bottom to be referred.

Not Available

Nozzle Attachments
-Tube Type / Stainless Steel Bar Type-

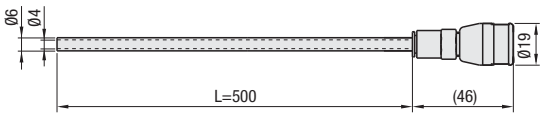
CAD Data

■Dedicated attachment for Nozzle Type ENZR-R Tubes can reach near the working area freely.

■Nozzle Attachments Tube Type RoHS

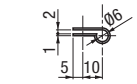


ENZR-T

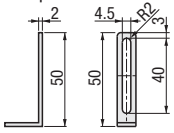


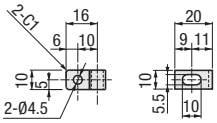
- Tube Fixing Metal (Accessories)

Ø6 One-Sided Band



L Shaped Metal





- Tube Nozzles
- Tube Length: 500 [mm]
- Tube Diameter: 6 [Ø]
- Recommended Air Pressure: 0.1~0.4[Mpa]
- Air Consumption: 55~155[L/min]
- Material: Naflon PTFE Conductive Tube (Fluorine Resin)

M Material: Metal: 1.4305/X10CrNiS18-9

Part Number	€ Unit Price
ENZR-T (Tube Type)	

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29
Discount Rate	€ Unit Price	5%

Qty. more than shown subject to quotation.

Free sample consignment available. For details P.460

Order Example

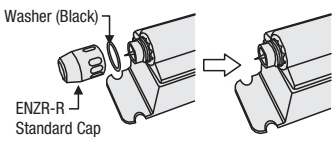
Part Number
ENZR-T

Days to Ship

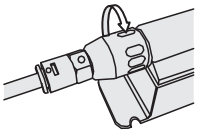
6 Days P.87

■How to Handle

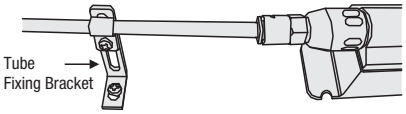
Step 1 Confirm that the main power is OFF, and remove the cable strain relief and the washer (black) from ENZR-R.



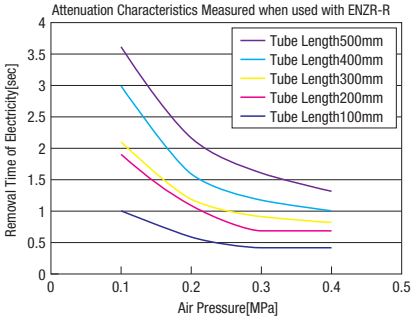
2. Attach the cap with a tube to the body. Cut a tube by the arbitrary length for use.



3. Fix the tube with the Included fixing metal.



■Neutralization Property by Length (Shorter length indicates shorter neutralization time.)



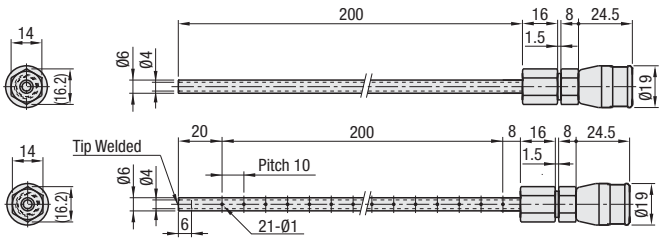
Conditions: Charge Plate Monitor Use (150mmX150mm,20pF) Measured Distance 50mm
Neutralization time is the time required when 1000V static is decreased to 100V.

■Nozzle Attachments Stainless Bar Type RoHS



ENZR-R1
(Pin Hole Type)

ENZR-R2
(Bar Type)



M Material: Metal Part: 1.4301/X5CrNi18-10 Resin Part: ABS

Part Number	Nominal	€ Unit Price
ENZR-R1 (Pin Hole Type)	200	
ENZR-R2 (Bar Type)	200	

Order Example

Part Number	-	Nominal
ENZR-R1	-	200

Samples are available for free consignments. For details, P.460

Days to Ship

6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

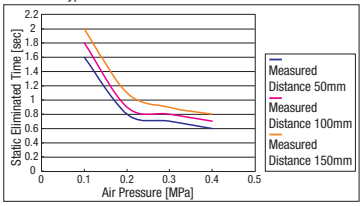
Quantity	1~19	20~29
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Features
- Nozzle attachments for Ionizer Blow Type.
- Select R1 for pinpoint neutralization accuracy, R2 for neutralization in stripes.

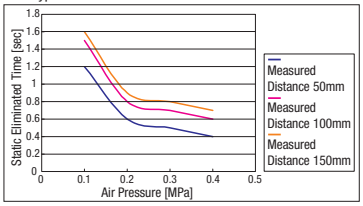
■Neutralization Property

- Pin Point Type



Conditions: Charge Plate Monitor Use, (150mmx150mm, 20pF) Attached to ENZR-R and measured at 50mm, 100mm and 150mm from the tip. Static eliminating time is the time required when 1000V static is decreased to 100V.

- Bar Type



Conditions: Charge Plate Monitor Use (150mmx150mm,20pF) Attached to ENZR-R and measured at the center of the bar. Static eliminating time is the time required when 1000V static is decreased to 100V.

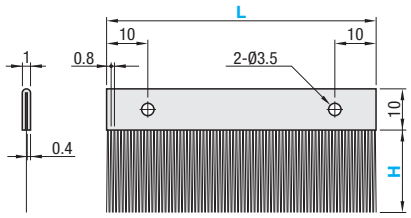
Neutralizer Brush / Conductive Copper Foil Tape / Neutralizer Tape

■Neutralization Brushes

RoHS



Type	Material	
	Holder	Brush
EBRS	EN AW-1050A/Al99,5	1.4301/X5CrNi18-10(12μm)



When L≥20, there will be 3 holes at 100mm from both ends and the center.

Part Number		L	€ Unit Price				
Type	H	1mm Increment	L50~100	L101~200	L201~300	L301~400	L401~500
EBRS	10	50~500					
	20						

Order Example: Part Number EBRS10 - L 500

Price

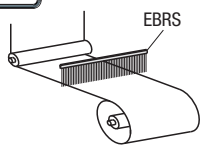
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

Qty. more than shown subject to quotation.

Days to Ship: 8 Days

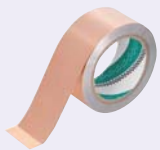
Example



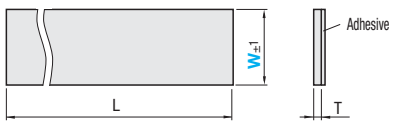
Static prone locations of transfer lines.

■Conductive Copper Foil Tape

RoHS



ECTP



Material: Body : Copper
Adhesive Part: Conductive Adhesives

■Features
- Usable in a wide range of applications to secure electroconductivity of equipments.
- Electroconductive adhesive with electric resistance of 160mΩ/4cm² is used.

■Characteristic Values

Item	Unit	Value
Electric Resistance of Adhesive Layer	mΩ/4cm²	160
Tensile Strength	N/cm	39.2
Adhesive Strength (for 180 Degree Peeling Strength)	gf/20mm	700
Elongation	%	-

The above values are not guaranteed values but an example of measured values.

Part Number		L	T	€ Unit Price	Volume Discount price
Type	W (mm)	(Meter)	(mm)	Qty. 1~19	20 pcs. or More
ECTP	50	10	0.08		42,50

L dimension is in meters.
Peel off backing paper to adhere it to an object. Clean adhered surface off oil or dirt before use.
Can be cut with a utility knife.

Order Example: Part Number ECTP50

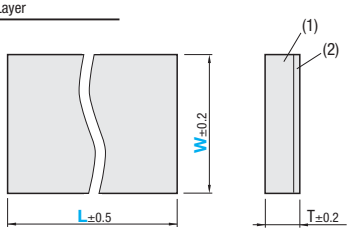
Days to Ship: 6 Days P.87

■Neutralization Tapes

RoHS



Type	Material
ELTA	(1) Silver Plating Polyester Fiber
	(2) Electric Conductivity Acrylic Adhesive Layer



Part Number		L	T	€ Unit Price				
Type	W	1mm Increment		L20~100	L101~200	L201~300	L301~400	L401~500
ELTA	10	20~500	0.6					
	25							
	50							

Order Example: Part Number ELTA10 - L 500

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

Qty. more than shown subject to quotation.

Brush
-Overview-

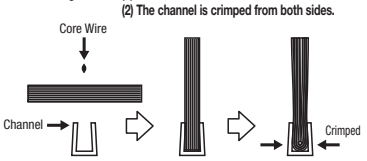
■General Information

The soft and resilient filament characteristics are well suited for various industrial uses such as parts leveling, dusting, and washing.
General purpose bar type Channel Brush and Roll Brush are offered.
Additionally, MISUMI original attachment bracket are provided.

■Features of Channel Brush

The Channel Brush has filaments arranged on a straight line, unlike a tooth brush where the filaments are planted. Mfg. method is shown on the right.
More economical than planted filament brush.

Mfg. Method (1) Filaments are held within the channel with a core wire.
(2) The channel is crimped from both sides.



■About the filament materials

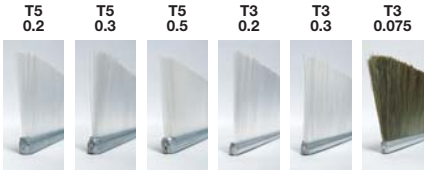
6 Nylon

General purpose material. Good anti-wear, fatigue resistance, and resiliency characteristics suitable for long term operation. Also usable in food processing.
Maximum temp limit for the filaments is 100°C. Care should be taken since 6 Nylon dissolves in strong hydrochloric acid, sulfuric acid, formic acid, and phenolic acid.

Thunderon ®:

Thunderon ® is an organic conductive fiber made by copper sulfide chemically bonded to acrylic fiber, more flexible than thin wire and carbon fiber materials and has excellent wear resistant characteristics. Use for anti-static measures. The conductive fiber has static neutralizing functionality.

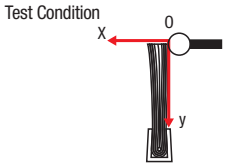
■Filament Diameter of Channel Brush (For 30mm H)



Part Number (Filament Material)	Filament Diameter (No)	Features
BRUSN (6 Nylon)	0.2	Feel of Tooth Brush (Normal)
	0.3	Harder than Tooth Brush (Hard)
	0.5	Feel of Deck Brush
BRUSE (Thundron®)	0.075	Diameter of average human hair.

■Elasticity Test of Channel Brush



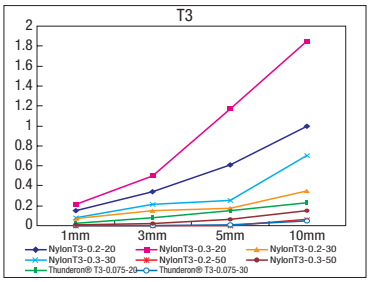


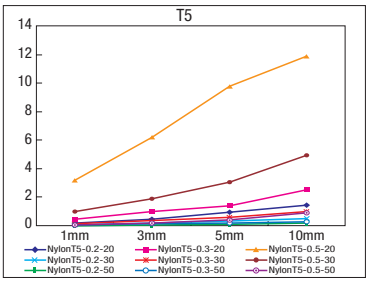
Loads are measured while the filament tip (y0~1mm) is pushed in X direction to cause the leaning of 1 · 3 · 5 and 10mm.
Actual measurements are for reference only. Not a guarantee.

See the test condition on the left

Brush Test Samples				Load(N) in X _ mm Direction			
Model No. (Material)	T	Filament Diameter (No)	Filament Length (H) mm	1mm	3mm	5mm	10mm
BRUSN (6 Nylon)	5	0.2	20	0.18	0.45	0.95	1.45
		0.3	20	0.45	0.98	1.40	2.50
		0.5	20	3.20	6.20	9.80	11.90
		0.2	30	0.05	0.16	0.33	0.50
		0.3	30	0.13	0.34	0.60	0.98
		0.5	30	1.00	1.90	3.05	4.95
		0.2	50	0.01	0.06	0.07	0.16
		0.3	50	0.06	0.15	0.16	0.26
		0.5	50	0.06	0.20	0.42	0.88
	3	0.2	20	0.15	0.34	0.61	1.00
		0.3	20	0.21	0.50	1.17	1.85
		0.2	30	0.07	0.15	0.17	0.35
		0.3	30	0.08	0.21	0.25	0.70
		0.2	50	-	-	-	0.06
		0.3	50	0.01	0.02	0.06	0.15
BRUSE (Thundron®)		0.075	20	0.02	0.08	0.15	0.23
		0.075	30	-	-	0.01	0.05

(R)Values are for reference only, not guaranteed.





■Notes on use

(1) Brush service life will vary depending on usage conditions and frequency. The filaments may break or fall out depending on usage condition. Do not unduly tug on the filaments.
(2) Maximum temp limit for the filaments is 100°C. The filaments will melt and fall off at above 100°C.
(3) 6 Nylon dissolves in strong hydrochloric acid, sulfuric acid, formic acid, and phenolic acid.
(4) Brush press contact length should be 2mm or less. Do not press further than necessary.
(5) Do not disassemble the brush.
(6) Do not bend the Channel Brush
(7) The Channel Brush has ±2mm bow/bend per L100mm.
(8) Use the brush at less than 1000RPM.

■Use and storage cautions

(1) For storage, care should be taken that the filaments are plastically deformed. If the brush is left in contact with work/fixture while in storage, the filaments may be deformed permanently.
Additionally, avoid filament tips from contacts when storing the brush by itself.
(2) Dry before storage.
(3) Remove any foreign objects from the brush.
(4) Do not use in high temp. environment or near fire.

Channel Brush

-Channel Brush · Attachment Brackets-

CAD Data

■Configurable lengths brush useable for parts leveling dusting · washing are provided with 10th day shipping.

■Channel Brush

RoHS

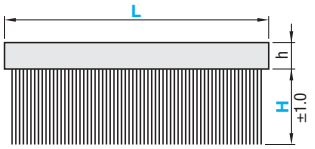


Type	Material Brush Filaments	Material Channel
BRUSN	6 Nylon	1.4301/X5CrNi18-10
BRUSE	Conductive Fiber Thunderon® (Copper Alloy)	

For cautions on use, see **P.464**

■L Dimension Tolerance

L (Unit: mm)	Tolerance
~100	±1.5
101~400	±2.0
401~800	±2.5



Brush filament materials and resiliency information, see **P.464**

Part Number Type	T	No Selection	H 5mm Increments	L 5mm Increments	h	d
BRUSN	3	0.2	10~50	50~800	3.5	0.21
		0.3				0.295
	5	0.2	10~50		5.5	0.21
		0.3				0.295
		0.5	15~50			0.535
BRUSE	3	0.075	10~30		3.5	0.075

Order Example: Part Number BRUSN3 - No 0.2 - H 30 - L 150

Days to Ship: 10 Days

Price

●BRUSN
■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~3	4~9	10~20
Discount Rate	€ Unit Price	8%	50%

For orders larger than indicated quantity, please request a quotation.

●BRUSE
■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~3	4~9	10~20
Discount Rate	€ Unit Price	8%	30%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	T	No	L (5mm Increments) 50 ~100	105 ~150	155 ~200	205 ~250	255 ~300	305 ~350	355 ~400	405 ~450	455 ~500	505 ~550	555 ~600	605 ~650	655 ~700	705 ~750	755 ~800
BRUSN	3	0.2															
		0.3															
	5	0.2															
		0.3															
		0.5															
BRUSE	3	0.075															

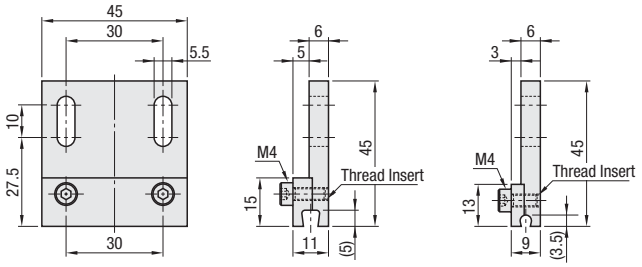
■MISUMI original design Channel Brush Attachment Brackets enabling quick brush changes are provided.

■Attachment

RoHS



Type	Material Body	Material Insert	Accessory
BRUSA	MC Nylon · Conductive Grade (Black)	1.4301/X5CrNi18-10	Screw (1.4301/X5CrNi18-10)



Part Number Type	No	Applicable Screw	€ Unit Price
BRUSA	3	M4	
	5		

The clamping slot is shaped for the brush used.
Wing screws enable quick brush changes.
Can be specified as an alteration.

Order Example: Part Number BRUSA3

Days to Ship: 6 Days **P.87**

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~5	6~10	11~15	16~20
Discount Rate	€ Unit Price	5%	8%	10%

For orders larger than indicated quantity, please request a quotation.

Example



Alterations: Part Number BRUSA3 - SET

	Wing Screws	Code	Spec.	Price Adder
Alterations	Includes wing screws for brush mounting 	SET	BRUSA3-SET Wing Screws: CHBS4-8 BRUSA5-SET Wing Screws: CHBS4-10 Wing Screws M Material: 1.4301/X5CrNi18-10	2,50

Roll Brush

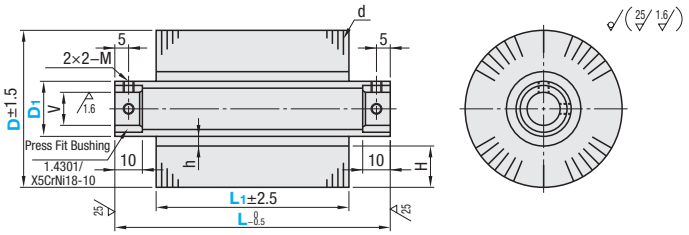
CAD Data

■Hollow core type roll brush for general purpose applications are provided with 10th day shipping.



Type	Ⓜ Material Brush Filaments	Ⓜ Material Hollow, Bushings
BRUSNR	6 Nylon	1.4301/X5CrNi18-10

For cautions on use, see P.464



Part Number		D	L	L1	V	h	d	H	M	Proper Motor Power (Unit: kW) Reference Value
Type	D1	Selection	Selection	5mm Increments						
BRUSNR	20	60	100	20~320	12	3.5	0.21	16.5	4	0.4
		80	150					26.5		0.75
		100						36.5		
	30	80	250		20	5.5	0.295	19.5	5	0.4
		100	350					29.5		0.75
		120		L1≤L-30				39.5		1.25

■Inner Diameter Tolerance (Bushings)

L	V
100	H9
150	
250	
350	+0.1/0

Brush press contact length should be 2mm or less. Do not press further than necessary.
Use at less than 1000RPM.
Motor power values shown are for reference only.
Actual motor power needed may be larger depending on how the brush is used.
For usage and storage cautions, see P.464

Part Number		D	L	€ Unit Price L1 (5mm Increments)					
Type	D1	Selection	Selection	20~100	105~150	155~200	205~250	255~300	305~320
BRUSNR	20	60	100						
		80							
		100							
		60	150						
		80							
		100							
		60	250						
		80							
		100							
		60	350						
		80							
		100							

Part Number		D	L	€ Unit Price L1 (5mm Increments)					
Type	D1	Selection	Selection	20~100	105~150	155~200	205~250	255~300	305~320
BRUSNR	30	80	100						
		100							
		120							
		80	150						
		100							
		120							
		80	250						
		100							
		120							
		80	350						
		100							
		120							

Order Example

Part Number	-	D	-	L	-	L1
BRUSNR20	-	80	-	150	-	100

Price

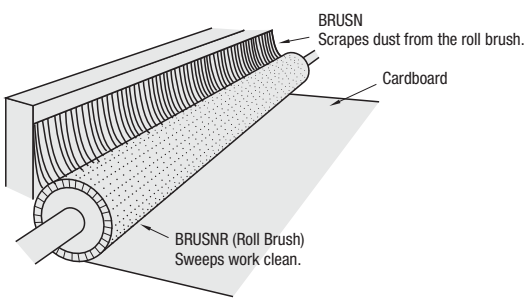
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~3	4~9	10
Discount Rate	€ Unit Price	5%	15%

Qty. more than shown subject to quotation.

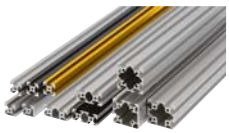
Days to Ship: 10 Days

Example



Aluminum Frames & Brackets

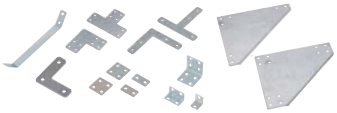
Aluminum Frames Extrusions & Brackets






Product Name	Aluminum Frames 20, 25, 40mm Square-HFS5 Series	-Aluminum Extrusion with Milled Surfaces-	Curved Aluminum Frames	Brackets	Brackets
Page	477~480	481	482	483~493	485







Corner Blind Brackets	Free Angle Brackets	Sheet Metal	Nuts for Aluminum Frames	Stoppers · Pre-Assembly Insertion Nuts
494, 495	496	497	500~502	502

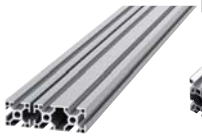






Post-Assembly Insertion Nuts for Aluminum Frames	Stoppers for Post-Assembly Insertion Nuts · Stopper Sets	Pre-Assembly Bolts · Post-Assembly Bolts · Flanged Nuts · Long Nuts	Various Nuts Package	Extrusion End Caps
503~505	503	506, 507	508	509, 510







Aluminum Frames 30, 60mm Square-HFS6 Series	Aluminum Frames 50, 100mm Square-HFS6 Series	Aluminum Frames - 6 Series, Base 30, Minimal Corner Radius	Aluminum Frames with Milled Surface	Curved Aluminum Frames
511~518	519	520	521	522

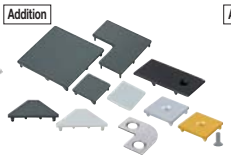






Brackets	Corner Blind Brackets · Blind Brackets	Sheet Metal · Brackets	Pre-Assembly Insertion Nuts for Aluminum Frames	Stoppers for Pre-Assembly Insertion Nuts
523~536	537~539	541	543~545	543




Post-Assembly Insertion Nuts for Aluminum Frames	Stoppers for Post-Assembly Insertion Nuts·Stopper Sets	Flanged Nuts·Nut Components·Long Nuts	Extrusion End Caps	Aluminum Frames 40, 80mm Square-HFS8 Series
546~548	546	549, 550	551	553~560







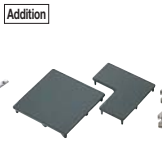

Aluminum Frames with Milled Surface	Curved Aluminum Frames	Brackets	Blind Brackets	Sheet Metal · Brackets	Pre-Assembly Insertion Nuts for Aluminum Frames
561	562	563~574	576, 577	579	581~583

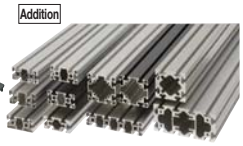












Stoppers for Pre-Assembly Insertion Nuts	Post-Assembly Insertion Nuts for Aluminum Frames	Stoppers for Post-Assembly Insertion Nuts·Stopper Sets	Flanged Nuts · Nut Components · Long Nuts	Extrusion End Caps	Aluminum Frames 45, 90mm Square
581~583	584~586	584	587, 588	589	591~596









Aluminum Frames 50, 100mm Square	Aluminum Frames 60mm Square	Aluminum Frames with Milled Surface	Aluminum Brackets -HFS8-45 Series
597	599	600	601~612













Sheet Metal · Brackets	Pre-Assembly Insertion Nuts for Aluminum Frames	Stoppers for Pre-Assembly Insertion Nuts	Post-Assembly Insertion Nuts for Aluminum Frames	Stoppers for Post-Assembly Nuts·Stopper Sets	Flanged Nuts · Nut Components·Long Nuts
613	615~617	615, 617	618~620	618	621, 622













Extrusion End Caps	Aluminum Frames - with Screw Joint Pre-assembled	-Center Joint Type-	-Simple Joint-	-Single Joints-	-Pre-Assy. Insertion Double Joint-
623	625	625	625	626	626













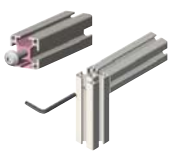


-Tapping Joints-	-Screw Joints-	-Center Joint Kits-	-Post-Assy. Insertion Double Joints-	-Simple Joint-	-Single Joint Kits-	-Pre-Assembly Insertion Double Joint Kits-
627	628	629	631	633	635	637







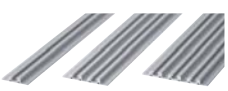




-Parallel Joint Kits-	-Hexagon Socket Head Cap Screw with Captured Washers-	Screws for Aluminum Frames	Alterations for Aluminum Frames	Aluminum Frames 15mm	Square · Brackets · Square Nuts
639	641	641~644	645~658	659	659

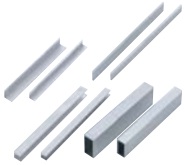












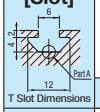
Aluminum Bracket Extrusions	Flat Aluminum Frames – No Shoulder Type	Flat Aluminum Frames	Fence Extrusions	Joint Brackets	Aluminum Frames
660	661	663	665	666	667, 668

Aluminum Frames Guide

Standard Type

[Shape] 20mm 25mm 40mm Square

[Slot]



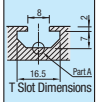
T Slot Dimensions

HFS5-2020 HFSH5-2020 HFS5-2040 HFS5-4040 HFS5-2060 HFS5-2525 HFS30A5-20 HFS5-404020
HFSF5-2020 HFSC5-2020 HFSF5-2040 HFS5-2080 HFS5-2550 HFS45A5-20 HFSR5-404020
HFST5-2020 HFST5-4040 HFSF5-4040 HFS5-4060 HFS5-4080 HFS60A5-20 HFSR5-2020

P.477 | P.478 | P.479 | P.480

[Shape] 30mm 50mm 60mm 100mm Square

[Slot]



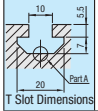
T Slot Dimensions

EFS6-3030 EFSF6-3030 EFST6-3030 EFS6-3060 HFS6-3060 HFS6-6060 HFSG6-6060 HFS6-3090 HFS30A6-30 HFS6-606030 HFS6-5050 HFS6-50100
HFS6-3030 HFSF6-3030 HFST6-3030 HFSF6-3060 HFSH6-3060 HFSF6-6060 HFST6-6060 EFS6-3090 HFS45A6-30 EFS6-606030 HFSF6-5050 HFST6-5050
HFSH6-3030 HFSC6-3030 EFSF6-3060 EFSH6-3060 HFS6-30120 HFS60A6-30 HFSR6-606030
EFSH6-3030 EFSC6-3030 HFST6-3060 HFS6-6090 EFS6-30120 HFS6-100100
HFS6-60120 HFSR6-3030 HFS45TR6-30

P.511·512 | P.513·514 | P.515·516 | P.517·518 | P.519

[Shape] 40mm 80mm Square

[Slot]



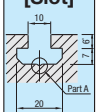
T Slot Dimensions

EFS8-4040 EFSF8-4040 EFST8-4040 EFS8-4080 HFSF8-4080 HFS8-8080 HFSF8-8080 HFSH8-8080 EFST8-8080 HFS30A8-40 HFS45A8-40
HFS8-4040 HFSF8-4040 HFST8-4040 HFS8-4080 EFSF8-4080 EFS8-8080 EFSF8-8080 EFS8-40120 HFS60A8-40 HFSR8-4040
HFSC8-4040 EFSC8-4040 HFST8-4080 HFS8-40160 EFS8-40160 HFS8-808040 HFSR8-808040
HFSH8-4040 EFSH8-4040 HFSH8-4080 HFS8-80160 EFS8-80160 EFS8-808040 HFS45TR8-40
EFSH8-4080

P.553·554 | P.555·556 | P.557·558 | P.559·560

[Shape] 45mm 50mm 60mm 90mm 100mm Square

[Slot]



T Slot Dimensions
*5.5 for Light Type HFSL HFSLF and HFLST.

EFS8-4545 EFSF8-4545 EFST8-4545 EFS8-4590 HFS8-9090 HFS30A8-45 HFS8-909045 EFS8-5050 EFS8-50100 HFS8-6060
HFS8-4545 HFSF8-4545 HFSC8-4545 HFS8-4590 HFS8-45180 HFS45A8-45 EFS8-909045 HFS8-5050 HFS8-50100 HFS8-6060
HFSH8-4545 HFST8-4545 EFSC8-4545 HFSF8-4590 HFS8-90180 HFS60A8-45 HFSF8-5050 HFST8-5050 HFST8-6060
EFSH8-4545 EFSF8-4590 HFSR8-4545 HFSR8-909045

P.591·592 | P.593·594 | P.595·596 | P.597·598

Alterations for Extrusions

■Tapping ■Extrusion Cut ■Wrench Hole ■Counterbore Hole ■D Hole ■S Hole ■M Hole ■L Hole ■Other Special Machining



P.647 | P.648 | P.649~652 | P.653 | P.654 | P.655 | P.656 | P.657 | P.658

High Rigidity Type (Shapes and materials of high rigidity)	Light Type (Lightweight· Inexpensive)	Clear Coating Type (Good appearance)	Black Anodize Type (Black)	Yellow Type (Color for Caution)	Bend · Parallel Chamfer	Mixed Slot Widths · Small Corner R
-	-	CAF5-2020 CAF5-2040 CAF5-4040	HFSB5-2020 HFSB5-2040 HFSB5-2525 HFSFB5-2020 HFSB5-4040 HFSB5-2550 HFSTB5-2020	HFSY5-2020	HFSP5-_ _ _ HFSP5-_ _ _ HFSMG5	-
-	-	P.477·478	P.477~479	P.477	P.481·482	-
GFS6-3030 GFS6-3060	HFSL6-3030 HFSL6-3060 HFSL6-5050	CAF6-3030 CAF6-3060 CAF6-6060	EFSB6-3030 HFSB6-3030 HFSLB6-3030 EFSB6-3060 HFSB6-3060 HFSLB6-3060 HFSTB6-3030 EFSTB6-3030 HFSFB6-3030 EFSFB6-3030 HFSB6-5050 HFSB6-6060 EFSB6-3090 EFSB6-5050 EFSB6-50100 EFSB6-30120	HFSY6-3030	HFSP6-_ _ _ HFSP6-_ _ _ HFSMG6	HFSV6-3030 HFSV6-3060 HFS6-5Y HFS6-5H
P.511.513	P.511·513·519	P.511~515	P.513~515	P.511	P.521·522	P.520
GFS8-4040 GFS8-4080 GFSF8-4040 GFST8-4040	HFSL8-4040 HFSL8-4080	CAF8-4040 CAF8-4080 CAF8-8080	EFSB8-4040 HFSB8-4040 HFSLB8-4040 EFSB8-4080 HFSB8-4080 HFSLB8-4080 HFSB8-80160 HFSFB8-4040 EFSTB8-4040 HFSB8-8080 EFSB8-40120 HFSTB8-4040 EFSFB8-4040 EFSB8-40160 EFSB8-8080	HFSY8-4040	HFSP8-_ _ _ HFSP8-_ _ _ HFSMG8	HFS8-5Y HFS8-6T HFS8-6H
P.553~555	P.553·555	P.553~557	P.553~558	P.553	P.561·562	P.562
GFS8-4545 GFS8-5050 GFS8-9090 GFS8-100100 GFSF8-4545 GFS8-50100 GFS8-100200 GFST8-4545 GFS8-6060 GFS8-4590	HFSL8-4545 HFSLF8-4545 HFSLT8-4545 HFSL8-4590	CAF8-4545 CAF8-4590 CAF8-9090	EFSB8-4545 HFSB8-4545 HFSFB8-4545 HFSTB8-4545 EFSB8-4590 HFSB8-50100 EFSB8-50100 HFSB8-4590 HFSB8-45180 HFSB8-5050 EFSB8-5050 HFSB8-90180	-	HFSP8-_ _ _ HFSP8-_ _ _	-
P.591~598	P.591·594	P.591~595	P.591~595	-	P.600	-

Special Shape Extrusions

■15mm Square ■Aluminum Bracket Extrusions

■Flat Aluminum Frames

■Aluminum Frames for General Use ■Fence Extrusions

■Aluminum Frames for Fence

■Aluminum Frames for Door · Sliding Door

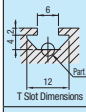
P.659	P.660	P.661	P.667	P.665	P.759	P.761·765

Brackets / Nuts / Extrusion End Caps / Joints / Others Guide

Tabbed Brackets / Post-Assembly Insertion Easy Brackets

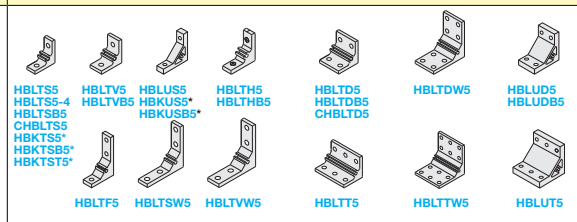
Extruded Brackets

[Shape] 20mm 25mm 40mm Square [Slot]



T Slot Dimensions

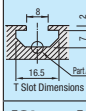




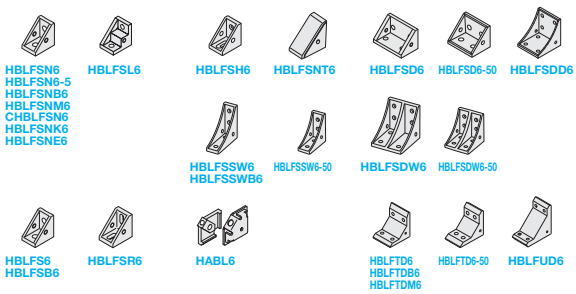
*There are tabs for putting slot.

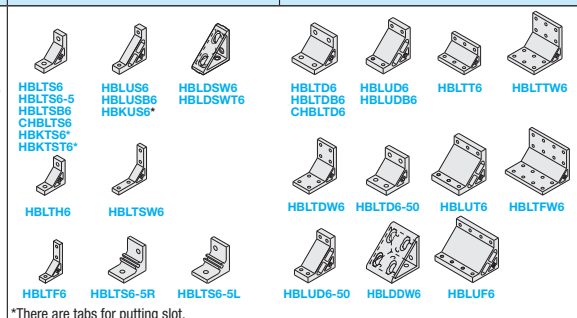
P.483·484 | P.485·486 | P.487·488 | P.489·490

[Shape] 30mm 50mm 60mm 100mm Square [Slot]



T Slot Dimensions

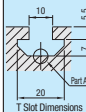




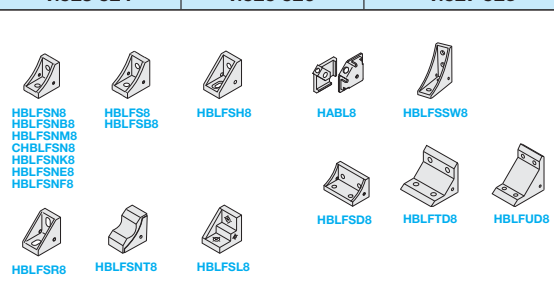
*There are tabs for putting slot.

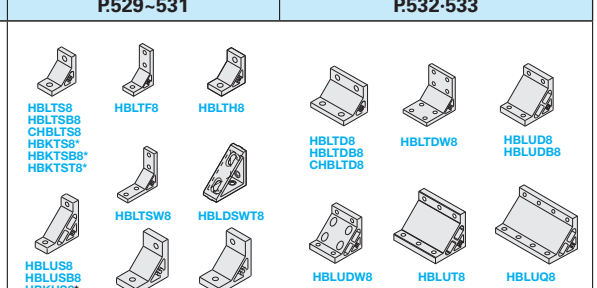
P.523·524 | P.525·526 | P.527·528 | P.529~531 | P.532·533

[Shape] 40mm 80mm Square [Slot]



T Slot Dimensions

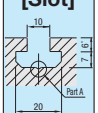




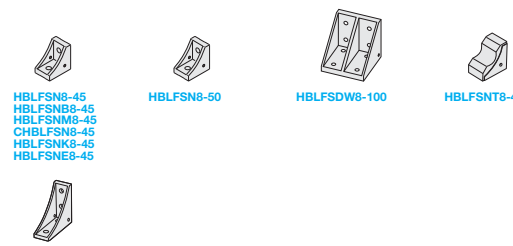
*There are tabs for putting slot.

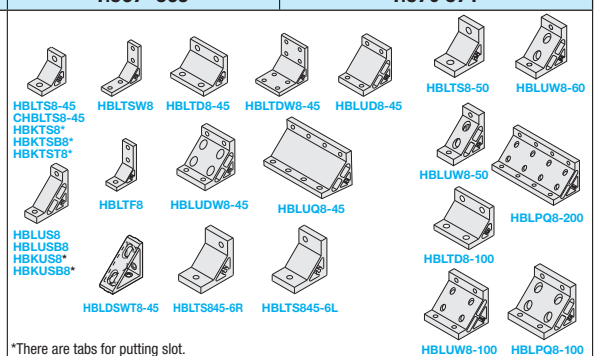
P.563·564 | P.565·566 | P.567~569 | P.570·571

[Shape] 45mm 50mm 60mm 90mm 100mm Square [Slot]



T Slot Dimensions
*5.5 for Light Type HFSL, HFSLF and HFLST.





*There are tabs for putting slot.

P.601·602 | P.603~606 | P.607·608

Blind Joint Components

■Pre-Assembly Insertion Aluminum Frames



P.625

■Tapping Joints



P.627

■Screw Joints



P.628

■Center Joint Kits



P.629

■Post Assy. Insertion Double Joints



P.631

■Simple Joints



P.633

■Single Joint Kit



P.635

■Pre Assy. Insertion Double Joint Kit

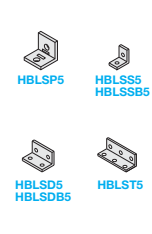
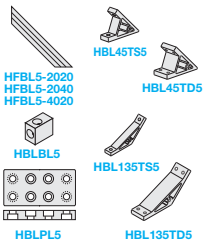
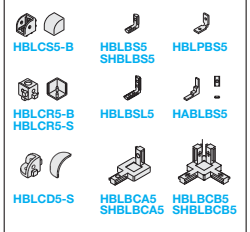
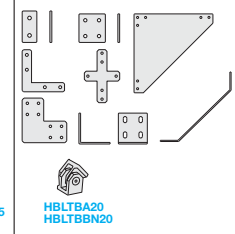
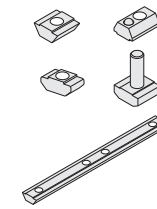
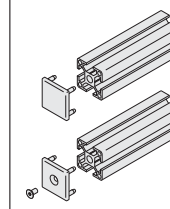
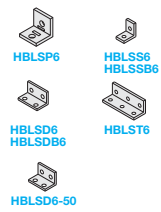
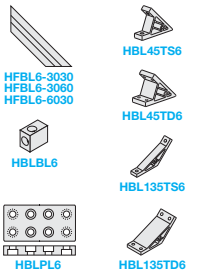
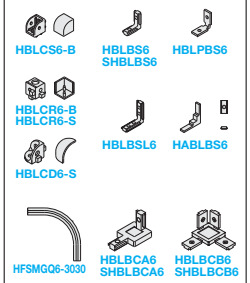
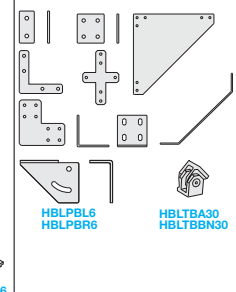
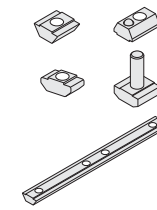
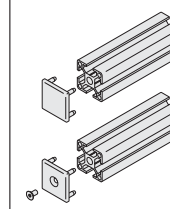
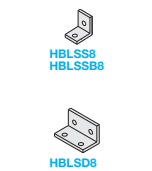
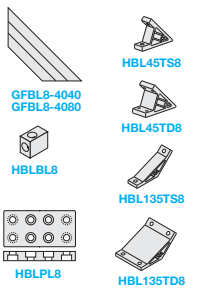
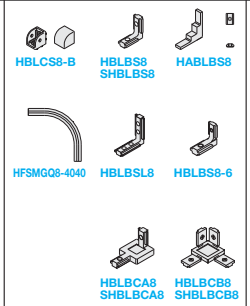
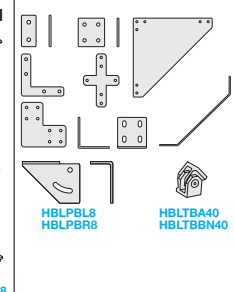
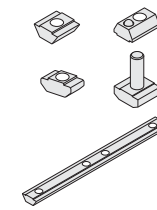
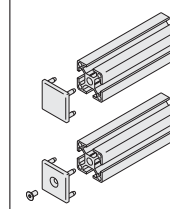
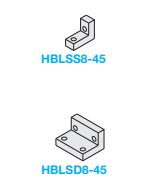
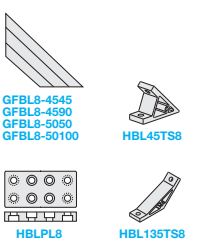
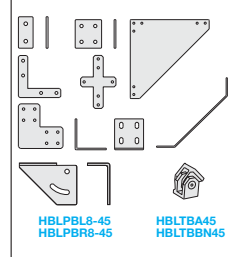
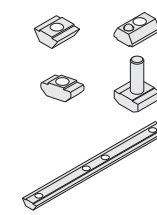
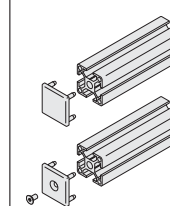


P.637

■Parallel Joints



P.639

Thin Brackets	Brackets for Reinforcement, Block Brackets, Plate rackets, Angular Brackets		Corner Brackets Blind Brackets		Sheet Metal Free Angle Brackets Others	Pre-Assembly Insertion Nuts, Post-Assembly Insertion Nuts, Special Nuts	Extrusion End Caps
						
P.491	P.492	P.493	P.494	P.494·495	P.497·498	P.500~508	P.509·510
						
P.534	P.535	P.536	P.537	P.538·539	P.540·541	P.543~550	P.551·552
						
P.572	P.573	P.574	P.575	P.576·577	P.578~580	P.581~588	P.589·590
							
P.609	P.610	P.610	P.611		P.612~614	P.615~622	P.623·624

Other Components

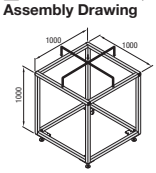
Others

■Hex Socket Head Cap Screws for Aluminum Frames



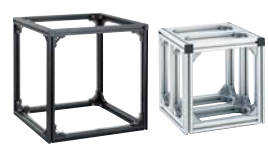
P.641

■Load Calculation, Assembly Drawing



P.671

■Units



P.767

■Assembling and Delivery Services



P.777

■Design Support Software



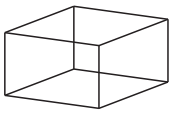
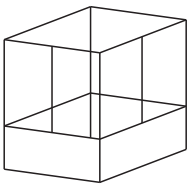
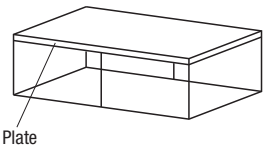
P.783

Aluminum Extrusion Design Steps

Design Support Software listed on P.783 can simplify and expedite the design process.

1. Determine the extrusion type used by intended equipment.

Selection of Aluminum Extrusion Frame Units based on applications and extrusions used

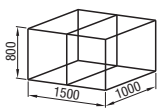
	(A) When extrusion is used as support unit	(B) As an equipment covering enclosure
		
Selection Method of Extrusions	**Choose a type that can withstand the load from the Load Capacity Table on P.673.**	**As a reference, select a type based on the maximum length of a side.** **1,000mm or Less →HFS5 20 SQ. - HFS6 30SQ.** **2,000mm or Less →HFS6 30 SQ. - HFS8 40SQ.** **2000mm~ →HFS8 40 SQ. - HFS8-45 45SQ.**
Notes on Selecting the Extrusions	**Table on P.673 stipulates that loads are applied at the center of extrusion frames.** **When placing a plate on the extrusion, refer to the uniform load value in the table since the load is spread evenly.** **In the example from this table, the size of the box is 1 sq m.** **When the extrusion size is larger, insert extra supports in the middle.**  Plate	**Thickness 3mm or 5mm resin panels for HFS5 Series, and thickness 5mm resin panels for HFS6 Series are taken in consideration for the basis of various accessories design.** **(The above description may not apply depending on installation methods.)**

2-A: For an equipment base...

(2-A-1) Determining Outer Perimeter Configuration

Standard Unit configurations on **P.775** are referenced, and W, D, and H dimensions are decided.

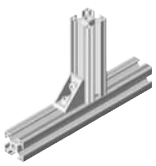
Shape and Size



(2-A-2) Selection of Connection Methods

Bracket connections and Blind Joint connections are the most frequently utilized methods.

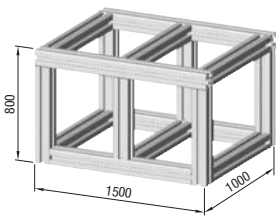
Bracket connection is used since there is no interference problem.

Bracket Connection		**The standard and economical connection method.** **Cover plates can be mounted by adding taps on the brackets.**
Blind Joint Connection		**A connection method that produces clean corners. Suitable for sections where equipment is loaded and unloaded or doors are to be mounted. Provides strength equal to the brackets. However, there are limitation on Blind Joint compatible extrusions. Check for the compatible extrusions on P.627~P.640**

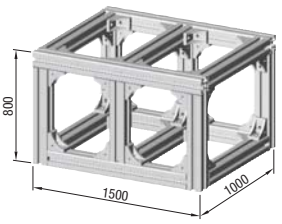
(2-A-3) Creation of a Unit Drawing

(Ex.) Width: 1500 Depth: 1000 Height: 800mm Extrusion: HFS8-4040 Connection: Bracket Connection

Draw Extrusion Width and Overlapping



Draw the Bracket (at all the corners) 4x11=44pcs.

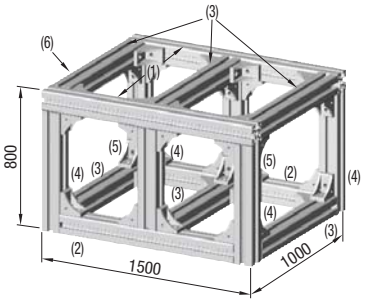


(2-A-4) Components Expanded

	Extrusions	Length	Qty.
(1)	**HFS8-4040-1500**		2
(2)	**HFS8-4040-1420**		2
(3)	**HFS8-4040-920**		6
(4)	**HFS8-4040-760**		4
(5)	**HFS8-4040-720**		2

	Brackets	Qty.
(6)	**HBLFSN8-SET**	44

(SET-applicable bolts and nuts are included.)

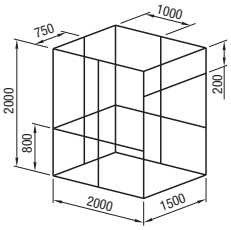


2-B: For an equipment covering enclosure...

(2-B-1) Determining Outer Perimeter Configuration

Width, depth, and height determined based on the equipment to be mounted.

Shape and Size



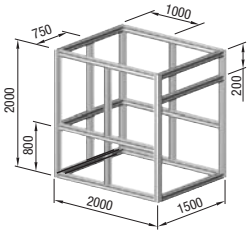
(2-B-2) Selection of Connection Methods

See (2-A-2) on left page for the connection methods.
Bracket connections for the panels, and Single Joint connections are selected for this example.

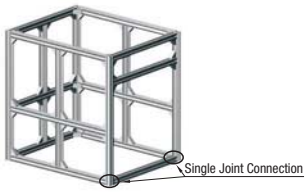
(2-B-3) Creation of a Unit Drawing

(Ex.) Width: 2000 Depth: 1500 Height: 2000mm Extrusion: HFS6-3030

Draw Extrusion Width and Overlapping



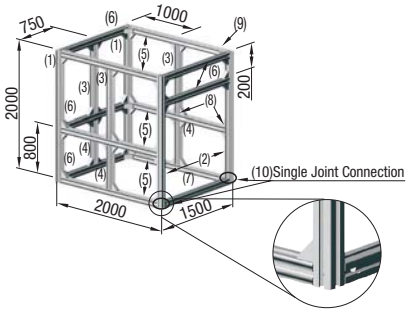
Determine the connection method



(2-B-4) Components Expanded

	Extrusions	Length	Qty.
(1)	**HFS6-3030-2000**		2
(2)	**See HFS6-3030-2000-LCH (P.649)**		2
(3)	**HFS6-3030-1170**		3
(4)	**HFS6-3030-740**		3
(5)	**HFS6-3030-1940**		6
(6)	**HFS6-3030-1440**		5
(7)	**See HFS6-3030-1440-RDH-LDH (P.654)**		1

	Brackets, Bolts, Nuts	Qty.
(8)	**HBLFSN6-C-SET**	4x13=52
(9)	**HBLFSN6-SET**	10
(10)	**HSJ6**	2



(Explanation)

(2) Add a wrench access hole on one end for Single Joint connection.
(7) A D Hole added to each end for Joint Nuts.
(8) Add tapped holes on brackets for panels. Also include the screw/nut sets. In this example, a panel is mounted to the side shown in the figure below. (Surfaces except front right and bottom)
(9) Top, bottom, and middle section brackets, include screw/nut sets.
(10) Single Joint Kits need with the extrusions on (7) and (2).

Complete with cover plates (provided separately) mounted.



Aluminum Extrusion Parts Selection

Selection of Related Parts

Numbers of applicable related parts are decided at the time of selecting aluminum extrusions.
When selecting related parts, see No. as reference.

(Ex.) When assembling with HFS6-3030 aluminum extrusions of HFS6 series

Brackets
HBLFSN6
HBLTS6 or other

Blind Brackets, Blind Joints
HBLBS6
HSJ6 or other

Nuts
HNTT6-Female Thread Hole Diameter
HNTAT6-Female Thread Hole Diameter or Other

Extrusion End Caps and Covers
HFC6-3030-Color
HSCA6-Color or Other

Casters and Adjuster Pads
HAJPS6
HCFT6-60 or Other

Door Parts
HHPSN6
HMGN6 or Other

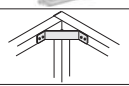
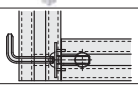
Other Accessories
HFCC6
LCSA6-Shaft Hole Diameter or Other

Many products can be used for both HFS8 series and HFS8 and 45 series.
Pre-Assembly Insertion Nut HNTT8-8
→ It can be used with HFS8 series.
→ It can be used with HFS8-45 series.

- Various related parts can be installed to the structure that uses the aluminum extrusion according to the usage.

Aluminum Frames Connection Method

There are two major methods of aluminum frames connection.
1. Bracket Attachment: Connects the frames with brackets. They may interfere with products or panels.
2. Blind Joint Attachment: The corner is streamlined.
However, usable extrusions are limited. Refer to every page for the product details.

Mounting Method	Name	Extrusion Applicability HFS5 (x 20)	HFS6 (x 30)	HFS8 (x 40)	HFS8 (40, 50, 60 sq.)	Price Low:◎⇒○⇒△: High (*1)	Screw Fastening Locations (*2)	Extrusions Alteration	Materials	Example	How to Mount Listed Page
Brackets	Brackets	Applicable	Applicable	Applicable	Applicable	◎	Two	Not Provided	EN AC-46100/G-AlSi12Cu		P.483 Others
									EN AC-51400/AlMgSi0,7-T5		P.487 Others
	Post-Assembly. Simple Brackets				-	△	One		1.0330/DC01 1.1191/C45E 1.7220/34CrMo4		P.485 Others
	Sheet Metal Brackets				Applicable	◎	Two		1.0320/St.22 1.4301/X5CrNi18-10		P.497 Others
	Blind Brackets					○			1.1191/C45E / 1.0330/DC01 / 1.4308/G-X6CrNi18-9 / 1.4301/X5CrNi18-10 Sintered Alloy 1.4301/X5CrNi18-10		P.495 Others
Blind Joints	Tapping Joints	Applicable	Applicable	Applicable	-	◎	One	Provided	JIS SWCH-18A		P.627
	Screw Joints	-			Applicable	○			1.7220/34CrMo4 1.0330/DC01		P.628
	Center Joints	Applicable				△			1.1191/C45E 1.7220/34CrMo4		P.629
	Post-Assembly Insertion Double Joints					△			1.4308/G-X6CrNi18-9 1.4301/X5CrNi18-10		P.631
	Simple Joints	-		-	-	○			1.1191/C45E 1.7220/34CrMo4		P.633
	Single Joints			Applicable	Applicable	○			1.0038/S235JR 1.4401/X5CrNiMo17-12-2 1.0330/DC01 1.4301/X5CrNi18-10		P.635
	Pre-Assembly Insertion Double Joints					△	Two		1.4401/X5CrNiMo17-12-2 1.4301/X5CrNi18-10		P.637
	Parallel Joints	Applicable			-	△	One		1.4308/G-X6CrNi18-9 1.7220/34CrMo4		P.639

*1 The price is a sum of bracket (blind joint) +bolt+pre-assembly insertion nut+alteration.
*2 The number of bolt tightening are compared on basis of each bracket (blind joint) under the connection of HFS6-3030 parts.

Aluminum Extrusion Tolerance Data

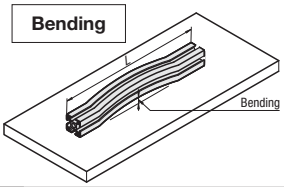
■Aluminum Extruded Shape of JIS Standard

•Bend Tolerance (Special Class)

Unit: mm

Diameter of Circumcircle	Minimum Thickness	Per Arbitrary Section of 300mm Length	Per full length (L) mm
38 or Less	2.4 or Less	1.3 or Less	1.3x $\frac{L}{300}$ or Less
	Over 2.4	0.3x or Less	0.3x $\frac{L}{300}$ or Less
38 to 300	-	0.3x or Less	0.3x $\frac{L}{300}$ or Less
Over 300	-	0.5 or Less	0.5x $\frac{L}{300}$ or Less

Bending



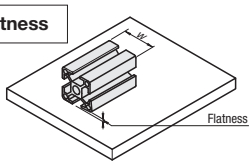
Note
- Given values are for extrusions placed on flat surfaces with minimized bends by own wight.
- When the overall length is not an integral multiple of 300mm, determine the tolerance by rounding up the remainder length to 300mm.

•Flatness Tolerance

Unit: mm

Shape Type / Minimum Thickness of Measurement Point / Width	General Shape	Hollow Shape	
	-	4.7 or Less	Over 4.7
25 or Less	0.10 or Less	0.15 or Less	0.10 or Less
Over 25	0.4%xW or Less	0.6%xW or Less	0.4%xW or Less
Per Arbitrary Section of 25mm Width	0.10 or Less	0.15 or Less	0.10 or Less

Flatness



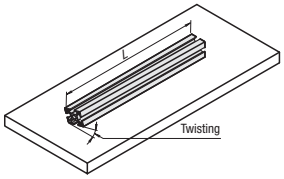
Note
Not Applicable to the plane including open section.

•Twist Tolerance

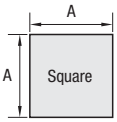
Unit: Degrees

Diameter of Circumcircle mm	Length	
	Per Arbitrary Section of 300mm Length	Per full length (L) mm
38 or Less	1 or Less	1 x $\frac{L}{300}$ or Less However Max. Value 7
Over 38 to 76	1/2 or Less	$\frac{1}{2}$ X $\frac{L}{300}$ or Less However Max. Value 5
Over 76	1/4 or Less	$\frac{1}{4}$ X $\frac{L}{300}$ or Less However Max. Value 3

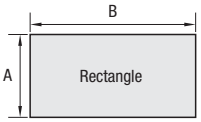
Twisting



■Reference: Tolerance of Outer Dimension (JIS)



Outer Dimension Tolerance (JIS)	A Dimension
HFS5-2020	±0.41
HFS5-4040	±0.54
HFS6-3030	
HFS6-6060	±0.86
HFS8-4040	±0.54
HFS8-8080	±0.86
HFS8-4545	±0.60
HFS8-9090	±0.86



Outer Dimension Tolerance (JIS)	A Dimension	B Dimension
HFS5-2040	±0.41	±0.54
HFS6-3060	±0.54	±0.86
HFS8-4080		
HFS8-4590	±0.60	

*MISUMI Aluminum Frames are within JIS dimension tolerance above.

■Mechanical Properties of Aluminum Frames

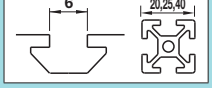
	JIS Standard (Reference)	JIS Standard (Reference)	Actual Measurement
Series	HFS Series	GFS Series	
Materials (JIS Symbol)	En AC51400-T5	EN AW-6061-T6	
Tensile Strength (N/mm²)	245 or More	265 or More	278
Proof Stress (N/mm²)	205 or More	245 or More	247
Longitudinal Elastic Modulus (N/mm²)	69972	69972	
Brinell Hardness (HB)	88	88	
Surface Treatment	Anodize 9μm or More	Anodize 9μm or More	

■There is more useful reference information listed at the end of this product index at P.669.

HFS5 Series Aluminum Frames
20 · 25 · 40mm Square
-1 Slot-

NEW

HFS5 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.483 ~ P.496	P.499 ~ P.506	P.627 ~ P.640	P.509	P.645 ~ P.658

CAD Data

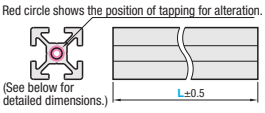
Features: Small and light aluminum extrusions suited for locations where small forces apply, such as for covers and safety fences.

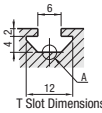
RoHS

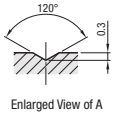


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS5 HFS_5	KHFS5 KHFS_5	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize
HFSB5 HFS_B5	KHFSB5 KHFS_B5		Black Anodize
CAF5	-		Clear Coating (Clear Anodize + Clear Painting)
HFSY5	-		Baked-on Finish (Yellow)

Cut surface and altered parts are not surface treated.



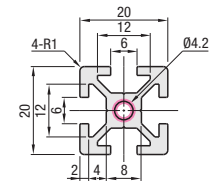




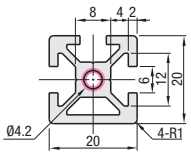
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard Cross Section Shape.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.
	Baked-on Finish · Yellow	Can be used on doors or hazardous areas as a warning color. The color is D22 -80V (Munsell Value Reference 2.5YR6/14) by Japan Paint Manufacturers Association.

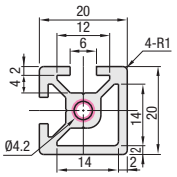
HFS5-2020
HFSB5-2020 (Black Anodize)
CAF5-2020 (Clear Coating)
HFSY5-2020 (Baked-on Finish, Yellow)



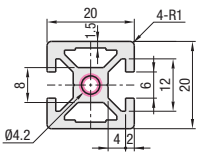
HFSF5-2020
HFSFB5-2020
(Black Anodize)



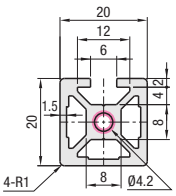
HFST5-2020
HFSTB5-2020
(Black Anodize)



HFSH5-2020



HFSC5-2020



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
HFS5	2020	50~4000	0.50	183	0.742x10⁴	0.742x10⁴						
HFSB5 (Black Anodize)												
CAF5 (Clear Coating)												
HFSY5 (Baked-on Finish, Yellow)												
HFSF5			0.53	195	0.834x10⁴	0.746x10⁴						
HFSFB5 (Black Anodize)												
HFST5				196	0.808x10⁴	0.808x10⁴						
HFSTB5 (Black Anodize)												
HFSH5				199	0.74x10⁴	0.89x10⁴						
HFSC5			0.56	208	0.81x10⁴							

Fixed Length Extrusion (1000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~19 pcs.	Volume Discount 20~
KHFS5	2020	1000	183	0.742x10⁴	0.742x10⁴		

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
KHFS5	2020	4000	183	0.742x10⁴	0.742x10⁴		
KHFSB5 (Black Anodize)							
KHFSF5			195	0.834x10⁴	0.746x10⁴		
KHFSFB5 (Black Anodize)							
KHFST5			196	0.808x10⁴	0.808x10⁴		
KHFSTB5 (Black Anodize)							
KHFSH5			199	0.74x10⁴	0.89x10⁴		
KHFSC5			208	0.81x10⁴			

Order Example

Part Number	-	L
HFS5-2020	-	800
KHFSF5-2020	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS5-2020-180=2,50 EUR
When L is 300 or more
Prices are calculated as follows: € Unit Price/m x Specified Full Length = Price
ex: HFS5-2020-800
4,70x0.8m=2,50 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days
5 Days

Alterations

Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

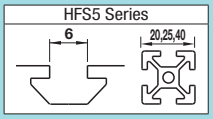
Fixed Length Extrusions (KHFS5-2020-1000)
6 Days P.87

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS5-2020-4000)

Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS5 Series Aluminum Frames
20 · 25 · 40mm Square
-2 Slots-

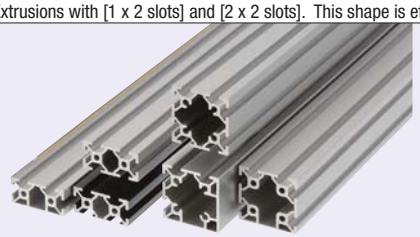


Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.483 ~ P.496	P.499 ~ P.506	P.627 ~ P.640	P.509	P.645 ~ P.658

CAD Data

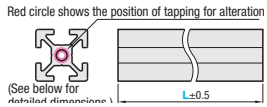
Features: Extrusions with [1 x 2 slots] and [2 x 2 slots]. This shape is effective where forces apply.

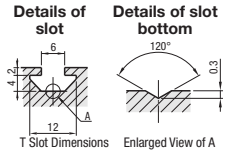
RoHS



Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS5 HFS_5	KHFS5 KHFS_5	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize
HFSB5	KHFSB5		Black Anodize
CAF5	-		Clear Coating (Clear Anodize + Clear Painting)

Cut surface and altered parts are not surface treated.

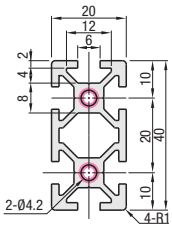




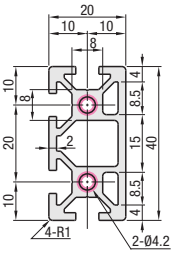
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard Cross Section Shape.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.

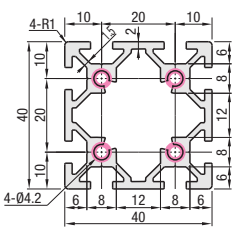
HFS5-2040
HFSB5-2040 (Black Anodize)
CAF5-2040 (Clear Coating)



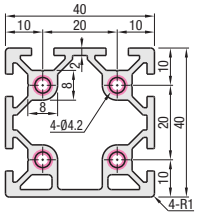
HFSF5-2040



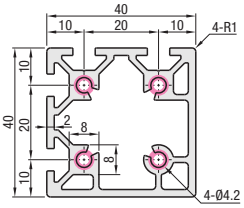
HFS5-4040
HFSB5-4040 (Black Anodize)
CAF5-4040 (Clear Coating)



HFSF5-4040



HFST5-4040



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
HFS5	2040	50~4000	0.88	324	1.358x10⁴	5.13x10⁴						
HFSB5 (Black Anodize)												
CAF5 (Clear Coating)												
HFSF5			0.93	344	1.52x10⁴	5.40x10⁴						
HFS5	4040		1.28	472	8.89x10⁴	8.89x10⁴						
HFSB5 (Black Anodize)												
CAF5 (Clear Coating)												
HFSF5			1.41	522	9.78x10⁴	9.32x10⁴						
HFST5			1.35	497	9.60x10⁴	9.60x10⁴						

Fixed Length Extrusion (1000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~19 pcs.	Volume Discount 20~
KHFS5	2040	1000	324	1.358x10⁴	5.13x10⁴		

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
KHFS5	2040	4000	324	1.358x10⁴	5.13x10⁴		
KHFSB5 (Black Anodize)							
KHFSF5			344	1.52x10⁴	5.40x10⁴		
KHFS5	4040		472	8.89x10⁴	8.89x10⁴		
KHFSB5 (Black Anodize)							
KHFSF5			522	9.78x10⁴	9.32x10⁴		
KHFST5			497	9.60x10⁴	9.60x10⁴		

Order Example

Part Number	-	L
HFS5-2040	-	800
KHFSF5-2040	-	4000

Days to Ship

Configurable Length Extrusions: 5 Days

Fixed Length Extrusions (KHFS5-2040-1000): 6 Days P.88

Fixed Length Extrusions (Effective Length 4000mm): 7 Days (KHFS5-2040-4000)
For orders of 20 or more identical pieces, please request a quotation.

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex. HFS5-2040-180=2,60 EUR
When L is 300 or more
Prices are calculated as follows: € Unit Price/m x Specified Full Length = Price
ex: HFS5-2040-800
8,90x0.8m=2,60 EUR
(Round down to ten Cent.)

Alterations

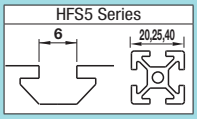
Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS5 Series Aluminum Frames 20·25·40mm Square

-Aluminum Frames 25mm Square with 3 or more slots-



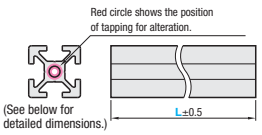
Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.483 ~ P.496	P.499 ~ P.506	P.627 ~ P.640	P.509	P.645 ~ P.658

CAD Data

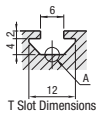
Features: Extrusions shaped with [1 x 3 slots] and [2 x 4 slots], etc. 25mm square is also available.



Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS5	KHFS5	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize
HFSB5	KHFSB5		Black Anodize

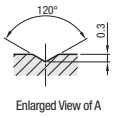


Details of slot



T Slot Dimensions

Details of slot bottom

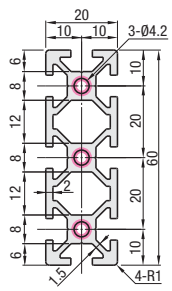


Enlarged View of A

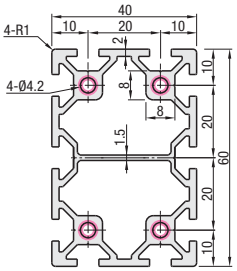
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard cross section shape.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

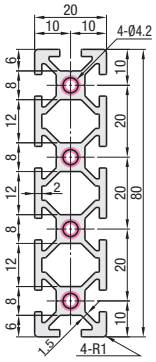
HFS5-2060



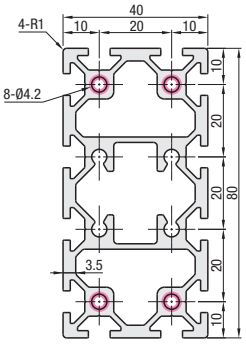
HFS5-4060



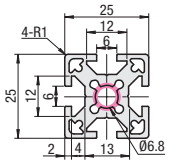
HFS5-2080



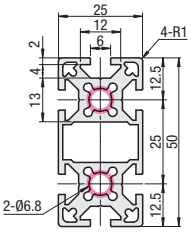
HFS5-4080



HFS5-2525
HFSB5-2525 (Black Anodize)



HFS5-2550
HFSB5-2550 (Black Anodize)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
HFS5	2060	50~4000	1.26	464	$1.97x10^4$	$15.98x10^4$						
	2080		1.64	605	$2.56x10^4$	$36.0x10^4$						
	4060		1.80	665	$12.63x10^4$	$27.0x10^4$						
	4080		2.69	994	$18.29x10^4$	$63.3x10^4$						
	2525		0.81	320	$1.71x10^4$	$1.71x10^4$						
	2550		1.36	503	$2.97x10^4$	$12.74x10^4$						
HFSB5 (Black Anodize)	2525		0.81	320	$1.71x10^4$	$1.71x10^4$						
	2550		1.36	503	$2.97x10^4$	$12.74x10^4$						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
KHFS5	2060	4000	464	$1.97x10^4$	$15.98x10^4$		
	2080		605	$2.56x10^4$	$36.0x10^4$		
	4060		665	$12.63x10^4$	$27.0x10^4$		
	4080		994	$18.29x10^4$	$63.3x10^4$		
	2525		320	$1.71x10^4$	$1.71x10^4$		
	2550		503	$2.97x10^4$	$12.74x10^4$		
KHFSB5 (Black Anodize)	2525		320	$1.71x10^4$	$1.71x10^4$		
	2550		503	$2.97x10^4$	$12.74x10^4$		

Order Example

Part Number	-	L
HFS5-2060	-	800

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS5-2060-180=3,50 EUR

When L is 300 or more
Prices are calculated as follows: € Unit Price/m x Specified Full Length = Price
ex: HFS5-2060-800
11,70x0.8m=3,50 EUR
(Round down to ten Cent.)

Days to Ship

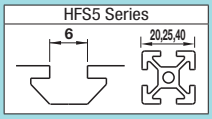
Configurable Length Extrusions
6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.

Alterations
Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS5 Series Aluminum Frames 20·25·40mm Square
-Other Shapes-

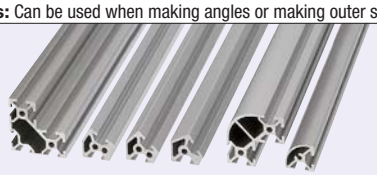


Fixing Parts				Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.483 ~ P.496	P.499 ~ P.506	P.627 ~ P.640	P.509	P.645 ~ P.658

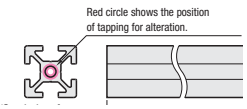
CAD Data

Features: Can be used when making angles or making outer surface in radius.

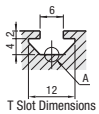
RoHS



Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS5 HFSR5 HFS_ _A5	KHFS5 KHFSR5 KHFS_ _A5	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize

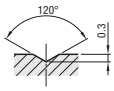


Details of slot



T Slot Dimensions

Details of slot bottom

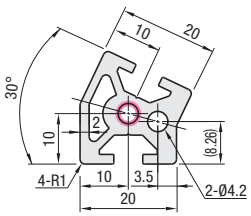


Enlarged View of A

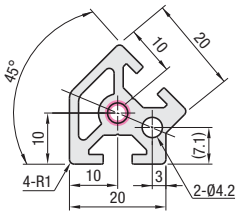
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard Cross Section Shape.
Surface Treatment	Clear Anodize	Common surface treatment.

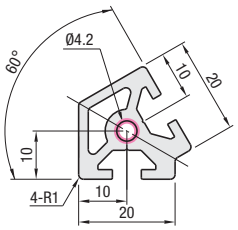
HFS30A5-20



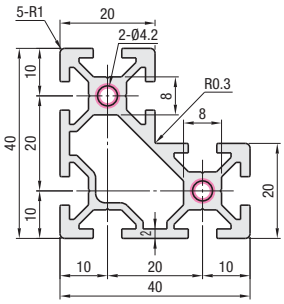
HFS45A5-20



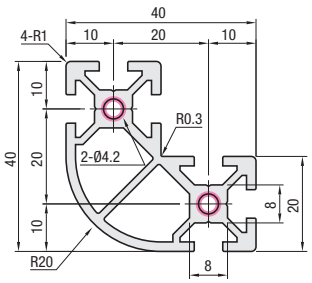
HFS60A5-20



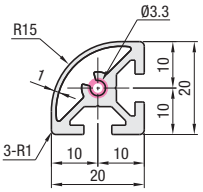
HFS5-404020



HFSR5-404020



HFSR5-2020



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
HFS30A5	20	50~4000	0.61	228	0.80x10⁴	0.98x10⁴						
HFS45A5			0.59	221	0.82x10⁴	0.92x10⁴						
HFS60A5			0.61	227	0.86x10⁴							
HFS5	404020		1.16	429	6.61x10⁴	6.61x10⁴						
HFSR5	404020		1.13	419	5.95x10⁴	5.95x10⁴						
	2020		0.42	153	0.57x10⁴	0.57x10⁴						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
KHFS30A5	20	4000	228	0.80x10⁴	0.98x10⁴		
KHFS45A5			221	0.82x10⁴	0.92x10⁴		
KHFS60A5			227	0.86x10⁴			
KHFS5	404020		429	6.61x10⁴	6.61x10⁴		
KHFSR5	2020		153	0.57x10⁴	0.57x10⁴		

Order Example

Part Number	-	L
HFS30A5-20	-	800

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex. HFS30A5-20-180=2,00 EUR
When L is 300 or more
Prices are calculated as follows: € Unit Price/m x Specified Full Length = Price
ex: HFS30A5-20-800
6,70x0.8m=2,00 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions: 6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusions (Effective Length 4000mm): 7 Days
For orders of 20 or more identical pieces, please request a quotation.

Alterations

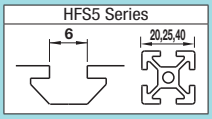
Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS5 Series

-Aluminum Extrusion with Milled Surfaces-



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.483 ~ P.496	P.499 ~ P.506	P.627 ~ P.640	P.509	P.645 ~ P.658

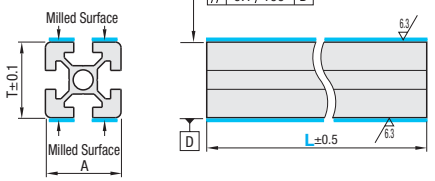
CAD Data

Features: Milled on upper and lower surfaces. Usable for Linear Guides, etc.



RoHS

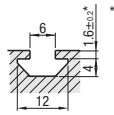
HFSP



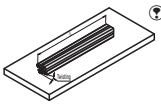
Milled and cut end surfaces are not anodized.

M Material:EN AC-51400/AlMgSi0,7-T5
S Surface Treatment: Anodize

Detailed view of slot on milled surface



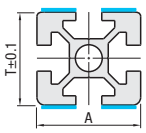
*Due to the extrusion tolerance, the thickness tolerance of the slot on the milled surface becomes as shown above, while T dimension tolerance is ±0.1.



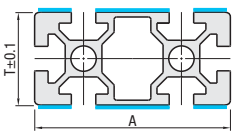
Being extruded sections, products can twist. It is recommended to support overall length of extrusion when using. See tolerance data on aluminum extrusions on **P.476**.

For detailed dimensions and shapes EXCEPT the slots on the milled surface, A and T dimensions, please refer to the drawing of the product of the below Part Number Without "P". (For HFS5 series, refer to P.477) (Ex.) HFSP5-2020 → Fig. HFS5-2020 (P.477)

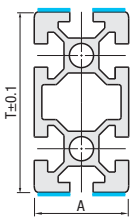
Square Type
HFSP5-2020
HFSP5-2525
HFSP5-4040



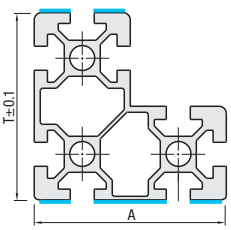
Rectangle Type (Horizontal)
HFSP5-4020
HFSP5-5025
HFSP5-6020
HFSP5-8020
HFSP5-6040
HFSP5-8040



Rectangle Type (Vertical)
HFSP5-2040
HFSP5-2550
HFSP5-2060
HFSP5-2080
HFSP5-4060
HFSP5-4080



L-Shaped Type
HFSP5-404020



Part Number		L 0.5mm Increment	Extrusions Series	T	A	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	Alteration Charge (Body+) Counterboring XA~XE (per row)		Drill Wrench Hole AV~EV (per row)		Tapping (Refer to P.647) Tap Shapes	Left LTP	Right RTP	Both TPW
HFSP5	2020	100~3000	HFS5	19.2	20			Z5 d5.5 d↕9.5	250	D7 Ø7.35	150	M5 Depth 15	180	180	360
	4020			19.2	40				500		300		360	360	720
	2040			39.2	20				250		150				
	2525			24.2	25				250		150	M8 Depth 24	180	180	360
	5025			24.2	50				500		300		360	360	720
	2550			49.2	25				250		150				
	6020			19.2	60				750		450	M5 Depth 15	540	540	1,080
	2060			59.2	20				250		150				
	8020			19.2	80			Z6 d6.5 d↕11	1,000		600		720	720	1,440
	2080			79.2	20				-		150				
	4040			39.2	40				500		300				
	6040			39.2	60				750		450				
	4060			59.2	40				500		300				
	8040			39.2	80				1,000		600				
	4080			79.2	40				-		300				
	404020			39.2	40				500		300		360	360	720

Order Example

Part Number	-	L
HFSP5-2020	-	300

Days to Ship 8 Days

Example



Price

Volume Discount P.87

Qty.		1~9 pcs.	10~49	50~
Discount Rate	Less than 300mm	€ Unit Price	5%	10%
	300mm or more	€ Unit Price/m	5%	10%

Round down to one Cent.
Round down to ten Cent.

When L<300mm € € Unit Price = Price
When L≥300mm € € Unit Price/m x Specified Full Length = Price

(Ex.) HFSP5-2020-600
25,20 x 0.6m = 15,10 EUR (Round down to ten Cent.)

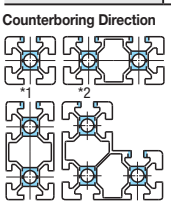
Alterations Drilling hole at a specified position can be done.

• Nuts for Extrusion
Please use nuts for aluminum extrusions. **Refer to P.499~508**

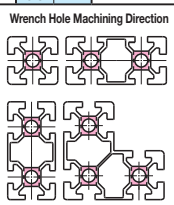
Alterations	Counterboring							Wrench Hole				
Code	Z Selection			XA	XB	XC	XD	XE	D Selection	AV	BV	CV	DV	EV
Spec.	Z	d	d1	Distance from The Left End Plane mm					D	Distance from The Left End Plane mm				
Specifications of Hole Size and Hole Position	5	5.5	9.5	7~L-7					7	7~L-7				
	6	6.5	11											

When the cross section is L-shaped, select distance from left end with lower section in front.

Counterboring Direction



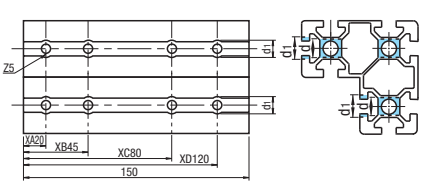
Wrench Hole Machining Direction

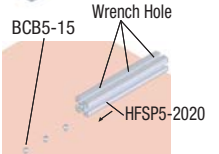


*1 When the cross section is rectangle (vertical), counterboring is not available for extrusions exceeding 60mm in the length direction.
*2 When the cross section is L-shaped, counterboring is not available for extrusions exceeding 60mm in longitudinal direction, except for the lower portion.

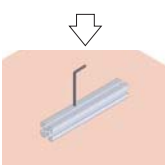
Order Example

HFSP5 - 404020 - 150 - Z5 - XA20 - XB45 - XC80 - XD120
HFSP5 - 2020 - 2000 - D7 - AV100 - BV120 - CV1000 - DV1880 - EV1900
HFSP5 - 4040 - 800 - LTP



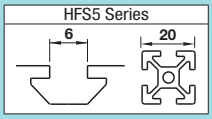


Install button bolts temporarily in reference plane, then slide the frame to fixing position, passing bolt heads through frame slot.



Put wrench in the wrench hole and tighten the screw.

HFS5 Series
-Curved Extrusions-



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.483 ~ P.496	P.499 ~ P.506	P.627 ~ P.640	P.509	P.645 ~ P.658

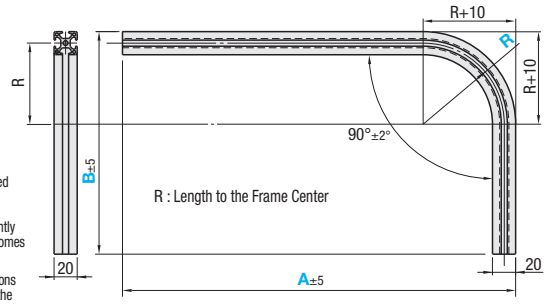
CAD Data

Features: Bending is applied to HFS5-2020. Combination use with Curved Panel is possible. (Refer to **P.886**)



RoHS

HFSMG



For R=140, the frame slot may be deformed and becomes narrower in width at the spot where the frame is bent. Therefore, slot nut cannot be used.

(For dedicated Curved Panels, refer to **P.886**)

Bending is applied after anodizing; therefore, bent section may slightly discolor and becomes white.

A and B dimensions not indicated in the price list are not available.

M Material: EN AC-51 400/ AlMgSi0,7-T5

S Surface Treatment: Anodize

Part Number		A 1mm Increment	B 1mm Increment	R *	Series	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴	
Type	No.							ℓx	ℓy
HFSMG	5-2020	200~1500	200~1000	140 300* 500*	HFS5	0.50	183	0.742x10⁴	0.742x10⁴

* Curved panels for R300 and R500 are not available.

Order Example

Part Number	-	A	-	B	-	R
HFSMG5-2020	-	A350	-	B700	-	R140

Days to Ship: **10 Days**

Price

Volume Discount (Round down to one Cent.) **P.87**

Qty.	1~9	10~49	50~
Discount Rate	€ Unit Price	5%	10%

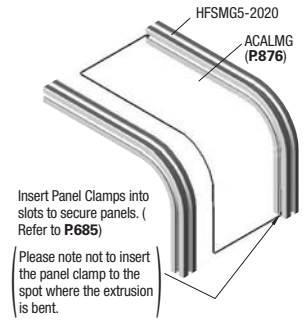
Part Number		A	€ Unit Price																
			R140								R300						R500		
			B								B						B		
Type	No.		200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000	400~500	501~600	601~700	701~800	801~900	901~1000	600~700	701~800	801~900
HFSMG	5-2020	200~300																	
		301~400																	
		401~500																	
		501~600																	
		601~700																	
		701~800																	
		801~900																	
		901~1000																	

Alterations

Part Number	-	A	-	B	-	R	-	(LTP · RTP · TPW...etc.)
HFSMG5-2020	-	A400	-	B500	-	R140	-	LTP-LMH

10 Days

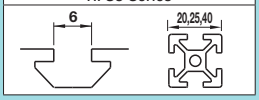
Example



Alterations	Tap (Refer to P.647)			M Hole (Refer to P.656)			
Code	LTP	RTP	TPW	LMH	LMV	RMH	RMV
Spec.	Tapping to the center hole Tap Shape M5 Depth 15 **LTP**: Tapping on the Left End Face **RTP**: Tapping on the Bottom End Face **TPW**: Tapping on the Both Ends Ex. LTP Tapped			Adds M type hole in specified position. **LMH**,**RMH**: Machines M type hole on the left-hand bottom of the extrusion from the horizontal direction. Ex. LMH 10, Ø7.1 **LMV**,**RMV**: Machines a hole on the left-hand bottom of the extrusion from the vertical (right) direction. Ex. RMV Ø7.1			
When tapping and M type hole alteration are both specified, the depth of tapping hole will be up to M Hole.							
Applicable Extrusions							
HFSMG5-2020	2,70		5,40	1,20			

Tabbed Brackets
-SlotType: HFS5 Series
(Aluminum Frames 20 · 25 · 40 Square)-

HFS5 Series



Features: Tabbed Brackets to be connected by both L and Cross-Connections.

Reversal Tabbed Brackets

RoHS

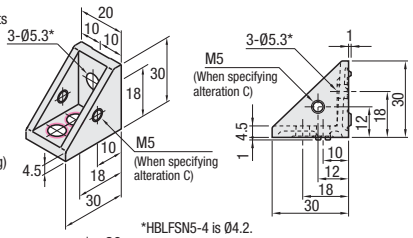


Type	Material	Surface Treatment
HBLFSN5	EN AC-46100/ G-AlSi 12Cu	-
HBLFSN5-4		-
HBLFSNB5		Black Anodize
HBLFSNM5		Electroless Nickel Plating
CHBLFSN5		Baked-on Finish (Silver)
HBLFSNF5		-

*Baked-on Finish (Silver) is color coordinated with Clear Coating Extrusions.

·Reversal Tabbed Brackets

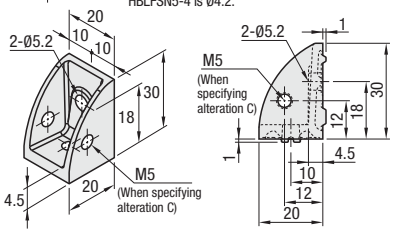
HBLFSN5
HBLFSN5-4
(For M4 Bolt)
HBLFSNB5
(Black Anodize)
HBLFSNM5
(Electroless Nickel Plating)
CHBLFSN5
(Baked-on Finish / Silver)



*HBLFSN5-4 is Ø4.2.

·Reversal Tabbed Brackets (Depth 20m)

HBLFSNF5



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSN5	15	CBM5-10	2	HNTT5-5	2	1176		
HBLFSN5-4 (For M4 Bolt)		CBM4-10		HNTT5-4				
HBLFSNB5* (Black Anodize)		CBM5-10		HNTT5-5				
HBLFSNM5 (Electroless Nickel Plating)								
CHBLFSN5 (Baked-on Finish · Silver)								
HBLFSNF5	13							

* For repairing black anodizing, refer to **P.748**

ex **Example**

Use one of the two holes on bottom, depending on mounting direction.

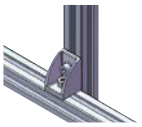


L-Connection



Cross-Connection

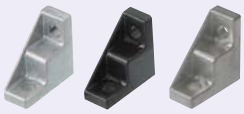
■HBLFSNF5 prevents brackets from protruding from extrusions when cross-connected.



Features: One-Sided Tabbed Rib Brackets. Easy to work with wrenches.

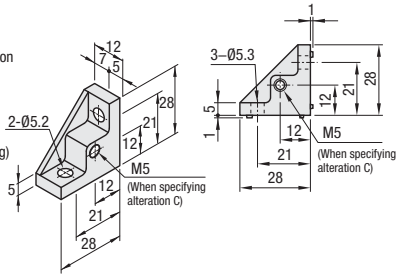
One-Side Rib Brackets

RoHS



Type	Material	Surface Treatment
HBLFSL5	EN AC-46100/ G-AlSi12Cu	-
HBLFSLB5		Cathodic Electro-deposition Coating: Black
HBLFSLM5		Electroless Nickel Plating

HBLFSL5
HBLFSLB5
(Cathodic Electrodeposition Coating: Black)
HBLFSLM5
(Electroless Nickel Plating)

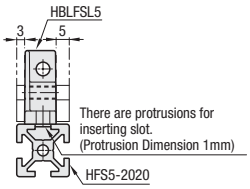


Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSL5	13	CBM5-10	2	HNTT5-5	2	1176		
HBLFSLB5* (Cathodic Electro-deposition Coating: Black)								
HBLFSLM5 (Electroless Nickel Plating)								

* For repairing black anodizing, refer to **P.748**

ex **Example**

Can be combined with both cover plates of 5mm and 3mm thickness.



Features: Pressing nuts against the long tabs makes cumbersome hole positioning unnecessary.

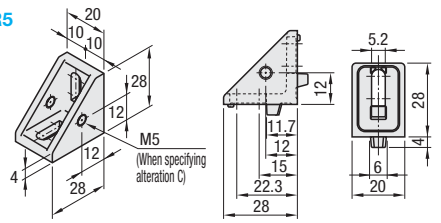
Nut-Fixing Brackets

RoHS



Type	Material	Surface Treatment
HBLFSR5	EN AC-46100/ G-AlSi12Cu	-

HBLFSR5

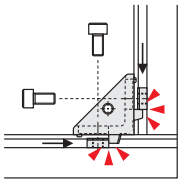


Slotted holes are made to fit various hole positions.
Bracket tabs may be damaged when nuts are fallen on them.
Use of washers are recommended.
(Refer to alterations on the right, SEC)

Part No. / Type	Mass (g)	Applicable Screw / T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSR5	15	CBM5-10	2	HNTT5-5	2	1176		

ex **Example**

When nuts are wedged through until the tab, hole positions of bracket and nuts are aligned and fine adjustment becomes unnecessary.
⊗Not applicable to Short Nuts, HNTM and HNTAM.



Features: Brackets with single side tabs. Panels can be mounted on the side without tabs as shown in the example.

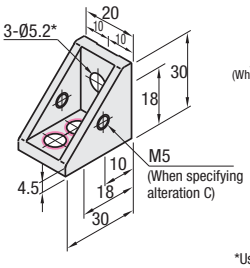
Brackets with Single Side Tab

RoHS

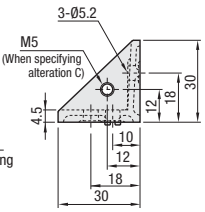


Type	Material
HBLFSNK5	EN AC-46100/ G-AlSi12Cu
HBLFSNE5	

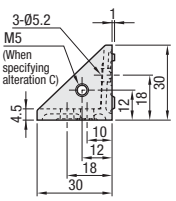
HBLFSNK5
HBLFSNE5



HBLFSNE5 Side View



HBLFSNK5 Side View



*Use one hole between the two holes in the figure.
(Depends on the attaching direction)

Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSNK5	15	CBM5-10	2	HNTT5-5	2	1176		
HBLFSNE5								

Example

Can be mounted on a plate directly.

Example of HBLFSNK5



Example of HBLFSNE5



Features: Reversal Tabbed Brackets with Cover. Designed to prevent dust build-up.

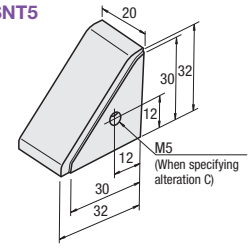
Brackets with Caps

RoHS

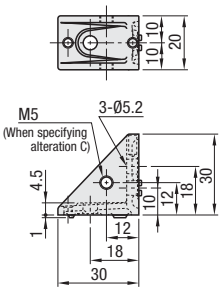


Type	Material
HBLFSNT5	EN AC-46100/G-AlSi12Cu (Body) Polyamide Black (Cover)

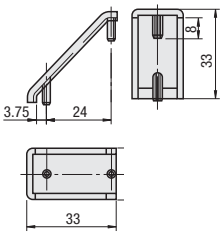
HBLFSNT5



Bracket for Covers

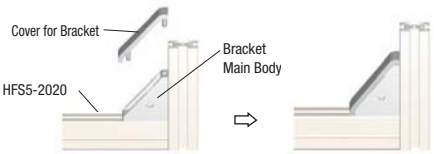


Cover for Brackets



Part No. / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSNT5	17	CBM5-10	2	HNTT5-5	2	1176		

Example



Order Example

Part Number
HBLFSN5
HBLFSL5
HBLFSR5
HBLFSNK5
HBLFSNT5

Days to Ship

6 Days
2 Days

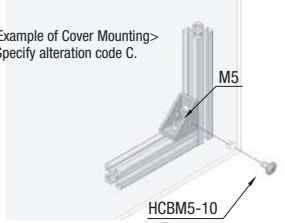
P.87

Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLFSNK5 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM)	HBLFSN5	0,20
			HBLFSN5-4	
			HBLFSNB5	0,50
			HBLFSNM5	0,20
			CHBLFSN5	0,45
			HBLFSNF5	0,20
			HBLFSL5	0,20
			HBLFSLB5	
			HBLFSLM5	
			HBLFSR5	
			HBLFSNK5	
			HBLFSNE5	
			HBLFSNT5	0,40

<Example of Cover Mounting>
Specify alteration code C.



Alterations	Code	Spec.	Applicable Brackets	Price Adder: SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFSN5 is specified,	HBLFSN5	0,82	0,60	1,06	1,64	1,06	1,24	1,24
			HBLFSN5-4							-
			HBLFSNB5	0,92	-	1,16	-	1,16	-	
			HBLFSNM5							
			CHBLFSN5	0,82	0,60	1,06	1,64	1,06	1,24	1,24
			HBLFSNF5							
			HBLFSL5	0,82	0,60	1,06	1,64	1,06	1,24	
			HBLFSLB5	0,92	-	1,16	-	1,16	-	-
			HBLFSLM5	0,82	0,60	1,06	1,64	1,06	1,24	
			HBLFSR5							1,24
			HBLFSNK5	0,82	0,60	1,06	1,64	1,06	1,24	-
			HBLFSNE5							
			HBLFSNT5	0,95	1,00	1,19	2,04	1,19	1,64	-

Code	Screws	Nuts
SET	CBM5-10	HNTT5-5
	SCB5-10	HNTTBS5-5
SEU	CBM5-10	HNTU5-5
SSU	SCB5-10	SHNTU5-5
SEP	CBM5-10	HNTP5-5
SSP	SCB5-10	SHNTP5-5
SEC	HCBST5-12	HNTT5-5

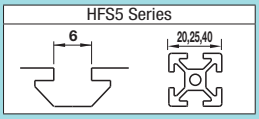
When specifying other than HBLFSN6, check for the applicable screws and nuts.

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). P.641
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Post-Assembly Insertion Easy Brackets / Tabbed Brackets

-Slot Type: HFS5 Series (Aluminum Frames 20 · 25 · 40 Square)-

HFS5 Series



Features: 2 aluminum extrusions can be easily connected with only tightening 1 screw. Brackets can be mounted on the extrusion slots after assembly.

Brackets

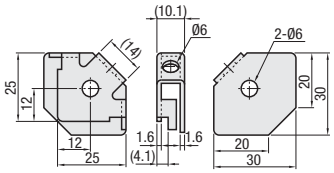
RoHS



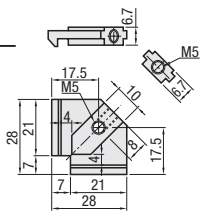
Components	Material	Surface Treatment
(1) Joint Plates	1.0330/DC01	Trivalent Chromate
(2) Joint Bracket	1.1191/C45E	
(3) Hexagon Socket Head Cap Screw	1.7220/34CrMo4	

HABL5

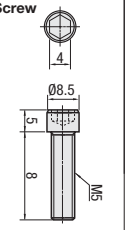
(1) Joint Plates



(2) Joint Bracket



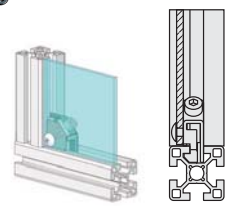
(3) Hexagon Socket Head Cap Screw



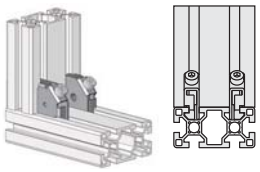
Overtightening may cause deformation of joint plates. (Reference Tightening Torque 5.5N·m)

Part Number / Type	Mass (g)	Included Screw: Screw	Included Screw: Qty.	Allowable Load (N)	€ Unit Price: 1~99 pcs.	Volume Discount: 100~
HABL5	30	Hex Socket Head Cap Screws M5x8	1	250		

Example



Holes are tapped on a bracket for cover mounting.



For aluminum extrusions with 2 slots, brackets can be mounted on both sides.

Connection Method

Step	Front View	Side view	Sketch Drawing
1			 Place 2 Aluminum extrusions, and adjust the frame positions.
2			 Fit the joint bracket (2) in the slot of the aluminum extrusions.
3			 Cover the joint bracket (2) on the joint plate (1).
4			 Overtightening may cause deformation of joint plates. Tighten a hexagon socket head cap screw (3) to fix the plate. (Reference Tightening Torque 5.5N·m)

Features: Reversal Tabbed Brackets with twice as many screws. Extrusions can be connected more securely.

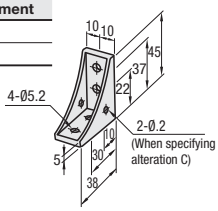
Reversal Tabbed Brackets

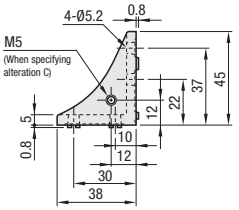


RoHS

Type	Material	Surface Treatment
HBLFSSW5	EN AC-46100/G-AlSi12Cu	-
HBLFSSWB5		Black Anodize

HBLFSSW5
HBLFSSWB5
(Black Anodize)





Part Number	Mass (g)	Applicable Bolt · T Nut: Bolt	Qty.	T Nut	Qty.	Allowable Load (N) (N)	€ Unit Price: 1~99 pcs.	Volume Discount: 100~
HBLFSSW5 HBLFSSWB5* (Black Anodize)	24	CBM5-10	4	HNTT5-5	4	1470		

* For repairing black anodizing, refer to **P.748**

Example

Can be connected in parallel and perpendicular directions to the extrusion slot.



Features: Extrusions with 2-slots (HFS5-4040, etc.) can be connected with one bracket.

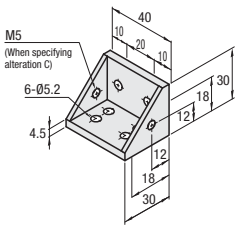
Reversal Tabbed Brackets

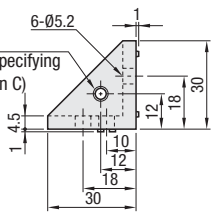


RoHS

Type	Material
HBLFSD5	EN AC-46100/G-AlSi12Cu

HBLFSD5





Part Number	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price: 1~99 pcs.	Volume Discount: 100~
HBLFSD5	25	CBM5-10	4	HNTT5-5	4	1470		

Example

Can be connected in parallel and perpendicular directions to the extrusion slot.



CAD Data

Features: Tabbed Brackets with 2-slots for extrusions (HFS5-4040, etc.).

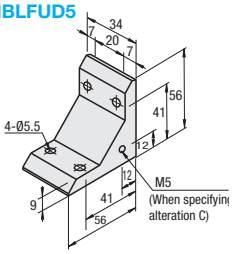
Tabbed Brackets

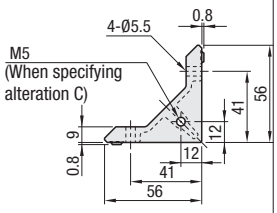


RoHS

Type	Material
HBLFUD5	EN AC-46100/G-AlSi12Cu

HBLFUD5





Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFUD5	76	CBM5-14	4	HNTT5-5	4	1470		

Example



Features: Ribbed Brackets with twice as many screws. Extrusions can be connected more securely.

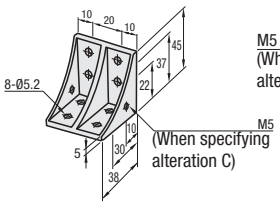
Reversal Tabbed Brackets

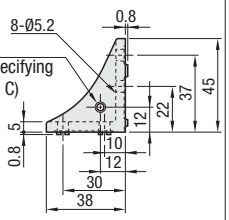


RoHS

Type	Material
HBLFSDW5	EN AC-46100/G-AlSi12Cu

HBLFSDW5





Part Number	Mass (g)	Applicable Bolt · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Bolt	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSDW5	47	CBM5-10	8	HNTT5-5	8	2156		

Example

Can be connected in parallel and perpendicular directions to the extrusion slot.



Order Example

Part Number
HBLFSD5

Days to Ship

6 Days P.87 2 Days

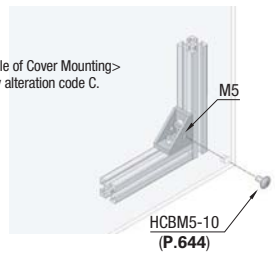
Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLFSD5 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM)	HBLFSSW5	0,50
			HBLFSSWB5	
			HBLFSD5	0,20
			HBLFSDW5	0,50
			HBLFUD5	

C Hole Alteration

<Example of Cover Mounting>
Specify alteration code C.



Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Post-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFSSW5 is specified,	HBLFSSW5	1,64	1,20	2,12	3,28	2,12	2,48	-
			HBLFSSWB5	1,84	-	2,32	-	2,32	-	
			HBLFSD5	1,64	1,20	2,12	3,28	2,12	2,48	2,48
			HBLFUD5	1,68		2,16		2,16		2,52
			HBLFSDW5	3,28	2,40	4,24	6,56	4,24	4,96	-

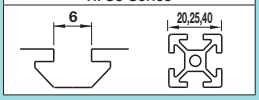
Code	Screws	Nuts
SET	CBM5-10	HNTT5-5
	SCB5-10	HNTTBS5-5
SEU	CBM5-10	HNTU5-5
SSU	SCB5-10	SHNTU5-5
SEP	CBM5-10	HNTP5-5
SSP	SCB5-10	SHNTP5-5
SEC	HCBST5-12	HNTT5-5

When specifying other than HBLFSSW5, check for the applicable screws and nuts.

Extruded Brackets -for 1-slot-

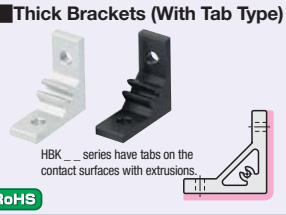
-Slot Type: HFS5 Series (Aluminum Frames 20·25·40 Square)-

HFS5 Series



Features: Extruded Brackets with tabs to fit extrusions. Since the tabs stop rotating the brackets when tightening, improves work efficiency.

Thick Brackets (With Tab Type)



HBK _ _ series have tabs on the contact surfaces with extrusions.

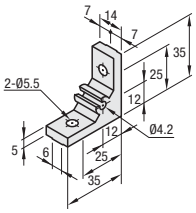
RoHS

Type	Material	Surface Treatment
HBKTST5	EN AC-51400/ ALMGSI0,7-T5	Anodize
HBKTS5		
HBKTSB5		Black Anodize

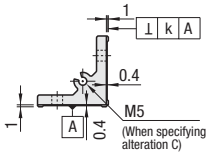
HBKTST5
(Perpendicularly Machined)

HBKTS5
HBKTSB5
(Black Anodize)

Part Number	Perpendicularity K
HBKTST5	0.03
HBKTS5	0.06
HBKTSB5* (Black Anodize)	



Tabs for the aluminum extrusion slots are located on the bottom of brackets.



(When specifying alteration C)

Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKTST5	15	CBM5-10	2	HNTT5-5	2	833		
HBKTS5								
HBKTSB5* (Black Anodize)								

* For repairing black anodizing, refer to **P.748**

Features: Aluminum Extruded Brackets. Excels in appearance.

Thick Brackets

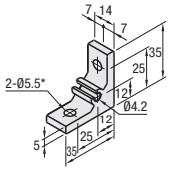


RoHS

Type	Material	Surface Treatment
HBLTS5 (-4)	EN AC-51400/ ALMGSI0,7-T5	Anodize
HBLTSB5		Black Anodize
CHBLTS5		Clear Coating (Anodize + Clear Coating)

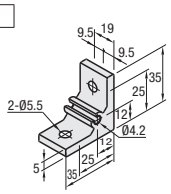
HBLTS5
HBLTS5-4
(For M4 Bolt)
HBLTSB5
(Black Anodize)
CHBLTS5
(Clear Coating)

*HBLTS5-4 is Ø4.5.



25 Square

HBLTV5
HBLTVB5
(Black Anodize)

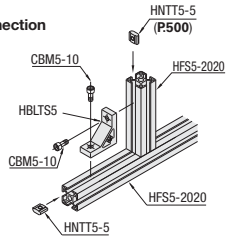


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTS5	15	CBM5-10	2	HNTT5-5	2	833		
HBLTS5-4 (For M4 Bolt)		CBM4-10		HNTT5-4				
HBLTSB5* (Black Anodize)		CBM5-10		HNTT5-5				
CHBLTS5 (Clear Coating)								
HBLTV5	20							
HBLTVB5* (Black Anodize)								

* For repairing black anodizing, refer to **P.748**

Example of Frame Connection
Connection with Thick Bracket

Example



Features: Numbers of screws are the same as HBKTS8. Extrusions can be connected more securely.

RoHS

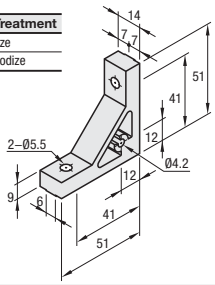


HBK _ _ series have tabs on the contact surfaces with extrusions.

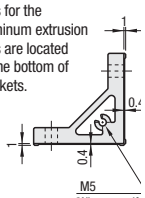
Type	Material	Surface Treatment
HBKUS5	EN AC-51400/ ALMGSI0,7-T5	Anodize
HBKUSB5		Black Anodize

Ultra Thick Brackets
(With Tab)

HBKUS5
HBKUSB5
(Black Anodize)



Tabs for the aluminum extrusion slots are located on the bottom of brackets.



(When specify alteration C)

Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKUS5	31	CBM5-14	2	HNTT5-5	2	833		
HBKUSB5* (Black Anodize)								

Features: Numbers of screws are the same as HBLTS8-45. Extrusions can be connected more securely.

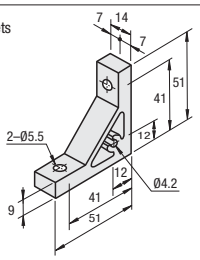
RoHS



Type	Material	Surface Treatment
HBLUS5	EN AC-51400/ ALMGSI0,7-T5	Anodize

Ultra Thick Brackets

HBLUS5



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUS5	31	CBM5-14	2	HNTT5-5	2	833		

CAD Data

Features: Hole positions are eccentric. Can be combined with plates of 5mm and 3mm thickness when using taps for mounting covers.

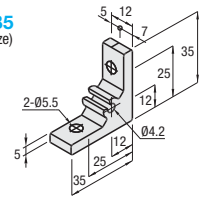
Eccentric Brackets



RoHS

Type	Material	Surface Treatment
HBLTH5	EN AC-51400/ ALMGSI0,7-T5	Anodize
HBLTHB5		Black Anodize

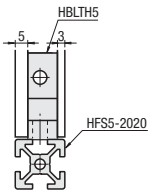
HBLTH5
HBLTHB5
(Black Anodize)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTH5	15	CBM5-10	2	HNTT5-5	2	833		
HBLTHB5* (Black Anodize)								

* For repairing black anodizing, refer to **P.748**

Example



HBLTH5 and HBLTHB5 are eccentric. Can be combined with both cover plates of 5mm and 3mm thickness.

Features: Extruded Brackets with twice as many screws. Extrusions can be connected more securely.

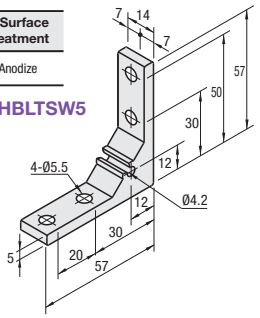
Thick Brackets



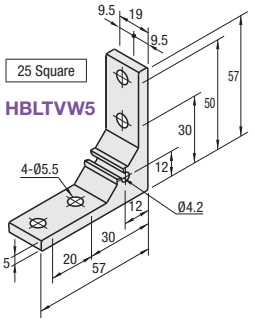
RoHS

Type	Material	Surface Treatment
HBLTSW5 HBLTVW5	EN AC-51400/ ALMGSI0,7-T5	Anodize

HBLTSW5



HBLTVW5



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTSW5	26	CBM5-10	4	HNTT5-5	4	1176		
HBLTVW5	36							

Features: Extruded Brackets Unequal Sides. Effective when strength is required in the narrow clearances between extrusions.

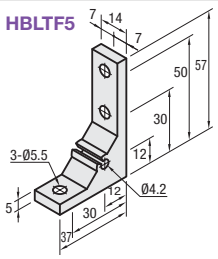
Scalene Brackets



RoHS

Type	Material	Surface Treatment
HBLTF5	EN AC-51400/ALMGSI0,7-T5	Anodize

HBLTF5



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTF5	21	CBM5-10	3	HNTT5-5	3	1004		

Order Example

Part Number
HBLTSW5

Days to Ship

6 Days P.87 2 Days

Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLTF5 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds taps on a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM)	HBLTS5	0,30
			HBLTS5-4	
			CHBLTS5	0,50
			HBLTV5	0,40
			HBLTVB5	
			HBLUS5	0,30
			HBKTS5	
			HBKUS5	
			HBLUS5	
			HBLTH5	
			HBLTHB5	
			HBLTSW5	
			HBLTVW5	0,40
			HBLTF5	0,30

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Pre-assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)	HBLTS5	0,82	0,60	1,06	1,64	1,06	1,24	1,24
			HBLTS5-4							
			HBLTSB5	0,87	-	1,11	-	1,11	-	
			CHBLTS5	0,82	0,60	1,06	1,64	1,06	1,24	1,24
			HBLTV5							
			HBLTVB5	0,87	-	1,11	-	1,11	-	
			HBKTST5	0,82	0,60	1,06	1,64	1,06	1,24	1,24
			HBKTS5							
			HBKTSB5	0,87	-	1,11	-	1,11	-	
			HBLUS5	0,84	0,60	1,08	1,64	1,08	1,24	1,28
			HBKUS5							
			HBKUSB5	0,89	-	1,13	-	1,13	-	
			HBLTH5	0,82	0,60	1,06	1,64	1,06	1,24	1,24
			HBLTHB5	0,87	-	1,11	-	1,11	-	
			HBLTSW5	1,64	1,20	2,12	3,28	2,12	2,48	-
			HBLTVW5							
			HBLTF5	1,23	90	1,62	2,46	1,62	1,86	1,86

(Ex.) When HBLTS5 is specified,

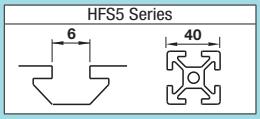
Code	Screws	Nuts
SET	CBM5-10	HNTT5-5
	SCB5-10	HNTBS5-5
SEU	CBM5-10	HNTU5-5
SSU	SCB5-10	SHNTU5-5
SEP	CBM5-10	HNTP5-5
SSP	SCB5-10	SHNTP5-5
SEC	HCBST5-12	HNTT5-5

When specifying other than HBLTS5, check for the applicable screws and nuts.

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 2-slots-

-Slot Type: HFS5 Series (Aluminum Frames 40 Square)-



CAD Data

Features: Extrusions with 2-slots (HFS5-4040, etc.) can be connected with one bracket.

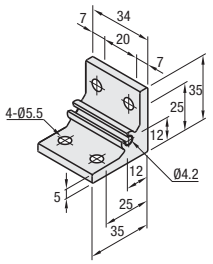
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTD5	EB AC-51400/ AlMgSi0,7-T5	Clear Anodize
HBLTDB5		Black Anodize
CHBLTD5		Clear Coating Clear Anodize + clear coating film

HBLTD5
HBLTDB5
(Black Anodize)
CHBLTD5
(Clear Coating)

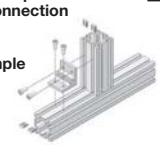


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTD5	36	CBM5-10	4	HNTT5-5	4	1470		
HBLTDB5 *(Black Anodize)								
CHBLTD5 (Clear Coating)								

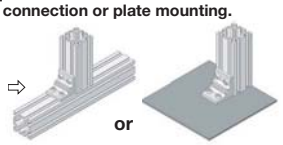
*For repairing black anodizing, refer to **P.748**

Example of HBLTD Connection

ex Example



Can be used for extrusion connection or plate mounting.



Features: Increased strength Thick Brackets. Recommended for enhancing the strength without increasing procedural steps.

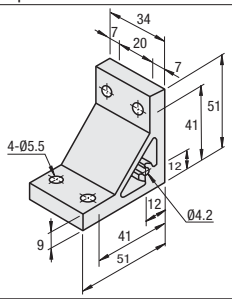
Ultra Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLUD5	EB AC-51400/ AlMgSi0,7-T5	Clear Anodize
HBLUDB5		Black Anodize

HBLUD5
HBLUDB5
(Black Anodize)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUD5	75	CBM5-14	4	HNTT5-5	4	1470		
HBLUDB5 *(Black Anodize)								

*For repairing black anodizing, refer to **P.748**

Features: Brackets for 2-slots with twice as many screws. Extrusions can be connected more securely.

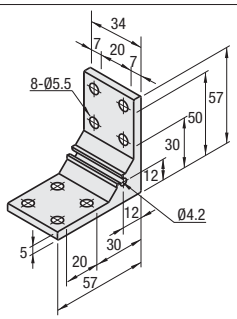
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTDW5	EB AC-51400/ AlMgSi0,7-T5	Clear Anodize

HBLTDW5



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTDW5	59	CBM5-10	8	HNTT5-5	8	2156		

Order Example: Part Number → HBLTD5

Days to Ship: 6 Days P.87

Alterations: Part Number HBLTD5 - (C • SET • SST • SEU • SSU • SEP • SSP • SEC) SET

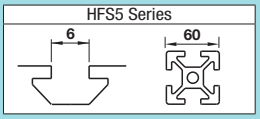
Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds taps on a bracket for cover mounting. (M5 on Both Sides, Depth 15mm) (Mounting screw **P.644** HCBM)	HBLTD5	0,30
			CHBLTD5	0,50
			HBLTDW5	0,30
			HBLUD5	0,20

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTD5 is specified, Code: SET — Screws: CBM5-10 — Nuts: HNTT5-5; SCB5-10 — HNTTBS5-5; SEU — CBM5-10 — HNTU5-5; SSU — SCB5-10 — SHNTU5-5; SEP — CBM5-10 — HNTP5-5; SSP — SCB5-10 — SHNTP5-5; SEC — HCBST5-12 — HNTT5-5. When specifying other than HBLTD5, check for the applicable screws and nuts.	HBLTD5	1,64	1,20	2,12	3,28	2,12	2,48	2,48
			HBLTDB5	1,84	-	2,32	-	2,32	-	-
			CHBLTD5	1,64	1,20	2,12	3,28	2,12	2,48	2,48
			HBLTDW5	3,28	2,40	4,24	6,56	4,24	4,96	-
			HBLUD5	1,68	1,20	2,16	3,28	2,16	2,48	2,52
			HBLUDB5	1,88	-	2,36	-	2,36	-	-

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 3-slots-

-Slot Type: HFS5 Series (Aluminum Frames 60 Square)-

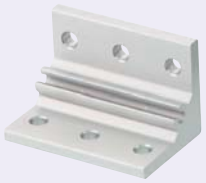


CAD Data

Features: Extrusions with 3-slots (HFS5-2060, etc.) can be connected with one bracket.

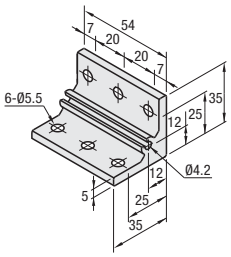
Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLTT5	EB AC-51400/ AlMgSi0,7-T5	Clear Anodize

HBLTT5



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTT5	60	CBM5-10	6	HNTT5-5	6	1960		

Features: Numbers of screws are the same as HBLTT5. Extrusions can be connected more securely.

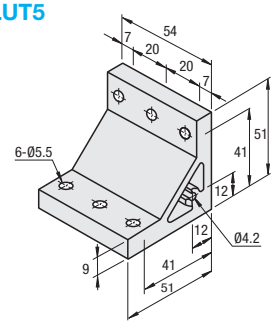
Ultra Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLUT5	EB AC-51400/ AlMgSi0,7-T5	Clear Anodize

HBLUT5



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUT5	119	CBM5-14	6	HNTT5-5	6	1960		

Features: Brackets for 3-slots with twice as many screws. Extrusions can be connected more securely.

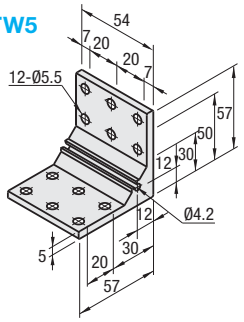
Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLTTW5	EB AC-51400/ AlMgSi0,7-T5	Clear Anodize

HBLTTW5



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTTW5	96	CBM5-10	12	HNTT5-5	12	2940		

Order Example: Part Number **HBLTT5**

Days to Ship: **6 Days** P.87

Alterations: Part Number HBLTT5 - (C • SET • SST • SEU • SSU • SEP • SSP • SEC) SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds taps on a bracket for cover mounting. (M5 on Both Sides, Depth 15mm) (Mounting screw **P.644** HCBM)	HBLTT5 HBLUT5 HBLTTW5	0,30

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTT5 is specified, Code: SET — Screws: CBM5-10 — Nuts: HNTT5-5 SCB5-10 — HNTTBS5-5 SEU — CBM5-10 — HNTU5-5 SSU — SCB5-10 — SHNTU5-5 SEP — CBM5-10 — HNTP5-5 SSP — SCB5-10 — SHNTP5-5 SEC — HCBST5-12 — HNTT5-5 When specifying other than HBLTT5, check for the applicable screws and nuts.	HBLTT5	2,25	1,80	2,97	4,92	2,97	3,72	3,51
			HBLUT5	2,52	1,90	3,24	5,02	3,24	3,82	3,78
			HBLTTW5	4,92	3,60	6,36	9,84	6,36	7,44	-

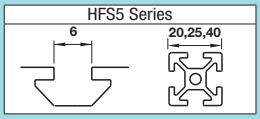
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Brackets -Thin Brackets-

-Slot Type: HFS5 Series (Aluminum Frames 20 · 25 · 40 Square)-

Price Reduction 10%

HFS5 Series



CAD Data

Features: Thin Extruded Brackets. Space saving design.

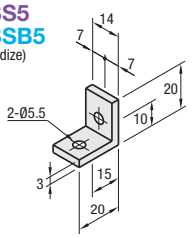
Thin Brackets

RoHS

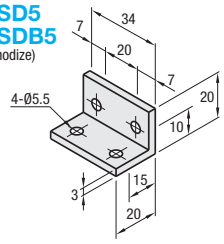


Type	Material	Surface Treatment
HBLS_5	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize
HBLS_B5		Black Anodize

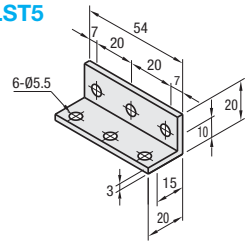
HBLSS5
HBLSSB5
(Black Anodize)



HBLSD5
HBLSDB5
(Black Anodize)



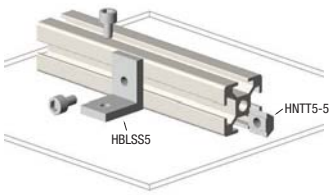
HBLST5



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLSS5	3.8	CBM5-8	2	HNTT5-5	2	686		
HBLSSB5* (Black Anodize)								
HBLSD5	10		4		4	1176		
HBLSDB5* (Black Anodize)								
HBLST5	15		6		6	1617		

*For repairing black anodizing, refer to **P.748**

ex. Example



Features: Thin Brackets with tabs to fit extrusions and stop when tightening. Excels in work efficiency.

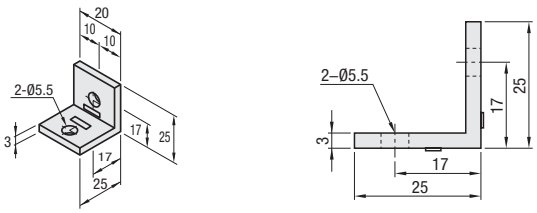
Thin Stainless Steel Tabbed Brackets

RoHS



Type	Material	Surface Treatment
HBLSP5	1.4301/X5CrNi18-10	-

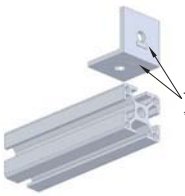
HBLSP5



Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLSP5	10	CBM5-8	2	HNTT5-5	2	686		

ex. Example

Features of HBLSP (Slot Stainless Steel Brackets with tabs)



Tab fits into the groove.
*There are tabs for putting slot.
(Depth: 0.9mm)

Order Example

Part Number
HBLST5

Days to Ship

6	Days
2	Days

P.87

Alterations

Part Number - (SET · SST · SEU · SSU · SEP · SSP)
HBLST5 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)	HBLSS5	0,82	0,60	1,06	1,64	1,06	1,24
			HBLSSB5	0,92	-	1,16	-	1,16	-
			HBLBL5	0,82	0,60	1,06	1,64	1,06	1,24
			HBLSDB5	1,02	-	1,26	-	1,26	-
			HBLSD5	1,64	1,20	2,12	3,28	2,12	2,48
			HBLST5	2,25	1,80	2,97	4,32	2,97	3,12
			HBLSP5	0,82	0,60	1,06	1,64	1,06	1,24

(Ex.) When HBLSS5 is specified,

CODE	Screws	Nuts
SET	CBM5-8	HNTT5-5
SST	SCB5-8	HNTTBS5-5
SEU	CBM5-8	HNTU5-5
SSU	SCB5-8	SHNTU5-5
SEP	CBM5-8	HNTP5-5
SSP	SCB5-8	SHNTP5-5

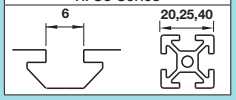
When specifying other than HBLSS5, check for the applicable screws and nuts.

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Brackets -Block Brackets · Brackets for Reinforcement · Plate Brackets-

-Slot Type: HFS5 Series (Aluminum Frames 20 · 25 · 40 Square)-

HFS5 Series



CAD Data

Features: These brackets do not protrude from the widths of the extrusions when used for cross connecting. Space-saving design compared to Tabbed Reversal Brackets.

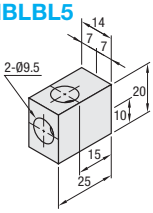
Block Brackets

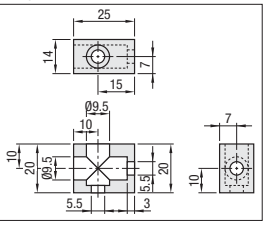
RoHS



Type	Material	Surface Treatment
HBLBL5	EN AW-6063/ AlMg0,7Si	Anodize

HBLBL5





Part Number / Type	Mass (g)	Applicable Screw: Screw	Applicable Screw: Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLBL5	13	CBM5-8	2	686		

Order Example: Part Number HBLBL5

Days to Ship: 6 Days P.87

Features: Reinforcement Brackets machined from extrusions. Usable on locations needing more strength after connecting with brackets.

Brackets for Reinforcement

RoHS

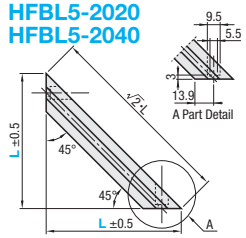


For * part, use other brackets to fix.

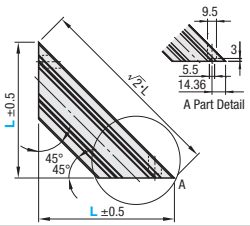
Type	Material	Surface Treatment
HFBL5	EN AC-51400/AlMgSi0,7-T5	Clear Anodize

(No surface treatment on 45 ° cut ends and counterbores.)

HFBL5-2020
HFBL5-2040



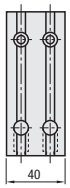
HFBL5-4020



<Front View>
HFBL5-2020
HFBL5-4020



<Front View>
HFBL5-2040



Part Number Type	Part Number No.	L 1mm Increment	Applicable Screw · Nut: Screw	Qty.	Nut	Qty.	L100~300: € Unit Price 1~4 pcs.	L100~300: Volume Discount 5~20	L301~500: € Unit Price 1~4 pcs.	L301~500: Volume Discount 5~20
HFBL5	2020	100~500	CBM5-8	2	HNTT5-5	2				
	2040			4		4				
	4020			2		2				

Order Example: Part Number HFBL5-2020 - L 300

Days to Ship: 8 Days

Alterations

Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLBL5 is specified,	HBLBL5	0,82	0,60	1,06	1,64	1,06	1,24
			HFBL5-2020	1,42	1,20	1,66	2,24	1,66	2,24
			HFBL5-2040	2,24	1,80	2,26	2,84	2,26	2,84
			HFBL5-4020	1,42	1,20	1,66	2,24	1,66	2,24

CODE	Screws	Nuts
SET	CBM5-8	HNTT5-5
SST	SCB5-8	HNTTBS5-5
SEU	CBM5-8	HNTU5-5
SSU	SCB5-8	SHNTU5-5
SEP	CBM5-8	HNTP5-5
SSP	SCB5-8	SHNTP5-5

When specifying other than HBLBL5, check for the applicable screws and nuts.

⊗ A set of mounting screws and nuts is not available for black anodized parts.
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Features: Direct bolt-on brackets to use on tapped extrusions.

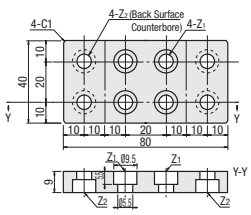
Plate Brackets

RoHS



Type	Material	Surface Treatment
HBLPL5	1.0038/S235JR	Electroless Nickel Plating

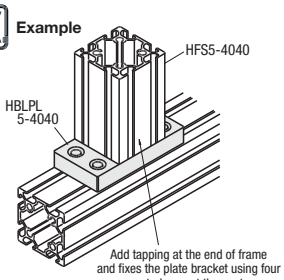
HBLPL5-4040



Order Example: Part Number HBLPL5 - Extrusions 4040

Days to Ship: 8 Days

Example



Part Number Type	Extrusions	Z1 Applicable Screw	Z2 Applicable Screw	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HBLPL5	4040	M5	M5	210		

Alterations

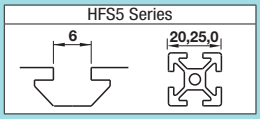
Part Number HBLPL5 - Extrusions 4040 - (DC) DC10

10 Days

Alteration	Code	Spec.	Price Adder
Through Hole 	DC	Add a through hole. DC=Hole Dia. 1 mm Increment 10≤DC≤20 Ordering Code DC12	6,00

Brackets -Angled Brackets-

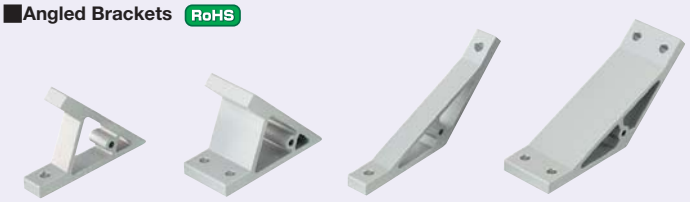
-Slot Type: HFS5 Series (Aluminum Frames 20 Square · 40 Square)-



CAD Data

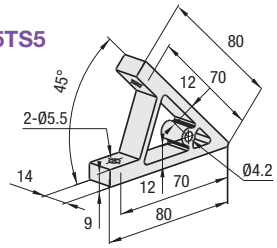
Features: Extruded Brackets to connect extrusions at angles.

Angled Brackets RoHS

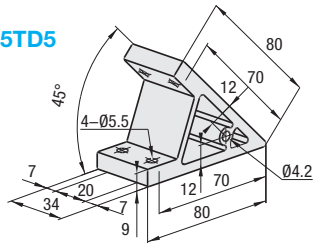


Type	Material	Surface Treatment
HBL45T_5 HBL135T_5	EB AC-51400/ AlMgSi0,7-T5	Clear Anodize

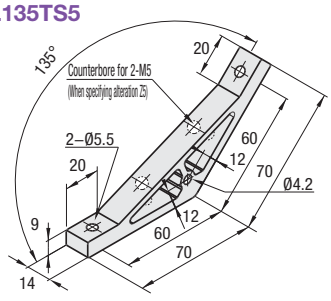
HBL45TS5



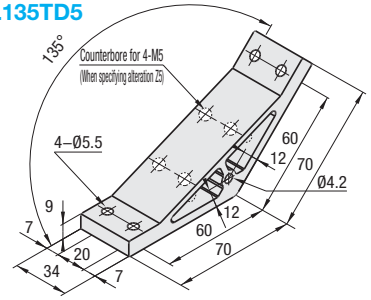
HBL45TD5



HBL135TS5



HBL135TD5



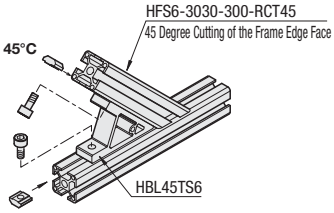
Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBL45TS5	41	CBM5-14	2	HNTT5-5	2	833		
HBL45TD5	100		4		4	1470		
HBL135TS5	48		2		2	833		
HBL135TD5	118		4		4	1470		

Order Example — Part Number: HBL45TS5

Days to Ship — 6 Days | 2 Days P.87

Example

Example of use: 45°C Angle Brackets



Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · Z5)
HBL45TS5 - SET

Z5 only (Products except Z5 are in stock.)

8 Days

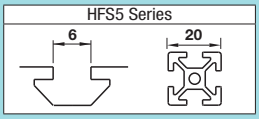
Alterations	Code	Spec.	Applicable Brackets	Price Adder					
Mounting Holes for Cover	C	Adds taps on a bracket for cover mounting. (M5 on Both Sides, Depth 15mm) (Mounting screw P.644 HCBM)	HBL45TS5 HBL135TS5	0,30					
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU0 (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBL45TS5 is specified, Code: SET / SST / SEU / SSU / SEP / SSP Screws: CBM5-14 / SCB5-14 / CBM5-14 / SCB5-14 / CBM5-14 / SCB5-14 Nuts: HNTT5-5 / HNTTBS5-5 / HNTU5-5 / SHNTU5-5 / HNTP5-5 / SHNTP5-5 When specifying other than HBL45TS5, check for the applicable screws and nuts.		SET	SST	SEU	SSU	SEP	SSP
			HBL45TS5	0,84	0,92	1,08	1,88	1,08	1,48
			HBL45TD5	1,68	1,84	2,16	3,92	2,16	3,12
			HBL135TS5	0,84	0,92	1,08	1,88	1,08	1,48
			HBL135TD5	1,68	1,84	2,16	3,92	2,16	3,12
Machines 2 counterbored holes on 135 degree bracket	Z5	Machines 2 counterbored holes on 135 degree bracket HBL135T_5. (Applicable screws: M5) 8 Days Combination with SET · is not available.	HBL135TS5	1,60					
			HBL135TD5	3,20					

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Corner Brackets · Corner Blind Brackets

-Slot Type: HFS5 Series (Aluminum Frames 20 Square)-

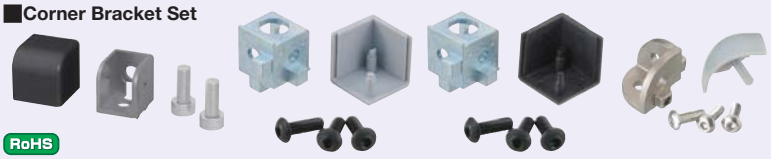
HFS5 Series



CAD Data

Features: A bracket can connect extrusions in 2 and 3-ways.

Corner Bracket Set



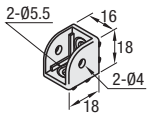
RoHS

Type	Material	Surface Treatment
HBLCS5	(1) EN AC-46100 (2) Polyamide	-
HBLCR5	(1)ZC0400/ZnAl4 (2) Polyamide	
HBLCD5	(1)1.4308/G-X6CrNi18-9 (2) Polyamide	

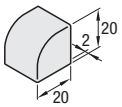
Two-Way Type

HBLCS5-B (Cap: Black)

(1)



(2) Cap for Corner Brackets



(Included: Low Head Cap Screws 2 pcs.)

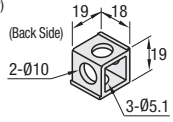
Three-Way Type

HBLCR5-B (Cap: Black)
HBLCR5-S (Cap: Gray)

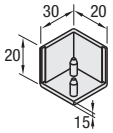
(1) (Front Side)



(Back Side)



2. Cap for Corner Brackets

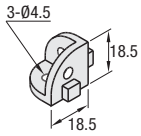


(Included: Button Head Cap Screws 3 pcs.)

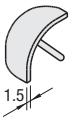
As HBLCR5-_ is zinc die cast, keep under 100°C temperature.

HBLCD5-S (Cap: Gray)

(1)



(2) Cap for Corner R Brackets

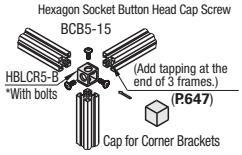


(Included: Button Head Cap Screws 3 pcs.)

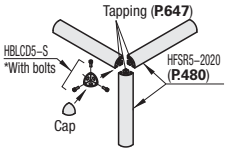
Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.		1~99 pcs.	100~
HBLCS5-B	8	CBS5-16	2	400		
HBLCR5-B	25	BCB5-15	3	676		
HBLCR5-S						
HBLCD5-S	18	Button Head Cap Screw M4 x 12	3	774		

Example

Example of use: Corner Brackets HBLCR



Example of use: R Frame



Order Example

Part Number
HBLCD5-S

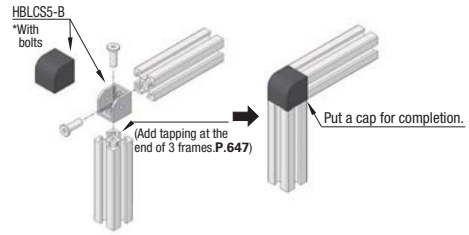
Days to Ship

6 Days

2 Days

P.87

Example of use: Corner Bracket HBLCS



Features: Brackets to be inserted into extrusion slots, can also function as rame end caps.

Corner Blind Brackets

RoHS

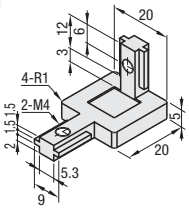


Type	Material	Surface Treatment
HBLBC_5	1.1191/C45E	Trivalent Chromate
SHBLBC_5	1.4308/G-X6CrNi18-9	-

Two-Way Type

HBLCA5
SHBLCA5
(Stainless Steel)

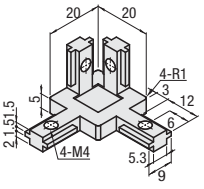
Not applicable to Aluminum Frames 25 Square and 40 Square.



Three-Way Type

HBLCB5
SHBLCB5
(Stainless Steel)

Not applicable to Aluminum Frames 25 Square and 40 Square.



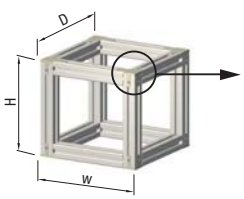
Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.		1~99 pcs.	100~
HBLBCA5	21	Set Screw M4 x 5	2	196		
SHBLBCA5 (Stainless Steel)						
HBLBCB5	26		4	620		
SHBLBCB5 (Stainless Steel)						

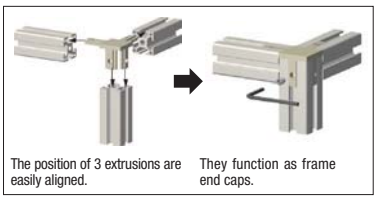
Example

Example of use: Corner Blind Brackets

Length of extrusion fitted like below (mm)

- Extrusion length L used for W
  L=W-(Extrusion Thickness x2)
- Extrusion length L used for D
  L=D-L=D-(Extrusion Thickness x2)X
- Extrusion length L used for H
  L=H-10
  (Thickness of corner blind brackets x Upper and Lower 2 pcs.)





The position of 3 extrusions are easily aligned.

They function as frame end caps.

Order Example

Part Number
SHBLBCA5

Days to Ship

6 Days

2 Days

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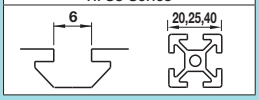
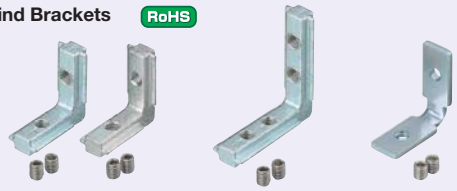
Brackets · Blind Brackets · Free Angle Brackets
-Slot Type: HFS5 Series (Aluminum Frames 20 · 25 · 40 Square)-

HFS5 Series



Features: No need for alterations to mount on extrusions. Brackets can be hidden inside of the slot.

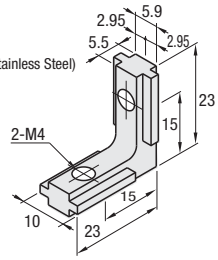
Blind Brackets RoHS



Type	M Material	S Surface Treatment
HBLBS5	1.1191/C45E	Trivalent Chromate
SHBLBS5	1.4308/G-X6CrNi18-9	-
HBLBSL5	1.1191/C45E	Trivalent Chromate
HBLPBS5	1.0330/DC01	

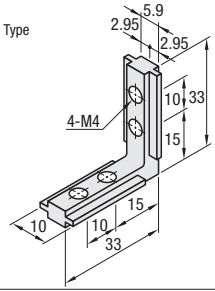
Blind Brackets

HBLBS5
SHBLBS5(Stainless Steel)



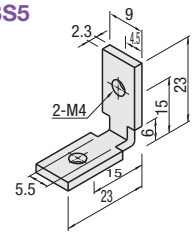
Blind Brackets / Long Type

HBLBSL5



Sheet Metal Blind Brackets

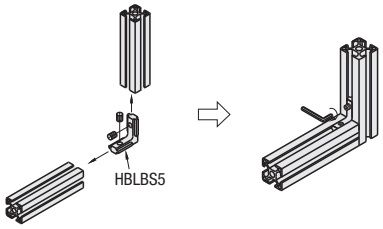
HBLPBS5



Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.		1~99 pcs.	100~
HBLBS5	11	Set Screw M4 x 5	2	196		
SHBLBS5 (Stainless Steel)						
HBLBSL5	17		4	274		
HBLPBS5	6		2	190		

Example

How to Use Blind Brackets



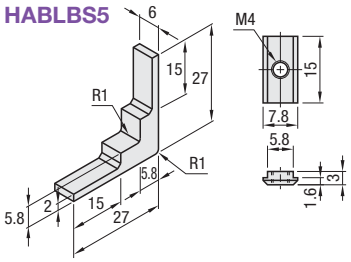
Features: Post-Assembly Insertion Type for Blind Brackets.

Post-Assembly Insertion Blind Brackets RoHS



Type	Components	M Material	S Surface Treatment
HABLBS5	Post-Assembly Insertion BB Body	1.4308/ G-X6CrNi18-9	-
	Post-Assembly Insertion BB Nut	1.4301/ X5CrNi18-10 Sintered Alloy	
	Set Screw	1.4301/ X5CrNi18-10	

HABLBS5



Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.		1~99 pcs.	100~
HABLBS5	11	Nut · Set Screw M4 x 3	2	190		

Order Example

Part Number
HBLBS5

Days to Ship

6 Days

2 Days

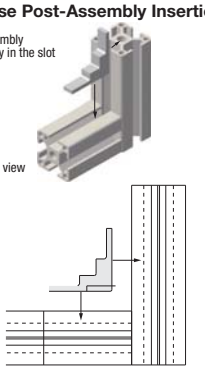
P.87

Example

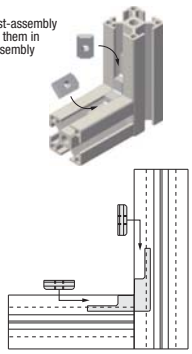
How to Use Post-Assembly Insertion Blind Brackets

(1) Fit the post-assembly insertion BB body in the slot of extrusions.

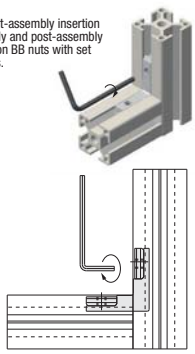
Side view



(2) Tilt two pieces of post-assembly insertion nuts and fit them in both ends of post-assembly insertion BB body.



(3) Fix post-assembly insertion BB body and post-assembly insertion BB nuts with set screws.



Features: Extrusions can be connected at any arbitrary angle.

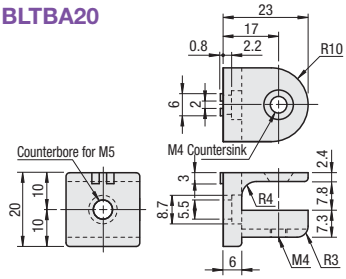
Free Angle Brackets

RoHS

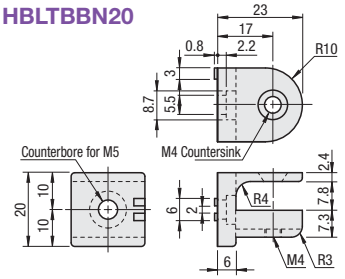


Type	Material	Surface Treatment
HBLTBA20	EN AC-46100/G-AlSi12Cu	-
HBLTBBN20		
Included Screws	1.7220/34CrMo4	Trivalent Chromate

HBLTBA20



HBLTBBN20

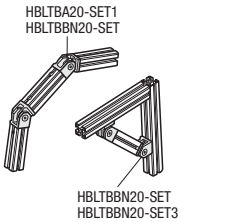


Part Number	Applicable Extrusion	Mass (g)	Included Hexagon Socket Flat Head Cap Screw (1 pc.)	€ Unit Price 1~14 pcs.	Volume Discount 15~
HBLTBA20	20 square (HFS5)	10.8	M4x6		
HBLTBBN20					

Order Example Part Number: HBLTBA20

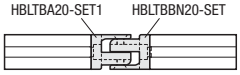
Days to Ship 6 Days P.87

Example



(1) Connection of Two End Sections

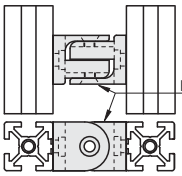
The method of connecting two end sections of extrusions is to add taps to the extrusions.
Either HBLTBA20 or HBLTBBN20 can be used for connection.



(2) Connection of Two Extrusion Side Faces (HBLTBA20 Connection)

Anti-spin protrusion is shown in the right figure. Connect two extrusions side to side with HBLTBA20, screws and nuts.

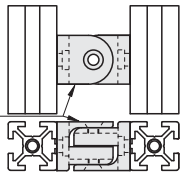




(3) Connection of Two Extrusions Side Faces (HBLTBBN20 Connection)

Anti-spin protrusion is shown in the right figure.Connect two extrusions side to side with HBLTBBN20, screws and nuts.





Alterations Part Number - (SET · SET1 · SET2 · SET3)
HBLTBA20 - SET2
HBLTBBN20 - SET

Alterations	Code	How to use	Part Number Type	Accessories Screw	Qty.	Nuts Pre-Assembly Insertion Double Joint	Qty.	Price Adder
Applicable Screws and Nuts come as a set.	SET	End Section Mount	HBLTBBN20	CBM5-15	1	-	-	0,15
	SET1		HBLTBA20					
	SET2	Side Mount		CBM5-8		HNTT5-5	1	0,50
	SET3		HBLTBBN20					

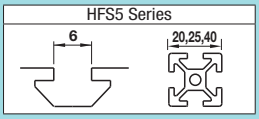
When -SET_ is specified, it is not RoHS compliant.

Other Connection Methods

Mounting Method	Name	Extrusion Applicability HFS5 (20 square)	HFS6 (30 square)	HFS8 (40 square)	HFS8 (45 · 50 · 60 square)	Price Low: ◎→○→Δ: High (*1)	Number of Screw Tightening (*2)	Extrusions Alteration	Materials	Example	How to Mount Listed Page
Blind Joints	Tapping Joint	Applicable	Applicable	Applicable	-	◎	One	Provided	JIS SWCH18A ~C18		P.627
	Screw Joint	-			Applicable	○			1.7220/34CrMo4 1.0330/DC01		P.628
	Center Joint	Applicable				Δ			1.1191/C45E 1.7220/34CrMo4		P.629
	Post-Assy. Insertion Double Joint					Δ			1.4308/G-X6CrNi18-9 1.4301/X5CrNi18-10rNi18-9		P.631
	Simple Joint	-		-	-	○			1.1191/C45E 1.7220/34CrMo4		P.633
	Single Joint			Applicable	Applicable	○			1.0038/S235JR / 1.4401/X5CrNiMo17-12-2 1.0330/DC01 / 1.4301/X5CrNi18-10		P.635
	Pre-Assy. Insertion Double Joint					Δ	Two		1.4401/X5CrNiMo17-12-2 1.4301/X5CrNi18-10		P.637
	Parallel Joint	Applicable			-	Δ	One		JIS SCSB 1.7220/34CrMo4		P.639

*1The price is a sum of bracket (blind joint) +screw+pre-assembly insertion nut+alteration.
*2 The "Number of Screws" shown are for one bracket (blind joint), used for connecting HFS6-3030 extrusions.

Sheet Metal
-HFS5 Series-



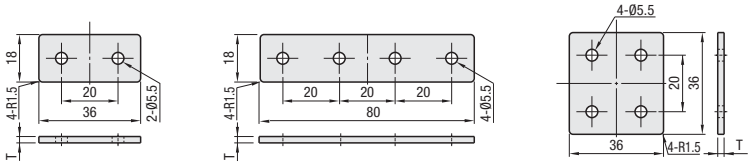
Features: Can be used for reinforcement of connecting extrusions.



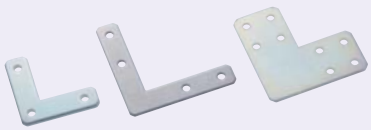
Type	Material	Surface Treatment
HPTSS, HPTSSL, HPTSD	1.0320/St.22	Carbon Steel Bright Chromate Plating
SHPTSS, SHPTSSL, SHPTSD	1.4301/ X5CrNi18-10	-

RoHS
Not RoHS compliant

HPTSS5 SHPTSS5 / HPTSSL5 SHPTSSL5 / HPTSD5 SHPTSD5



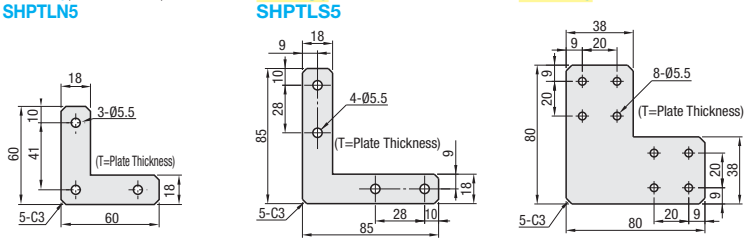
Part Number	Mass (g)	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nut	Qty.	1~99 pcs.	100~
HPTSS5	11	2.3	M5-8	2	M5	2		
SHPTSS5		2						
HPTSSL5	22	2.3		4		4		
SHPTSSL5		2						
HPTSD5	21	2.3						
SHPTSD5		2						



Type	Material	Surface Treatment
HPTLN	1.0320/St.22	Trivalent Chromate
HPTLS, HPTLD	1.0320/St.22	Carbon Steel Bright Chromate Plating
SHPTLN	1.4301/ X5CrNi18-10	-
SHPTLS		

RoHS
Not RoHS compliant

HPTLN5 (Trivalent Chromate) SHPTLN5 / HPTLS5 SHPTLS5 / HPTLD5



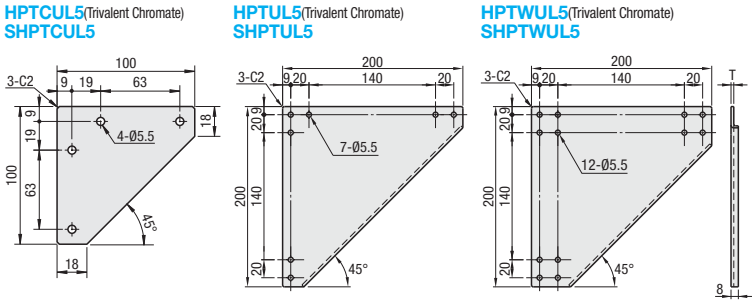
Part Number	Mass (g)	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nut	Qty.	1~99 pcs.	100~
HPTLN5	41	3.2	M5-8	3	M5	3		
SHPTLN5		2						
HPTLS5	46	3.2		4		4		
SHPTLS5		2		4		4		
HPTLD5	81	2.3		8		8		



Type	Material	Surface Treatment
HPTCUL, HPTUL, HPTWUL	1.0320/St.22	Trivalent Chromate
SHPTCUL, SHPTUL, SHPTWUL	1.4301/ X5CrNi18-10	-

RoHS

HPTCUL5 (Trivalent Chromate) SHPTCUL5 / HPTUL5 (Trivalent Chromate) SHPTUL5 / HPTWUL5 (Trivalent Chromate) SHPTWUL5



Part Number	Mass (g)	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nut	Qty.	1~99 pcs.	100~
HPTCUL5	95	2.3	M5-8	4	M5	4		
SHPTCUL5	95	2		4		4		
HPTUL5	380	2.3		7		7		
SHPTUL5		2						
HPTWUL5	378	2.3		12		12		
SHPTWUL5		2						

Alterations

Part Number - (SET)
HPTSS5 - SET

When -SET is specified, it is not RoHS compliant.

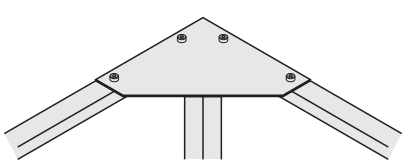
Alteration	Code	Spec.	Plates · Brackets	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.	HPTSS5	0,85
			SHPTSS5	1,00
			HPTSSL5	1,70
			SHPTSSL5	2,00
			HPTSD5	1,70
			SHPTSD5	2,00
			HPTLN5	1,25
			SHPTLN5	1,50
			HPTLS5	1,70
			SHPTLS5	2,00
			HPTLD5	3,40
			HPTCUL5	1,70
			SHPTCUL5	2,00
			HPTUL5	2,95
			SHPTUL5	3,50
			HPTWUL5	5,10
			SHPTWUL5	6,00

Materials	Set
1.0320	Screws: CBM, Nuts: HNTT
1.4301	Screws: SCB, Nuts: HNTTSN

Order Example Part Number: HPTSS5

Days to Ship 6 Days P.87

Example

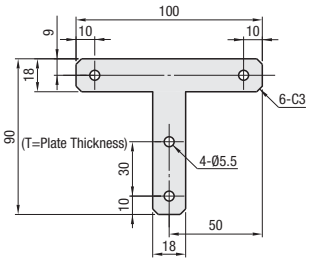




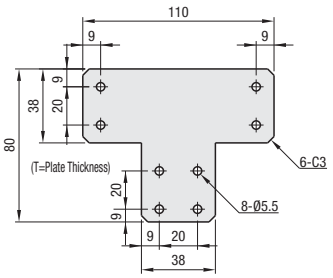
RoHS
Not RoHS compliant

Type	Material	Surface Treatment
HPTTS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTTD		
SHPTTS	1.4301	-

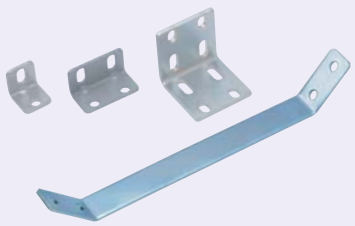
HPTTS5
SHPTTS5



HPTTD5



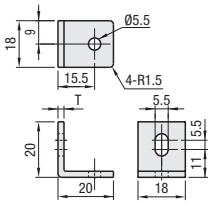
Part Number	Mass (g)	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nut	Qty.	1~99 pcs.	100~
HPTTS5	52	3.2	M5-8	4	M5	4		
SHPTTS5		2		4		4		
HPTTD5	97	2.3		8		8		



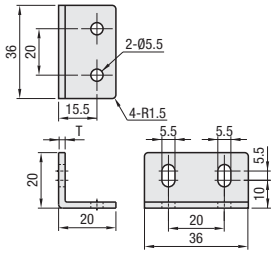
RoHS
Not RoHS compliant

Type	Material	Surface Treatment
HPTBS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTBD		
HPTBDW		
HPTGS		
SHPTBS	1.4301/ X5CrNi18-10	-
SHPTBD		
SHPTBDW		

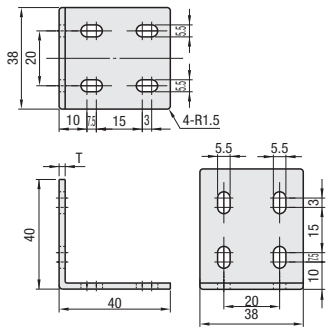
HPTBS5
SHPTBS5



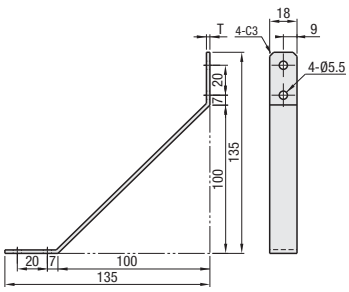
HPTBD5
SHPTBD5



HPTBDW5
SHPTBDW5



HPTGS5



Part Number	Mass (g)	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nut	Qty.	1~99 pcs.	100~
HPTBS5	10	2.3	M5-8	2	M5	2		
SHPTBS5		2						
HPTBD5	21	2.3		4		4		
SHPTBD5		2						
HPTBDW5	58	3.2		8		8		
SHPTBDW5		3						
HPTGS5	64	2.3		4		4		

Alterations

Part Number - (SET)
HPTTD5 - SET

When -SET is specified, it is not RoHS compliant.

Alteration	Code	Spec.		Plates· Brackets	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.		HPTTS5	1,70
		Materials	Set	SHPTTS5	2,00
		1.0320/ St.22	Screws: CBM	HPTTD5	3,40
			Nuts: HNTT	HPTBS5	0,85
		1.4301	Screws: SCB	SHPTBS5	1,00
			Nuts: HNTTSN	HPTBD5	1,70
				SHPTBD5	2,00
				HPTBDW5	3,40
				SHPTBDW5	4,10
				HPTGS5	1,70

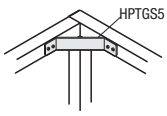
Order Example

Part Number
HPTTD5

Days to Ship

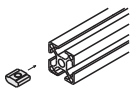
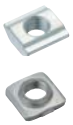
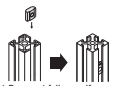
6 Days P.87

Example



Nuts for Aluminum Frames Guide

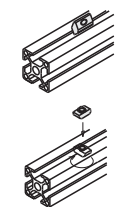
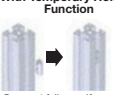
Pre-Assembly Insertion Nuts Slide the nuts into slots from the ends before assembly. Less play in the slot makes it easy to tighten the screws.

	Shapes	Product Name	Not RoHS compliant	Page	Temporary Holding Function	Price	Thread Locking	Stainless Steel Type	Applicable Stoppers
Standard 		Pre-Assembly Insertion Nuts	HNTT	500, 543, 581, 615		○			HNST/SHNST
		Pre-Assembly Insertion Nuts (Thread Locking Adhesive Type)	HNTTV	500, 543, 581, 615		△	○ (Adhesive) *1		HNST/SHNST
		Pre-Assembly Insertion Nuts (Thread Locking Resin Coating Type)	HNTTZ	500, 543, 581, 615		△	○ (Resin Coating) *2		HNST/SHNST
		Pre-Assembly Insertion Nuts Stainless Steel Sintering Type	HNTTSN	500, 543, 581, 615		○		○ (1.4401/X5CrNiMo17-12-2, Sintered)	HNST/SHNST
		Pre-Assembly Insertion Nuts Stainless Steel Type	HNTTSS	500, 543, 581, 615		△		○ (1.4305/X10CrNiS18-9)	HNST/SHNST
		Pre-Assembly Insertion Nuts Stainless Steel Sheet Metal Type	HNTTBS	500, 616		◎		○ (1.4301/X5CrNi18-10)	-
With Temporary Holding Function  * Does not fall even if a extrusion is placed vertically.		Stopper Integrated Nuts	HNTE	501, 544, 582, 616	○	○ *3			-
		Pre-Assembly Insertion Spring Nuts	HNTU	501, 544, 582, 616	○	○ *4			-
		Pre-Assembly Insertion Spring Nuts (Thread Locking Adhesive Type)	HNTUV	501, 544, 582, 616	○	△	○ (Adhesive) *1		-
		Pre-Assembly Insertion Spring Nuts (Thread Locking Resin Coating Type)	HNTUZ	501, 544, 582, 616	○	△	○ (Resin Coating) *2		-
		Pre-Assembly Insertion Spring Nuts Stainless Steel Sintering Type	SHNTU	501, 544, 582, 616	○	△		○ (1.4301/X5CrNi18-10 , Sintering)	-
Others		Pre-Assembly Insertion Lock Nuts *5	HNTC	502, 545, 583, 617		△			-
		Pre-Assembly Insertion Short Nuts *6	HNTJ	502, 545, 583, 617		△			-
		Pre-Assembly Insertion Offset Nuts *7	HNTHSN	545, 583, 617		△		○ (1.4401/X5CrNiMo17-12-2 , Sintered)	HNST/SHNST
		Pre-Assembly Insertion Square Nuts	HNKK	502, 545, 583, 617		◎			HNKKST
Long Nuts		Long Nuts	HNTLF or other	507, 550, 588, 622					-
		Long Nuts Stainless Steel Type	SHNTLF or other	507, 550, 588, 622				○ (1.4305/X10CrNiS18-9)	-

Other features

*1 Thread Locking Adhesive Type: Nuts with thread locker applied on the inside of tap. Anaerobic adhesive is used. The property decrease after once loosened.
*2 Thread Locking Resin Coating Type: Nuts with thread locking resin coated on the inside of tap. The effect lasts even after repeated tightening and loosening many times.
*3 Price of Stopper Integrated Nut: More economical than the total price of Pre-Assembly Insertion Nut HNTT and Resin Stopper HNST.
*4 Price of Pre-Assembly Insertion Spring Nut: to the total price of Pre-Assembly Insertion Nut HNTT and Resin Stopper HNST.
*5 Pre-Assembly Insertion Lock Nut: The nut can be fixed in place by tightening the included set screw.
Convenient when fixing the nuts in position by themselves for sensor mounting and removing panels repeatedly.
*6 Pre-Assembly Insertion Short Nut: The length of slot is shorter for space-saving than Pre-Assembly Insertion Nut HNTT.
*7 Pre-Assembly Insertion Offset Nuts: Hole position is offset. When connecting the extrusions at corners with Pre-Assembly Insertion Double Joint (refer to **P.637**), the nut does not protrude from the extrusion.

Post-Assembly Insertion Nuts Since the nuts can be inserted into slots at any arbitrary positions, adding is possible even after assembly.

	Shapes	Product Name	Not RoHS compliant	Page	Temporary Holding Function	Price	Thread Locking	Stainless Steel Type	Applicable Stoppers
Standard 		Post-Assembly Insertion Stopper Nuts	HNTA	503, 546, 584, 618		○			HNAST/HNBST
		Post-Assembly Insertion Stopper Nuts (Thread Locking Adhesive Type)	HNTAV	503, 546, 584, 618		△	○(Adhesive) *1		HNAST/HNBST
		Post-Assembly Insertion Stopper Nuts (Thread Locking Resin Coating Type)	HNTAZ	503, 546, 584, 618		△	○(Resin Coating) *2		HNAST/HNBST
		Post-Assembly Insertion Stopper Nuts Stainless Steel Sintering Type	HNTASN	503, 546, 584, 618		○		○ (1.4401/X5CrNiMo17-12-2, Sintered)	HNAST/HNBST
		Post-Assembly Insertion Stopper Nuts Stainless Steel Type	HNTASS	503, 546, 584, 618		△		○ (1.4305/X10CrNiS18-9)	HNAST/HNBST
		Post-Assembly Insertion Nuts	HNTF	503, 546, 584, 618		△			-
		Post-Assembly Insertion Nuts (Thread Locking Adhesive Type)	HNTFV	503, 546, 584, 618		△	○(Adhesive) *1		-
		Post-Assembly Insertion Nuts (Thread Locking Resin Coating Type)	HNTFZ	503, 546, 584, 618		△	○(Resin Coating) *2		-
		Post-Assembly Insertion Nuts Stainless Steel Sintering Type	HNTFSN	503, 546, 584, 618		△		○ (1.4401/X5CrNiMo17-12-2, Sintered)	-
With Temporary Holding Function  * Does not fall even if a extrusion is placed vertically.		Post-Assembly Insertion Nuts with Leaf Springs	HNTAP	504, 547, 585, 619	○	○ *8			-
		Post-Assembly Insertion Spring Nuts	HNTP	504, 547, 585, 619	○	○ *9			-
		Post-Assembly Insertion Spring Nuts (Thread Locking Adhesive Type)	HNTPV	504, 547, 585, 619	○	△	○(Adhesive) *1		-
		Post-Assembly Insertion Spring Nuts (Thread Locking Resin Coating Type)	HNTPZ	504, 547, 585, 619	○	△	○(Resin Coating) *2		-
		Post-Assembly Insertion Spring Nuts Stainless Steel Sintering Type	SHNTP	504, 547, 585, 619	○	△		○ (1.4401/X5CrNiMo17-12-2, Sintered)	-
Others		Post-Assembly Insertion Lock Nuts *10	HNTR	505, 548, 586, 620		△			-
		Post-Assembly Insertion Lock Nuts Stainless Steel Sintering Type *10	HNTRSN	505, 548, 586, 620		△		○ (1.4401/X5CrNiMo17-12-2, Sintered)	-
		Lock Nuts with Leaf Springs *11	HNTRP	505, 548, 586, 620	○	△			-
		Post-Assembly Insertion Short Nuts *12	HNTAJ	505, 548, 586, 620	○	△			-
Long Nuts		Long Nuts	HNTALF or other	507, 550, 588, 622					-
		Long Nuts Stainless Steel Type	SHNTALF or other	507, 550, 588, 622				○ (1.4305/X10CrNiS18-9)	-

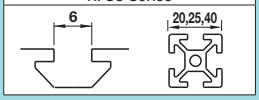
Other features

*8 Price of Post-Assembly Insertion Nut with a Leaf Spring: More economical than the total price of Post-Assembly Insertion Nut HNTA and Resin Stopper HNAST.
*9 Price of Post-Assembly Insertion Spring Nut: to the total price of Post-Assembly Insertion Nut HNTA and Resin Stopper HNAST.
*10 Post-Assembly Insertion Lock Nut: The nut can be fixed in place by tightening the included set screw.
Convenient when fixing the nuts in position by themselves for sensor mounting and removing panels repeatedly.
*11 Lock Nut with a Leaf Spring: Leaf Spring prevents the nut from slipping off from vertically-placed extrusions, making for easy nut positioning.
Also the nut can be fixed in place by tightening the included set screw.
*12 Post-Assembly Insertion Short Nut: The length of slot is short for space-savings. Convenient for installing sensors or other components closely in combination.

Pre-Assembly Insertion Nuts · Stoppers for Aluminum Frames Standard

-For HFS5 Series Aluminum Frames 20 · 25 · 40 Square-

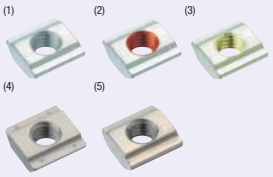
HFS5 Series



CAD Data

■Pre-Assembly Insertion Nuts

RoHS

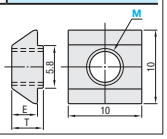


HNTT5 (1.0301/C10)
HNTTV5 (Thread Locking Adhesive · 1.0301/C10 Equivalent)
HNTTZ5 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTTSN5 (1.4401/X5CrNiMo17-12-2 · Sintering)
HNTTSS5 (1.4305/X10CrNiS18-9)

Type	Material	Surface Treatment
(1)**HNTT5** (2)**HNTTV5** (3)**HNTTZ5**	1.0301/C10	Trivalent Chromate
(4)**HNTTSN5***	1.4401/X5CrNiMo17-12-2 (Sintering)	-
(5)**HNTTSS5**	1.4305/X10CrNiS18-9	

* Electrically conductive

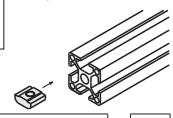
Reference Tightening Torque (N·m)	
M	1.0301 Equivalent 1.4401 (Sintering) 1.4305
5	6.8



Example

· **Pre-Assembly Insertion Nuts**
Nuts are pre-inserted in the aluminum extrusion.

HNTU	HNTUV
HNTUZ	SHNTU
HNTTBS	HNTT
HNTTV	HNTTZ
HNTTSN	HNTTSS
HNTJ	



Part Number	M	E	T	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTT5 (1.0301/C10)	3 4 5	3.3	4.1				
HNTTV5 (Thread Locking · 1.0301/C10)	5						
HNTTZ5 (Thread Locking · 1.0301/C10)	5						
HNTTSN5 (1.4401/X5CrNiMo17-12-2, Sintering)	3 4 5	3.5	4.3				
HNTTSS5 (1.4305/X10CrNiS18-9)	5	3.3	4.1				

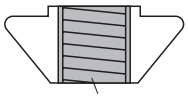
Order Example

Part Number	-	M
HNTT5	-	5

Days to Ship: 6 Days / 2 Days P.87

Bulk-packages are cost effective for in-house stock and large qty. uses. (**P.508**)

■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.
Thread Locking Adhesive is ··· A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.
Resin Coating ··· Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

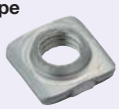
■Effect of Thread Locker (Reference)

Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	5.2N · m	-
Thread Locking Adhesive Type	· Prevents loosening effectively. · Thread locking properties are lost once loosened. · Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	7.6N · m	Test ConditionsMeasured value (HNTTV5-5) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 6.8N · m.
Thread Locking Resin Coating Type	· Can be used repeatedly. (Thread locking effect decreases after repeated use.) · Thread locking effect is immediately seen right after tightening.	6.5N · m	Thread locking effect decreases after repeated use. 5th loosening torque: 6.2N · m Measurement at HNTTZ5-5

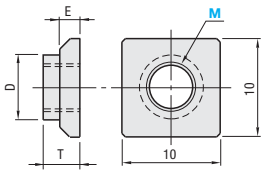
■Pre-Assembly Insertion Nuts Stainless Steel Sheet Metal Type

RoHS



M Material: 1.4301/X5CrNi18-10

HNTTBS5
(1.4301/X5CrNi18-10)



M	T	D
3	2.7	4.3
4	3.4	5.6
5	3.7	6.7

Part Number	M	E	T	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTTBS5 (1.4301/X5CrNi18-10)	3 4 5	2.0	Above Table				

Order Example

Part Number	-	M
HNTTBS5	-	5

Days to Ship: 6 Days / 2 Days P.87

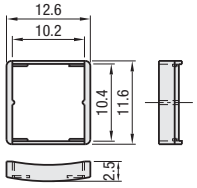
■Pre-Assembly Insertion Stoppers

RoHS

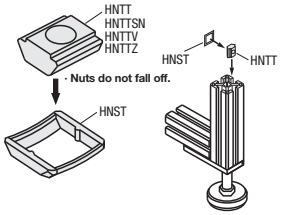


M Material: Polyamide

HNST5



Example · Hold pre-assembly insertion nuts temporarily in the extrusion.



Part Number	Applicable Pre-Assembly Insertion Nuts	Color	€ Unit Price 1~499 pcs.	Volume Discount 500~999	1000~
HNST5	HNTT5 HNTTV5 HNTTZ5 HNTTSN5 HNTTSS5	Black			

Order Example: Part Number HNST5

Days to Ship: 6 Days / 2 Days P.87

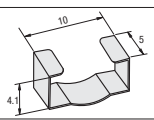
■Pre-Assembly Insertion Metal Stoppers

RoHS

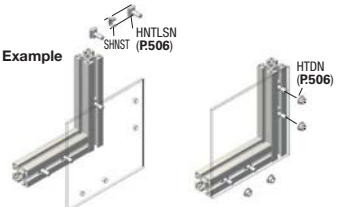


M Material: 1.4319/X3CrNiN17-8

SHNST5



Example



* Can be used with Pre-Assembly Insertion Bolts.

Part Number	Applicable Pre-Assembly Insertion Nuts	€ Unit Price 1~499 pcs.	Volume Discount 500~999	1000~
SHNST5	HNTT5 HNTTV5 HNTTZ5 HNTTSN5 HNTTSS5			

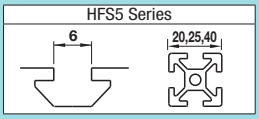
Order Example: Part Number SHNST5

Days to Ship: 6 Days / 2 Days P.87

Pre-Assembly Insertion Nuts · Stoppers for Aluminum Frames With Temporary Holding Function

-For HFS5 Series Aluminum Frames 20 · 25 · 40 Square-

HFS5 Series



CAD Data

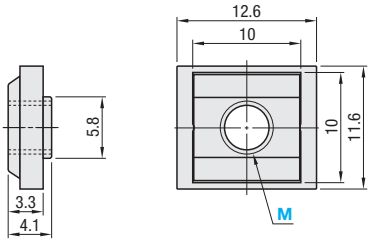
■Stopper Integrated Nuts

RoHS



M Material: Body: 1.0301/C10 Stopper: Polyamide
S Surface Treatment: Trivalent Chromate Plating

HNTE5



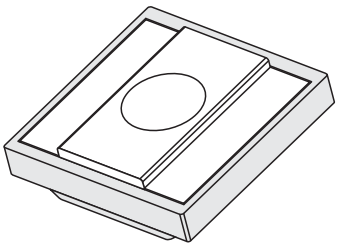
M	Reference Tightening Torque (N·m) 1.0301/C10 1.4301/X5CrNi18-10 (Sinterin)
5	6.8

Part Number	M	€ Unit Price	Volume Discount		
		1~499 pcs.	500~749	750~999	1000~
HNTE5	3 4 5				

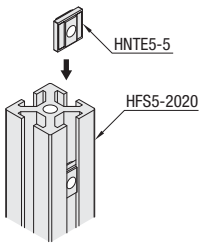
Order Example: Part Number HNTE5 - M 5

Days to Ship: 6 Days P87

Example



Integrated Pre-Assembly Insertion Nuts and Stoppers.



The nuts do not slip off even inserted into the vertically-placed extrusions.

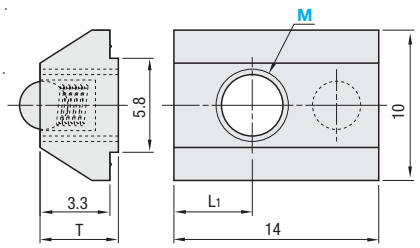
■Pre-Assembly Insertion Spring Nuts

RoHS



HNTU5(1.0301/C10)
HNTUV5
(Thread Locking Adhesive Type · 1.0301/C10)
HNTUZ5
(Thread Locking Resin Coating · 1.0301/C10 Equivalent)
SHNTU5
(1.4301/X5CrNi18-10)

Type	M Material Body	Ball	Spring	S
(1) HNTU5 (2) HNTUV5 (3)HNTUZ5	1.0301/C10	1.4301/X5CrNi18-10	JIS SWP-A	Trivalent Chromate
(4)SHNTU5	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10	1.4301-WP8	-



M	Reference Tightening Torque (N·m) 1.0301/C10 1.4301/X5CrNi18-10 (Sinterin)
5	6.8

Part Number	M	T	L1	€ Unit Price	Volume Discount		
				1~499 pcs.	500~749	750~999	1000~
HNTU5(1.0301/C10)	3 4 5	4.1	4.5				
HNTUV5 (Thread Locking · 1.0301/C10)	5						
HNTUZ5 (Thread Locking · 1.0301/C10)	5						
SHNTU5(1.4301/X5CrNi18-10)	3 4 5	4.7	3.5				

Order Example: Part Number HNTU5 - M 5

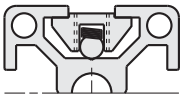
Days to Ship: 6 Days P87 / 2 Days

Bulk-packages are cost effective for in-house stock and large qty. uses. (P508)

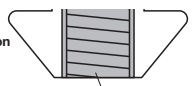
Example

- Does not fall even if a extrusion is placed vertically.

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.



■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.

Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening.
Note that it requires a hardening time (72 hours at room temperature 25°C).
The adhesive property is lost once loosened.

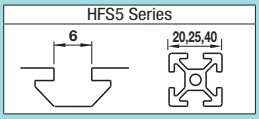
Resin CoatingResin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

■Effect of Thread Locker (Reference) Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	5.2N·m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	7.6N·m	Test ConditionsMeasured value (HNTTV5-5) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 6.8N·m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	6.5N·m	Thread locking effect decreases after repeated use. 5th loosening torque: 6.2N·m Measurement at HNTTZ5-5

Pre-Assembly Insertion Nuts · Stoppers for Aluminum Frames Others

-For HFS5 Series Aluminum Frames 20 · 25 · 40 Square-



CAD Data

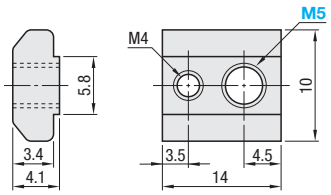
■Pre-Assembly Insertion Lock Nuts RoHS



M Material: 1.0301/C10
S Surface Treatment: Trivalent Chromate Plating

HNTC5

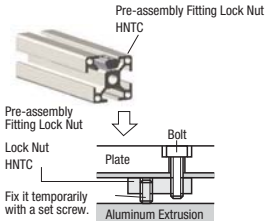
Reference Tightening Torque (N·m)	
M	1.0301/C10
5	6.8



Part Number	M	Accessories	€ Unit Price	Volume Discount		
			1~499 pcs.	500~749	750~999	1000~
HNTC5	5	M4 Set screw 1 pc.				

Example

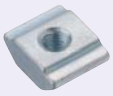
•Pre-Assembly Insertion Lock Nuts
The position of the nut can be held temporarily with a set screw.



Order Example: Part Number HNTC5 - M 5

Days to Ship: 6 Days P.87

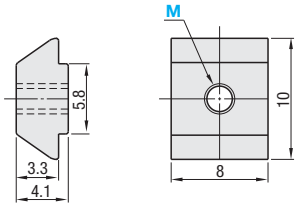
■Pre-Assembly Insertion Short Nuts RoHS



M Material: 1.0301/C10
S Surface Treatment: Trivalent Chromate Plating

HNTJ5

Reference Tightening Torque (N·m)	
M	1.0301/C10
5	6.8



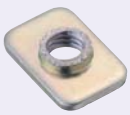
Part Number	M	€ Unit Price	Volume Discount		
		1~499 pcs.	500~749	750~999	1000~
HNTJ5	3 4 5				

-Overall length is shorter than the Pre-Assembly Insertion Nuts HNTT. Convenient for installing sensors or other components closely in combination.
-Stopper is not included.

Order Example: Part Number HNTJ5 - M 5

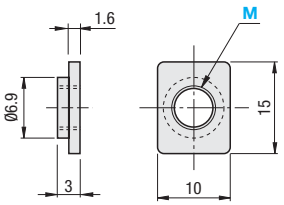
Days to Ship: 6 Days P.87

■Pre-Assembly Insertion Square Nuts RoHS



M Material: 1.0330/DC01
S Surface Treatment: Trivalent Chromate

HNKK5



Example

- Pre-Assembly Insertion Nuts



Part Number	M	€ Unit Price	Volume Discount	
		1~9 package	10~19	20~29
HNKK5	3 4 5			

100 pcs. per package Insert it into the extrusion upside down.

Order Example: Part Number HNKK5 - M 5

Days to Ship: 6 Days P.87

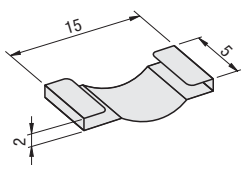
2 Days

■Metal Stoppers for Pre-Assembly Insertion Square Nuts RoHS



M Material: 1.4319/X3CrNiN17-8

HNKKST5



Example



Part Number	Applicable Pre-Assembly Insertion Nuts	€ Unit Price	Volume Discount	
		1~9 package	10~19	20~29
HNKKST5	HNKK5			

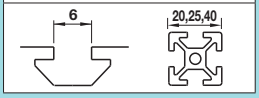
100 pcs. per package

Order Example: Part Number HNKKST5

Days to Ship: 6 Days 2 Days P.87

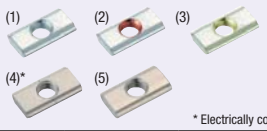
NEW Post-Assembly Insertion Nuts / Stoppers for Aluminum Frames Standard -For HFS5 Series Aluminum Frames 20, 25, 40 Square-

HFS5 Series



CAD Data

Post-Assembly Insertion Stopper Nuts RoHS



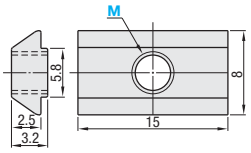
* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTA5 (2)HNTAV5 (3)HNTAZ5	1.0301/C10	Trivalent Chromate
(4)HNTASN5*	1.4401 X5CrNiMo 17-12-2 (Sintering)	-
(5)HNTASS5	1.4305/X10CrNiS18-9	-

HNTA5 (1.0301/C10)
HNTAV5 (Thread Locking Adhesive · 1.0301/C10)
HNTAZ5 (Equivalenthread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTASN5 (1.4401/X5CrNiMo17-12-2 · Sintering)
HNTASS5 (1.4305/X5CrNi18-10)

Details of Thread Locking Type **P.504**

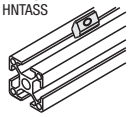
M	Ref. Tightening Torque (N.m) 1.0301/C10 1.4401 (Sinterin) / 1.4305
5	6.8



Example

•Post-Assy. Insertion Stopper Nuts

HNTA
HNTAV
HNTAZ
HNTASN
HNTASS



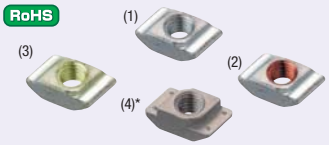
Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTA5 (1.0301/C10)	3 4				
	5				
HNTAV5 (Thread Locking · 1.0301/C10)	5				
HNTAZ5 (Thread Locking · 1.0301/C10)	5				
HNTASN5 (1.4401/X5CrNiMo17-12-2 · Sintering)	3 4 5				
HNTASS5 (1.4305/X10CrNiS18-9)	5				

Bulk-packages are cost-saving for in-house stock or large quantities. **(Refer to P.508)**

Order Example: Part Number - M → HNTA5 - 5

Days to Ship: 6 Days / 2 Days P.87

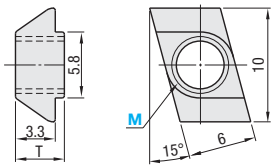
Post-Assembly Insertion Nuts RoHS



* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTF5 (2)HNTFV5 (3)HNTFZ5	1.0301/C10	Trivalent Chromate
(4)HNTFSN5*	1.4401/ X5CrNiMo17-12-2 (Sintering)	-

HNTF5 (1.0301/C10)
HNTFV5 (Thread Locking Adhesive · 1.0301/C10)
HNTFZ5 (EquivalentThread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTFSN5 (1.4401/X5CrNiMo17-12-2 · Sintering)

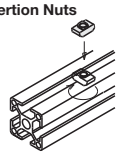


Details of Thread Locking Type **P.504**

Example

•Post-Assy. Insertion Nuts

HNTF
HNTFV
HNTFZ
HNTFSN



Post-Assembly Insertion Nuts Stainless Steel Type cannot be used, since it causes interference with the bracket tab. (**P.483~P.484**)

The post-assembly insertion nuts 5-5 size are not applicable as the outside of tap is thin, and tightening force is weak. Please use post-assembly insertion nuts and stopper set 5-5 size.

Part Number	M	T	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTF5 (1.0301/C10)	3 4					
HNTFV5 (Thread Locking · 1.0301/C10)	4	4.1				
HNTFZ5 (Thread Locking · 1.0301/C10)	4					
HNTFSN5 (1.4401/X5CrNiMo17-12-2 · Sintering)	3 4	5.0				

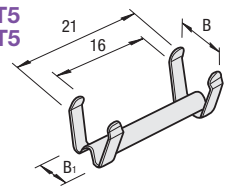
Order Example: Part Number - M → HNTF5 - 4

Days to Ship: 6 Days / 2 Days P.87

Post-Assembly Insertion Stoppers RoHS



Type	M Material
(1)HNAST	Polypropylene
(2)HNBST	1.4319/X3CrNiN17-8



HNAST5
HNBST5

Part Number	Applicable Stopper Nuts	Color	B	B1	€ Unit Price 1~499 pcs.	Volume Discount 500~999	1000~
HNAST5	HNTA5 HNTAV5 HNTAZ5 HNTASN5 HNTASS5	White	6.6	5			
HNBST5		-	8.5	4			

Post-Assembly Insertion Nut · Stopper Set RoHS



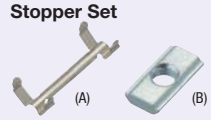
HNTAT5 (1.0301/C10 Set)
HNTATSN5 (1.4401/X5CrNiMo17-12-2 Eq.)

Type	(B) Stopper Nuts	(A) Stoppers
HNTAT5	HNTA5	HNAST5
HNTATSN5*	HNTASN5	

* Electrically conductive

Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTAT5	3 4				
	5				
HNTATSN5	3 4 5				

Post-Assembly Insertion Nut / Metal Stopper Set RoHS



HNTBT5 (1.0301/C10 Set)
HNTBTSN5 (1.4401/X5CrNiMo17-12-2 Eq.)

Type	(B) Stopper Nuts	(A) Stoppers
HNTBT5	HNTA5	HNBST5
HNTBTSN5*	HNTASN5	

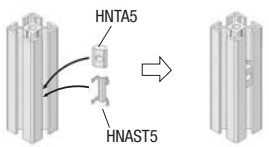
* Electrically conductive

Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTBT5	3 4				
	5				
HNTBTSN5	3 4 5				

Order Example: Part Number - M → HNTAT5 - 5

Days to Ship: 6 Days / 2 Days P.87

Example

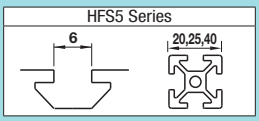


* Insert a stopper into the extrusion and put into a nut on it.

* Does not fall even if the extrusion is placed vertically.

Post-Assembly Insertion Nuts for Aluminum Frames With Temporary Holding Function

-For HFS5 Series Aluminum Frames 20 · 25 · 40 Square-



CAD Data

■Post-Assembly Insertion Nuts with Leaf Springs

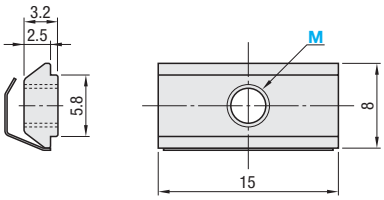
RoHS



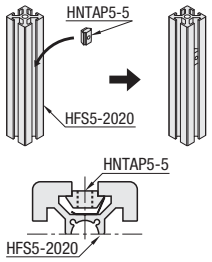
Part	M Material	S Surface Treatment
Body	1.0301/C10	Trivalent Chromate
Wing Part	1.4301/ X5CrNi18-10	-

HNTAP5

Reference Tightening Torque (N.m)	
M	1.0301/C10
5	6.8



ex Example



Welded Leaf Springs prevent the nuts from slipping off even inserted into the vertically-placed extrusions.

Part Number	M			€ Unit Price	Volume Discount		
				1~499 pcs.	500~749	750~999	1000~
HNTAP5	3	4	5				

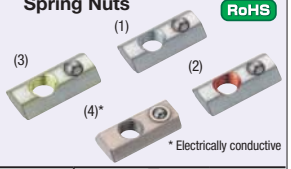
Order Example

Part Number	-	M
HNTAP5	-	5

Days to Ship: 6 Days P.87

■Post-Assembly Insertion Spring Nuts

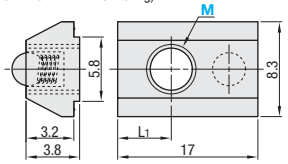
RoHS



* Electrically conductive

Type	M Material			S Surface Treatment
	Body	Ball	Springs	
(1)HNTP5 (2)HNTPV5 (3)HNTPZ5	1.0301	1.4301	JIS SWP-A	Trivalent Chromate
(4)SHNTP5*	1.4401 (Sintering)	1.4301	1.4301-WP8	-

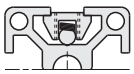
HNTP5 (1.0301/C10)
HNTPV5 (Thread Locking Adhesive · 1.0301/C10)
HNTPZ5 (Equivalenthread Locking Resin Coating · 1.0301/C10 Equivalent)
SHNTP5 (1.4401/X5CrNiMo17-12-2 · Sintering)

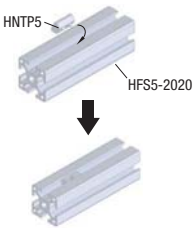


Reference Tightening Torque (N.m)	
M	1.0301 / 1.4401 (Sinterin)
5	6.8

ex Example

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.





* Does not fall even if a extrusion is placed vertically.

Part Number	M			L1	€ Unit Price	Volume Discount		
					1~499 pcs.	500~749	750~999	1000~
HNTP5 (1.0301/C10)	3	4	5	6				
HNTPV5 (Thread Locking · 1.0301/C10)	5			6				
HNTPZ5 (Thread Locking · 1.0301/C10)	5			6				
SHNTP5 (1.4401/X5CrNiMo17-12-2 , Sintering)	3	4		6.5				
	5			6.5				

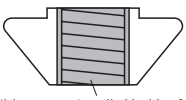
Bulk-packages are cost-saving for in-house stock or large quantities. (Refer to P.508)

Order Example

Part Number	-	M
HNTAP5	-	5

Days to Ship: 6 Days / 2 Days P.87

■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap.
Reduce loosening caused by vibration at transportation or operation of equipment.
Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening.
Note that it requires a hardening time (72 hours at room temperature 25°C).
The adhesive property is lost once loosened.
Resin Coating ---Resin is coated along the threads.
Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

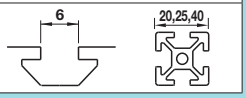
■Effect of Thread Locker (Reference) Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	5.0N.m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	6.3N.m	Test Conditions Measurement of the value when loosening a bolt on HNTPV5-5 after drying for 72 hours at room temperature (25 °C) after tightening with 6.8N.m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	6.1N.m	Thread locking effect decreases after repeated use. 5th loosening torque: 5.7N.m Measurement at HNTAZ5-5

Post-Assembly Insertion Nuts · Stoppers for Aluminum Frames Others

-For HFS5 Series Aluminum Frames 20 · 25 · 40 Square-

HFS5 Series



CAD Data

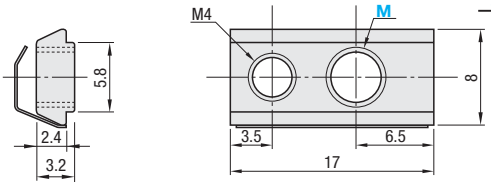
■Post-Assembly Insertion Lock Nuts with Leaf Springs

RoHS



Part	M Material	S Surface Treatment
Body	1.0301/C10	Trivalent Chromate
Wing Part	1.4301	-

HNTRP5



Reference Tightening Torque (N·m)	
M	1.0301/C10
5	6.8

Part Number	M	Accessories	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTRP5	5	M4 Set screw 1 pc.				

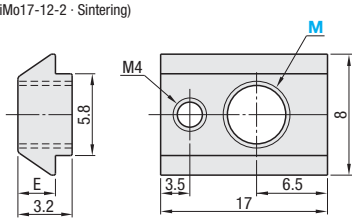
■Post-Assembly Insertion Lock Nuts

RoHS



Type	M Material	S Surface Treatment
HNTR5	1.0301/C10	Trivalent Chromate
HNTRSN5	1.4401(Sintering)	-

HNTR5 (1.0301/C10)
HNTRSN5 (1.4401/X5CrNiMo17-12-2 · Sintering)



Reference Tightening Torque (N·m)	
M	1.0301·1.4401/ X5CrNiMo17-12-2 · (Sinterin)
5	6.8

Part Number	M	E	Accessories	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTR5 (1.0301/C10)	3 4 5	2.4	M4 Set screw 1 pc.				
HNTRSN5 (1.4401/X5CrNiMo17-12-2 · Sintering)		2.5					

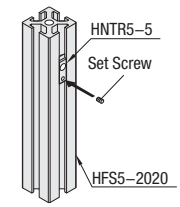
Order Example

Part Number	-	M
HNTR5	-	5
HNTRP5	-	5

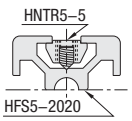
Days to Ship: 6 Days / 2 Days P.87

Example

■Post-Assy. Insertion Lock Nuts (HNTR)

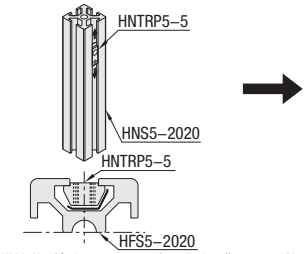


The nut can be fixed in place by itself by tightening the included set screw.

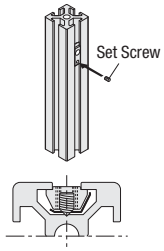


Suitable for use in the environment which requires high repeatability. Usable for use when mounting sensor or removing panels repeatedly.

■Post-Assembly Insertion Lock Nuts with Leaf Springs (HNTRP)



Welded Leaf Springs prevents nuts from slipping off even inserted into the vertically-placed extrusions and leads to easy positioning.



Also, the nut can be fixed in place by tightening the included set screw.

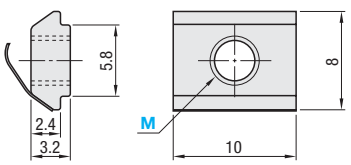
■Post-Assembly Insertion Short Nuts

RoHS



Part	M Material	S Surface Treatment
Body	1.0301/C10	Trivalent Chromate
Wing Part	1.4301	-

HNTAJ5



-Overall length is shorter than Pre-Assembly Insertion Nuts HNTT.
Suitable for installing sensors or other components closely together.

Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTAJ5	3 4 5				

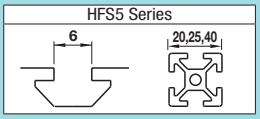
Order Example

Part Number	-	M
HNTAJ5	-	5

Days to Ship: 6 Days P.87

Pre-Assembly Insertion Bolts/ Post-Assembly Insertion Bolts/Flanged Nuts

-For HFS5 Series Aluminum Frames 20 · 25 · 40 Square-



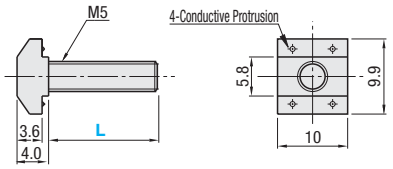
CAD Data

■Pre-Assembly Insertion Bolts RoHS

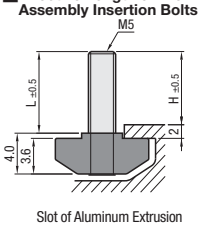


Material: Nuts: 1.4401/X5CrNiMo17-12-2 (Sintering)
* Electrically conductive Bolts: 1.4301/X5CrNi18-10

HNTLSN5-5



■Effective Length of Pre-Assembly Insertion Bolts



Slot of Aluminum Extrusion

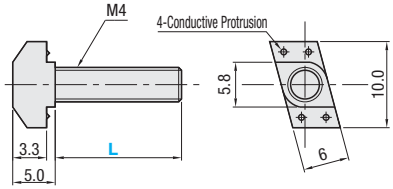
Part Number	L	H	Applicable Extrusions (Series)	Reference Tightening Torque (N·m)	€ Unit Price	Volume Discount	
					1~299 pcs.	300~499	500~
HNTLSN5-5	12	10.8	HFS5	6.8			
	17	15.8					

■Post-Assembly Insertion Bolts RoHS

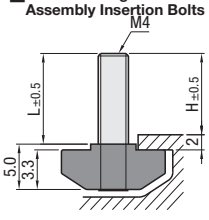


Material: Nuts: 1.4401/X5CrNiMo17-12-2 (Sintering)
* Electrically conductive Bolts: 1.4301/X5CrNi18-10

HATLSN5-4



■Effective Length of Post-Assembly Insertion Bolts



Slot of Aluminum Extrusion

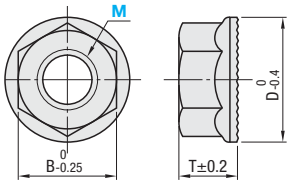
Part Number	L	H	Applicable Extrusions (Series)	€ Unit Price	Volume Discount	
				1~299 pcs.	300~499	500~
HATLSN5-4	12	11.7	HFS5			
	17	16.7				

■Flanged Nuts RoHS



Material: 1.4301/X5CrNi18-10

HTDN



Part Number		B	T	D	€ Unit Price	Volume Discount	
Type	M				1~499 pcs.	500~999	1000~
HTDN (Stainless Steel)	4	7	4.2	10			
	5	8	5.5	12			

Order Example

Part Number
HNTLSN5-5-12
HTDN5

Days to Ship

6	Days
2	Days

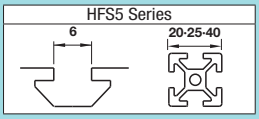
P.87

Example



Long Nuts

-For HFS5 Series Aluminum Frames 20 · 25 · 40 Square-

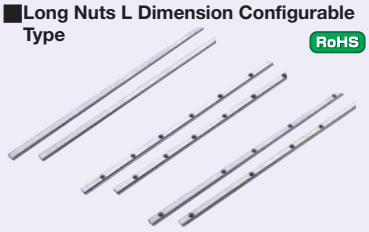


CAD Data

Tightening Torque P.676

Long Nuts L Dimension Configurable Type

RoHS

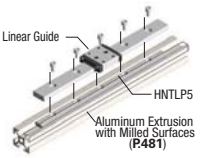


Type		M	S	Reference Tightening Torque (N·m)
Pre-Assy. Insertion	Post-Assy. Insertion	Material	Surface Treatment	
HNTLF5	HNTALF5	1.0301/C10	Trivalent Chromate	6.8
HNTLP5	HNTALP5			
HNTLS5	HNTALS5			
SHNTLF5	-	1.4305/ X10CrNiS18-9	-	
SHNTLP5	SHNTALP5			
SHNTLS5	SHNTALS5			

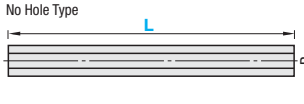
Cross Section Shape	A	B	E	T
Pre-Assy. Insertion	5.8	10	3.5	4.1
Post-Assy. Insertion	5.8	8	2.5	3.2

Reference Tightening Torque (N · m)	
M	1.0301/C10 · 1.4305/10CrNiS18-9
5	6.8

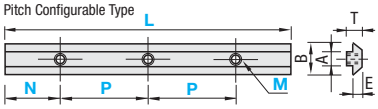
Example



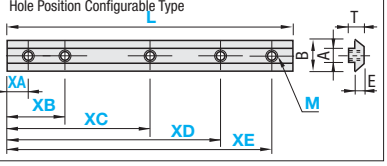
No Hole Type



Pitch Configurable Type



Hole Position Configurable Type



No Hole Type

Part Number		L Specified in 1mm Increment	HNTLF5		SHNTLF5		HNTALF5	
			€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion) HNTLF5 SHNTLF5	(Post-Assembly Insertion) HNTALF5	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000						

Pitch Configurable Type

Part Number		L Specified in 1mm Increment	M	N Specified in 1mm Increment	P Specified in 1mm Increment	Number of taps S	HNTLP5		SHNTLP5		HNTALP5		SHNTALP5	
							€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion) HNTLP5 SHNTLP5	(Post-Assembly Insertion) HNTALP5 SHNTALP5	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000	3 4 5	5≤N≤L-5	2M≤P≤L-2M	2≤S≤20								

Hole Position Configurable Type

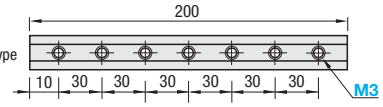
Part Number		L Specified in 1mm Increment	M	XA~XE Specified in 1mm Increment	HNTLS5		SHNTLS5		HNTALS5		SHNTALS5	
					€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion) HNTLS5 SHNTLS5	(Post-Assembly Insertion) HNTALS5 SHNTALS5	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000	3 4 5	5~L-5								

Number of tapped holes can be specified between 1 to 5.

Order Example

Part Number	-	L	-	M	-	N	-	P	-	S	-	XA	-	XB	-	XC	-	XD	-	XE
HNTLF5	-	1800																		
HNTALF5	-	400																		
HNTLP5	-	200	-	M3	-	N10	-	P30	-	7										
HNTALP5	-	210	-	M5	-	N8	-	P15	-	8										
HNTLS5	-	1050	-	M5	-	XA20	-	XB105												
SHNTLS5	-	1050	-	M5	-	XA20	-	XB105	-	XC250	-	XD500	-	XE755						
HNTALS5	-	1000	-	M5	-	XA25	-	XB55	-	XC78	-	XD975	-	XE992						

(Ex.) Pitch Configurable Type



Hole Machining Charge

Pitch Configurable Type	€ Unit Price / 1 Hole	Hole Position Configurable Type	€ Unit Price / 1 Hole
HNTLP5 · HNTALP5		HNTLS5 · HNTALS5	
SHNTLP5 · SHNTALP5		SHNTLS5 · SHNTALS5	

Days to Ship: 8 Days — Express A 5,00 EUR/ piece — P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

The prices of Pitch Configurable Type and Hole Position Configurable Type are found by adding the unit prices in the table to the hole machining charges.

(Ex.) Part Number: HNTLS5 - L: 400 - M: M5 - XA: XA10 - XB: XB70 When

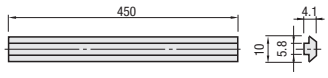
(€ Unit Price/m x Specified OAL) + (Hole Machining Charge) = Sales Price
2,90EUR x0.4 + 3,20EUR x2 = 7,50 EUR
(Round down to ten Cent.)

Long Nuts L Dimension Fixed Type

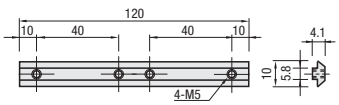
RoHS



L Dimension Fixed without Holes
HNTK5



L Dimension Fixed with Holes
HNTLG5
SHNTLG5



Reference Tightening Torque (N · m)	
M	1.0301/C10 · 1.4305/X10CrNiS18-9
5	6.8

Type	M Material	S Surface Treatment
HNTK5	1.0301/C10	Trivalent Chromate
HNTLG5		
SHNTLG5	1.4305/ X10CrNiS18-9	-

L Dimension Fixed without Holes

Part Number	€ Unit Price	Volume Discount	
	1~499 pcs.	500~999	1000~
HNTK5			

L Dimension Fixed with Holes

Part Number	€ Unit Price	Volume Discount	
	1~499 pcs.	500~999	1000~
HNTLG5			
SHNTLG5 (Stainless Steel)			

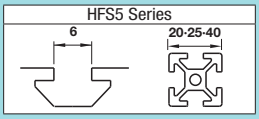
Order Example: Part Number HNTLG5

Days to Ship: 6 Days — P.88

Alterations: Part Number HNTLG5 - (SET) SET

Alteration	Code	Spec.				Type	Price Adder
Hexagon Socket Set Screw Set	SET	Hexagon socket set screws come as a set.				HNTLG5	0,50
		Type	Set Screw	Qty.		SHNTLG5	0,85
		HNTLG	MSSK	4			
		SHNTLG	MSSU	4			

Nuts for Aluminum Frames · Pack



CAD Data

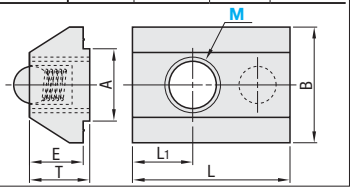
Features: Bulk-packages are cost efftive for in-house stock or large quantity uses.

Pre-Assembly Insertion Spring Nuts · Pack (100pcs. per package)

RoHS



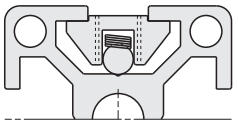
Type	Material: Body	Ball	Springs	Surface Treatment
PACK-HNTU	1.0301/C10	1.4301/ X5CrNi18-10	JIS SWP-A	Trivalent Chromate



Example

- Does not fall even if a extrusion is placed vertically.

The built-in spring prevents slips.
Moves easily in the slot when pressed slightly by hand.



Part Number Type	No.	M	Applicable Extrusion (Series)	A	B	E	T	L	L1	€ Unit Price (1~10 packages) Package Price	Price per pc.
PACK-HNTU (100 pcs. per package)	5	3 4 5	HFS5	5.8	10	3.3	4.1	14	4.5		
	6	3 4 5 6	HFS6	7.8	15	6	6.8	16	5		
	8	4 5 6 8	HFS8 (-45)	9.8	17	6	9.0	18	6		

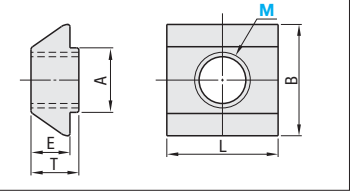
For orders larger than indicated quantity, please request a quotation.

Pre-Assembly Insertion Nuts · Pack (100pcs. per package)

RoHS



Type	Material	Surface Treatment
PACK-HNTT	1.0301/C10	Trivalent Chromate



Part Number Type	No.	M	Applicable Extrusion (Series)	A	B	E	T	L	€ Unit Price (1~10 packages) Package Price	Price per pc.
PACK-HNTT (100 pcs. per package)	5	3 4 5	HFS5	5.8	10	3.3	4.1	10		
	6	3 4 5 6	HFS6	7.8	15	5.5	6.3	14		
	8	4 5 6 8	HFS8 (-45)	9.8	17	6	9.0	17		

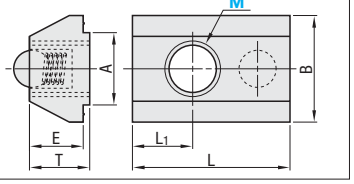
For orders larger than indicated quantity, please request a quotation.

Post-Assembly Insertion Spring Nuts · Pack (100pcs. per package)

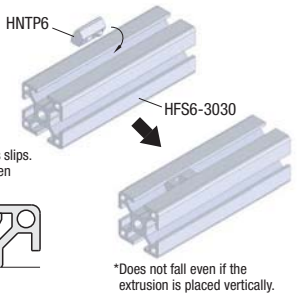
RoHS



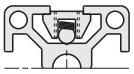
Type	Material: Body	Ball	Springs	Surface Treatment
PACK-HNTP	1.0301/ C10	1.4301/ X5CrNi18-10	JIS SWP-A	Trivalent Chromate



Example



The built-in spring prevents slips.
Moves easily in the slot when pressed slightly by hand.



*Does not fall even if the extrusion is placed vertically.

Part Number Type	No.	M	Applicable Extrusion (Series)	A	B	E	T	L	L1	€ Unit Price (1~10 packages) Package Price	Price per pc.
PACK-HNTP (100 pcs. per package)	5	3 4 5	HFS5	5.8	8.3	3.2	3.8	17	6		
	6	3 4 5 6	HFS6	7.8	11.5	6.3	6.8	17	6		
	8	4 5 6 8	HFS8 (-45)	9.8	14.5	6.3	7.0	20	8		

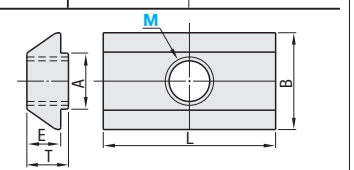
For orders larger than indicated quantity, please request a quotation.

Post-Assembly Insertion Stopper Nuts · Pack (100pcs. per package)

RoHS

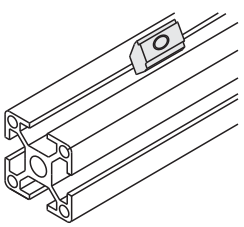


Type	Material	Surface Treatment
PACK-HNTA	1.0301/C10	Trivalent Chromate



Stoppers are sold separately. ☞ P.503 · 546 · 584

Example



Part Number Type	No.	M	Applicable Extrusion (Series)	A	B	E	T	L	€ Unit Price (1~10 packages) Package Price	Price per pc.
PACK-HNTA (100 pcs. per package)	5	3 4 5	HFS5	5.8	8.3	2.5	3.2	15		
	6	3 4 5 6	HFS6	7.8	11.5	5.5	6.3	17		
	8	4 5 6 8	HFS8 (-45)	9.8	14.5	4.5	6.5	20		

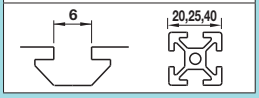
For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number - M: PACK-HNTA6 - 6

Days to Ship: 6 Days ☞ P.87

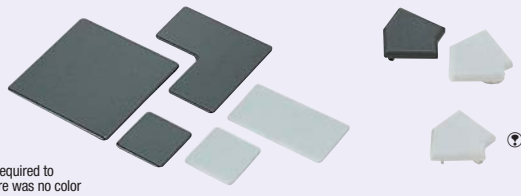
Extrusion End Caps
-HFS5 Series-

HFS5 Series



Features: Standard caps for protecting frame end faces. Alterations are not required. When the cap is hard to insert, tap with a wooden or plastic hammer.

RoHS

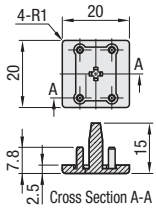


Type	Material
HFC	Polyamide
HFCL	Low Density Polyethylene

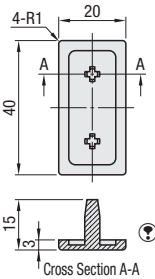
※Some products are not required to specify colors, since there was no color configuration in the former catalogs. In that case, color is black.

※The pin's shape and numbers of extrusion end caps may be changed to prevent caps from easily falling off.

HFC5-2020 / HFCL5-2020

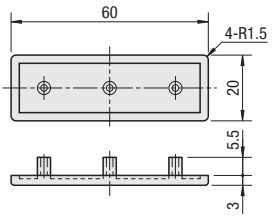


HFC5-2040 / HFCL5-2040

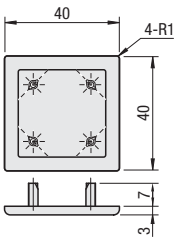


※The shapes are changed to be less likely to fall off.
HFC: A tool is required to remove.
HFCL: Removable by hand.

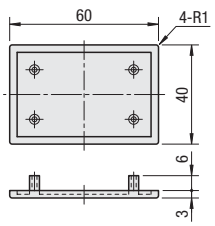
HFC5-2060



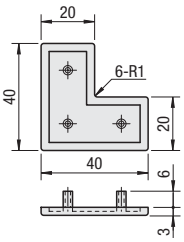
HFC5-4040



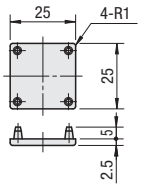
HFC5-4060



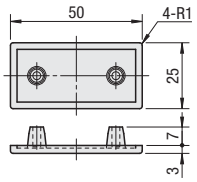
HFC5-404020



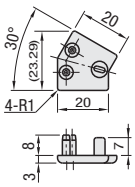
HFC5-2525



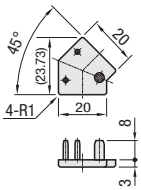
HFC5-2550



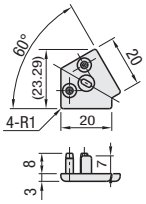
HFC30A5



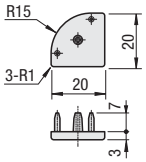
HFC45A5



HFC60A5



HFCR5-2020



Part Number		Color	€ Unit Price	Volume Discount		Applicable Extrusions
Type	No.		1~14 pcs.	15~19	20~	
HFC5	2020	B (Black) S (Light Gray)				HFS5-2020
	2040					HFS5-2040
	2060					HFS5-2060
	4040					HFS5-4040
	4060					HFS5-4060
	404020					HFS5-404020
	2525					HFS5-2525
	2550					HFS5-2550
HFCL5	2020					HFS5-2020
	2040					HFS5-2040
HFC30A5						HFS30A5-20
HFC45A5						HFS45A5-20
HFC60A5						HFS60A5-20
HFCR5-2020						HFSR5-2020

* For Aluminum Frame EFS Series, the same frame caps as of HFS Series can be used.

Order Example

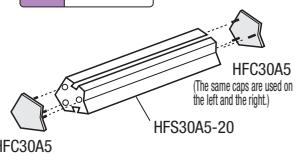
Part Number	-	Color
HFC30A5	-	B

Days to Ship

6 Days P.87

2 Days

Example



When using Aluminum Extrusion HFS5-2080, please use 2 pieces of HFC5-2040.



NEW

CAD Data

Features: Three-Sided Frame Caps for protecting 3 corners. Alterations are not required.

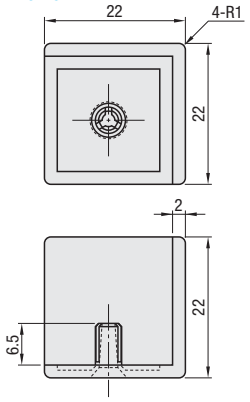
Three-Sided Caps for Corners RoHS



The pin shape and numbers of extrusion caps may be changed to prevent caps from easily falling off.

Material: Polyamide

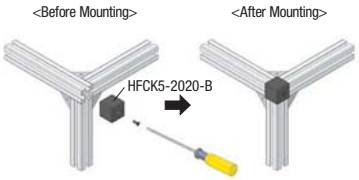
HFCK5-2020



Order Example: Part Number - Color → HFCK5-2020 - B

Days to Ship: 6 Days P.87

Example

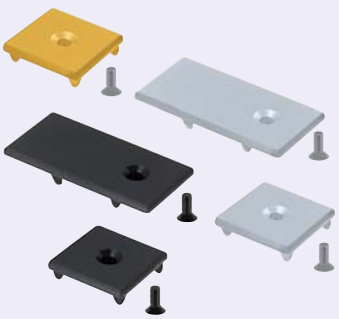


Tapping on extrusion is not required.

Part Number	Color	Accessories	Applicable Extrusion	€ Unit Price 1~14 pcs.	Volume Discount 15~19	Volume Discount 20~
HFCK5-2020	B (Black)	HFBMB3-12	HFS5-2020			

Features: Frame End Caps, Screw Mounting Type. Excels in safety, prevent caps from falling off without alterations.

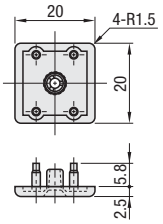
Screw Mounted RoHS



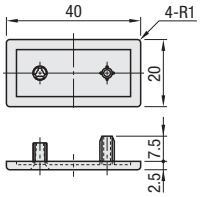
The pin shape and numbers of extrusion caps may be changed to prevent caps from easily falling off.

Material: Polyamide (Black · Light Gray · Yellow)

HFCB5-2020



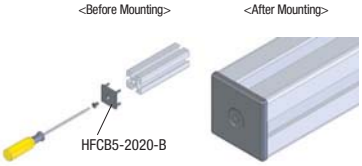
HFCB5-2040



Order Example: Part Number - Color → HFCB5-2020 - B

Days to Ship: 6 Days P.87

Example



Tapping on extrusion is not required.

Part Number Type	Part Number No.	Color	€ Unit Price 1~14 pcs.	Volume Discount 15~19	Volume Discount 20~	Applicable Extrusions
HFCB5	2020	B(Black) S(Light Gray) Y(Yellow) Yellow Type is available only for 2020.				HFS5-2020
	2040					HFS5-2040

Flat Head Cap Screw is included. (Black: HFBMB3 - 12, Light Gray, Yellow: SHFBS3 -12)

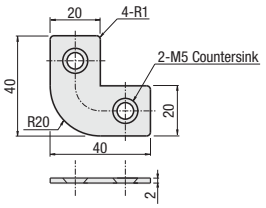
Features: End plates for HFSR5-404020. Alterations are reqired on extrusions.

End Plates RoHS



Material: 1.4301/X5CrNi18-10

HFCR5-404020



Part Number Type	Applicable Screw	€ Unit Price 1~14 pcs.	Volume Discount 15~19	Volume Discount 20~	Applicable Extrusions
HFCR5-404020	SHFBS5-6				HFSR5-404020

For HFCR5-404020, alterations on the extrusion end section and applicable bolts are required for mounting. (Bolts are not included.)

HFSR5-End plates mounting for HFSR5-404020

Alterations		Hole Machining for End Plate Mounting		
Code		LTS	RTS	TSW
Spec.		The standard extrusion position is shown below. LTS: Machined on the left end RTS: Machined on the right end TSW: Machined on both ends Ex. LTS 		
Applicable Extrusions	Applicable Screw			
HFSR5-404020	SHFBS5-6	6,60	6,60	13,20

Order Example: Part Number → HFCR5-404020

Days to Ship: 6 Days P.87

NEW

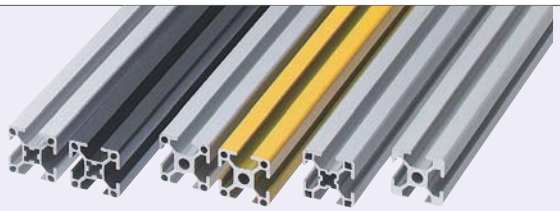
HFS6 Series Aluminum Frames 30 · 60 mm Square

-1 Slot-

Price Reduction
Up to 2.3%

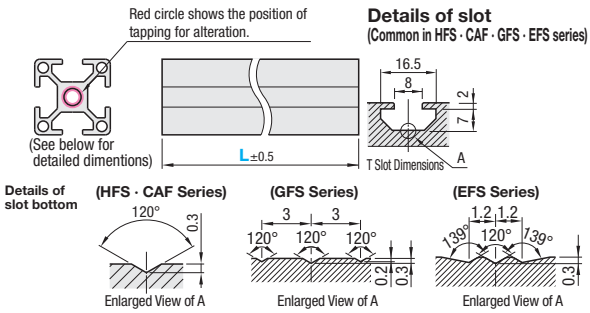
Features: Standard extrusions for various use such as covers or frames.

RoHS



Type		M	S
Configurable Length	Fixed Length	Material	Surface Treatment
GFS6	KGFS6	EN AW6061-T6	Clear Anodize
HFS6 HFSL6	KEFS6 KHFS6 KHFSL6	EN AW6061/ EN AW- AlMg1SiCu-T5	Clear Anodize
EFSB6 HFSB6 HFSLB6	KEFSB6 KHFSB6 KHFSLB6		Black Anodize
CAF6	-		Clear Coating (Clear Anodize + Clear Painting)
HFSY6	-		Baked-on Finish (Yellow)

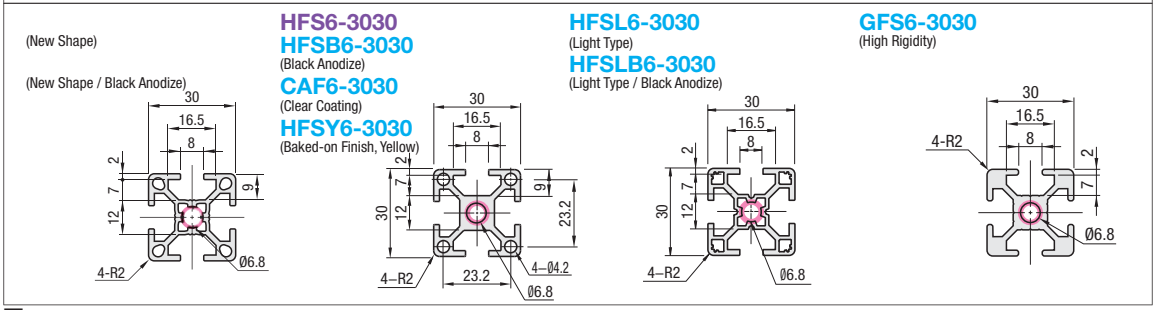
Ⓣ Cut surface and altered parts are not surface treated.



Details of slot
(Common in HFS · CAF · GFS · EFS series)

Features of Extrusions

Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.
	Baked-on Finish · Yellow	Can be used on doors or hazardous areas as a warning color. The color is D22 -80V (Munsell Value Reference 2.5YR6/14) by Japan Paint Manufacturers Association.



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
(New Shape)	3030	50~4000	0.80	296	2.85x10⁴	2.85x10⁴						
(New Shape / Black Anodize)												
HFS6			0.90	333	2.83x10⁴	2.83x10⁴						
HFSB6(Black Anodize)												
CAF6(Clear Coating)												
HFSY6(Baked-on Finish · Yellow)												
HFSL6(Light Type)			0.76	280	2.68x10⁴	2.68x10⁴						
HFSLB6(Light Type · Black Anodize)												
GFS6(High Rigidity)			1.02	377	3.47x10⁴	3.47x10⁴						

Fixed Length Extrusion (1000mm)

Ⓣ Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~19 pcs.	Volume Discount 20~
KHFS6	3030	1000	333	2.83x104	2.83x104		8,80

Fixed Length Extrusions (Effective Length 4000mm)

Ⓣ Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
(New Shape)	3030	4000	296	2.85x10⁴	2.85x10⁴		
(New Shape · Black Anodize)							
KHFS6			333	2.83x10⁴	2.83x10⁴		
KHFSB6(Black Anodize)							
KHFSL6(Light Type)			280	2.68x10⁴	2.68x10⁴		
KHFSLB6(Light Type · Black Anodize)							
KGFS6(High Rigidity)			377	3.47x10⁴	3.47x10⁴		

Order Example

Part Number	-	L
HFS6-3030	-	800
KHFS6-3030	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS6-3030-180=3,70 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFS6-3030-800
8,30x0.8m=3,70 EUR
(Round down to ten Cent.)

Days to Ship

■Configurable Length Extrusions
6 Days / 5 Days
Up to 79 pcs.
Ⓣ Shipping of 2nd business day is available for orders of 80~160 pcs.

■Fixed Length Extrusion (KHFS6-3030-1000)
6 Days P87

■Fixed Length Extrusions (Effective Length 4000mm)
7 Days
Ⓣ For orders of 20 or more identical pieces, please request a quotation.
(KHFS6-3030-4000)

Alterations

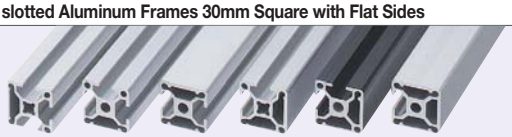
Alterations are available for Configurable Length Extrusions. For details, refer to P.645

■Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97), and contact the person in charge of Special Orders at MISUMI QCT Center.
Ⓣ Some extrusions are not applicable.

CAD Data

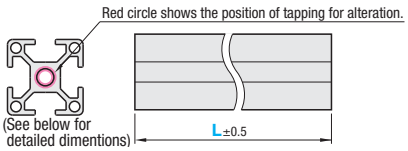
Features: 1 slotted Aluminum Frames 30mm Square with Flat Sides

RoHS

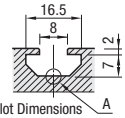


Type		S
Configurable Length	Fixed Length	Surface Treatment
HFS_6	KHFS_6	EN AC-51400 Clear Anodize
HFS_B6	KHFS_B6	Black Anodize

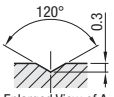
Cut surface and altered parts are not surface treated.



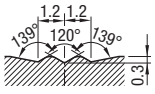
Details of slot (Common to HFS / EFS series)



Details of slot bottom (HFS Series)



(EFS Series)

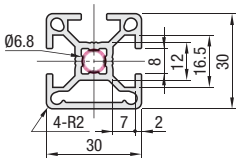


Features of Extrusions

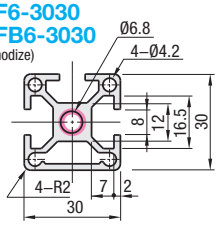
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard Cross Section Shape.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

HFSF6-3030
HFSFB6-3030

(New Shape · Black Anodize)

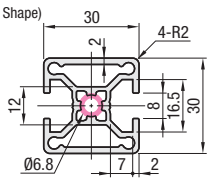


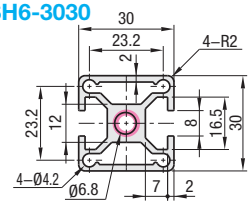
(Black Anodize)



HFSH6-3030

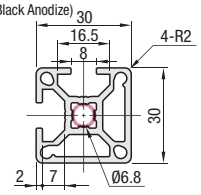
(New Shape)



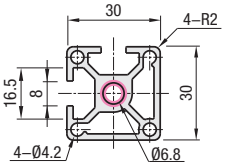


HFST6-3030
HFSTB6-3030

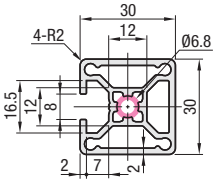
(New Shape · Black Anodize)



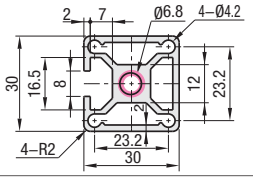
(Black Anodize)



(New Shape)



HFSC6-3030



Configurable Length Extrusions

Part Number	L 0.5mm Increment		Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
(New Shape)	3030	50~4000	0.86	320	$3.06x10^4$	$2.8x10^4$						
(New Shape · Black Anodize)												
HFSF6			0.92	338	$3.03x10^4$	$2.76x10^4$						
HFSFB6(Black Anodize)												
(New Shape)			0.91	337	$3.08x10^4$	$3.08x10^4$						
(New Shape · Black Anodize)			0.95	351	$3.03x10^4$	$3.03x10^4$						
HFSTB6(Black Anodize)												
(New Shape)			0.85	314	$2.75x10^4$	$3.29x10^4$						
HFSH6			0.93	345	$2.69x10^4$	$3.23x10^4$						
(New Shape)			0.89	331	$3.05x10^4$	$3.29x10^4$						
HFSC6			0.97	361	$2.99x10^4$	$3.24x10^4$						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number	L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
(New Shape)	3030 4000	320	$3.06x10^4$	$2.8x10^4$		
(New Shape · Black Anodize)						
KHFSF6		338	$3.03x10^4$	$2.76x10^4$		
KHFSFB6(Black Anodize)						
(New Shape)		337	$3.08x10^4$	$3.08x10^4$		
(New Shape · Black Anodize)						
KHFST6		351	$3.03x10^4$	$3.03x10^4$		
KHFSTB6(Black Anodize)						
(New Shape)		314	$2.75x10^4$	$3.29x10^4$		
KHFSH6		345	$2.69x10^4$	$3.23x10^4$		
(New Shape)		331	$3.05x10^4$	$3.29x10^4$		
KHFSC6		361	$2.99x10^4$	$3.24x10^4$		

Order Example

Part Number	-	L
	-	800
KHFSF6-3030	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFSF6-3030-180=3,70 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFSF6-3030-800
8,70x0.8m=3,70 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.

Alterations

Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

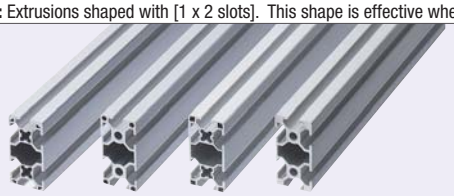
Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS6 Series Aluminum Frames 30 · 60 mm Square
-2 Slots-

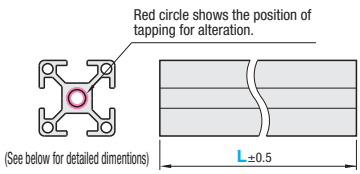
Features: Extrusions shaped with [1 x 2 slots]. This shape is effective where loads apply.

RoHS

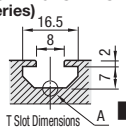


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
GFS6	KGFS6	EN AW-6061-T6	Clear Anodize
HFS6 HFS_6	KHFS6 KHFS_6	EN AC-51400/ AlMgSi0,7-T5	
HFSB6 HFS_B6	KHFSB6 KHFS_B6		Black Anodize
CAF6	-		Clear Coating (Anodize + Clear Painting)

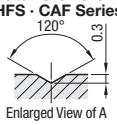
Cut surface and altered parts are not surface treated.



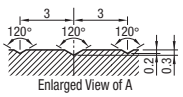
Slot
(Common in HFS · CAF · GFS · EFS series)



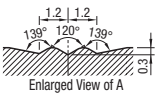
Details of slot
(HFS · CAF Series)



(GFS Series)



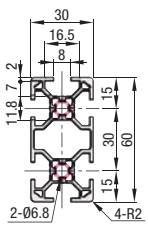
(EFS Series)



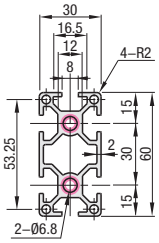
Features of Extrusions

Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.

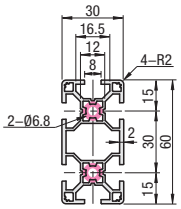
(New Shape)
(New Shape · Black Anodize)



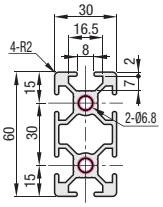
HFS6-3060
HFSB6-3060 (Black Anodize)
CAF6-3060 (Clear Coating)



HFSL6-3060 (Light Type)
HFSLB6-3060
(Light Type · Black Anodize)



GFS6-3060 (High Rigidity)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount 10~49	50~	€ Unit Price·m 300mm or more 1~9 pcs.	Volume Discount·m 300mm or more 10~49	50~
(New Shape)	3060	50~4000	1.44	535	5.49x10⁴	20.6x10⁴						
(New Shape · Black Anodize)												
HFS6			1.60	592	5.33x10⁴	20.56x10⁴						
HFSB6 (Black Anodize)												
CAF6 (Clear Coating)			1.60	592	5.33x10⁴	20.56x10⁴						
HFSL6 (Light Type)												
HFSLB6 (Light Type / Black Anodize)			1.29	476	4.87x10⁴	17.87x10⁴						
GFS6 (High Rigidity)			1.71	634	5.95x10⁴	23.78x10⁴						

Fixed Length Extrusion (1000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~19 pcs.	Volume Discount 20~
KHFS6	3060	1000	592	5.33x10⁴	20.56x10⁴		

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
(New Shape)	3060	4000	535	5.49x10⁴	20.6x10⁴		
(New Shape · Black Anodize)							
KHFS6			592	5.33x10⁴	20.56x10⁴		
KHFSB6 (Black Anodize)							
KHFSL6 (Light Type)			476	4.87x10⁴	17.87x10⁴		
KHFSLB6 (Light Type · Black Anodize)							
KGFS6 (High Rigidity)			634	5.95x10⁴	23.78x10⁴		

Order Example Part Number - L
HFS6-3060 - 800
KHFS6-3060 - 4000

Price
When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS6-3060-180=4,20 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS6-3060-800
14,30x0.8m=4,20 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusion (KHFS6-3060-1000)
6 Days P.87

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
(KHFS6-3060-4000)
For orders of 20 or more identical pieces, please request a quotation.

Alterations
Alterations are available for Configurable Length Extrusions. For details, refer to P.645

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

CAD Data

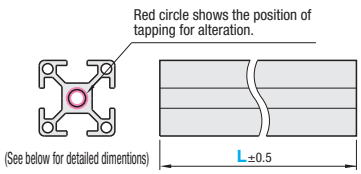
Features: Extrusions shaped with [1 x 2 slots]. This shape is effective where loads apply.

RoHS

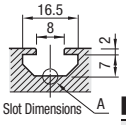


Type		Material	Surface Treatment
Configurable Length	Fixed Length		
HFS_6	KHFS_6	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize

Cut surface and altered parts are not surface treated.

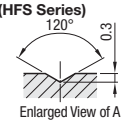


Slot (Common to HFS EFS series)

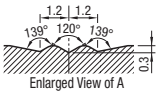


Details of slot

(HFS Series)



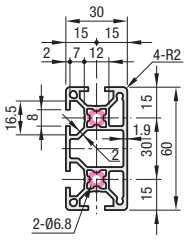
(EFS Series)

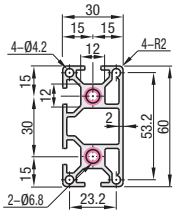


Features of Extrusions

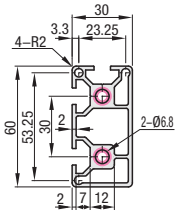
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

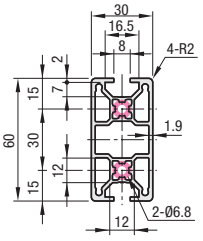
HFSF6-3060



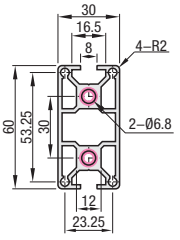


HFST6-3060





HFSH6-3060



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
(New Shape)	3060	50~4000	1.54	573	$5.97x10^4$	$21.1x10^4$						
HFSF6			1.67	616	$5.81x10^4$	$20.93x10^4$						
HFST6			1.68	624	$5.93x10^4$	$23.01x10^4$						
(New Shape)			1.58	585	$6.45x10^4$	$21.53x10^4$						
HFSH6			1.73	642	$6.36x10^4$	$21.41x10^4$						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
(New Shape)	3060	4000	573	$5.97x10^4$	$21.1 x10^4$		
KHFSF6			616	$5.81x10^4$	$20.93x10^4$		
KHFST6			624	$5.93x10^4$	$23.01x10^4$		
(New Shape)			585	$6.45x10^4$	$21.53x10^4$		
KHFSH6			642	$6.36x10^4$	$21.41x10^4$		

Order Example

Part Number	-	L
HFSH6-3060	-	800
KHFST6-3060	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS6-3060-180=4,20 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS6-3060-800
14,30x0.8m=4,20 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days

Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Alterations

Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Fixed Length Extrusions (Effective Length 4000mm)
7 Days

For orders of 20 or more identical pieces, please request a quotation.

Aluminum Frames with 4000mm or more

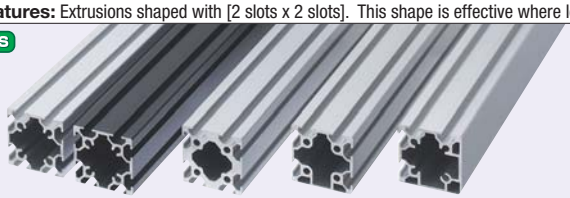
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS6 Series Aluminum Frames 30 · 60 mm Square
-2 Slots-

Price Reduction
Up to 5.9%

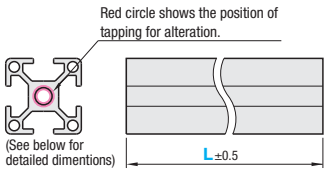
Features: Extrusions shaped with [2 slots x 2 slots]. This shape is effective where loads apply.

RoHS

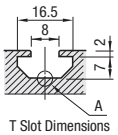


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS6 HFS_6	KHFS6 KHFS_6	EN AC51400/ AlMgSi0,7-T5	Clear Anodize
HFSB6	KHFSB6		Black Anodize
CAF6	-		Clear Coating (Anodize + Clear Painting)

Cut surface and altered parts are not surface treated.

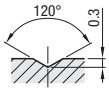


Slot (Common in HFS • CAF series)



T Slot Dimensions

Details of slot bottom (HFS Series)

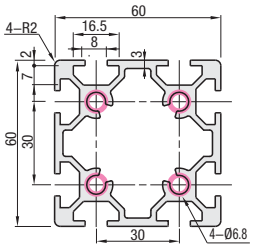


Enlarged View of A

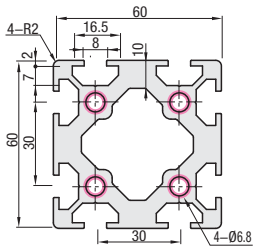
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard cross section shape.
	HFSG Extrusions	Suitable for heavy devices due to the extremely thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.

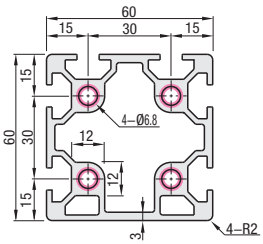
HFS6-6060
HFSB6-6060(Black Anodize)
CAF6-6060(Clear Coating)



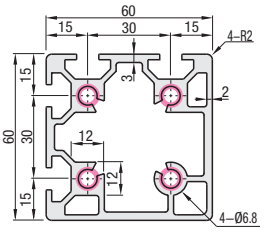
HFSG6-6060(Heavy Type)



HFSF6-6060



HFST6-6060



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	Volume Discount Less than 300mm 50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	Volume Discount/m 300mm or more 50~
HFS6	6060	50~4000	2.63	971	41.4x10⁴	41.4x10⁴						
HFSB6(Black Anodize)												
CAF6(Clear Coating)												
HFSG6(Heavy Type)			4.13	1529	54.2x10⁴	54.2x10⁴						
HFSF6			2.90	1072	45.4x10⁴	43.3x10⁴						
HFST6			2.73	1011	43.8x10⁴	43.8x10⁴						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
KHFS6	6060	4000	971	41.4x10⁴	41.4x10⁴		
KHFSB6(Black Anodize)							
KHFSG6(Heavy Type)			1529	54.2x10⁴	54.2x10⁴		
KHFSF6			1072	45.4x10⁴	43.3x10⁴		
KHFST6			1011	43.8x10⁴	43.8x10⁴		

Order Example

Part Number	-	L
HFS6-6060	-	800
KHFST6-6060	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS6-6060-180=7,20 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFS6-6060-800
24,00x0.8m=7,20 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days
5 Days

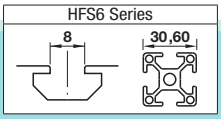
Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.

Alterations
Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS6 Series Aluminum Frames
30 · 60 mm Square
-3 or more slots-

HFS6 Series

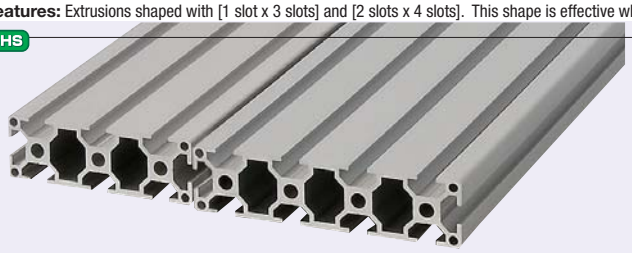


Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.523 ~ P.540	P.543 ~ P.550	P.627 ~ P.640	P.551	P.645 ~ P.658

CAD Data

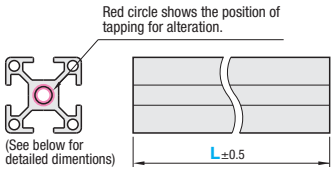
Features: Extrusions shaped with [1 slot x 3 slots] and [2 slots x 4 slots]. This shape is effective where forces apply.

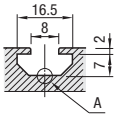
RoHS



Type		Material	Surface Treatment
Configurable Length	Fixed Length		
HFS6	KHFS6	EN AC51400/ AlMgSi0,7-T5	Clear Anodize
EFSB6	KEFSB6		Black Anodize

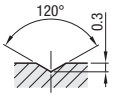
Cut surface and altered parts are not surface treated.





Slot

T Slot Dimensions



Details of slot bottom

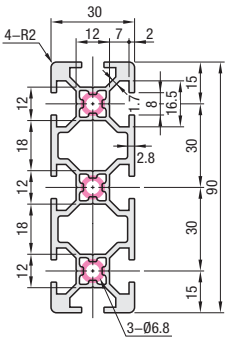
Enlarged View of A

Features of Extrusions

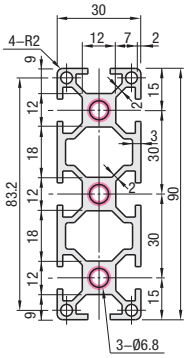
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

HFS6-3090

(New Shape)

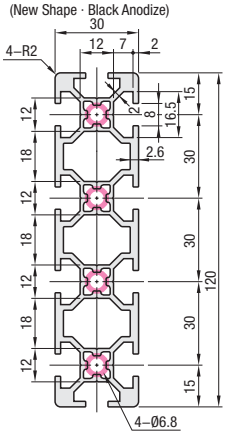


(New Shape · Black Anodize)

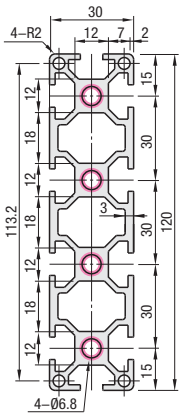


HFS6-30120

(New Shape)



(New Shape · Black Anodize)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	Volume Discount Less than 300mm		€ Unit Price/m 300mm or more	Volume Discount/m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
(New Shape)	3090	50~4000	2.24	831	8.80x10⁴	69.05x10⁴						
(New Shape · Black Anodize)												
HFS6			2.44	902	8.44x10⁴	66.28x10⁴						
(New Shape)	30120		3.01	1116	11.48x10⁴	157.62x10⁴						
(New Shape · Black Anodize)												
HFS6			3.21	1188	11.19x10⁴	152.2x10⁴						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount
				ℓx	ℓy	1~9 pcs.	10~19
(New Shape)	3090	4000	831	8.80x10⁴	69.05x10⁴		
(New Shape · Black Anodize)							
KHFS6			902	8.44x10⁴	66.28x10⁴		
(New Shape)	30120		1116	11.48x10⁴	157.62x10⁴		
(New Shape · Black Anodize)							
KHFS6			1188	11.19x10⁴	152.2x10⁴		

Order Example

Part Number	-	L
HFS6-3090	-	800
KHFS6-30120	-	4000

Days to Ship

Configurable Length Extrusions: 6 Days

Fixed Length Extrusions (Effective Length 4000mm): 7 Days

For orders of 20 or more identical pieces, please request a quotation.

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS6-3090-180=7,80 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS6-3090-800
26,10x0.8m=7,80 EUR
(Round down to ten Cent.)

Alterations

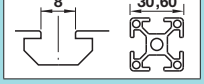
Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS6 Series Aluminum Frames 30 · 60 mm Square
-3 or more slots-

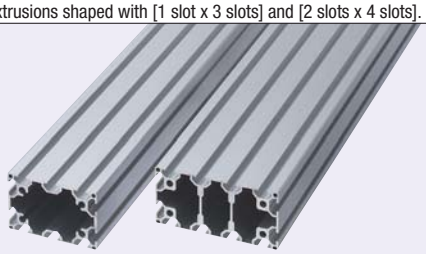
HFS6 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.523 ~ P.540	P.543 ~ P.550	P.627 ~ P.640	P.551	P.645 ~ P.658

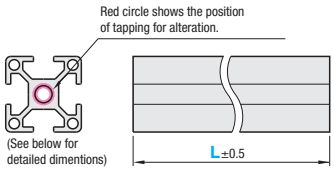
Features: Extrusions shaped with [1 slot x 3 slots] and [2 slots x 4 slots]. This shape is effective where forces apply.

RoHS

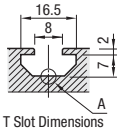


Type		Material	Surface Treatment
Configurable Length	Fixed Length		
HFS6	KHFS6	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize

Cut surface and altered parts are not surface treated.

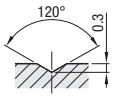


Slot



T Slot Dimensions

Details of slot bottom

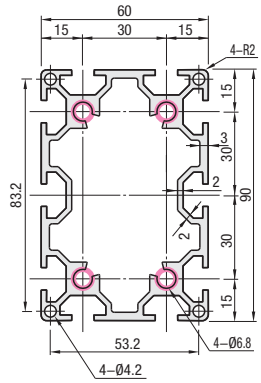


Enlarged View of A

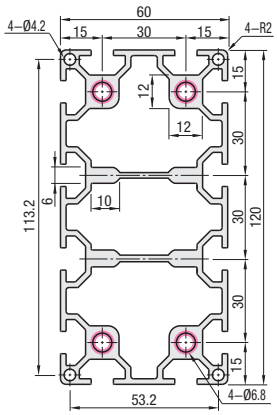
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard cross section shape.
Surface Treatment	Clear Anodize	Common surface treatment.

HFS6-6090



HFS6-60120



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	Volume Discount Less than 300mm		€ Unit Price/m 300mm or more	Volume Discount/m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
HFS6	6090	50~4000	3.10	1147	$52.6x10^4$	$111.0x10^4$						
	60120		4.53	1677	$69.0x10^4$	$246.7x10^4$						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount
				ℓx	ℓy	1~9 pcs.	10~19
KHFS6	6090	4000	1147	$52.6x10^4$	$111.0x10^4$		
	60120		1677	$69.0x10^4$	$246.7x10^4$		

Order Example

Part Number	-	L
HFS6-6090	-	800
KHFS6-60120	-	4000

Price

When L is less than 300 Unit prices are indicated in the table regardless of the length.
ex: HFS6-3090-180=7,80 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS6-3090-800
26,10x0.8m=7,80 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

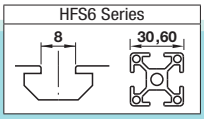
Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.

Alterations
Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS6 Series Aluminum Frames 30 · 60 mm Square
-Other shapes-

HFS6 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.523 ~ P.540	P.543 ~ P.550	P.627 ~ P.640	P.551	P.645 ~ P.658

CAD Data

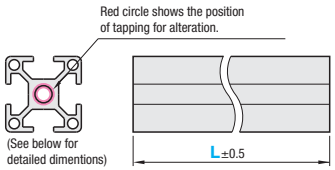
Features: Can be used when making angles or making outer surface in radius.

RoHS

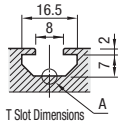


Type		Material	Surface Treatment
Configurable Length	Fixed Length		
HFS6 HFSR6 HFS__A6 HFS45TR6	KEFS6 KHFS6 KHFSR6 KHFS__A6 KHFS45TR6	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize

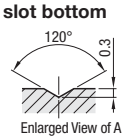
Cut surface and altered parts are not surface treated.



Slot



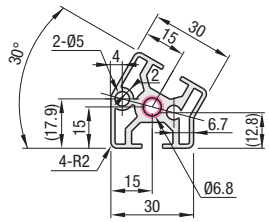
Details of slot bottom



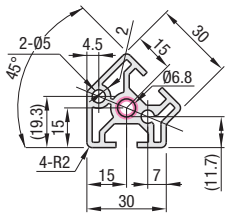
Features of Extrusions

Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
Surface Treatment	Clear Anodize	Common surface treatment.

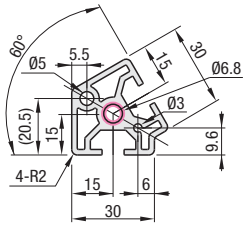
HFS30A6-30



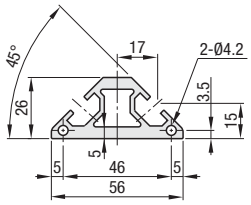
HFS45A6-30



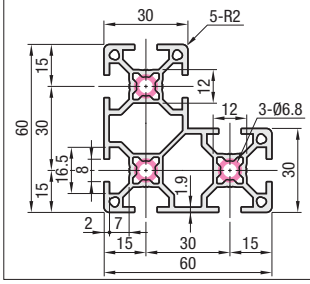
HFS60A6-30



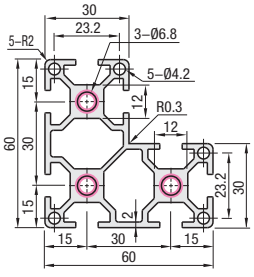
HFS45TR6-30



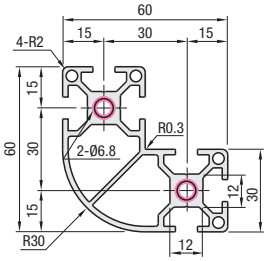
EFS6-606030 (New Shape)



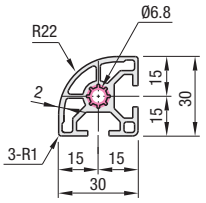
HFS6-606030



HFSR6-606030



HFSR6-3030



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
HFS30A6	30	50~4000	1.11	412	3.15x10⁴	3.86x10⁴						
HFS45A6			1.08	401	3.21x10⁴	3.72x10⁴						
HFS60A6			1.10	410	3.33x10⁴	3.70x10⁴						
	606030		2.21	819	27.38x10⁴	27.38x10⁴						
HFS6			2.33	864	27.3x10⁴	27.3x10⁴						
HFSR6			1.97	732	27.75x10⁴	27.75x10⁴						
HFSR6	3030		0.82	306	2.42x10⁴	2.42x10⁴						
HFS45TR6	30		1.33	492	3.42x10⁴	9.47x10⁴						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
KHFS30A6	30	4000	412	3.15x10⁴	3.86x10⁴		
KHFS45A6			401	3.21x10⁴	3.72x10⁴		
KHFS60A6			410	3.33x10⁴	3.70x10⁴		
KEFS6	606030		819	27.38x10⁴	27.38x10⁴		
KHFS6			864	27.3x10⁴	27.3x10⁴		
KHFSR6	3030		306	2.42x10⁴	2.42x10⁴		
KHFS45TR6	30		492	3.42x10⁴	9.47x10⁴		

Order Example

Part Number	-	L
HFS30A6-30	-	800
KHFS30A6-30	-	4000

Price

When L is less than 300 Unit prices are indicated in the table regardless of the length.
ex: HFS30A6-30-180=3,60 EUR
When L is 300 or more Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS30A6-30-800
12,30x0.8m=3,60 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
(KHFS30A6-30-4000)
For orders of 20 or more identical pieces, please request a quotation.

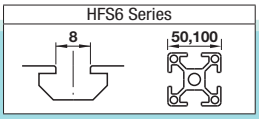
Alterations
Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS6 Series Aluminum Frames 50 · 100mm Square

Price Reduction Up to 2.3%

HFS6 Series



CAD Data

Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.523 ~ P.540	P.543 ~ P.550	P.627 ~ P.640	P.551	P.645 ~ P.658

Features: Convenient for switching from Cut-and-Weld tubing methods.

RoHS

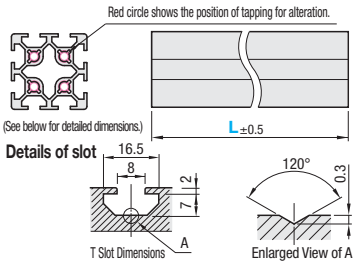


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS6	KHFS6	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize
HFS_6	KHFS_6		Black Anodize
HFSB6	KHFSB6		

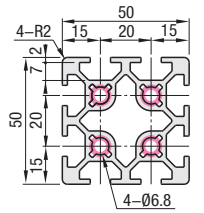
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

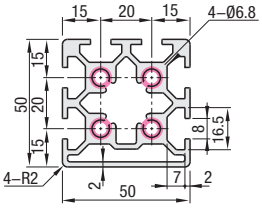
Cut surface and altered parts are not surface treated.



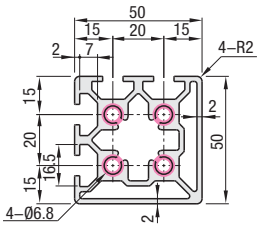
HFS6-5050
HFSB6-5050 (Black Anodize)



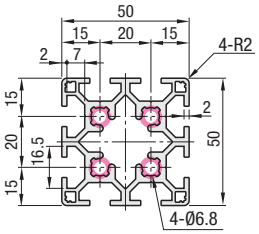
HFSF6-5050



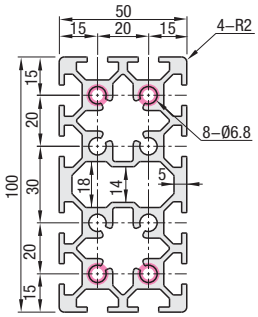
HFST6-5050



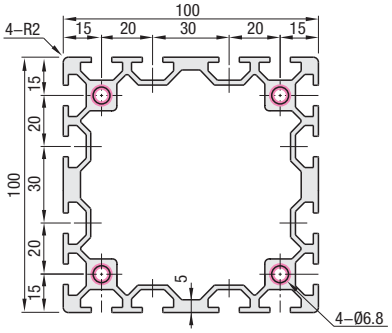
HFSL6-5050



HFS6-50100
HFSB6-50100 (Black Anodize)



HFS6-100100
HFSB6-100100 (Black Anodize)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	Volume Discount Less than 300mm		€ Unit Price/m 300mm or more	Volume Discount/m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
HFS6	50100	50~4000	4.36	1614	42.40x10⁴	153.5x10⁴						
HFSB6 (Black Anodize)												
HFSL6	50100		2.05	760	18.79x10⁴	18.79x10⁴						
HFSF6	50100		2.32	861	22.23x10⁴	21.40x10⁴						
HFST6	50100		2.36	874	22.26x10⁴	22.26x10⁴						
HFS6	100100		5.52	2043	265.2x10⁴	265.2x10⁴						
HFSB6 (Black Anodize)	100100											

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount
				ℓx	ℓy	1~9 pcs.	10~19
KHFS6	50100	4000	1614	42.40x10⁴	153.5x10⁴		
KHFSB6 (Black Anodize)							
KHFSF6	50100		861	22.23x10⁴	21.40x10⁴		
KHFST6	50100		874	22.26x10⁴	22.26x10⁴		
KHFS6	100100		2043	265.2x10⁴	265.2x10⁴		
KHFSB6 (Black Anodize)	100100						

Order Example

Part Number	-	L
HFS6-5050	-	800
KHFST6-5050	-	4000

Days to Ship

Configurable Length Extrusions: 6 Days

Fixed Length Extrusions (Effective Length 4000mm): 7 Days

For orders of 20 or more identical pieces, please request a quotation.

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS6-5050-180=7,00 EUR
When L is 300 or more Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS6-5050-800
23,30x0.8m=18,60 EUR (Round down to ten Cent.)

Alterations

Alterations are available for Configurable Length Extrusions. For details, refer to P.645

Aluminum Frames with 4000mm or more

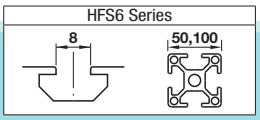
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

NEW

HFS6 Series Aluminum Frames

-Minimal Corner Radius Extrusions · Slot Width Mixed Extrusions-

HFS6 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.523 ~ P.540	P.543 ~ P.550	P.627 ~ P.640	P.551	P.645 ~ P.658

CAD Data

Features: Corner radiuses are small as R0.3, can be used side by side as a base.

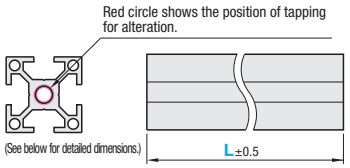
Aluminum Frames - Minimal Corner Radius

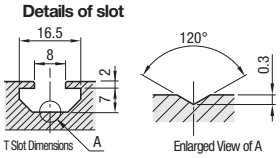


M Materials: EN AC-51400/AlMgSi0,7-T5

S Surface Treatment: White Alumite

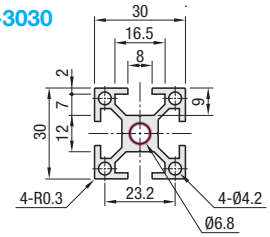
RoHS



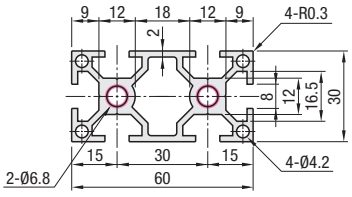


Clear Anodize is not available for cut surfaces and machined parts.

HFSV6-3030



HFSV6-3060



Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFSV6	3030	50~4000	0.91	335	2.91x10⁴	2.91x10⁴		
	3060		1.60	594	5.41x10⁴	20.83x10⁴		

Order Example: Part Number HFSV6-3030 - L 1200

Days to Ship: 6 Days

Price

Volume Discount P.87

Qty.	1~9	10~49	50~
Discount Rate	€ Unit Price	5%	10%
	€ Unit Price/m	5%	10%

Round down to one Cent. / Round down to ten Cent.

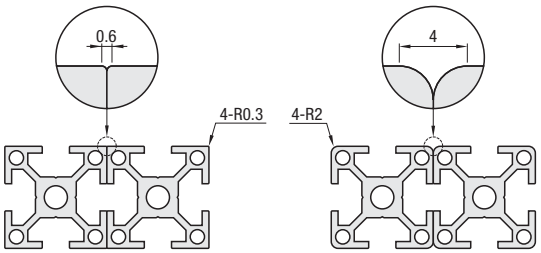
When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFSV6-3030-180=4,10 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFSV6-3030-1200
9,20x1.2m=4,10 EUR
(Round down to ten Cent.)

Alterations: Alterations are available for Configurable Length Extrusions. For details, refer to P.645

Features

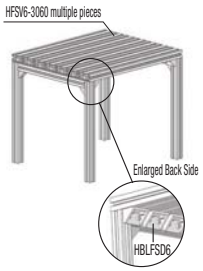
<HFSV Series> Small gap collects few dusts.

<Existing HFS Series>



Example

Effective use is to align frames, as shown below.



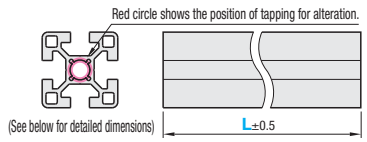
Features: Mixed Slot Width Extrusions of HFS5 and HFS6 series.

Aluminum Frames -Slot Width Mixed-



RoHS

HFS6-5H-3030
HFS6-5Y-2030

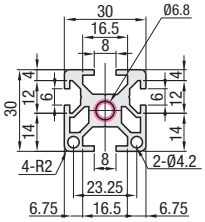


Cut surfaces are not anodized.

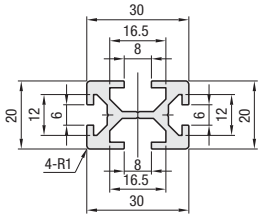
M Material: EN AC-51400/AlMgSi0,7-T5

S Surface Treatment: Clear Anodize

HFS6-5H-3030



HFS6-5Y-2030



Part Number Type	Shapes	No.	L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFS6-5	H	3030	50~4000	1.04	388	3.08x10⁴	3.51x10⁴		
	Y	2030		0.70	260	1.10x10⁴	2.61x10⁴		

Order Example: Part Number HFS6-5H-3030 - L 800

Days to Ship: 6 Days

Price

Volume Discount P.88

Qty.	1~9	10~49	50~
Discount Rate	€ Unit Price	5%	10%
	€ Unit Price/m	5%	10%

Round down to one Cent. / Round down to ten Cent.

When L<300, the unit prices indicated in the table are regardless of the length.
ex: HFS6-5H-3030-180=3,40 EUR

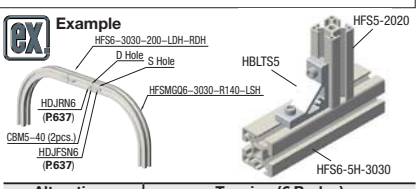
When L=300, total prices are calculated as follows.
€ Unit Price/m x Specified Full Length = Price
ex:HFS6-5H-3030-500
11,50x0.5m=5,70 EUR (Round down to ten Cent.)

Alterations: Part Number HFS6-5H-3030 - L 800 - (Alteration Code) TPW

7 Days

For details of tapping, refer to P.647

Example



Alterations Spec. Code			Tapping (€ Body+) Tap Shape	Left LTP	Right RTP	Both TPW
HFS6-5	H	3030	M8 Depth 24			

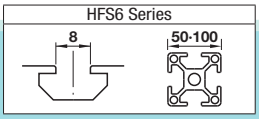
Not applicable to HFS6-5Y-2030.

Add. Spec.

HFS6 Series

-Parallel Chamfered Extrusions · Curved Aluminum Frames-

HFS6 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.523 ~ P.540	P.543 ~ P.550	P.627 ~ P.640	P.551	P.645 ~ P.658

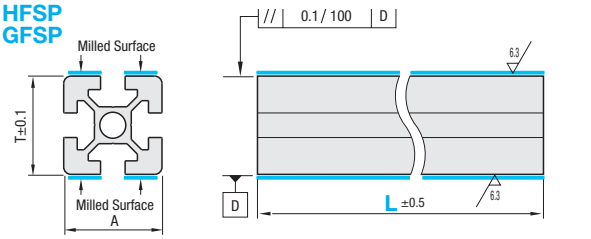
■**Features:** Milled on surfaces. Usable for Linear Guides, etc.

■**Parallel Chamfered Extrusions**



RoHS

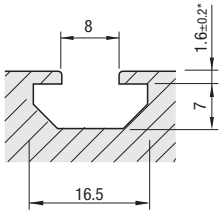
HFSP
GFSP



Ⓥ Milled surfaces and cut surfaces are not anodized.

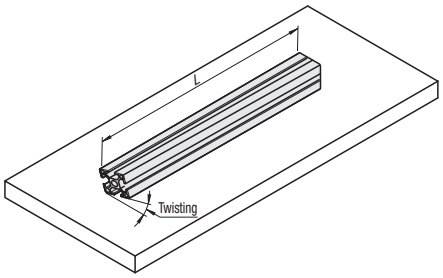
Type	Ⓜ Material	Ⓢ Surface Treatment
HFSP6	EN AC-51400/AlMgSi0,7-T5	Clear Anodize
GFSP6	EN AW-6061/En AW-AlMg1SiCu-T6	

Detailed view of slot on milled surface



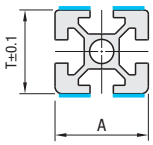
Ⓥ Being extruded sections, products can twist. It is recommended to support overall length of extrusion when using. See tolerance data on aluminum extrusions on **P.476**.

* Due to the extrusion outer dimentional tolerance, the thickness tolerance of the slot on the milled surface is shown above, while T dimension tolerance is ±0.1.

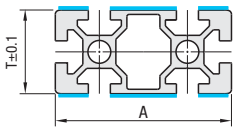


Ⓥ For detailed dimensions and shapes EXCEPT the slots on the milled surface, A and T dimensions, please refer to the drawing of the product of the below Part Number Without "P".(Ex.) HFSP6-3030→Ref. fig. HFS6-3030 (Refer to P.511.)

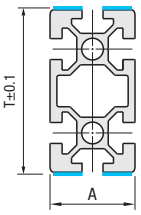
Square Type
HFSP6-3030
HFSP6-5050
HFSP6-100100
HFSP6-6060
GFSP6-3030



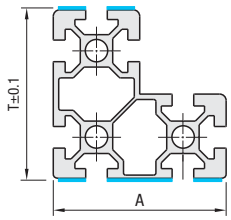
Rectangle Type (Horizontal)
HFSP6-6030
HFSP6-9030
HFSP6-10050
HFSP6-9060
GFSP6-6030



Rectangle Type (Vertical)
HFSP6-3060
HFSP6-3090
HFSP6-50100
HFSP6-6090
GFSP6-3060



L-Shaped Type
HFSP6-606030



Part Number		L 0.5mm Increment	Extrusions Series	T	A	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	Alteration Charge (€ Body+) Counterboring XA~XE (per row)		Drill Wrench Hole AV~EV (per row)		€ Tapping (P.647) Tap Shape	Left LTP	Right RTP	Both TPW
HFSP6	3030	100~3000	HFS6	29.2	30			Z6 d6.5 d11 Z8 d9 d14		D8 Ø8		M8 Depth 24			
	6030			29.2	60										
	3060			59.2	30										
	9030			29.2	90										
	3090			89.2	30										
	5050			49.2	50										
	10050			49.2	100										
	50100			99.2	50										
	100100			99.2	100										
	6060			59.2	60										
	9060			59.2	90										
	6090			89.2	60										
	606030			59.2	60										
GFSP6	3030		GFS6	29.2	30										
	6030			29.2	60										
	3060			59.2	30										

Order Example

Part Number	-	L	Days to Ship	8 Days	Price
HFSP6-3030	-	300			

■**Volume Discount** P.87

Qty.	1~9 pcs.	10~49	50~
Discount Rate	€ Unit Price	5%	10%
	€ Unit Price/m	5%	10%

Ⓥ Round down to one Cent.
Ⓥ Round down to ten Cent.

When L<300mm € Unit Price = Price
When L≥300mm € Unit Price/m x Specified Full Length = Price
Ex.: HFSP6-3030-600
29,20x0.6=17,50 EUR (Round down to ten Cent.)

Alterations

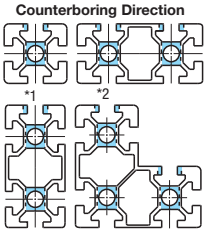
Drilling hole at a specified position can be done.

- Nuts for Extrusion
Please use nuts for aluminum extrusions. For the nuts, refer to **P.543~548**

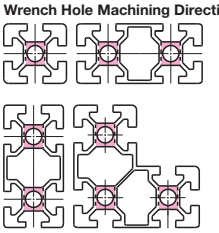
Alterations	Counterboring							Wrench Hole					
Code	Z Selection			XA	XB	XC	XD	XE	D Selection	AV	BV	CV	DV	EV
Spec.	Z	d	d1	Distance from The Left End Plane mm					D	Distance from The Left End Plane mm				
Specifications of Hole Size and Hole Position	6	6.5	11	7~L-7					8	7~L-7				
	8	9	14											

When the cross section is L-shaped, select distance from left end with lower section in front.

Counterboring Direction

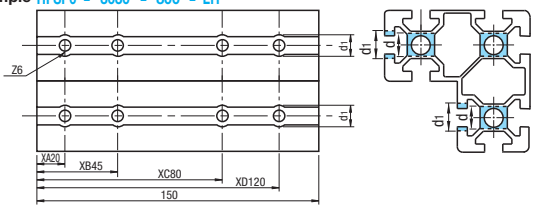


Wrench Hole Machining Direction



Order Example

HFSP6 - 606030 - 150 - Z6 - XA20 - XB45 - XC80 - XD120
HFSP6 - 3030 - 2000 - D8 - AV100 - BV120 - CV1000 - DV1880 - EV1900
HFSP6 - 3030 - 800 - LTP



*1 When the cross section is rectangle (vertical), counterboring is not available for extrusions exceeding 60mm in the longitudinal direction.
*2 When the cross section is L-shaped, counterboring is only applicable to the lower section of extrusions exceeding 60mm in length direction.

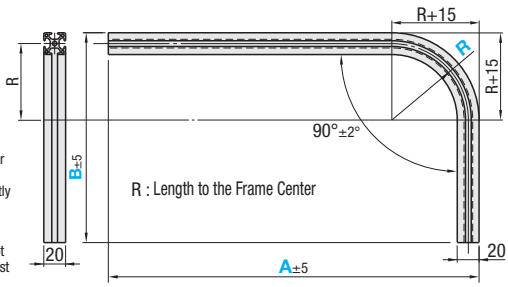
Features: Bending is applied to HFS6-3030.

Curved Aluminum Frames



RoHS

HFSMG6



Bending is applied after anodizing; therefore, bent section may slightly discolor and becomes white.

A and B dimensions not indicated in the price list are not available.

For R=140, the frame slot may be deformed and becomes narrower in width at the spot where the frame is bent. Therefore, slot nut cannot be used.
(For dedicated Curved Panels, refer to **P.886**)

M Material: EN AC-51400/AlMg0,7Si-T5
S Surface Treatment: Clear Anodize

Part Number Type	Part Number No.	A 1mm Increment	B 1mm Increment	R *	Series	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy
HFSMG	6-3030	200~1500	200~1000	140 300* 500*	HFS6	0.90	333	2.83x10⁴	2.83x10⁴

Order Example

Part Number - A - B - R
HFSMG6-3030 - A350 - B700 - R140

Days to Ship 10 Days

* Curved panels for R300 and R500 are not available.

Price

Volume Discount (Round down to one Cent.) **P.87**

Qty.	1~9 pcs.	10~49	50~
Discount Rate	€ Unit Price	5%	10%

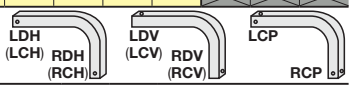
Part Number Type	Part Number No.	A	€ Unit Price R140 B 200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000	R300 B 400~500	501~600	601~700	701~800	801~900	901~1000	R500 B 600~700	701~800	801~900
HFSMG	6-3030	200~300																	
		301~400																	
		401~500																	
		501~600																	
		601~700																	
		701~800																	
		801~900																	
		901~1000																	
		1001~1100																	
		1101~1200																	
		1201~1300																	
		1301~1400																	
		1401~1500																	

Alterations

Part Number - A - B - R - (LTP · RTP · TPW · etc.)
HFSMG6-3030 - A400 - B500 - R140 - LTP-RCV

10 Days

Blind Joints (Pre-Assy. Insertion Double Joint) Connecting Example

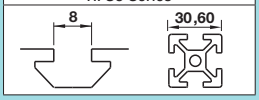


Alterations	Tap (P.647)			D Hole (P.654)				M Hole (P.656)				S Hole (P.655)				Wrench Hole (P.651)					
Code	LTP	RTP	TPW	LDH	LDV	RDH	RDV	LMH	LMV	RMH	RMV	LSH	LSV	RSH	RSV	LCH	LCV	LCP	RCH	RCV	RCP
Spec.	Tapping to the center hole Tap Shape M8 Depth 24 **LTP**: Tapping on the Left End Face **RTP**: Tapping on the Bottom End Face **TPW**: Tapping on the Both Ends Ex. LTP Tapped			Adds D type hole in specified position. **LDH · RDH**: D hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LDH 15 Ø11.1 **LDV · RDV**: D hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RDV Ø11.1 15				Adds M type hole in specified position. **LMH · RMH**: M hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LMH 15 Ø11.1 **LMV · RMV**: M hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RMV Ø11.1 15				Adds S type hole in the specified position. **LSH, RSH**:D hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LSH 15 Ø11.1 Ø16.5 **LSV, RSV**: D hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RSV Ø16.5 Ø11.1 15				**LCH, RCH** Wrench hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. RCH Ø8 15 **LCV · RCV** Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCV 15 Ø8 **LCP · RCP**: Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCP 15 2-Ø8			
When the tapping and D, M S or wrench holes are specified in combination, tap depth is the distance to D, M, S or wrench holes.																					
Applicable Extrusions																					
HFSMG6-3030	2,70		5,40	1,20				1,20				3,90				1,20	2,40		1,20		2,40

Tabbed Brackets -Slot Type:

HFS6 Series (Aluminum Frames 30 · 60 Square)-

HFS6 Series



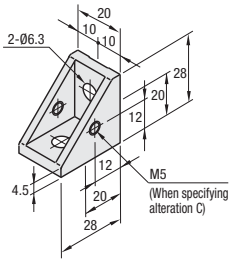
Features: Brackets with tabs to fit in slots of extrusions and stop rotating when tightening. Excels in work efficiency.

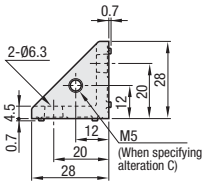
Tabbed Brackets RoHS



Type	Material	Surface Treatment
HBLFS6	EN AC-46100/ G-AlSi12Cu	-
HBLFSB6		Cathodic Electrodeposition Coating: Black

HBLFS6
HBLFSB6 (Cathodic Electrodeposition Coating: Black)





Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFS6	13	CBM6-12	2	HNTT6-6	2	1176		
HBLFSB6 (Cathodic Electrodeposition Coating: Black)								

ex. Example

Used for L-connections.



Features: Tabbed Brackets to be connected by both L and Cross-Connections.

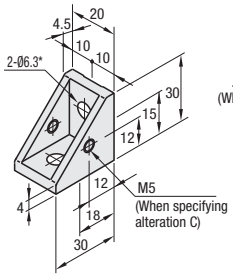
Reversal Tabbed Brackets RoHS

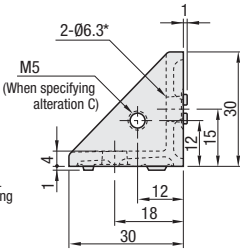


Type	Material	Surface Treatment
HBLFSN6 (-5)	EN AC-46100/ G-AlSi12Cu	-
HBLFSNB6		Black Anodize
HBLFSNM6		Electroless Nickel Plating
CHBLFSN6		Baked-on Finish (Silver)

* Baked-on Finish (Silver) is color coordinated with Clear Coating Extrusions.

HBLFSN6
HBLFSN6-5 (For M5 Screw)
HBLFSNB6 (Black Anodize)
HBLFSNM6 (Electroless Nickel Plating)
CHBLFSN6 (Baked-on Finish / Silver)

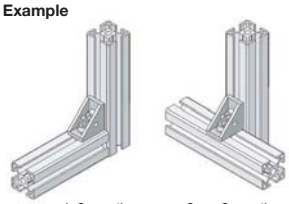




* Ø5.2 when HBLFSN9-5 is specified.

Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSN6	15	CBM6-12	2	HNTT6-6	2	1176		
HBLFSN6-5 (For M5 Screw)		CBM5-12		HNTT6-5				
HBLFSNB6* (Black Anodize)		CBM6-12		HNTT6-6				
HBLFSNM6 (Electroless Nickel Plating)								
CHBLFSN6 (Baked-on Finish · Silver)								

ex. Example



L-Connection Cross-Connection

Can be installed in either direction.

* For repairing black anodizing, refer to **P.748**

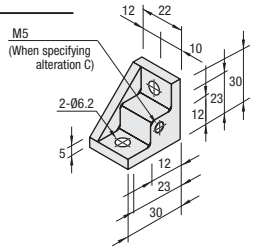
Features: One-Sided Tabbed Rib Brackets. Easy to work with wrenches.

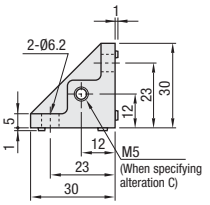
One-Side Rib Brackets RoHS



Type	Material	Surface Treatment
HBLFSL6	EN AC-46100/G-AlSi12Cu	-

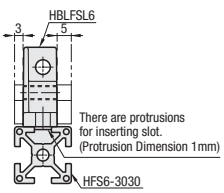
HBLFSL6





Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSL6	17	CBM6-12	2	HNTT6-6	2	1176		

ex. Example



Can be combined with both cover plates of 5mm and 3mm thickness.

NEW

CAD Data

Features: Pressing nuts against the long tabs makes cumbersome hole positioning unnecessary.

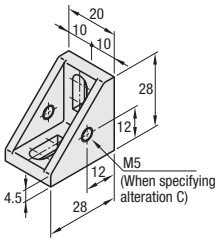
Nut-Fixing Brackets

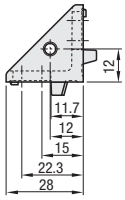
RoHS

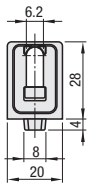


Type	Material	Surface Treatment
HBLFSR6	EN AC-46100/ G-AlSi12Cu	-

HBLFSR6







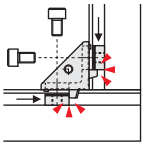
<Back View>

- Slotted holes are for various nut hole positions.
- Bracket tabs may be damaged when nuts are fallen on them.
- Use of washers are recommended. (Alteration SEC below)

Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
		Screw	Qty.	T Nut	Qty.			
HBLFSR6	15	CBM6-12	2	HNTT6-6	2	1176		

ex Example

When nuts are wedged through until the tab, hole positions of bracket and nuts are aligned and fine adjustment becomes unnecessary.
⊗Short Nuts, HNTM, HNTAM are not applicable.



Features: Brackets with single side tabs. Plates can be mounted on the side with no tabs.

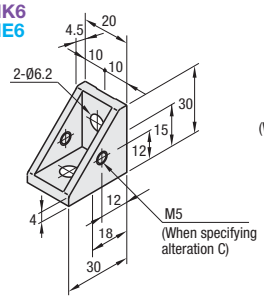
Brackets with Single Side Tab

RoHS

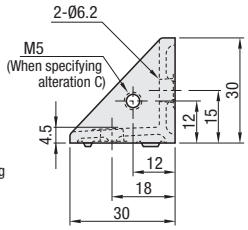


Type	Material	Surface Treatment
HBLFSNK6 HBLFSNE6	EN AC-46100/ G-AlSi12Cu	-

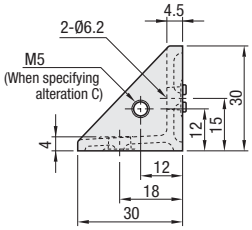
HBLFSNK6
HBLFSNE6



HBLFSNK6 Side View



HBLFSNE6 Side View

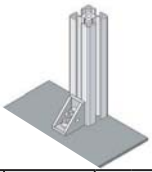


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
		Screw	Qty.	T Nut	Qty.			
HBLFSNK6 HBLFSNE6	15	CBM6-12	2	HNTT6-6	2	1176		

ex Example

- Can be mounted on a plate directly.

HBLFSNK6 Example of HBLFSNE6



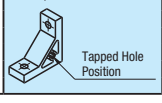
Example of HBLFSNE6



Order Example — Part Number: HBLFS6

Days to Ship — 6 Days / 2 Days P.87

Alterations — Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLFS6 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM) 	HBLFS6	0,20
			HBLFSB6	0,50
			HBLFSN6	0,20
			HBLFSN6-5	0,20
			HBLFSNB6	0,50
			HBLFSNM6	0,20
			CHBLFSN6	0,45
			HBLFSL6	0,20
			HBLFSR6	
			HBLFSNK6	
			HBLFSNE6	

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFS6 is specified,	HBLFS6	0,88	0,96	1,14	1,82	1,14	1,36	1,44
			HBLFSB6	0,98	-	1,24	-	1,24	-	-
			HBLFSN6	0,88	0,96	1,14	1,82	1,14	1,36	1,44
			HBLFSN6-5							
			HBLFSNB6	0,98	-	1,24	-	1,24	-	-
			HBLFSNM6	0,88	0,96	1,14	1,82	1,14	1,36	1,44
			CHBLFSN6							
			HBLFSL6							
			HBLFSR6							
			HBLFSNK6							-
			HBLFSNE6							

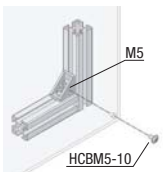
Code	Screws	Nuts
SET	CBM6-12	HNTT6-6
SST	SCB6-12	HNTTSN6-6
SEU	CBM6-12	HNTU6-6
SSU	SCB6-12	SHNTU6-6
SEP	CBM6-12	HNTP6-6
SSP	SCB6-12	SHNTP6-6
SEC	HCBST6-15	HNTT6-6

When specifying other than HBLFS6, check for the applicable screws and nuts.

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). Refer to P.641
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

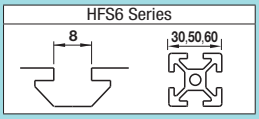
Example of Cover Mounting

- Specify alteration code C.



Post-Assy. Insertion Easy Brackets/Tabbed Brackets

-Slot Type: HFS6 Series (Aluminum Frames 30 · 50 · 60 Square)-



Features: 2 aluminum extrusions can be easily connected with tightening only 1 screw. Brackets can be mounted on the extrusion slots after assembly.

Brackets

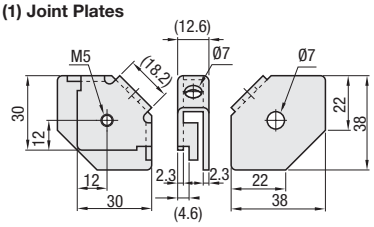
RoHS



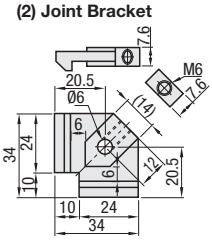
Components	Material	Surface Treatment
(1) Joint Plates	1.0330/DC01	Trivalent Chromate
(2) Joint Bracket	1.1191/C45E	
(3) Hexagon Socket Head Cap Screw	1.7220/34CrMo4	

HABL6

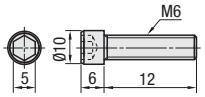
(1) Joint Plates



(2) Joint Bracket



(3) Hexagon Socket Head Cap Screw

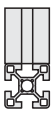
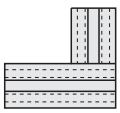
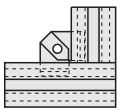
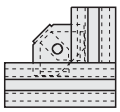
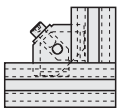


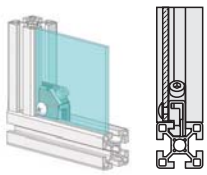
Overtightening may cause deformation of joint plates. (Reference Tightening Torque 10.5N·m)

Part Number / Type	Mass (g)	Included Screw: Screw	Included Screw: Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HABL6	90	Hex Socket Head Cap Screws M6x12	1	600		3,51

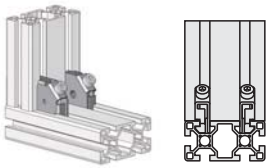
Example

Connection Method

Step	Front View	Side view	Sketch Drawing
1			 Place 2 Aluminum extrusions, and adjust the frame positions.
2			 Fit the joint bracket (2) in the slot of the aluminum extrusions.
3			 Cover the joint bracket (2) on the joint plate (1).
4			 Overtightening may cause deformation of joint plates. Tighten a hexagon socket head cap screw to fix the plate. (Reference Tightening Torque 10.5N·m)



Holes are tapped on a bracket for cover mounting.



For aluminum extrusions with 2 slots, brackets can be mounted on both sides.

Features: Tabbed Brackets with Slotted Hole on one side. Hexagon Socket Head Cap Screws with Captured Washers can be used for mounting without interference between screw heads.

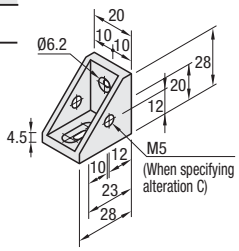
Brackets with Slotted Hole on one side

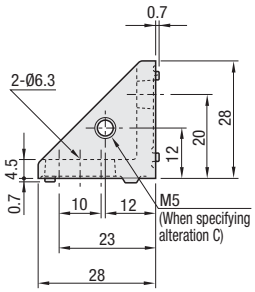
RoHS



Type	Material	Surface Treatment
HBLFSH6	EN AC-46100/ G-AlSi12Cu	-

HBLFSH6



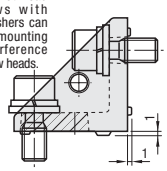


Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSH6	12	CBM6-12	2	HNT6-6	2	1176		1,11

Example

2 Days

Hexagon Socket Head Cap Screws with Captured Washers can be used for mounting without interference between screw heads.



Features: Reversal Tabbed Brackets with twice as many screws. Extrusions can be connected more securely.

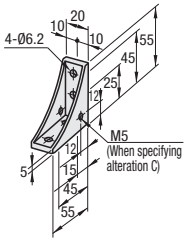
Reversal Tabbed Brackets

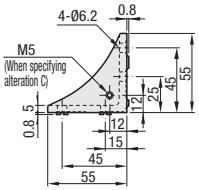
RoHS



Type	Material	Surface Treatment
HBLFSSW6	EN AC-46100/ G-AlSi12Cu	-
HBLFSSWB6		Black Anodize
HBLFSSW6-50		-

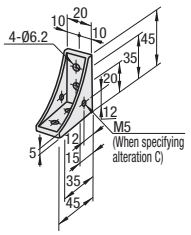
HBLFSSW6
HBLFSSWB6(Black Anodize)

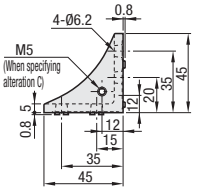




For 50 Sq.

HBLFSSW6-50

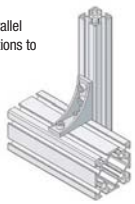




Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSSW6	37	CBM6-12	4	HNTT6-6	4	1764		
HBLFSSWB6* (Black Anodize)								
HBLFSSW6-50	27							

Example

Can be connected in parallel and perpendicular directions to the extrusion slot.



* For repairing black anodizing, refer to **P.748**

Features: Reversal Tabbed Brackets with Cover. Designed to prevent dust build-up.

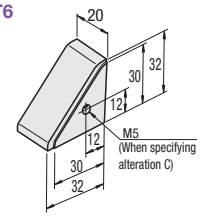
Brackets with Caps

RoHS

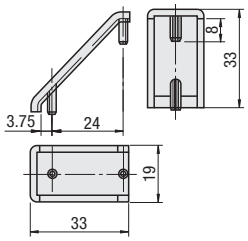


Type	Material	Surface Treatment
HBLFSNT6	Cover for Brackets: Polyamide (Black) Bracket: EN AC-46100/G-AlSi12Cu	-

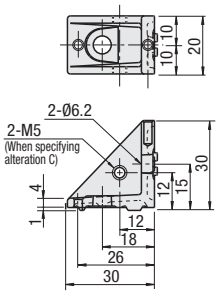
HBLFSNT6



Cover for Brackets



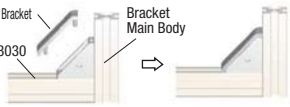
Bracket for Covers



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Accessory Components (1)	Qty.	(2)	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSNT6	17	CBM6-12	2	HNTT6-6	2	Bracket	1	Cover for Brackets	1	1176		

Example

•Example of Mounting Covers to Brackets



Order Example

Part Number
HABL6
HBLFSH6
HBLFSSW6
HBLFSNT6

Days to Ship

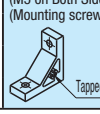
6 Days
2 Days

P.87

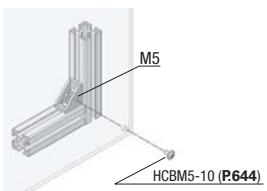
Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLFSH6 - SET
⊗Except HABL6.

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM)	HBLFSH6	0,20
			HBLFSSW6	0,50
			HBLFSSWB6	
			HBLFSSW6-50	
			HBLFSNT6	0,40



C Hole Alteration
(Example of Cover Mounting)
-Specify alteration code C.



Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion) SSP (Post-Assy. Spring Nuts Stainless Steel) SEC (Captured er Screws · Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFSH6 is specified,	HBLFSH6	0,88	0,96	1,14	1,82	1,14	1,36	1,44
			HBLFSSW6	1,76	1,92	2,28	3,64	2,28	2,72	2,88
			HBLFSSWB6	2,00	-	2,52	-	2,52	-	-
			HBLFSSW6-50	1,76	1,92	2,28	3,64	2,28	2,72	2,88
			HBLFSNT6	0,95	1,00	1,21	1,86	1,21	1,40	-

Code	Screw	Nuts
SET	CBM6-12	HNTT6-6
	SCB6-12	HNTTSN6-6
SEU	CBM6-12	HNTU6-6
SSU	SCB6-12	SHNTU6-6
SEP	CBM6-12	HNTP6-6
SSP	SCB6-12	SHNTP6-6
SEC	HCBST6-15	HNTT6-6

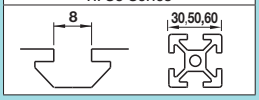
⊗When specifying other than HBLFSH6, check for the applicable screws and nuts.

⊗Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). Refer to **P.641**
⊗When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Tabbed Brackets -for 2 slots x 2 slots-

-Slot Type: HFS6 Series (Aluminum Frames 30 · 50 · 60 Square)-

HFS6 Series



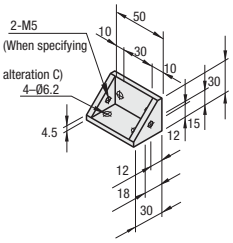
Features: Extrusions with 2-slots (HFS6-6060, etc.) can be connected with one bracket.

Reversal Tabbed Brackets RoHS

Type	M Material	S Surface Treatment
HBLFSD6 HBLFSD6-50	EN AC-46100/G-AlSi12Cu	-

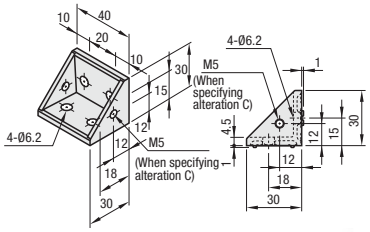


HBLFSD6



For 50 Sq.

HBLFSD6-50



Part Number / Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSD6	28	CBM6-12	4	HNTT6-6	4	1764		
HBLFSD6-50	24							

Example

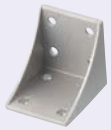


Reversal Tabbed Brackets can be connected in parallel and perpendicular directions to the extrusion slot.

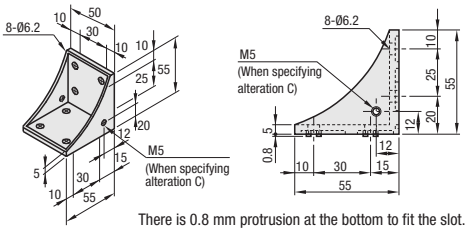
Features: Brackets for 2-slots with twice as many screws. Extrusions can be connected more securely.

Reversal Tabbed Brackets RoHS

Type	M Material	S Surface Treatment
HBLFSDD6	EN AC-46100/G-AlSi12Cu	-



HBLFSDD6



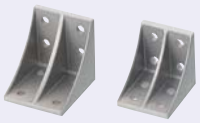
There is 0.8 mm protrusion at the bottom to fit the slot.

Part Number / Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSDD6	65	CBM6-12	8	HNTT6-6	8	2940		

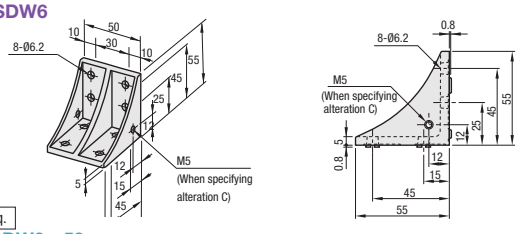
Features: Ribbed Brackets for 2-slots with twice as many screws. Extrusions can be connected more securely.

Reversal Tabbed Brackets RoHS

Type	M Material	S Surface Treatment
HBLFSDW6 HBLFSDW6-50	EN AC-46100/G-AlSi12Cu	-

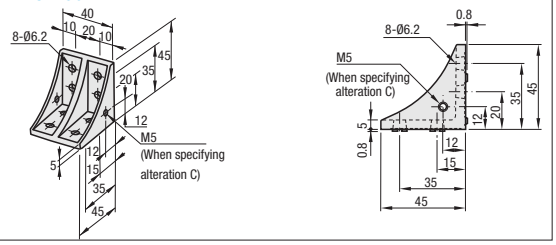


HBLFSDW6



For 50 Sq.

HBLFSDW6—50



Example



Reversal Tabbed Brackets can be connected in parallel and perpendicular directions to the extrusion slot.



Part Number / Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSDW6	88	CBM6-12	8	HNTT6-6	8	2940		
HBLFSDW6-50	53					2964		

CAD Data

Features: Tabbed Brackets for 2-slots. Since the tabs stop rotating the brackets when tightening, improves work efficiency.

Tabbed Brackets

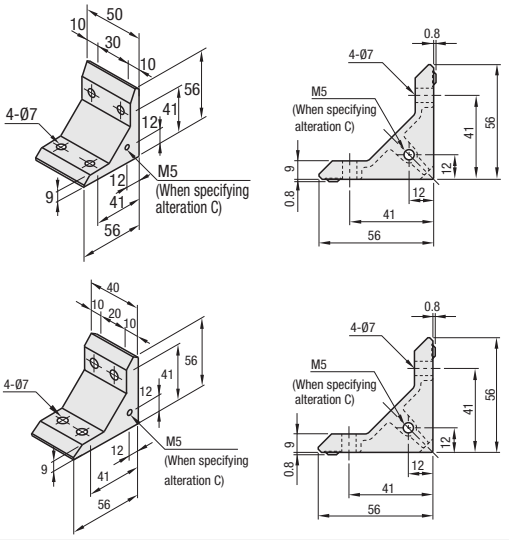
RoHS



Type	M Material	S Surface Treatment
HBLFTD6 HBLFTD6-50	EN AC-46100/ G-AlSi12Cu	-
HBLFTDB6		Black Anodize
HBLFTDM6		Electroless Nickel Plating

HBLFTD6
HBLFTDB6(Black Anodize)
HBLFTDM6(Electroless Nickel Plating)

For 50 Sq.
HBLFTD6-50



Part Number Type	Mass (g)	Applicable Screw · T Nut Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFTD6	88	CBM6-15	4	HNTT6-6	4	1960		
HBLFTDB6* (Black Anodize)	102							
HBLFTDM6 (Electroless Nickel Plating)								
HBLFTD6-50	86							

* For repairing black anodizing, refer to **P.748**

Features: Tabbed Brackets for 2-slots. Since the tabs stop rotating the brackets when tightening, improves work efficiency.

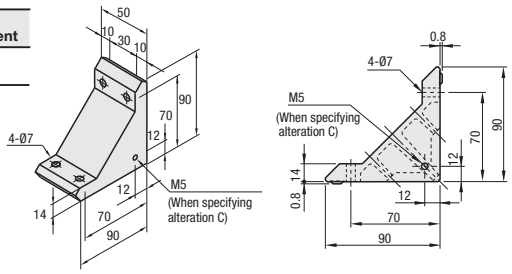
Tabbed Brackets

RoHS



Type	M Material	S Surface Treatment
HBLFUD6	EN AC-46100/ G-AlSi12Cu	-

HBLFUD6



Part Number Type	Mass (g)	Applicable Screw · T Nut Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFUD6	270	CBM6-20	4	HNTT6-6	4	1960		

Order Example Part Number: **HBLFTD6**

Days to Ship 6 Days / 2 Days P.87

Alterations Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLFTD6 - SET

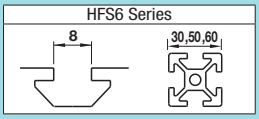
Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM)  Tapped Hole Position	HBLFSD6	0,20
			HBLFSD6-50	
			HBLFSDD6	0,30
			HBLFSDW6	0,50
			HBLFSDW6-50	
			HBLFTD6	0,50
			HBLFTDB6	
			HBLFTDM6	
			HBLFTD6-50	
			HBLFUD6	1,00

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFSD6 is specified, Code / Screws / Nuts SET / CBM6-12 / HNTT6-6 / SCB6-12 / HNTTSN6-6 SEU / CBM6-12 / HNTU6-6 SSU / SCB6-12 / SHNTU6-6 SEP / CBM6-12 / HNTP6-6 SSP / SCB6-12 / SHNTP6-6 SEC / HCBST6-15 / HNTT6-6 When specifying other than HBLFSD6, check for the applicable screws and nuts.	HBLFSD6	1,76	1,92	2,28	3,64	2,28	2,72	-
			HBLFSD6-50							
			HBLFSDD6	3,54	3,86	4,58	7,30	4,58	5,46	5,78
			HBLFSDW6							
			HBLFSDW6-50							
			HBLFTD6	1,80	1,95	2,32	3,67	2,32	2,75	2,96
			HBLFTDB6	2,28	-	2,80	-	2,80	-	-
			HBLFTDM6	1,80	1,95	2,32	3,67	2,32	2,75	2,96
			HBLFTD6-50							
			HBLFUD6		1,80		3,52		2,60	2,76

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). Refer to **P.641**
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 1-slot-

-Slot Type: HFS6 Series (Aluminum Frames 30 · 50 · 60 Square)-



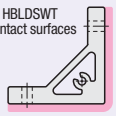
Features: Extruded Brackets with tabs to fit extrusions. Since the tabs stop rotating the brackets when tightening, improves work efficiency. The position of the nut can be held temporarily with a set screw.

Thick Brackets (With Tab Type)

RoHS



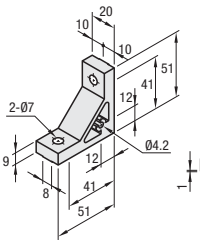
HBK _ _ Series and HBLDSWT have tabs on the contact surfaces with extrusions.



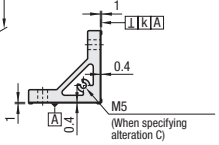
Type	M Material	S Surface Treatment
HBKTST6 HBKTS6	EN AC-51400/ AlMgSi0,7-T5	Anodize

HBKTST6
(Perpendicularly Machined)
HBKTS6

Part Number	Perpendicularity K
HBKTST6	0.03
HBKTS6	0.06



The Protrusion Type has a protrusion on the bracket bottom which fits into the aluminum frame extrusion groove.

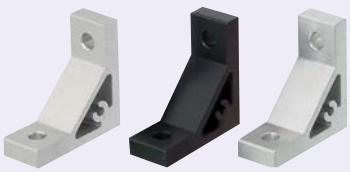


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKTST6	44	CBM6-15	2	HNTT6-6	2	1176		
HBKTS6								

Features: Aluminum Extruded Brackets. Good appearance designed to prevent dust build up.

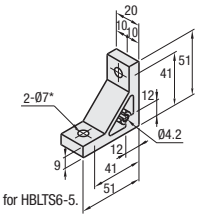
Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLTS6 (-5)	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLTSB6		Black Anodize
CHBLTS6		Clear Coating (Anodize + Clear Coating)

HBLTS6
HBLTS6-5
(For M5 Screw)
HBLTSB6
(Black Anodize)
CHBLTS6
(Clear Coating)



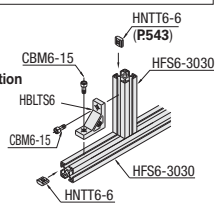
* Ø5.5 for HBLTS6-5.

Part Number Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTS6	44	CBM6-15	2	HNTT6-6	2	1176		
HBLTS6-5 (For M5 Screw)		CBM5-15		HNTT6-5				
HBLTSB6* (Black Anodize)		CBM6-15		HNTT6-6				
CHBLTS6 (Clear Coating)								

* For repairing black anodizing, refer to **P.748**

Example

Example of Frame Connection
Connection with Thick Bracket



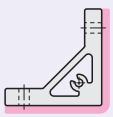
Features: Numbers of screws are the same as HBLKTS6. Extrusions can be connected more securely.

Ultra Thick Brackets (With Tab)

RoHS

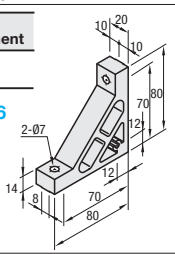


HBK _ _ Series and HBLDSWT have tabs on the contact surfaces with extrusions.

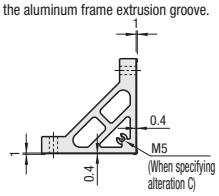


Type	M Material	S Surface Treatment
HBKUS6	EN AC-51400/ AlMgSi0,7-T5	Anodize

HBKUS6



The Protrusion Type has a protrusion on the bracket bottom which fits into the aluminum frame extrusion groove.



Part Number Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKUS6	101	CBM6-20	2	HNTT6-6	2	1176		

Features: Numbers of screws are the same as HBLTS6. Extrusions can be connected more securely.

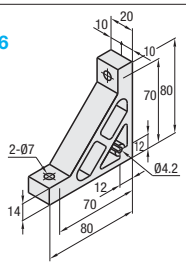
Ultra Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLUS6	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLUSB6		Black Anodize

HBLUS6
HBLUSB6
(Black Anodize)



Part Number Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUS6	101	CBM6-20	2	HNTT6-6	2	1176		
HBLUSB6 *(Black Anodize)								

* For repairing black Anodize, refer to **P.748**

CAD Data

Features: Hole positions are offset. Can be combined with plates of 3mm and 5mm thickness when using taps for mounting covers.

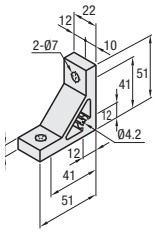
Eccentric Brackets

RoHS



Type	M Material	S Surface Treatment
HBLTH6	EN AC-51400/ AlMgSi0,7-T5	Anodize

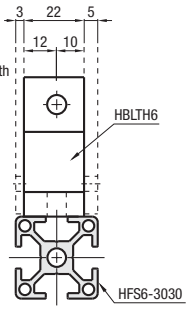
HBLTH6



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLTH6	44	CBM6-15	2	HNTT6-6	2	1176		

Example

They can be combined with cover plates of thickness 3mm and 5mm.



Features: Extruded Brackets with Unequal Sides. Effective when strength is required in narrow clearances between extrusions.

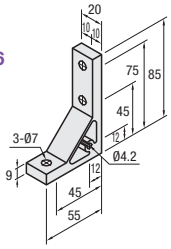
Scalene Brackets

RoHS



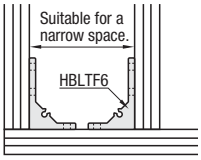
Type	M Material	S Surface Treatment
HBLTF6	EN AC-51400/ AlMgSi0,7-T5	Anodize

HBLTF6



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLTF6	62	CBM6-15	3	HNTT6-6	3	1470		

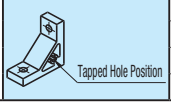
Example



Order Example — Part Number: HBLUS6

Days to Ship: 6 Days P.88 2 Days

Alterations — Part Number: HBLTS6 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM) 	HBLTS6 HBLTS6-5	0,30
			CHBLTS6	0,50
			HBKTS6	0,30
			HBLTH6	0,30
			HBLTF6	
			HBLUS6	
			HBKUS6	

Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Pre-assy. nsertion Spring Nuts) SEU (Pre-assy. Insertion Spring Nuts Stainless Steel) SSU (Post-Assy. ertion) SEP (Post-Assy. Spring Nuts Stainless Steel) SSP (Captured er Screws · Nuts) SEC	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTS6 is specified, Code: SET — Screws: CBM6-15 — Nuts: HNTT6-6; SCB6-15 — HNTTSN6-6; SEU — CBM6-15 — HNTU6-6; SSU — SCB6-15 — SHNTU6-6; SEP — CBM6-15 — HNTP6-6; SSP — SCB6-15 — SHNTP6-6; SEC — HCBST6-20 — HNTT6-6	HBLTS6	0,88	0,96	1,14	1,82	1,14	1,36	1,46
			HBLTS6-5							-
			HBLTSB6	1,12	-	1,38	-	1,38	-	
			CHBLTS6	0,88	0,96	1,14	1,82	1,14	1,36	1,46
			HBKTS6							
			HBKTST6							
			HBLTH6	0,88	0,96	1,14	1,82	1,14	1,36	1,46
			HBLTF6	1,33	1,44	1,71	2,73	1,71	2,04	2,19
			HBLUS6	0,90	0,90	1,16	1,76	1,16	1,30	1,38
			HBLUSB6	1,14	-	1,40	-	1,40	-	-
			HBKUS6	0,90	0,90	1,16	1,76	1,16	1,30	1,38

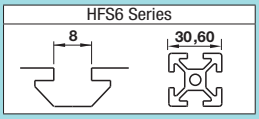
When specifying other than HBLTS6, check for the applicable screws and nuts.

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 1-slot-

-Slot Type: HFS6 Series (Aluminum Frames 30 · 60 Square)-



CAD Data

Features: Extruded Brackets with twice as many screws. Extrusions can be connected more securely.

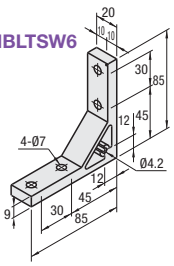
Thick Brackets

RoHS

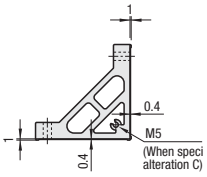


Type	Material	Surface Treatment
HBLTSW6	EN AC-51400/ AlMgSi0,7-T5	Anodize

HBLTSW6



The Protrusion Type has a protrusion on the bracket bottom which fits into the aluminum frame extrusion groove.



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLTSW6	76	CBM6-15	4	HNTT6-6	4	1764		

Features: Brackets with twice as many screws. Extrusions can be connected more securely.

Triangle Brackets

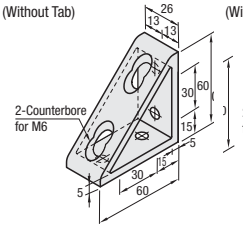
RoHS



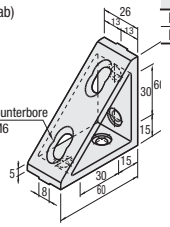
HBK _ _ Series and HBLDSWT have tabs on the contact surfaces with extrusions.



HBLDSW6 (Without Tab)

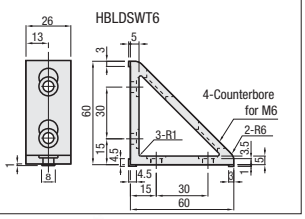


HBLDSWT6 (With Tab)



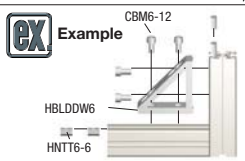
Type	Material	Surface Treatment
HBLDSW6	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLDSWT6		

HBLDSWT6



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLDSW6	100	CBM6-12	4	HNTT6-6	4	1764		
HBLDSWT6	110							

ex Example



HBLDSWT6 Example



Features: Brackets to connect Extrusions 30 · 20 square.

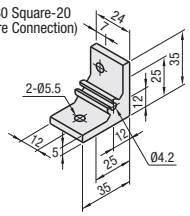
Assembly Brackets for Different Extrusion Sizes

RoHS

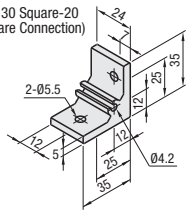


Type	Material	Surface Treatment
HBLTS6-5L	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLTS6-5R		

HBLTS6-5L (For 30 Square-20 Square Connection)

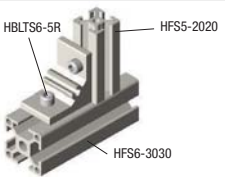


HBLTS6-5R (For 30 Square-20 Square Connection)



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLTS6-5L	26	CBM5-12	1	HNTT6-5	1	-		
		CBM5-10		HNTT5-5				
HBLTS6-5R		CBM5-12		HNTT6-5				
		CBM5-10		HNTT5-5				

ex Example



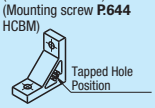
Order Example — Part Number: HBLTSW6

Days to Ship: 6 Days / 2 Days P.87

Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)

HBLTSW6 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM)  Tapped Hole Position	HBLTSW6	0,40
			HBLTS6-5L	0,30
			HBLTS6-5R	

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Applicable Screws and Nuts come as a set.	SET (Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)		
	SEU (Pre-assy. Insertion Spring Nuts)	(Ex.) When HBLTSW6 is specified,		
	SSU (Pre-assy. Insertion Spring Nuts Stainless Steel)			
	SEP (Post-Assy. Insertion)			
	SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)			
	SEC (Captured Washer Screws · Nuts)	When specifying other than HBLTSW6, check for the applicable screws and nuts.		

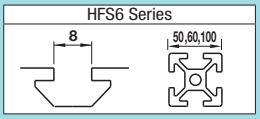
Code	Screws	Nuts
SET	CBM6-15	HNTT6-6
	SCB6-15	HNTTSN6-6
SEU	CBM6-15	HNTU6-6
SSU	SCB6-15	SHNTU6-6
SEP	CBM6-15	HNTP6-6
SSP	SCB6-15	SHNTP6-6
SEC	HCBST6-20	HNTT6-6

Applicable Brackets	SET	SST	SEU	SSU	SEP	SSP	SEC
HBLTSW6	1,76	1,92	2,28	3,64	2,28	2,72	2,92
HBLDSW6	1,85	1,95	2,37	3,67	2,37	2,75	-
HBLDSWT6							
HBLTS6-5L	0,84	-	-	-	-	-	-
HBLTS6-5R							

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 2-slots-

-Slot Type: HFS6 Series (Aluminum Frames 50 · 60 · 100 Square)-



CAD Data

Features: Extruded Brackets to connect Extrusions with 2-slots (HFS6-6060, etc.) with one bracket.

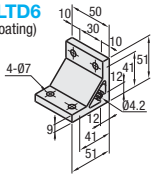
Thick Brackets

RoHS

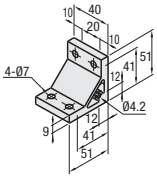


Type	Material	Surface Treatment
HBLTD6 (-50)	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLTDB6		Black Anodize
CHBLTD6		Clear Coating + (Anodize + Clear oating)

HBLTD6
HBLTDB6 (Black Anodize)
CHBLTD6 (Clear Coating)



For 50 Sq.
HBLTD6—50



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTD6	111	CBM6-15	4	HNTT6- 6	4	1960		
HBLTDB6* (Black Anodize)								
CHBLTD6 (Clear Coating)								
HBLTD6-50	88							

* For repairing black anodizing, refer to **P.748**

Features: Numbers of screws are the same as HBLTD6. Extrusions can be connected more securely.

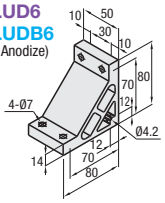
Ultra Thick Brackets

RoHS

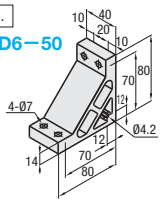


Type	Material	Surface Treatment
HBLUD6	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLUDB6		Black Anodize
HBLUD6-50		Anodize

HBLUD6
HBLUDB6 (Black Anodize)



For 50 Sq.
HBLUD6—50



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUD6	256	CBM6-20	4	HNTT6- 6	4	1960		
HBLUDB6* (Black Anodize)								
HBLUD6-50	211	CBM6-20						

* For repairing black anodizing, refer to **P.748**

Features: Brackets for 2-slots with twice as many screws. Extrusions can be connected more securely.

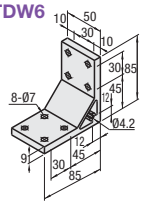
Thick Brackets
Triangle Brackets

RoHS

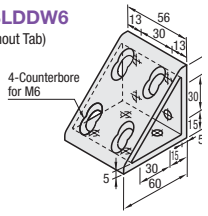


Type	Material	Surface Treatment
HBLDDW6	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLTDW6		

HBLTDW6

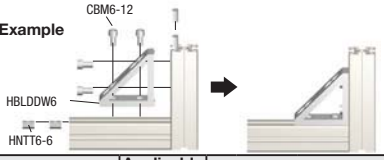


HBLDDW6 (Without Tab)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLDDW6	190	CBM6-12	8	HNTT6- 6	8	2940		
HBLTDW6	192	CBM6-15	8		8	2940		

EX Example



Order Example Part Number: HBLTD6

Days to Ship 6 Days / 2 Days P.87

Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLTD6 - SET

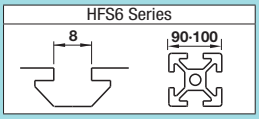
Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM)	HBLTD6	0,30
			CHBLTD6	0,50
			HBLTD6-50	0,30
			HBLUD6	
			HBLUD6-50	
			HBLTDW6	

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws · Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTD6 is specified, Code: SET — Screws: CBM6-15, SCB6-15 — Nuts: HNTT6-6, HNTTSN6-6; SEU — CBM6-15 — HNTU6-6; SSU — SCB6-15 — SHNTU6-6; SEP — CBM6-15 — HNTP6-6; SSP — SCB6-15 — SHNTP6-6; SEC — HCBST6-20 — HNTT6-6. When specifying other than HBLTD6, check for the applicable screws and nuts.	HBLTD6	1,76	1,76	2,28	3,48	2,28	2,56	2,92
			HBLTDB6	2,24	-	2,76	-	2,76	-	-
			CHBLTD6	1,76	1,92	2,28	3,64	2,28	2,72	2,92
			HBLTD6-50	1,76	1,76	2,32	3,52	2,32	2,56	4,08
			HBLUD6	1,80	1,80	2,32	3,52	2,32	2,60	3,72
			HBLUDB6	2,28	-	2,80	-	2,80	-	-
			HBLUD6-50	1,80	1,80	2,32	3,52	2,32	2,60	3,72
			HBLDDW6	3,70	3,90	4,74	7,34	4,74	5,50	-
			HBLTDW6	3,52	3,90	4,56	7,34	4,56	5,50	-

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 3 or more slots-

-Slot Type: HFS6 Series (Aluminum Frames 90 · 100 Square)-



CAD Data

Features: Extruded Brackets to connect Extrusions with 3-slots (HFS6-3090, etc.) with one bracket.

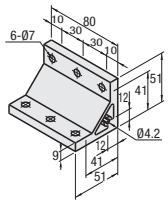
Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLTT6	EN AC-51400/ AlMgSi0,7-T5	Anodize

HBLTT6



Part Number Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTT6	180	CBM6-15	6	HNTT6-6	6	2744		

Features: Brackets to connect Extrusions with 3-slots and 4-slots (HFS6-3090, 50100 etc.) with one bracket.

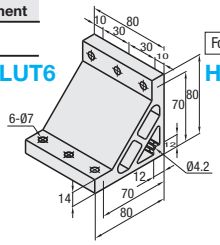
Ultra Thick Brackets

RoHS



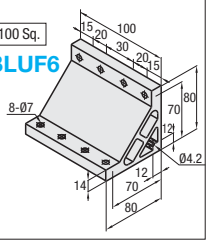
Type	M Material	S Surface Treatment
HBLUT6 HBLUF6	EN AC-51400/ AlMgSi0,7-T5	Anodize

HBLUT6



For 100 Sq.

HBLUF6



Part Number Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUT6	409	CBM6-20	6	HNTT6-6	6	2744		
HBLUF6	512		8		8	2940		

Features: Brackets for 3-slots and 4-slots with twice as many screws. Extrusions can be connected more securely.

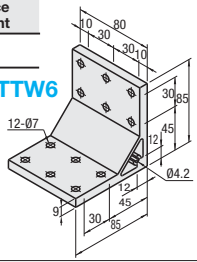
Thick Brackets

RoHS



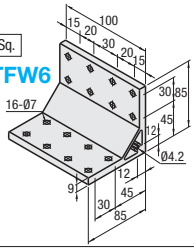
Type	M Material	S Surface Treatment
HBLTTW6 HBLTFW6	EN AC-51400/ AlMgSi0,7-T5	Anodize

HBLTTW6



For 100 Sq.

HBLTFW6



Part Number Type	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTTW6	308	CBM6-15	12	HNTT6-6	12	4116		
HBLTFW6	384		16		16	4410		

Order Example

Part Number: HBLTT6

Days to Ship

6 Days — P.88 — 2 Days

Alterations

Part Number HBLTT6 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides, Depth 15mm) (Mounting screw P.644 HCBM)	HBLTT6	0,30
			HBLUF6	0,40
			HBLTTW6	0,30
			HBLTFW6	0,40

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws · Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTT6 is specified, Code: SET / Screws: CBM6-15 / Nuts: HNTT6-6 SST / SCB6-15 / HNTTSN6-6 SEU / CBM6-15 / HNTU6-6 SSU / SCB6-15 / SHNTU6-6 SEP / CBM6-15 / HNTP6-6 SSP / SCB6-15 / SHNTP6-6 SEC / HCBST6-20 / HNTT6-6 When specifying other than HBLTT6, check for the applicable screws and nuts.	HBLTT6	2,64	2,90	3,42	5,48	3,42	4,10	4,38
			HBLUT6	2,70	3,00	3,48	5,58	3,48	4,20	4,14
			HBLUF6	3,70	3,90	4,74	7,34	4,74	5,50	5,62
			HBLTTW6	5,28	5,80	6,84	10,96	6,84	8,20	-
			HBLTFW6	7,40	7,40	9,48	14,28	9,48	10,60	-

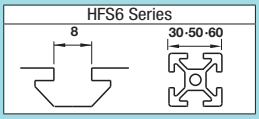
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Brackets -Thin Brackets-

-Slot Type: HFS6 Series (Aluminum Frames 30 · 50 · 60 Square)-

Price Reduction 10%

HFS6 Series



CAD Data

Features: Thin Extruded Brackets. Space saving design.

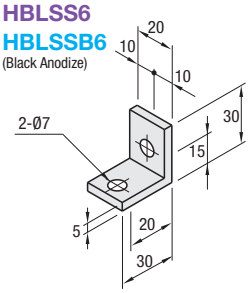
Thin Brackets

RoHS

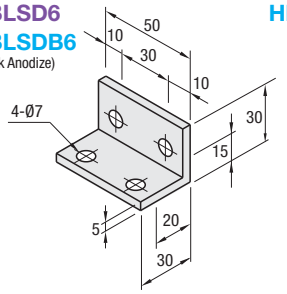


Type	M Material	S Surface Treatment
HBLS_6	EN AC-51400/ AlMgSi0,7-T5	Anodize
HBLS_B6		Black Anodize
HBLSD6-50		Anodize

HBLSS6
HBLSSB6 (Black Anodize)

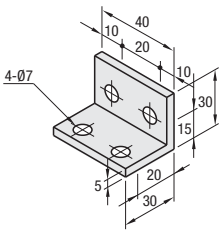


HBLSD6
HBLSDB6 (Black Anodize)

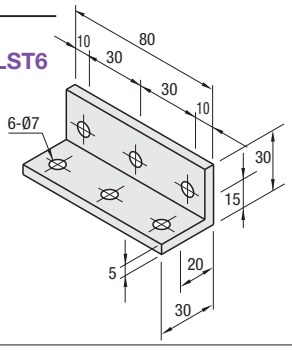


For 50 Sq.

HBLSD6-50

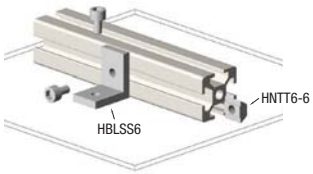


HBLST6



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLSS6	14	CBM6-12	2	HNTT6-6	2	980		
HBLSSB6* (Black Anodize)								
HBLSD6	35		4		4	1568		
HBLSDB6* (Black Anodize)								
HBLST6	56		6		6	2352		
HBLSD6-50	28		4		4	1568		

Example



* For repairing black anodizing, refer to **P.748**

Features: Thin Brackets with tabs to fit extrusions and stop when tightening. Excels in work efficiency.

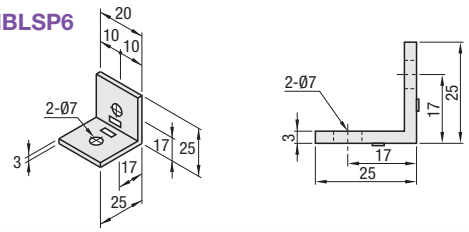
Thin Stainless Steel Tabbed Brackets

RoHS



Type	M Material
HBLSP6	1.4301/X5CrNi18-10

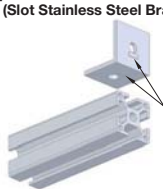
HBLSP6



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLSP6	33	CBM6-12	2	HNTT6-6	2	980		

Example

Features of HBLSP (Slot Stainless Steel Brackets with tabs)



Tab fits into the groove.
*There are tabs for putting slot.
(Depth: 0.9mm)

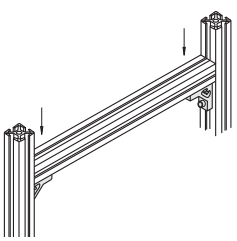
Order Example — Part Number: HBLSS6

Days to Ship — 6 Days / 2 Days P.87

Alterations — Part Number: HBLSS6 - (SET · SST · SEU · SSU · SEP · SSP): SET

Allowable Load of Bracket

- Allowable load of one bracket is calculated with assumption that extrusion (between two extrusions) is on both ends supported with brackets.



Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel(	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLSS6 is specified,	HBLSP6	0,82	0,60	1,08	1,46	1,08	1,00
			HBLSS6						
			HBLSSB6	1,06	-	1,32	-	1,32	-
			HBLSD6	1,64	1,20	2,16	2,92	2,16	2,00
			HBLSDB6	2,12	-	2,64	-	2,64	-
			HBLST6	2,25	1,80	3,03	4,38	3,03	3,00
			HBLSD6-50	1,76	1,76	2,28	3,48	2,28	2,56
			HBLSP6	0,82	0,60	1,08	1,46	1,08	1,00

Code	Screws	Nuts
SET	CBM6-12	HNTT6-6
SST	SCB6-12	HNTTSN6-6
SEU	CBM6-12	HNTU6-6
SSU	SCB6-12	SHNTU6-6
SEP	CBM6-12	HNTP6-6
SSP	SCB6-12	SHNTP6-6

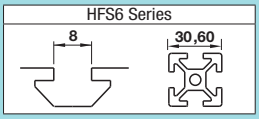
When specifying other than HBLSS6, check for the applicable screws and nuts.

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**

Brackets -Block Brackets · Brackets for Reinforcement-

-Slot Type: HFS6 Series (Aluminum Frames 30 · 60 Square)-



CAD Data

Features: The brackets do not protrude from extrusion widths when used to cross connect extrusions. Can be used in smaller spaces compared to the Tabbed Reversal Brackets.

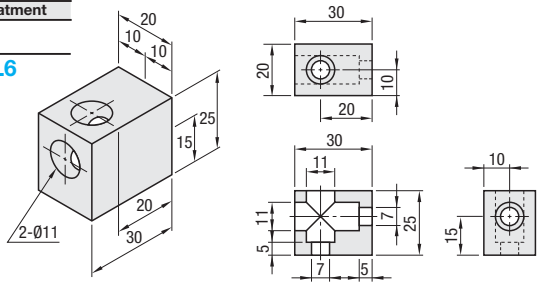
Block Brackets

RoHS



Type	Material	Surface Treatment
HBLBL6	EN AC-51400/ AlMhSi0,7	Anodize

HBLBL6

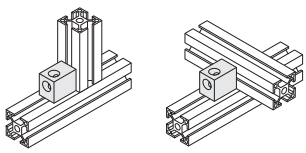


Part Number Type	Mass (g)	Applicable Screws Screw	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLBL6	31	CBM6-12	2	980		

Order Example: Part Number **HBLBL6**

Days to Ship: **6 Days** P.87

Example



Alterations: Part Number **HBLBL6** - (SET · SST · SEU · SSU · SEP · SSP) **SET**

Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)	HBLBL6	0,82	0,60	1,08	1,46	1,08	1,00

Code	Screws	Nuts
SET	CBM6-12	HNTT6-6
SST	SCB6-12	HNTTSN6-6
SEU	CBM6-12	HNTU6-6
SSU	SCB6-12	SHNTU6-6
SEP	CBM6-12	HNTP6-6
SSP	SCB6-12	SHNTP6-6

⊗A set of mounting screws and nuts is not available for black anodized parts.
When -SET, -SEU or -SEP is specified, it is not RoHS complaint.

Features: Reinforcement Brackets machined from extrusions. Usable on locations needing more strength after connecting with brackets.

Brackets for Reinforcement

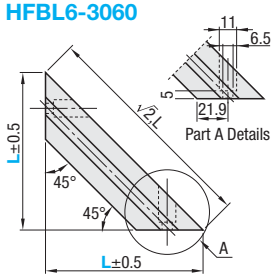
RoHS



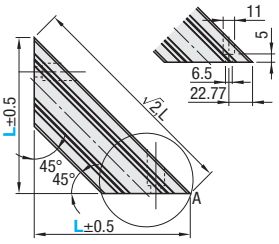
*For * part, fix with other brackets.

Type	Material	Surface Treatment
HFBL6	EN AC-51400/AlMhSi0,7	Anodize

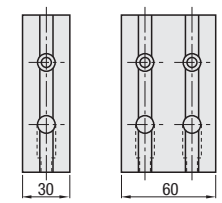
HFBL6-3030
HFBL6-3060



HFBL6-6030



<Front View> <Front View>
HFBL6-3030 HFBL6-3060
HFBL6-6030



(No surface treatment on 45 ° cut ends and counterbores.)

Part Number Type	No.	L 1mm Increment	Applicable Screw·Nut Screw	Qty.	Nuts	Qty.	L100~300 € Unit Price 1~4 pcs.	L100~300 Volume Discount 5~20	L301~500 € Unit Price 1~4 pcs.	L301~500 Volume Discount 5~20
HFBL6	3030	100~500	CBM6-12	2	HNTT6-6	2				
	3060			4		4				
	6030			2		2				

Order Example: Part Number **HFBL6-3030** - L **300**

Days to Ship: **8 Days**

Alterations: Part Number **HFBL6-3030** - L **300** - (SET · SST · SEU · SSU · SEP · SSP) **SET**

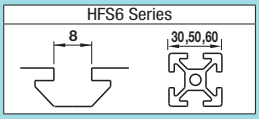
Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)	HFBL6-3030	1,42	-	1,68	-	1,68	-
			HFBL6-3060	2,24	-	2,76	-	2,76	-
			HFBL6-6030	1,42	-	1,68	-	1,68	-

Code	Screws	Nuts
SET	CBM6-12	HNTT6-6
	SCB6-12	HNTTSN6-6
SEU	CBM6-12	HNTU6-6
SSU	SCB6-12	SHNTU6-6
SEP	CBM6-12	HNTP6-6
SSP	SCB6-12	SHNTP6-6

⊗A set of mounting screws and nuts is not available for black anodized parts.
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Brackets -Thin Brackets-

-Slot Type: HFS6 Series (Aluminum Frames 30 · 50 · 60 Square)-



CAD Data

Features: Extruded Brackets to connect extrusions at angles.

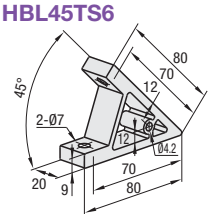
Angled Brackets

RoHS

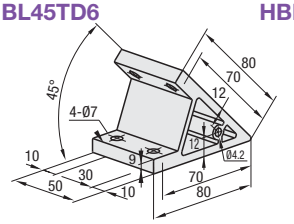


Type	Material	Surface Treatment
HBL45T_6	EN AC-51400/ AlMhSi0,7	Anodize
HBL135T_6		

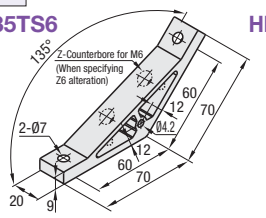
HBL45TS6



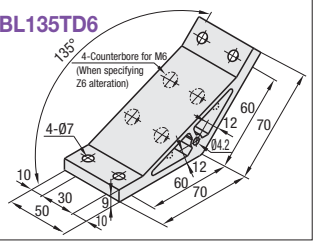
HBL45TD6



HBL135TS6

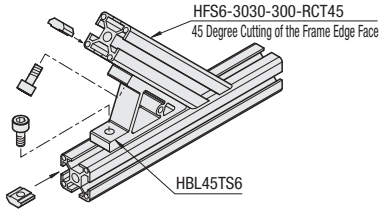


HBL135TD6



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBL45TS6	58	CBM6-15	2	HNTT6-6	2	1176		
HBL45TD6	147		4		4	1960		
HBL135TS6	68		2		2	1176		
HBL135TD6	172		4		4	1960		

Example



Order Example — Part Number: HBL45TS6

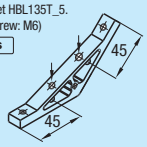
Days to Ship — 6 Days / 2 Days P.87

Alterations — Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · Z6)

HBL45TS6 - SET

Z6 Only (Items other than Z5 are in stock.)

8 Days

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides, Depth 15mm) (Mounting screw P.644 HCBM)	HBL45TS6 HBL45TD6 HBL135TS6	0,30
Machines 2 counterbored holes on 135 degree bracket	Z6	Machines 2 counterbored holes on 135 degree bracket HBL135T_5. (Applicable screw: M6) 8 Days  ⊗ Combination with SET and SST is not available.	HBL135TS6	1,60
			HBL135TD6	3,20

Altera-tions	Code	Spec.	Applicable Brackets	Price Adder					
				SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBL45TS6 is specified,	HBL45TS6	0,88	0,98	1,14	1,84	1,14	1,38
			HBL45TD6	1,76	1,95	2,28	3,67	2,28	2,75
			HBL135TS6	0,88	0,98	1,14	1,84	1,14	1,38
			HBL135TD6	1,76	1,95	2,28	3,67	2,28	2,75

Code	Screws	Nuts
SET	CBM6-15	HNTT6-6
SST	SCB6-15	HNTTSN6-6
SEU	CBM6-15	HNTU6-6
SSU	SCB6-15	SHNTU6-6
SEP	CBM6-15	HNTP6-6
SSP	SCB6-15	SHNTP6-6

When specifying other than HBL45TS6, check for the applicable screws and nuts.

When -SET, -SEU or -SEP is specified, it is not RoHS complaint.

Features: Direct bolt-on brackets to use on tapped extrusions.

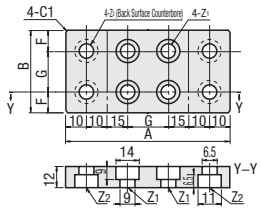
Plate Brackets

RoHS



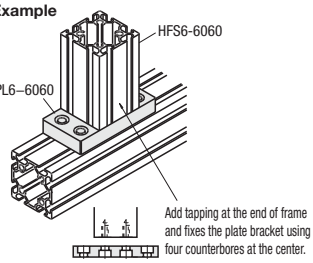
Type	Material	Surface Treatment
HBLPL6	1.0038/S235JR	Electroless Nickel Plating

HBLPL6



* Screws are not included.

Example



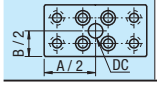
Part Number	Extrusions	A	B	Z1	Z2	G	Mass (g)	€ Unit Price	Volume Discount
				Applicable Screw				1~9 pcs.	10~
HBLPL6	5050	90	50	M8	M6	20	350		
	6060	100	60			30	470		

Order Example — Part Number: HBLPL6 - Extrusions: 5050

Days to Ship — 8 Days

Alterations — Part Number: HBLPL6 - Extrusions: 5050 - (DC): DC12

10 Days

Alteration	Code	Spec.	Price Adder
Through Hole 	DC	Add a through hole. DC=Hole Dia. 1 mm Increment 10≤DC≤20 Ordering Code DC12	6,00

Brackets -Corner Brackets · Corner Blind Brackets- -Slot Type: HFS6 Series (Aluminum Frames 30 Square)-

■**Features:** A bracket can connect extrusions in 2 and 3-ways.

■Corner Bracket Set

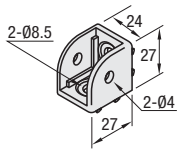
RoHS



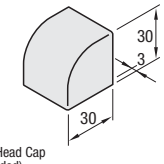
Type	Material	Surface Treatment
HBLCS6	(1) EN AC-46100/G-AlSi12Cu	-
	(2) Polyamide	
HBLCR6	(1) ZC0400/ZnAl4	
	(2) Polyamide	
HBLCD6	(1) 1.4308/G-X6CrNi18-9	
	(2) Polyamide	

Two-Way Type **HBLCS6—B**

(1)

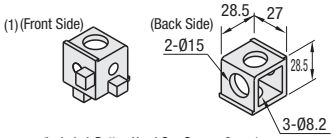


(2)Cap for Corner Brackets



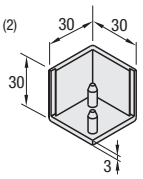
(Hexagon Socket Head Cap Screw 2 pcs. included)

Three-Way Type **HBLCR6—B** (Cap: Black)
HBLCR6—S (Cap: Gray)

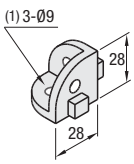


(Included: Button Head Cap Screws 3 pcs.)

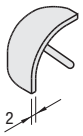
Cap for Corner Brackets



HBLCD6—S (Cap: Gray)



(2)Cap for Corner R Brackets



(Included: Button Head Cap Screws 3 pcs.)

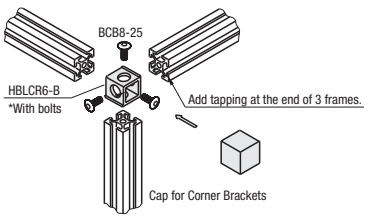
As HBLCR6-_ is zinc die casted, use it under 100°C temperature.

Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.		1~99 pcs.	100~
HBLCS6-B	27	SCB8-25	2	500		
HBLCR6-B	59	BCB8-25	3	999		
HBLCR6-S						
HBLCD6-S	45	Button Head Cap Screw M8 x 25	3	1862		

Example

■**Example of use: Corner Brackets HBLCR**

Hexagon Socket Button Head Cap Screw



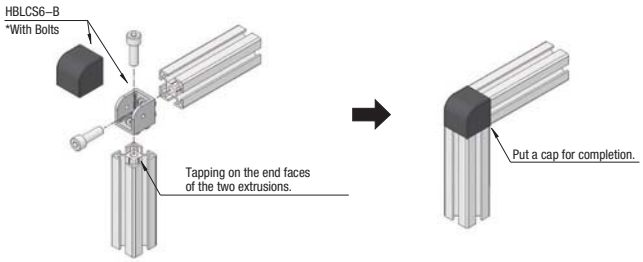
Order Example

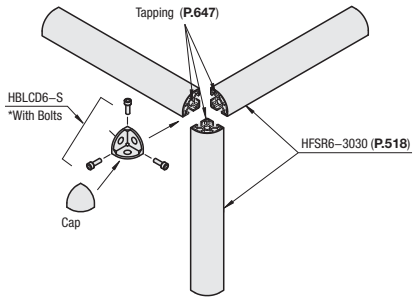
Part Number
HBLCR6-B

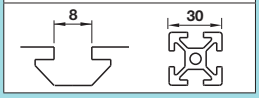
Days to Ship

6 Days
2 Days

P.87







CAD Data

Features: Brackets for internal connection without alterations, including function as frame end caps.

Corner Blind Brackets

RoHS



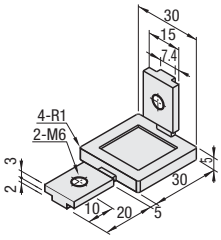
Type	Material	Surface Treatment
HBLBC_6	1.1191/C45E	Trivalent Chromate
SHBLBC_6	1.4308/G-X6CrNi18-9	-

(Two-Way Type)

HBLBCA6
SHBLBCA6

(Stainless Steel)

Not applicable to Aluminum Frames 50 / 60 Square.

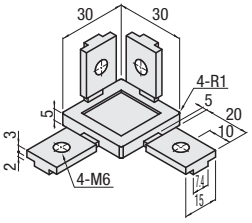


(Three-Way Type)

HBLBCB6
SHBLBCB6

(Stainless Steel)

Not applicable to Aluminum Frames 50 / 60 Square.



Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.		1~99 pcs.	100~
HBLBCA6	53	Set Screw M6x8	2	500		
SHBLBCA6 (Stainless Steel)						
HBLBCB6	71		4	1000		
SHBLBCB6 (Stainless Steel)						

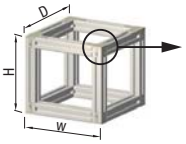
Order Example — Part Number: SHBLBCA6

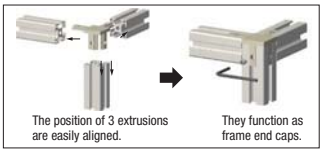
Days to Ship: 6 Days / 2 Days P.87

Example

Length of extrusion fitted like below (mm)
- Extrusion length L used for W
  L=W-(Extrusion Thickness x2)
- Extrusion length L used for D
  L=D-(Extrusion Thickness x2)
- Extrusion length L used for H
  L=H-10
  (Thickness of corner blind brackets x Upper and Lower 2 pcs.)

Example of use: Corner Blind Brackets





The position of 3 extrusions are easily aligned.

They function as frame end caps.

Features: Formed Aluminum Frames with a 140mm R.

90-degreee Curved Aluminum Frames for Corner

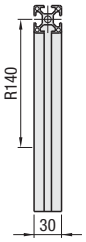


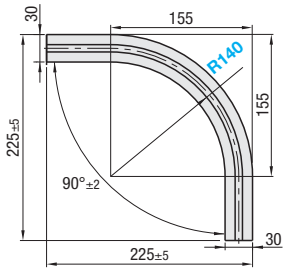
RoHS

The slot shape may change during the bending process, resulting in narrow slot width.

Type	Material	Surface Treatment
HFSMGQ	EN AC-51400/AlMgSi0,7	Anodize

HFSMGQ



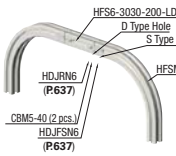


Part Number	R	Slot Width	Mass kg	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount
					ℓx	ℓy	1~8	9~pcs.
HFSMGQ6 -3030	140	8	0.8	333	2.83x10⁴	2.83x10⁴		

Order Example — Part Number: HFSMGQ6-3030 - R140

Days to Ship: 6 Days P.87

Example



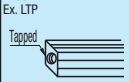
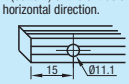
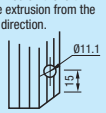
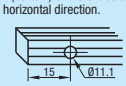
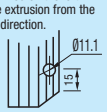
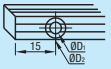
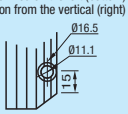
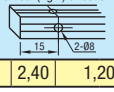
Blind Joints
(Pre-Assy. Insertion Double Joint)
Connecting Example

(Ex.) LDH (LCH) RDH (RCH) LDV (LCV) RDV (RCV) LCP RCP

Alterations

Part Number - R - (LTP, RTP, TPW...etc.)
HFSMGQ6-3030 - R140 - LTP-RCV

8 Days

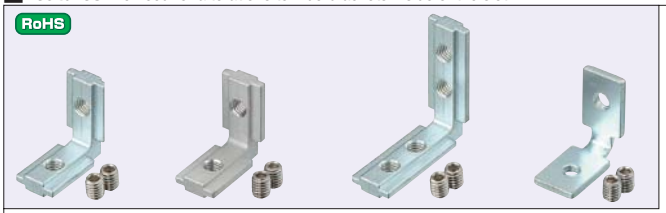
Alterations Code	Tapping (P.647)			D Hole (P.654)				M Hole (P.656)				S Hole (P.655)				Wrench Hole (P.651)					
	LTP	RTP	TPW	LDH	LDV	RDH	RDV	LMH	LMV	RMH	RMV	LSH	LSV	RSH	RSV	LCH	LCV	LCP	RCH	RCV	RCP
Spec.	Tapping to the center hole Tap Shape M8 Depth 24 **LTP**: Tapping on the Left End Face **RTP**: Tapping on the Bottom End Face **TPW**: Tapping on the Both Ends Ex. LTP 			Adds D type hole in specified position. **LDH**, **RDH**: D hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LDH  **LDV**, **RDV**: D hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RDV 				Adds M type hole in specified position. **LMH**, **RMH**:M hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LMH  **LMV**, **RMV**: M hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RMV 				Adds S type hole in the specified position. **LSH**, **RSH**: S hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LSH  **LSV**, **RSV**: S hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RSV 				**LCH**, **RCH**: Wrench hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. RCH  **LCV**,**RCV** Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCV  **LCP**,**RCP**: Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCP			
Applicable Extrusions																					
HFSMGQ6-3030	2,70		5,40	1,20				1,20				3,90				1,20	2,40		1,20		2,40

Brackets -Blind Brackets · Free Angle Brackets-

-Slot Type: HFS6 Series (Aluminum Frames 30 · 60 Square)-

Features: No need for alterations to hide brackets inside of the slot.

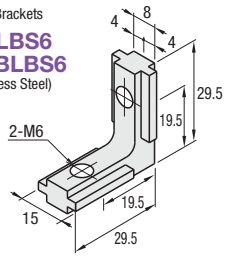
RoHS



Type	Material	Surface Treatment
HBLBS6	1.1191/C45E	Trivalent Chromate
HBLBSL6		
SHBLBS6	1.4308/G-X6CrNi18-9	-
HBLPBS6	1.0330/DC01	Trivalent Chromate

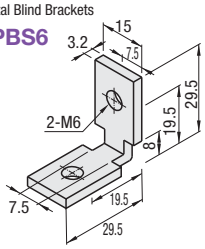
Blind Brackets

HBLBS6
SHBLBS6
(Stainless Steel)



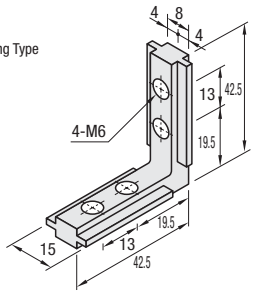
Sheet Metal Blind Brackets

HBLPBS6



Blind Brackets · Long Type

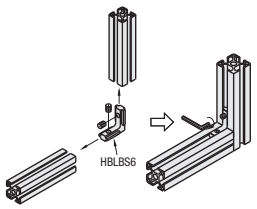
HBLBSL6



Part Number Type	Mass (g)	Included Screw Screw	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLBS6 / SHBLBS6 (Stainless Steel)	30	Set Screw M6 x 8	2	686		
HBLBSL6	38		4	957		
HBLPBS6	16		2	500		

Example

How to use: Blind Brackets



Features: Post-Assembly Insertion Type for Blind Brackets.

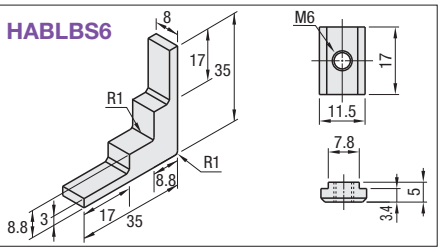
Post-Assembly Insertion Blind Brackets

RoHS



Type	Components	Material	Surface Treatment
HABLBS6	Post-Assembly Insertion BB Body	1.4308/G-X6CrNi18-9	-
	Post-Assembly Insertion BB Nut	1.4301/X5CrNi18-10 Sintered Alloy	
	Set Screw	1.4301/X5CrNi18-10	

HABLBS6



Part Number Type	Mass (g)	Included Screw Screw	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HABLBS6	28	Nut · Set Screw M6 x 5	2	500		

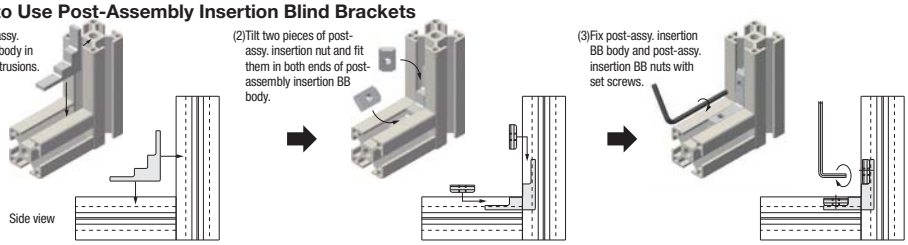
Example

How to Use Post-Assembly Insertion Blind Brackets

(1)Fit the post-assy. insertion BB body in the slot of extrusions.

(2)Tilt two pieces of post-assy. insertion nut and fit them in both ends of post-assembly insertion BB body.

(3)Fix post-assy. insertion BB body and post-assy. insertion BB nuts with set screws.



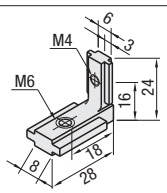
Features: Blind Brackets to connect Extrusions 30 / 20 square.

RoHS



Type	Material	Surface Treatment
HBLBS6-5	1.1191/C45E	Trivalent Chromate

HBLBS6-5
(For 30 Square-20 Square Connection)



Part Number Type	Mass (g)	Connectable Extrusion Series	Included Screw Screw	Qty.	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLBS6-5	20	HFS6 and HFS5	Set Screw M4 x 5	1		
			Set Screw M6 x 8	1		

Order Example

Part Number
HBLBS6

Days to Ship

6 Days

P.87

2 Days

CAD Data

Features: Extrusions can be connected at any arbitrary angles.

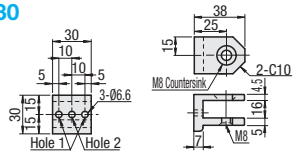
Free Angle Brackets

RoHS

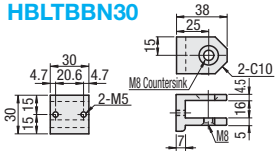


Type	Material	Surface Treatment
HBLTBA30 HBLTBBN30 HBLTBC30 HBLTBD30	EN AC-51400/AlMgSi0,7	Anodize
Included Screws	1.7220/34CrMo4	Trivalent Chromate

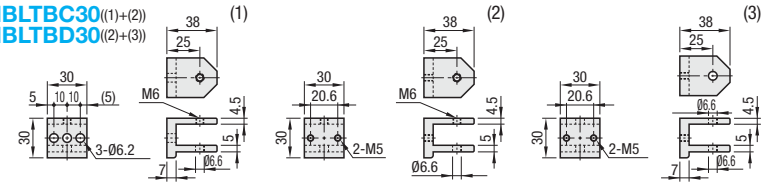
HBLTBA30



HBLTBBN30



HBLTBC30((1)+(2))
HBLTBD30((2)+(3))



Part Number Type	No.	Applicable Extrusion	Mass (g)	Accessories	Qty.	€ Unit Price 1~14 pcs.	Volume Discount 15~
HBLTBA	30	30 Square (HFS6)	33	M8x12	1		
HBLTBBN			35				
HBLTBC			86	CLDMC6-32-M	1		
HBLTBD			88				

Alterations Part Number - (SET · SET1 · SET2 · SET3 · SET4 · SET5)
HBLTBA30 - SET2
HBLTBBN30 - SET

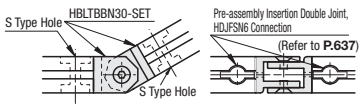
Alterations	Code	How to use	Part Number Type	No.	Accessories Screw	Qty.	Nuts · Pre-Assy. Insertion Double Joints	Qty.	Price Adder
Applicable Screws and Nuts come as a set.	SET		HBLTBBN	30	CBM5-25	2	HDJFSN6	1	1,40
	SET1	Use the hole 1.	HBLTBA		CBM6-15	2	HNTT6-6	2	0,95
	SET2	Use the hole 2.			CBM6-15	1	HNTT6-6	1	0,45
	SET3	Use the hole 1.	HBLTBC		CBM5-25	2	HDJFSN6	1	2,35
					CBM6-15	2	HNTT6-6	2	
	SET4	Use the hole 2.	HBLTBC		CBM5-25	2	HDJFSN6	1	1,85
					CBM6-15	1	HNTT6-6	1	
	SET5		HBLTBD		CBM5-25	4	HDJFSN6	2	2,80

Order Example: Part Number HBLTBA30
Days to Ship: 6 Days P.87
Example

When connecting with Pre-Assy. Insertion Double Joints, S type hole machining is required on extrusions.
(Refer to P.598)
When -SET_ is specified, it is not RoHS compliant.

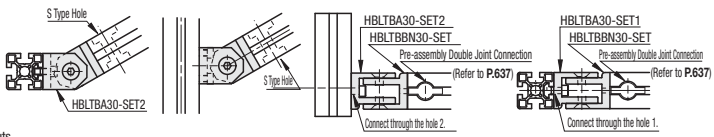
(1) Connection of Two End Sections

Two pieces of HBLTBBN are used to connect two end sections using Pre-Assy. Insertion Double Joints. Refer to (P.637)



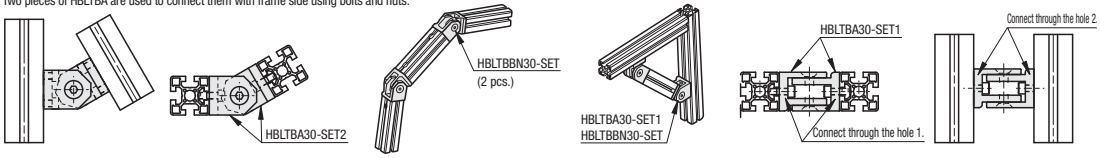
(2) Connection of Two Side Faces

One piece of HBLTBA and one piece of HBLTBBN are used to connect HBLTBA with the frame side face using a screw and a nut, and to connect HBLTBBN with the frame end section using the pre-assembly double joint.



(3)Connection of Two Side Faces

Two pieces of HBLTBA are used to connect them with frame side using bolts and nuts.



Features: Sheet Metal Brackets to fix at arbitrary positions.

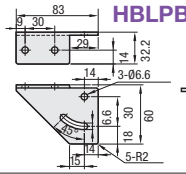
Free Angle Sheet Metal Brackets

RoHS

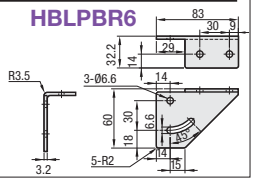


Type	Material	Surface Treatment
HBLPBL HBLPBR	1.0330/DC01	Trivalent Chromate

HBLPBL6



HBLPBR6



Order Example: Part Number HBLPBL6
Days to Ship: 6 Days P.88
Alterations: Part Number - (SET · SET1)
HBLPBL6 - SET
Example

Part Number Type	No.	Applicable Extrusion	Applicable Screw · Nut Hexagon Socket Head Cap Screws with Captured Washers	Qty.	Nuts	Qty.	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLPBL HBLPBR	6	30 Square (HFS6)	CBST6-12	4	HNTT6-6	4		

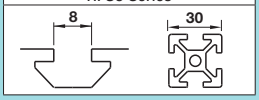
Alterations	Code	Spec.	Applicable Brackets	Price Adder
Set of Applicable Screws and Nuts	SET	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion.	HBLPBL6 HBLPBR6	2,80
Set with applicable screws, nuts and clamp levers	SET1	Applicable Screws 3 pcs. Clamp Lever (LNP) 1 Pc. Flat Washer (PWF) 1 Pc. Applicable Nuts 4 Pcs. Set with the above items.	HBLPBL6 HBLPBR6	7,50



Add. Spec.

Sheet Metal Plates -HFS6 series-

HFS6 Series



Features: Can be used for reinforcement of connecting extrusions.

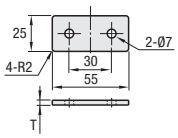


Type	Material	Surface Treatment
HPTSS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTSSL		
HPTSD		
SHPTSS	1.4301/ X5CrNi18-10	-
SHPTSSL		
SHPTSD		

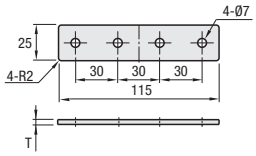
Not RoHS compliant

RoHS

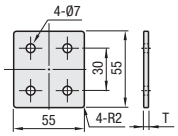
HPTSS6
SHPTSS6



HPTSSL6
SHPTSSL6



HPTSD6
SHPTSD6



Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTSS6	32	3.2	M6-10	2	M6	2		
SHPTSS6		3						
HPTSSL6	64	3.2		4		4		
SHPTSSL6		3						
HPTSD6	70	3.2						
SHPTSD6		3						

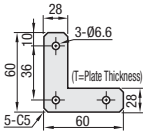


Type	Material	Surface Treatment
HPTLN	1.0320/St.22	Trivalent Chromate
HPTLS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTLD6		
HPTLD6-50	1.0320/St.22	Trivalent Chromate
SHPTLN	1.4301/ X5CrNi18-10	-
SHPTLS		

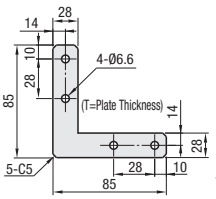
Not RoHS compliant

RoHS

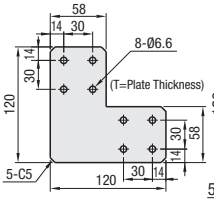
HPTLN6 (Trivalent Chromate)
SHPTLN6



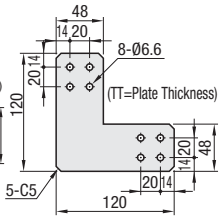
HPTLS6
SHPTLS6



HPTLD6



HPTLD6-50



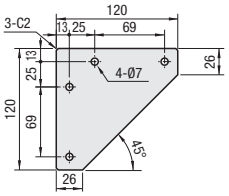
Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTLN6	56	3.2	M6-10	3	M6	3		
SHPTLN6		3						
HPTLS6	92	3.2		4		4		
SHPTLS6		3						
HPTLD6	250	3.2		8		8		
HPTLD6-50	230	3.2						

RoHS

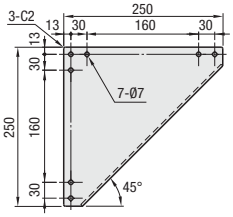


Type	Material	Surface Treatment
HPTCUL	1.0320/St.22	Trivalent Chromate
HPTUL		
HPTWUL		
SHPTCUL	1.4301/ X5CrNi18-10	-
SHPTUL		
SHPTWUL		

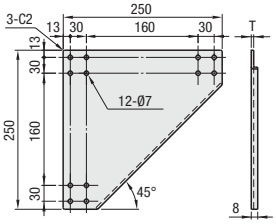
HPTCUL6 (Trivalent Chromate)
SHPTCUL6



HPTUL6 (Trivalent Chromate)
SHPTUL6



HPTWUL6 (Trivalent Chromate)
SHPTWUL6



Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTCUL6	150	2.3	M6-10	4	M6	4		
SHPTCUL6		2						
HPTUL6	600	2.3		7		7		
SHPTUL6		2						
HPTWUL6	598	2.3		12		12		
SHPTWUL6		2						

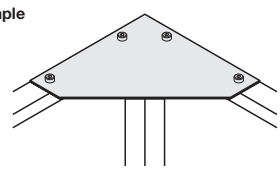
Order Example

Part Number
HPTSS6

Days to Ship

6 Days P.87

Example



Alterations

Part Number - (SET)
HPTSS6 - SET

When -SET is specified, it is not RoHS compliant.

Alteration	Code	Spec.		Part Number	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.		HPTSS6	0,95
				SHPTSS6	1,05
				HPTSSL6	1,90
				SHPTSSL6	2,10
				HPTSD6	1,90
				SHPTSD6	2,10
				HPTLN6	1,40
		Materials	Set	SHPTLN6	1,55
		1.0320/ St.22	Screws: CBM Nuts: HNTT	HPTLS6	1,90
				SHPTLS6	2,10
				HPTLD6	3,80
				HPTLD6-50	3,80
		1.4301/ X5CrNi 18-10	Screws: SCB Nuts: HNTTSN	HPTCUL6	1,90
				SHPTCUL6	2,10
				HPTUL6	3,30
				SHPTUL6	3,70
				HPTWUL6	5,25
				SHPTWUL6	6,20

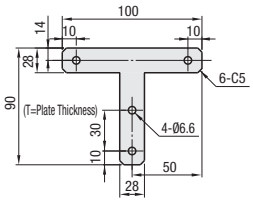


Type	Material	Surface Treatment
HPTTS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTTD		
HPTPS		
SHPTTS	1.4301/ X5CrNi18-10	-

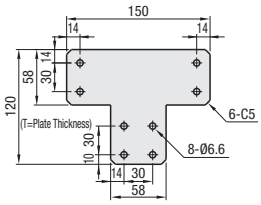
Not RoHS compliant

RoHS

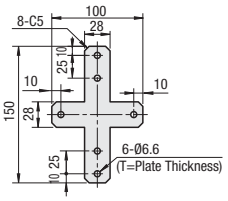
HPTTS6
SHPTTS6



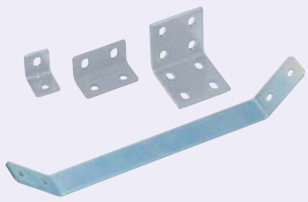
HPTTD6



HPTPS6



Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTTS6	106	3.2	M6-10	4	M6	4		
SHPTTS6		3						
HPTTD6	217	3.2		8		8		
HPTPS6	140			6		6		

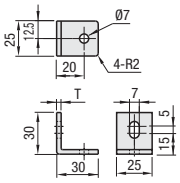


Type	Material	Surface Treatment
HPTBS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTBD6		
HPTBD6-50		Trivalent Chromate
HPTBDW		Carbon Steel Bright Chromate Plating
HPTGS		
SHPTBS	1.4301/ X5CrNi18-10	-
SHPTBD		
SHPTBDW		

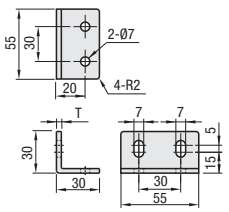
RoHS

Not RoHS compliant

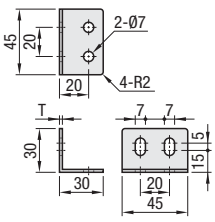
HPTBS6
SHPTBS6



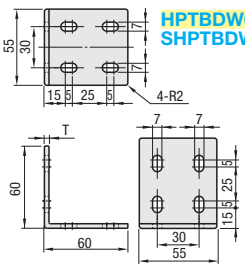
HPTBD6
SHPTBD6



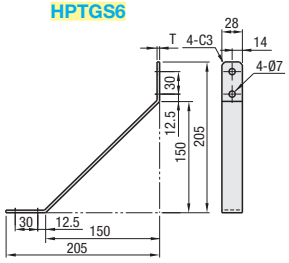
HPTBD6-50



HPTBDW6
SHPTBDW6



HPTGS6

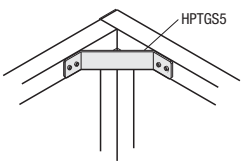


Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTBS6	31	3.2	M6-10	2	M6	2		
SHPTBS6		3						
HPTBD6	69	3.2		4		4		
SHPTBD6		3						
HPTBD6-50	64	3.2						
HPTBDW6	197	4.5		8		8		
SHPTBDW6		4						
HPTGS6	213	3.2		4		4		

Order Example — Part Number: HPTTS6

Days to Ship — 6 Days P.87

Example



Alterations — Part Number - (SET): HPTTS6 - SET

When -SET is specified, it is not RoHS compliant.

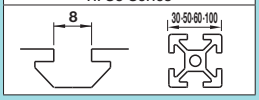
Alteration	Code	Spec.	Part Number	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.	HPTTS6	1,90
			SHPTTS6	2,10
			HPTTD6	3,80
			HPTPS6	1,90
			HPTBS6	0,95
			SHPTBS6	1,05
			HPTBD6	1,90
			SHPTBD6	2,10
			HPTBD6-50	2,10
			HPTGS6	1,90

Materials	Set
1.0320/ St.22	Screws: CBM Nuts: HNTT
1.4301/ X5CrNi 18-10	Screws: SCB Nuts: HNTTSN

Pre-Assy. Insertion Nuts · Stoppers for Aluminum Frames - Standard

-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-

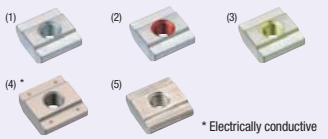
HFS6 Series



CAD Data

Tightening Torque P. 676

Pre-Assembly Insertion Nuts RoHS

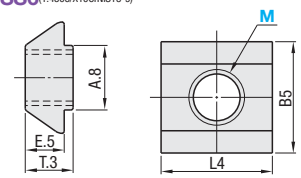


* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTT6 (2)HNTTV6 (3)HNTTZ6	1.0301/C10	Trivalent Chromate
(4)HNTTSN6*	1.4401(Sintering)	-
(5)HNTTSS6	1.4305	

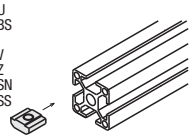
HNTT6(1.0301/C10)
HNTTV6(Thread Locking Adhesive · 1.0301/C10)
HNTTZ6Equivalentthread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTTSN6(1.4401/X5CrNiMo18-9 · Sintering)
HNTTSS6(1.4305/X10CrNiS18-9)

Reference Tightening Torque (N·m)	
M	1.0301/C10 1.4401/X5CrNiMo17-12-2 (Sintering) 1.4401/X5CrNiMo18-9
6	11.7



Example

· **Pre-Assembly Insertion Nuts**
Pre-insert the nut into the aluminum extrusion.
HNTU
HNTUV
HNTUZ
SHNTU
HNTTBS
HNTT
HNTTV
HNTTZ
HNTTSN
HNTTSS
HNTJ



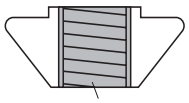
Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTT6(1.0301/C10)	3 4 5 6				
HNTTV6(Thread Locking · 1.0301/C10)	6				
HNTTZ6(Thread Locking · 1.0301/C10)					
HNTTSN6(1.4401/X5CrNiMo17-12-2 · Sintering)	3 4 5 6				
HNTTSS6(1.4305/X10CrNiS18-9)	6				

Order Example: Part Number HNTT6 - M 6

Days to Ship: 6 Days P.87 / 2 Days

Bulk-packages are cost effective for in-house stock and large qty. uses. (P508)

Thread Locking Type



Anti-loose agent applied inside of the tap

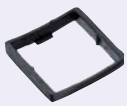
It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.
Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.
Resin Coating ---Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

Effect of Thread Locker (Reference)

Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

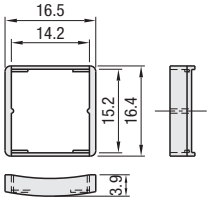
	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	8.2 N·m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	11.7 N·m	Test ConditionsMeasured value (HNTTV6-6) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 11.7N·m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	10.0 N·m	Thread locking effect decreases after repeated use. 5th loosening torque: 9.4N·m Measurement at HNTTZ6-6

Pre-Assembly Insertion Stoppers RoHS

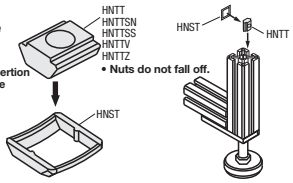


M Material: Polyamide

HNST6



Example



- Hold preassembly insertion nuts temporarily in the extrusion.
• Nuts do not fall off.

Part Number	Applicable Pre-Assembly Insertion Nuts	Color	€ Unit Price 1~499 pcs.	Volume Discount 500~999	1000~
HNST6	HNTT6 HNTTV6 HNTTZ6 HNTTSN6 HNTTSS6	Black			

Order Example: Part Number HNST6

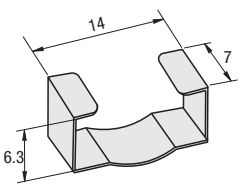
Days to Ship: 6 Days P.87 / 2 Days

Pre-Assembly Insertion Metal Stoppers RoHS

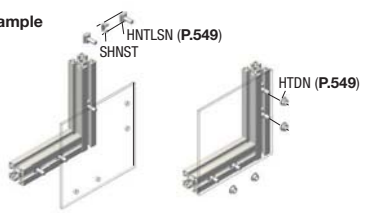


M Material: 1.4319/X3CrNiN17-8

SHNST6



Example



Part Number	Applicable Pre-Assembly Insertion Nuts	€ Unit Price 1~499 pcs.	Volume Discount 500~999	1000~
SHNST6	HNTT6 HNTTV6 HNTTZ6 HNTTSN6 HNTTSS6			

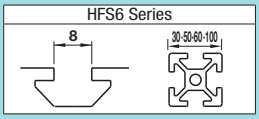
Order Example: Part Number SHNST6

Days to Ship: 6 Days P.87 / 2 Days

*Can also be used with Pre-Assembly Insertion Bolts.

Pre-Assy. Insertion Nuts for Aluminum Frames with Temporary Holding Function

-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-



CAD Data

Tightening Torque P. 676

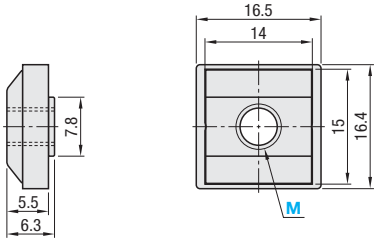
■Stopper Integrated Nuts

RoHS



M Material: Body: 1.0301/C10 Stopper: Polyamide
S Surface Treatment: Trivalent Chromate Plating

HNTE6



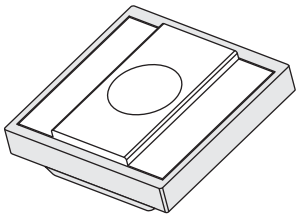
Reference Tightening Torque (N·m)	
M	1.0301/C10
6	11.7

Part Number	M	€ Unit Price	Volume Discount		
		1~499 pcs.	500~749	750~999	1000~
HNTE6	3 4 5 6				

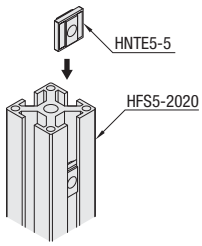
Order Example: Part Number HNTE6 - M 5

Days to Ship: 6 Days P.87

Example

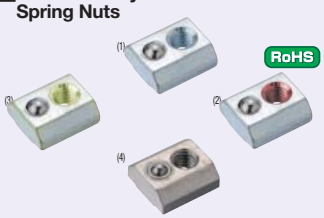


Integrated Pre-Assembly Insertion Nuts and Stoppers.



The nuts do not slip off even inserted into the vertically-placed extrusions.

■Pre-Assembly Insertion Spring Nuts

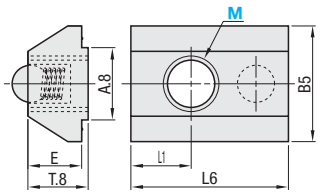


RoHS

Type	M Material			
	Body	Ball	Springs	S Surface Treatment
(1)HNTU6 (2)HNTUV6 (3)HNTUZ6	1.0301/C10	1.4301	JIS SWP-A	Trivalent Chromate
(4)SHNTU6	1.4301	1.4301	1.4301	-

HNTU6(1.0301/C10)
HNTUV6(Thread Locking Adhesive · 1.0301/C10)
HNTUZ6(Thread Locking Resin Coating · 1.0301/C10 Equivalent)
SHNTU6(1.4301/X5CrNi18-10 Sintering)

Reference Tightening Torque (N·m)	
M	1.0301/C10 · 1.4301/X5CrNi18-10 (Sintering)
6	11.7



Part Number	M	€ Unit Price	Volume Discount		
		1~499 pcs.	500~749	750~999	1000~
HNTU6(1.0301/C10)	3 4 5 6				
HNTUV6(Thread Locking · 1.0301/C10)	6				
HNTUZ6(Thread Locking · 1.0301/C10)					
SHNTU6(1.4301/X5CrNi18-10)	3 4 5 6				

Order Example: Part Number HNTU6 - M 6

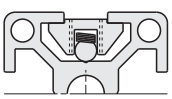
Days to Ship: 6 Days P.87 / 2 Days

Bulk-packages are cost effective for in-house stock and large qty. uses. (P.508)

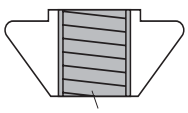
Example

- Does not fall even if a extrusion is placed vertically.

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.



■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.

Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.

Resin Coating ---Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

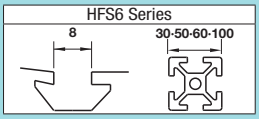
■Effect of Thread Locker (Reference)

Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	—	8.2 N·m	—
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	11.7 N·m	Test Conditions Measured value (HNTTV6-6) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 11.7N·m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	10.0 N·m	Thread locking effect decreases after repeated use. 5th loosening torque: 9.4N·m Measurement at HNTTZ6-6

Add. Spec. Pre-Assembly Insertion Nuts · Stoppers for Aluminum Frames Others

-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-



CAD Data

Tightening Torque P. 676

■Pre-Assembly Insertion Lock Nuts

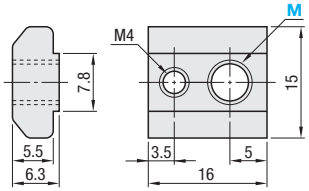
RoHS



M Material: 1.0301/C10
S Surface Treatment: Trivalent Chromate

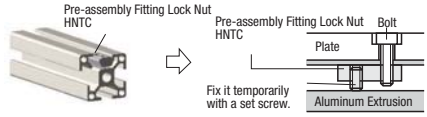
HNTC6

Reference Tightening Torque (N·m)	
M	1.0301/C10
6	11.7



Example

•Pre-Assembly Insertion Lock Nuts
The position of post-assembly insertion lock nuts can be fixed temporarily with the set screw.



Part Number	M	Accessories	€ Unit Price	Volume Discount		
			1~499 pcs.	500~749	750~999	1000~
HNTC6	6	M4 Set screw 1 pc.				

-Overall length is shorter than Pre-Assembly Insertion Nuts HNTT.
Suitable for installing sensors or other components closely together.
-Stopper is not included.

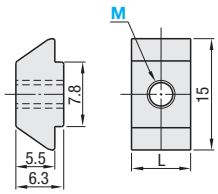
■Pre-Assembly Insertion Short Nuts

RoHS



M Material: 1.0301/C10
S Surface Treatment: Trivalent Chromate

HNTJ6



Part Number	M	L	€ Unit Price	Volume Discount		
			1~499 pcs.	500~749	750~999	1000~
HNTJ6	4 5	8				
	6	10				

The pre-assy. insertion offset nut, used in combination with a post-assy. insertion double joint, can be fixed in such a way that the nut, even if connected at the corner of the extrusion, does not protrude from the extrusion (frame).

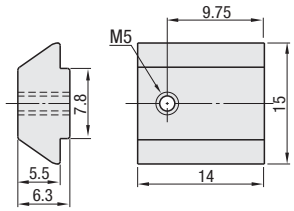
■Pre-Assy. Insertion Eccentric Nuts

RoHS



M Material: 1.4401/X5CrNiMo17-12-2 (Sintering)

HNTHSN6

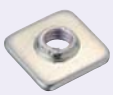


Part Number	€ Unit Price	Volume Discount
	1~99 pcs.	100~
HNTHSN6		

* Electrically conductive

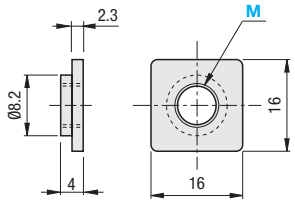
■Pre-Assembly Insertion Square Nuts

RoHS



M Material: 1.0330/DC01
S Surface Treatment: Trivalent Chromate Plating

HNKK6



Example

- Pre-Assembly Insertion Nut
HNKK



Part Number	M	€ Unit Price	Volume Discount	
		1~9 package	10~19	20~29
HNKK6	4 5 6			

100 pcs. per package. Insert it into the extrusion upside down.

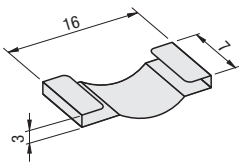
■Metal Stoppers for Pre-Assembly Insertion Square Nuts

RoHS



M Material: 1.4319/X3CrNiN17-8

HNKKST6



Example



Part Number	Applicable Pre-Assembly Insertion Nuts	€ Unit Price	Volume Discount	
		1~9 package	10~19	20~29
HNKKST6	HNKK6			

100 pcs. per package

Order Example

Part Number	-	M
HNTC6	-	6
HNTJ6	-	6
HNTHSN6		
HNKK6	-	6
HNKKST6		

- Applicable Extrusions and Brackets
Applicable to extrusions and brackets with the same type number.

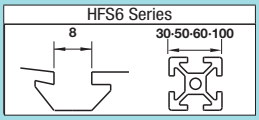
(Ex.)
Pre-Assy. Insertion Nut
Pre-Assembly Insertion Stoppers
Extrusions
Brackets

Part Number
HNTT6 - _
HNST6
HFS6 - _ _ _ _
HBLFSN6

Days to Ship
6 Days P.87
2 Days

Add. Spec. Post-Assy. Insertion Nuts · Stoppers for Aluminum Frames Standard

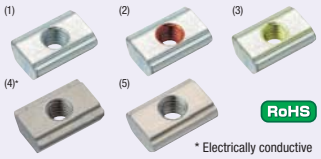
-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-



CAD Data

Tightening Torque P. 676

■Post-Assembly Insertion Stopper Nuts

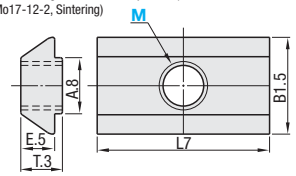


RoHS

* Electrically conductive

Type	Material	Surface Treatment
(1)HNTA6 (2)HNTAV6 (3)HNTAZ6	1.0301/C10	Trivalent Chromate
(4)HNTASN6*	1.4401/X5CrNiMo17-12-2 (Sintering)	-
(5)HNTASS6	1.4305/X10CrNiS18-9	-

HNTA6 (1.0301/C10)
HNTAV6 (Thread Locking Adhesive · 1.0301/C10 Equivalen)
HNTAZ6 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTASN6 (1.4401/X5CrNiMo17-12-2, Sintering)
HNTASS6



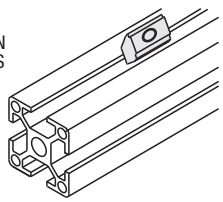
Reference Tightening Torque (N · m)	
M	1.0301/C10 · 1.4305/X10CrNiS18-9rNiMo17-12-2/(Sintering) · 1.4305/X10CrNiS18-9
6	11.7

Details of Thread Locking Type P.547

Example

- Post-Assy. Insertion Stopper Nuts

HNTA
HNTAV
HNTAZ
HNTASN
HNTASS



Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTA6 (1.0301/C10)	3 4 5				
	6				
HNTAV6 (Thread Locking / 1.0301/C10)	6				
HNTAZ6 (Thread Locking / 1.0301/C10)					
HNTASN6 (1.4401/X5CrNiMo17-12-2 · Sintering)	3 4 5 6				
HNTASS6 (1.4305/X10CrNiS18-9)	6				

Bulk-packages are cost effective for in-house stock and large qty. uses. (P.508)

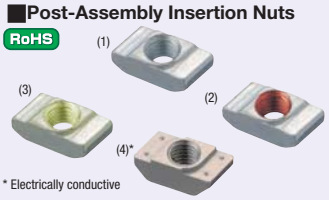
Order Example: Part Number HNTA6 - M 6

Days to Ship: 6 Days P.87

2 Days

■Post-Assembly Insertion Nuts

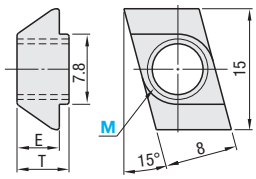
RoHS



* Electrically conductive

Type	Material	Surface Treatment
(1)HNTF6 (2)HNTFV6 (3)HNTFZ6	1.0301/C10	Trivalent Chromate
(4)HNTFSN6*	1.4401/X5CrNiMo17-12-2 (Sintering)	-

HNTF6 (1.0301/C10)
HNTFV6 (Thread Locking Adhesive · 1.0301/C10 Equivalent
HNTFZ6 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTFSN6 (1.4401/X5CrNiMo17-12-2 · Sintering)



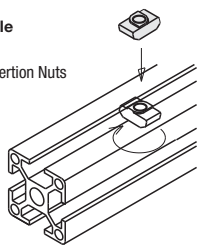
Reference Tightening Torque (N · m)	
M	1.0301/C 10 · 1.4401/X5CrNiMo17-12-2/(Sinterin)
6	11.7

Details of Thread Locking Type P.547

Example

- Post-Assy. Insertion Nuts

HNTF
HNTFV
HNTFZ
HNTFSN



Part Number	M	E	T	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTF6 (1.0301/C10)	3 4 5 6	5.5	6.3				
HNTFV6 (Thread Locking · 1.0301/C10)	6						
HNTFZ6 (Thread Locking · 1.0301/C10)							
HNTFSN6 (1.4401/X5CrNiMo17-12-2 · Sintering)	3 4 5 6	6.4	7.4				

Order Example: Part Number HNTF6 - M 6

Days to Ship: 6 Days P.87

2 Days

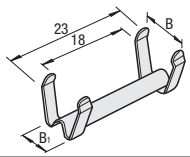
■Post-Assy. Insertion Stoppers · Metal Stoppers

RoHS



Type	Materials
(1)HNAST6	Polypropylene
(2)HNBST6	1.4319/X3CrNiN17-8

HNAST6 (Polypropylene)
HNBST6 (301 Stainless Steel)



Part Number	Applicable Stopper Nuts	Color	B	B1	€ Unit Price 1~499 pcs.	Volume Discount 500~999	1000~
HNAST6	HNTA6 HNTAV6 HNTASN6 HNTASS6	White	9.3	7.8			
HNBST6		-	10.5	6			

■Post-Assembly Insertion Nut · Stopper Set

RoHS



HNTAT6 (1.0301/C10 Set)
HNTATSN6 (1.4401/X5CrNiMo17-12-2 Equivalent

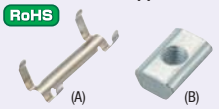
Type	(B) Stopper Nuts	(A) Stoppers
HNTAT6	HNTA6	HNAST6
HNTATSN6*	HNTASN6	

* Electrically conductive

Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTAT6	3 4 5				
	6				
HNTATSN6	3 4 5 6				

■Post-Assembly Insertion Nut · Metal Stopper Set

RoHS



HNTBT6 (1.0301/C10 Set)
HNTBTSN6 (1.4401/X5CrNiMo17-12-2 Equivalent

Type	(B) Stopper Nuts	(A) Stoppers
HNTBT6	HNTA6	HNBST6
HNTBTSN6*	HNTASN6	

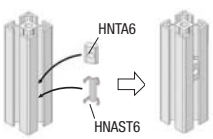
* Electrically conductive

Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTBT6	3 4 5				
	6				
HNTBTSN6	3 4 5 6				

Order Example: Part Number HNTA6 - M 6

Days to Ship: 2 Days P.87

Example

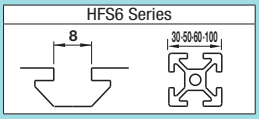


* Insert a stopper into the extrusion and put into a nut on it.

*Does not fall even if the extrusion is placed vertically.

Post-Assy. Insertion Nuts for Aluminum Frames With Temporary Holding Function

-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-



CAD Data

Tightening Torque P.676

■Post-Assembly Insertion Nuts with Leaf Springs

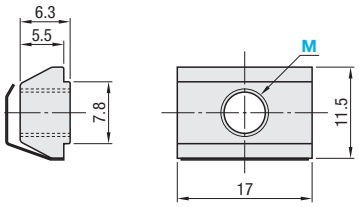
RoHS



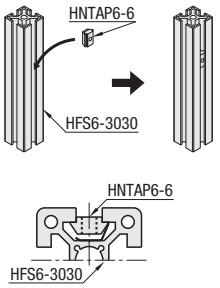
Part	M Material	S Surface Treatment
Body	1.0301/C10	Trivalent Chromate
Wing Part	1.4301/X5CrNi18-10	-

HNTAP6

Reference Tightening Torque (N·m)	
M	1.0301/C10
6	11.7



Example



Welded Leaf Springs prevent the nuts from slipping off even inserted into the vertically-placed extrusions.

Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTAP6	3 4 5 6				

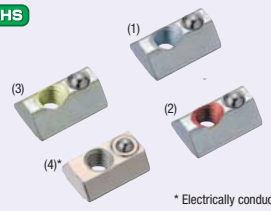
Order Example

Part Number	-	M
HNTAP6	-	6

Days to Ship: 6 Days P.87

■Post-Assembly Insertion Spring Nuts

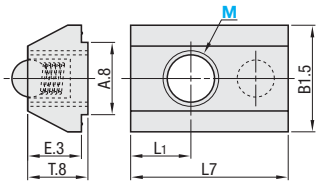
RoHS



* Electrically conductive

Type	M Material Body	Ball	Springs	S Surface Treatment
(1)HNTP6 (2)HNTPV6 (3)HNTPZ6	1.0301/C10	1.4301 /X5CrNi18-10	JIS SWP-A	Trivalent Chromate
(4)SHNTP6*	1.4401 (Sintering)	1.4301/ X5CrNi18-10	1.4301/ X5CrNi18-10-WP8	-

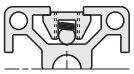
HNTP6(1.0301/C10)
HNTPV6(Thread Locking Adhesive · 1.0301/C10)
Equivalenthread Locking Resin Coating · 1.0301/C10 Equivalent)
SHNTP6(1.4401/X5CrNiMo17-12-2 · Sintering)



Reference Tightening Torque (N·m)	
M	1.0301/C10 / 1.4401/X5CrNiMo17-12-2 / (Sinterin)
6	11.7

Example

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.





*Does not fall even if the extrusion is placed vertically.

Part Number	M	L1	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTP6(1.0301/C10)	3 4 5 6	6				
HNTPV6(Thread Locking · 1.0301/C10)	6					
HNTPZ6(Thread Locking · 1.0301/C10)						
SHNTP6(1.4401/X5CrNiMo17-12-2 · Sintering)	3 4 5 6	6.5				

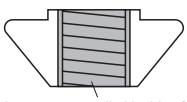
Bulk-packages are cost-saving for in-house stock or large quantities. **(Refer to P.508)**

Order Example

Part Number	-	M
HNTP6	-	6

Days to Ship: 6 Days P.87 2 Days

■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.
Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.
Resin Coating ---Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

■Effect of Thread Locker (Reference)

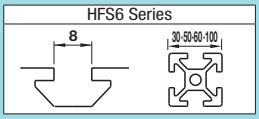
Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	—	8.2 N·m	—
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	11.7 N·m	Test ConditionsMeasured value (HNTPV6-6) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 11.7N·m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	9.4N·m	Thread locking effect decreases after repeated use. 5th loosening torque: 8.7N·m Measurement at HNTAZ6-6

NEW

Post-Assy. Insertion Nuts for Aluminum Frames Others

-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-



CAD Data

Tightening Torque P.676

■Post-Assembly Insertion Lock Nuts with Leaf Springs

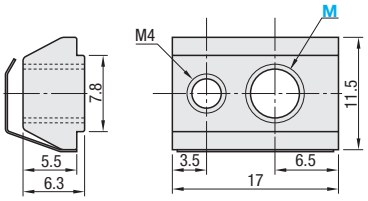
RoHS



Part	M Material	S Surface Treatment
Body	1.0301/C10	Trivalent Chromate
Wing Part	1.4301/X5CrNi18-10	-

HNTRP6

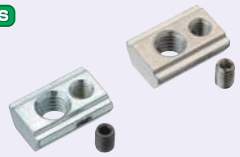
Reference Tightening Torque (N·m)	
M	1.0301/C10
6	11.7



Part Number	M	Accessories	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTRP6	6	M4 Set screw 1 pc.				

■Post-Assembly Insertion Lock Nuts

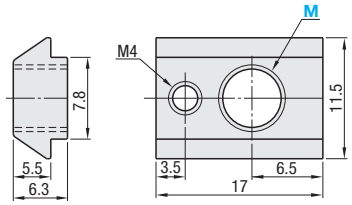
RoHS



Type	M Material	S Surface Treatment
HNTR6	1.0301/C10	Trivalent Chromate
HNTRSN6	1.4401/X5CrNiMo17-12-2 (Sintering)	-

HNTR6 (1.0301/C10)
HNTRSN6 (1.4401/X5CrNiMo17-12-2 · Sintering)

Reference Tightening Torque (N·m)	
M	1.0301/C10 / 1.4401/X5CrNiMo17-12-2 / (Sinterin)
6	11.7



Part Number	M	Accessories	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTR6(1.0301/C10) HNTRSN6(1.4401/X5CrNiMo17-12-2 · (Sintering)	3 4 5 6	M4 Set screw 1 pc.				

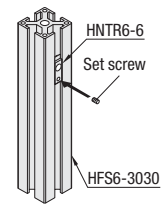
Order Example

Part Number	-	M
HNTR6	-	6

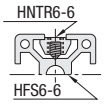
Days to Ship: 6 Days P.87 2 Days

Example

■Post-Assy. Insertion Lock Nuts (HNTR)

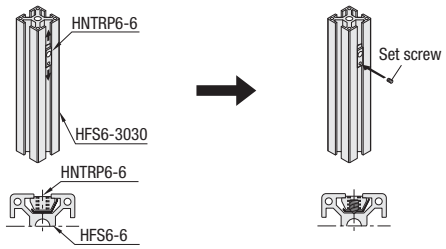


The nut can be fixed in place by itself by tightening the included set screw.



Suitable for use where high repeatability is required. Usable for use when mounting sensor or removing panels repeatedly.

■Post-Assembly Insertion Lock Nuts with Leaf Springs (HNTRP)



Welded Leaf Springs prevents nuts from slipping off even inserted into the vertically-placed extrusions, leading to easy locating.

Also, the nut can be fixed in place by tightening the included set screw.

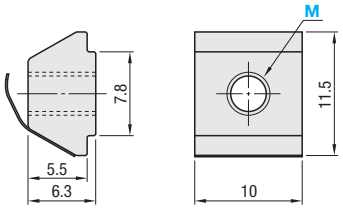
■Post-Assembly Insertion Short Nuts

RoHS



Part	M Material	S Surface Treatment
Body	1.0301/C10	Trivalent Chromate
Wing Part	1.4301/X5CrNi18-10	-

HNTAJ6



-Overall length is shorter than the Pre-Assembly Insertion Nuts HNTT. Convenient for installing sensors or other components closely in combination.

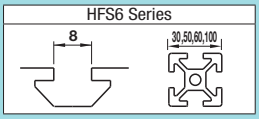
Part Number	M	€ Unit Price 1~499 pcs.	Volume Discount 500~749	750~999	1000~
HNTAJ6	3 4 5 6				

Order Example

Part Number	-	M
HNTAJ6	-	6

Days to Ship: 6 Days P.87

Pre-Assy. Insertion Bolts / Post-Assy. Insertion Bolts / Conductive Washers / Toothed Washer / Flanged Nuts
-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-



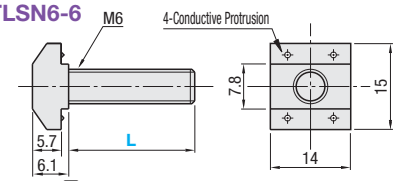
CAD Data

Tightening Torque P.676

Pre-Assembly Insertion Bolts RoHS

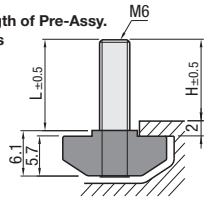


HNTLSN6-6



M Material: Nuts: 1.4401/X5CrNiMo17-12-2 (Sintering)
Bolts: 1.4301/X5CrNi18-10

Effective Length of Pre-Assy. Insertion Bolts



Slot of Aluminum Extrusion

Part Number	L	H	Applicable Extrusion (Series)	Reference Tightening Torque (N·m)	€ Unit Price 1~299 pcs.	Volume Discount 300~499	Volume Discount 500~
HNTLSN6-6	13	11.8	HFS6	11.7			
	17	16.8					
	22	21.8					

* Electrically conductive

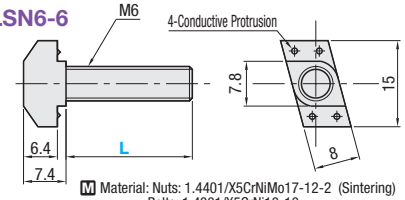
Order Example: Part Number HNTLSN6-6 - L 17

Days to Ship: 2 Days P.87

Post-Assembly Insertion Bolts RoHS

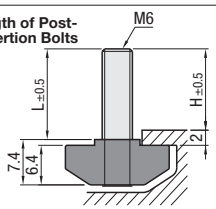


HATLSN6-6



M Material: Nuts: 1.4401/X5CrNiMo17-12-2 (Sintering)
Bolts: 1.4301/X5CrNi18-10

Effective Length of Post-Assembly Insertion Bolts



Slot of Aluminum Extrusion

Part Number	L	H	Applicable Extrusion (Series)	Reference Tightening Torque (N·m)	€ Unit Price 1~299 pcs.	Volume Discount 300~499	Volume Discount 500~
HATLSN6-6	13	12.0	HFS6	11.7			
	17	17.0					
	22	22.0					

* Electrically conductive

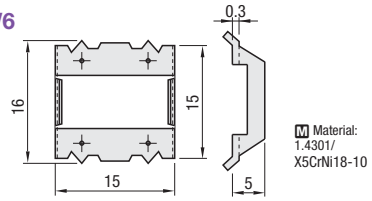
Order Example: Part Number HATLSN6-6 - L 17

Days to Ship: 2 Days P.87

Conductive Washers RoHS



HDW6



M Material: 1.4301/X5CrNi18-10

⚠ Be careful not to injure your hand when fitting onto nut.

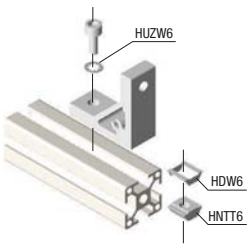
Part Number	Applicable Pre-Assy. Insertion Nut	€ Unit Price 1~99 pcs.	Volume Discount 100~
HDW6	HNTT6		

Order Example: Part Number HDW6

Days to Ship: 6 Days 2 Days P.87

Example

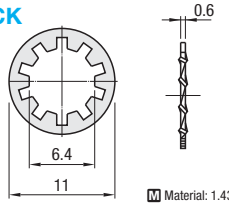
Conductivity between extrusions is achieved by combining HDW and HUZW.



Toothed Washer (Internal Teeth Type) RoHS



HUZW6PACK



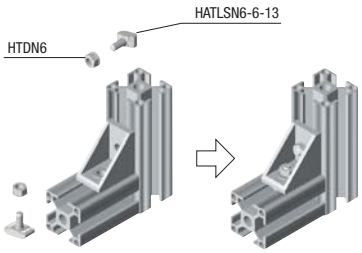
M Material: 1.4301/X5CrNi18-10

Part Number	€ Unit Price 1~4 package	Volume Discount 5~
HUZW6PACK		

100 pcs. per package

Order Example: Part Number HUZW6PACK

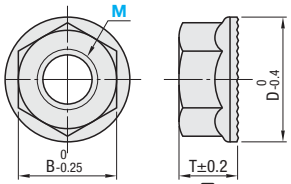
Days to Ship: 6 Days P.87



Flanged Nuts RoHS



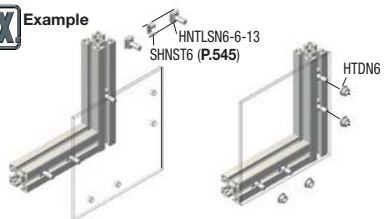
HTDN



M Material: 1.4301/X5CrNi18-10

Part Number Type	M	B	T	D	€ Unit Price 1~499 pcs.	Volume Discount 500~999	Volume Discount 1000~
HTDN (Stainless Steel)	4	7	4.2	10			
	5	8	5.5	12			
	6	10	6.0	13			

Example

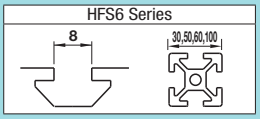


Order Example: Part Number HTDN6

Days to Ship: 2 Days P.87

Long Nuts

-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-



CAD Data

Tightening Torque P.676

Long Nuts L Dimension Configurable Type

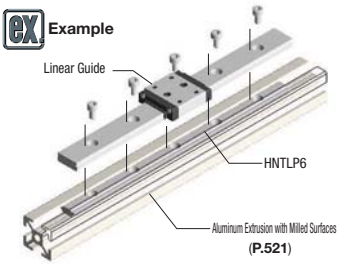
RoHS



Type		Material	Surface Treatment	Reference Tightening Torque (N·m)
Pre-Assy. Insertion	Post-Assy. Insertion			
HNTLF6	HNTALF6	1.0301/C10	Trivalent Chromate	11.7
HNTLP6	HNTALP6			
HNTLS6	HNTALS6			
SHNTLF6	-	1.4305/ X10CrNiS 18-9	-	
SHNTLP6	SHNTALP6			
SHNTLS6	SHNTALS6			

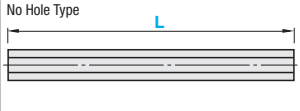
Cross Section Shape	A	B	E	T
Pre-Assy. Insertion	7.8	15	5.5	6.3
Post-Assy. Insertion	7.8	11.5	5.5	6.3

Example

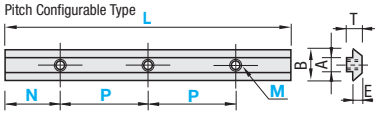


(P.521)

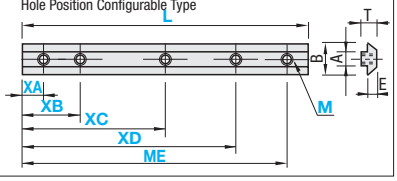
No Hole Type



Pitch Configurable Type



Hole Position Configurable Type



No Hole Type

Part Number		L 1mm Increment	HNTLF		SHNTLF		HNTALF	
			€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion)	(Post-Assembly Insertion)	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000						
HNTLF6 SHNTLF6	HNTALF6							

Pitch Configurable Type

Part Number		L 1mm Increment	M	N 1mm Increment	P 1mm Increment	Number of Taps S	HNTLP		SHNTLP		HNTALP		SHNTALP	
							€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assy. Insertion)	(Post-Assy. Insertion)	(Pre-Assy. Insertion) 50~2000 (Post-Assy. Insertion) 50~1000	3 4 5 6	5≤N≤L-5	2M≤P ≤L-2M	2≤S≤20								
HNTLP6 SHNTLP6	HNTALP6 SHNTALP6													

Hole Position Configurable Type

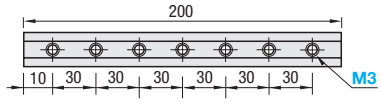
Part Number		L 1mm Increment	M	XA~XE 1mm Increment	HNTLS		SHNTLS		HNTALS		SHNTALS	
					€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assy. Insertion)	(Post-Assy. Insertion)	(Pre-Assy. Insertion) 50~2000 (Post-Assy. Insertion) 50~1000	3 4 5 6	5~L-5								
HNTLS6 SHNTLS6	HNTALS6 SHNTALS6											

Number of tapped holes can be specified between 1 to 5.

Order Example

Part Number	L	M	N	P	S	XA	XB	XC	XD	XE
HNTLF6 HNTALF6	1800 400									
HNTLP6 HNTALP6	200 210	M3 M5	N10 N8	P30 P15	7 8					
HNTLS6	1050	M5	XA20	XB105						
SHNTLS6	1050	M5	XA20	XB105	XC250	XD500	XE755			
HNTALS6	1000	M5	XA25	XB55	XC78	XD992	XE975			

(Ex.) Pitch Configurable Type



Hole Machining Charge

Pitch Configurable Type	€ Unit Price / 1 Hole	Hole Position Configurable Type	€ Unit Price / 1 Hole
HNTLP · HNTALP		HNTLS · HNTALS	
SHNTLP · SHNTALP		SHNTLS · SHNTALS	

Days to Ship 8 Days — Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

The prices of Pitch Configurable Type and Hole Position Configurable Type are found by adding the unit prices in the table to the hole machining charges.

(Ex.) Part Number - L - M - XA - XB

HNTLS6 - 400 - M5 - XA10 - XB70 When

(€ Unit Price/m x Specified Full Length) + (Hole Machining Charge) = Price

5,20x0.4 + 3,20x2 =8,40 EUR

(Round down to ten Cent.)

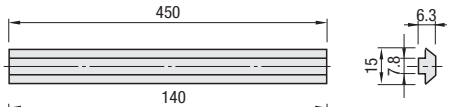
Long Nuts L Dimension Fixed Type

RoHS



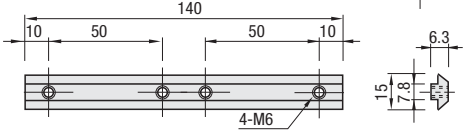
L Dimension Fixed without Holes

HNTK6



L Dimension Fixed with Holes

HNTLG6 SHNTLG6



Reference Tightening Torque (N·m)	
M	1.0301/C10 1.4305/X10CrNiS18-9
6	11.7

Type	Material	Surface Treatment
HNTK6	1.0301/C10	Trivalent Chromate
HNTLG6		
SHNTLG6	1.4305/ X10CrNiS18-9	-

L Dimension Fixed without Holes

Part Number	€ Unit Price	Volume Discount	
	1~499 pcs.	500~999	1000~
HNTK6			

L Dimension Fixed with Holes

Part Number	€ Unit Price	Volume Discount	
	1~499 pcs.	500~999	1000~
HNTLG6			
SHNTLG6 (Stainless Steel)			

Order Example Part Number HNTLG6

Days to Ship 6 Days P.87

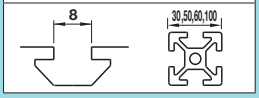
Alterations Part Number HNTLG6 - (SET) SET

Alteration	Code	Spec.	Type	Price Adder
Hexagon Socket Set Screw Set	SET	Hexagon socket set screws come with as a set. (Type: HNTLG, Set Screw: MSSK, Qty.: 4; Type: SHNTLG, Set Screw: MSSU, Qty.: 4)	HNTLG6	0,50
			SHNTLG6	0,85

Extrusion End Caps

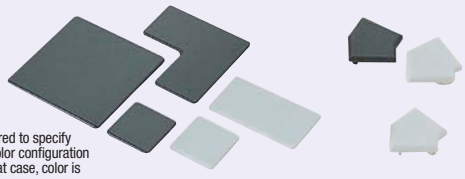
-For HFS6 Series Aluminum Frames 30 · 50 · 60 · 100 Square-

HFS6 Series



Features: Standard caps for protecting frame end faces. Alterations are not required. When the cap is hard to insert, tap with a wooden or plastic hammer.

RoHS

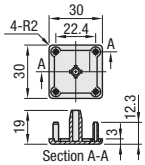


Some products are not required to specify colors, since there was no color configuration in the former catalogs. In that case, color is black.

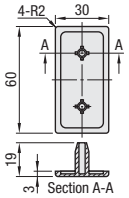
The pin's shape and numbers of extrusion end caps may be changed to prevent caps from easily falling off.

Type	Material
HFC	Polyamide
HFCL	Low Density Polyethylene

HFC6-3030
HFCL6-3030

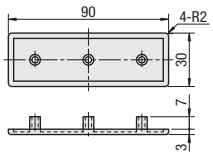


HFC6-3060
HFCL6-3060

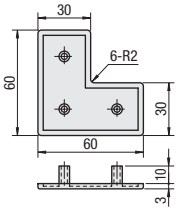


The shapes are changed to be less likely to fall off.
HFC: A tool is required to remove.
HFCL: Removable by hand.

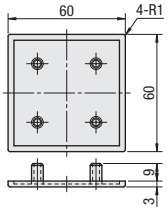
HFC6-3090



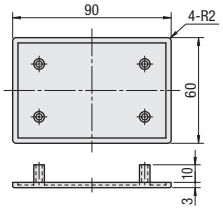
HFC6-606030



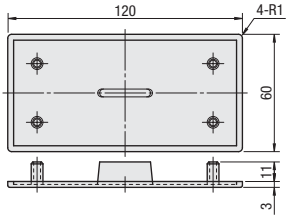
HFC6-6060



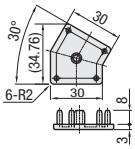
HFC6-6090



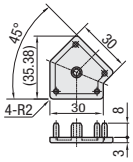
HFC6-60120



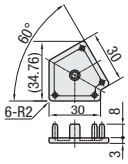
HFC30A6



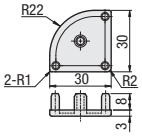
HFC45A6



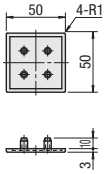
HFC60A6



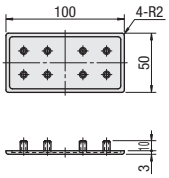
HFCR6-3030



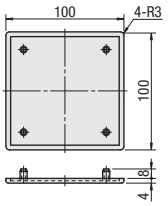
HFC6-5050



HFC6-50100



HFC6-100100



Part Number		Color	€ Unit Price	Volume Discount		Applicable Extrusions *
Type	No.		1~14 pcs.	15~19	20~	
HFC6	3030	B (Black) S (Light Gray)				HFS6-3030
	3060					HFS6-3060
	3090					HFS6-3090
	606030					HFS6-606030
	6060					HFS6-6060
	6090					HFS6-6090
	60120					HFS6-60120
HFCL6	3030					HFS6-3030
	3060					HFS6-3060
HFC30A6						HFS30A6-30
HFC45A6						HFS45A6-30
HFC60A6						HFS60A6-30
HFCR6-3030						HFSR6-3030
HFC6	5050					HFS6-5050
	50100					HFS6-50100
	100100					HFS6-100100

* For Aluminum Extrusion EFS Series, the same frame caps as of HFS Series can be used.

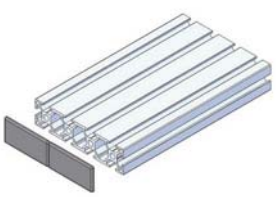
Order Example: Part Number - Color
HFC30A6 - B

Days to Ship: 6 Days | 2 Days

P.87

Example

When using Aluminum Extrusion HFS6-30120, please use 2 pieces of HFC6-3060.



CAD Data

Features: Three-Sided Frame Caps for protecting 3 corners. Alterations are not required.

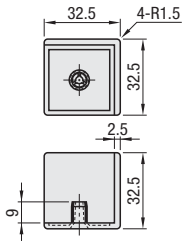
Three-Sided Caps for Corners

RoHS



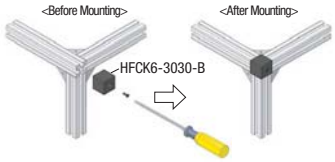
M Polyamide

HFCK6-3030



The shape and the number of extrusion end cap pin may be changed to prevent caps from easily falling off.

Example



Tapping on extrusion is not required.

Part Number	Color	Accessories	Applicable Extrusion*	€ Unit Price	Volume Discount	
				1~14 pcs.	15~19	20~
HFCK6-3030	B(Black)	HFBMB4-12	HFS6-3030			

* For Aluminum Extrusion EFS Series, the same frame caps as of HFS Series can be used.

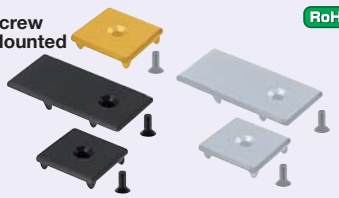
Order Example: Part Number - Color; HFCK6-3030 - B

Days to Ship: 6 Days P.87

Features: Frame End Caps, Screw Mounting Type. Excels in safety, prevent caps from falling off without alterations.

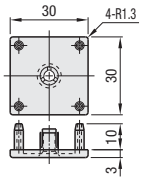
Screw Mounted

RoHS

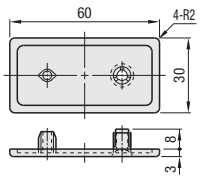


M Material: Polyamide (Black, Light Gray, Yellow)

HFCB6-3030
(Screw Fixing Type)



HFCB6-3060
(Screw Fixing Type)



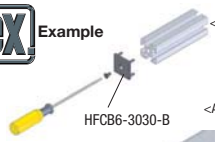
Part Number		Color	€ Unit Price	Volume Discount		Applicable Extrusions *
Type	No.		1~14 pcs.	15~19	20~	
HFCB6	3030	B (Black) S (Light Gray) Y (Yellow)				HFS6-3030
	3060	Yellow Type is only available for 3030.				HFS6-3060

* For Aluminum Extrusion EFS Series, the same frame caps as of HFS Series can be used.
For Screw Retained Type, flat head screws are included. (Black: HFBMB4 - 12, Light Gray, Yellow: SHFBS4 -12)

Order Example: Part Number - Color; HFCB6-3030 - B

Days to Ship: 6 Days 2 Days P.87

Example





Tapping on extrusion is not required.

Features: End plates for HFCR6-606030. Alterations are reqired on the extrusions.

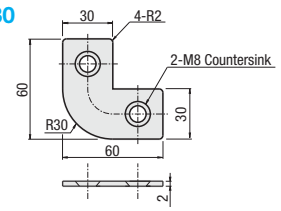
End Plates

RoHS



M Material: 1.4301/X5CrNi18-10

HFCR6-606030



Part Number	Applicable Screw (Not included)	€ Unit Price	Volume Discount		Applicable Extrusions
Type		1~14 pcs.	15~19	20~	
HFCR6-606030	SHFBS8-12				HFSR6-606030

For HFCR6-606030, alteration on the extrusion section and applicable screws are required for mounting. (Screws are not attached.)

End plates mounting for HFSR6-606030

Alterations		Hole Machining for End Plate Mounting		
Code		LTS	RTS	TSW
Spec.		The standard extrusion position is shown below. LTS: Machined on the left end RTS: Machined on the right end TSW: Machined on both ends Ex. LTS 		
Applicable Extrusions	Applicable Screw			
HFSR6-606030	SHFBS8-12	760	760	1,520

Order Example: Part Number; HFCR6-606030

Days to Ship: 6 Days P.87

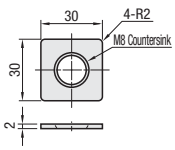
Features: Frame Caps only for High Rigidity Aluminum Frames GFS6-3030 and GFS6-3060.

Plates for High Rigidity Type

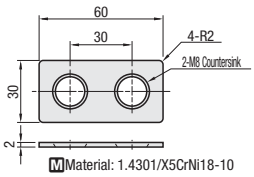


RoHS

HFCD6-3030



HFCD6-3060



M Material: 1.4301/X5CrNi18-10

Part Number		Applicable Screw (Not included)	Applicable Extrusion	€ Unit Price	Volume Discount
Type	No.			1~9 pcs.	10~
HFCD6	3030	SHFBS8-15	GFS6-3030		
	3060		GFS6-3060		

Special alteration is required on cross sections of extrusions to mount frame caps.(Refer to **P.658**)

Order Example: Part Number; HFCD6-3030

Days to Ship: 10 Days

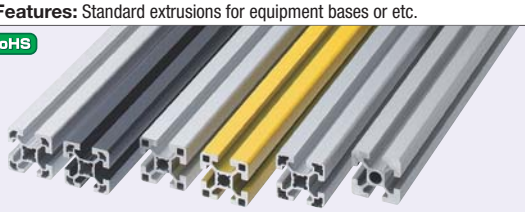
NEW

HFS8 Series Aluminum Frames
40 · 80mm Square -1 Slot-

Price Reduction
Up to 2.7%

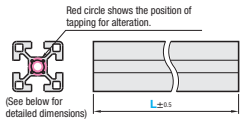
Features: Standard extrusions for equipment bases or etc.

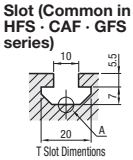
RoHS

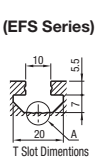


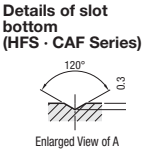
Type		M	S
Configurable Length	Fixed Length	Material	Surface Treatment
GFS8	KGFS8	EN AW-6061-T6	Clear Anodize
HFS8 HFSL8	KHFS8 KHFSL8	EN AC-51400/ AlMgSi0,7-T5	
HFSB8	KHFSB8		Black Anodize
CAF8	-		Clear Coating (Clear Anodize + Clear Painting)
HFSY8	-		Baked-on Finish (Yellow)

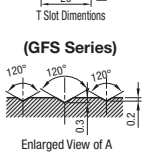
Cut surface and altered parts are not surface treated.

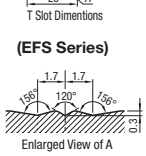












Features of Extrusions

Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.
	Baked-on Finish · Yellow	Can be used on doors or hazardous areas as a warning color. The color is D22 -80V (Munsell Value Reference 2.5YR6/14) by Japan Paint Manufacturers Association.

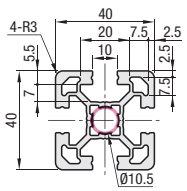
(New Shape)

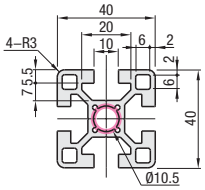
(New Shape · Black Anodize)

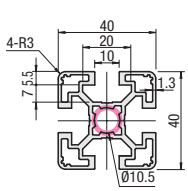
HFS8-4040
HFSB8-4040 (Black Anodize)
CAF8-4040 (Clear Coating)
HFSY8-4040 (Baked-on Finish · Yellow)

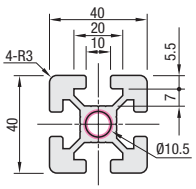
HFSL8-4040 (Light Type)
HFSLB8-4040
(Light Type · Black Anodize)

GFS8-4040 (High Rigidity)









Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	Volume Discount Less than 300mm 50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	Volume Discount/m 300mm or more 50~
(New Shape)			1.61	596	$10.5x10^4$	$10.5x10^4$						
(New Shape · Black Anodize)												
HFS8			1.73	640	$10.4x10^4$	$10.4x10^4$						
HFSB8 (Black Anodize)												
CAF8 (Clear Coating)	4040	50~4000										
HFSY8 (Baked-on Finish · Yellow)												
HFSL8 (Light Type)			1.27	478	$7.54x10^4$	$7.54x10^4$						
HFSLB8 (Light Type · Black Anodize)												
GFS8 (High Rigidity)			2.17	806	$13.76x10^4$	$13.76x10^4$						

Fixed Length Extrusion (1000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price 1~19 pcs.	Volume Discount 20~
KHFS8	4040	1000	640	$10.4x10^4$	$10.4x10^4$		16,00

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
(New Shape)			596	$10.5x10^4$	$10.5x10^4$		
(New Shape / Black Anodize)							
KHFS8			640	$10.4x10^4$	$10.4x10^4$		
KHFSB8 (Black Anodize)	4040	4000					
KHFSL8 (Light Type)			478	$7.54x10^4$	$7.54x10^4$		
KHFSLB8 (Light Type / Black Anodize)							
KGFS8 (High Rigidity)			806	$13.76x10^4$	$13.76x10^4$		

Order Example

Part Number	-	L
HFS8-4040	-	800
KHFS8-4040	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS8-4040-180=4,50 EUR
When L is 300 or more Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFS8-4040-600
15,10x0.6m=4,50 EUR (Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days / 5 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusion (KHFS8-4040-1000)
6 Days P87

Fixed Length Extrusion (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS8-4040-4000)

Alterations
Alterations are available for Configurable Length Extrusions.
For details, refer to P.645

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

NEW

HFS8 Series	
10	40,80

Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.563 ~ P.578	P.581 ~ P.588	P.627 ~ P.640	P.589	P.645 ~ P.658

CAD Data

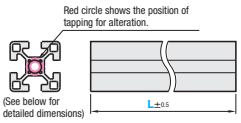
Features: Standard extrusions for equipment bases or etc..

RoHS

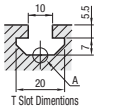


Type		M	S
Configurable Length	Fixed Length	Material	Surface Treatment
GFS_8	KGFS_8	EN AW-6061-T6	Clear Anodize
HFS_8	KHFS_8	EN AC-51400/ AlMgSi0,7-T5	Black Anodize
HFS_B8	KHFS_B8		

Cut surface and altered parts are not surface treated.

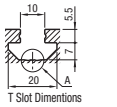


Slot (HFS /GFS)



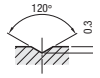
T Slot Dimentions

(EFS Series)



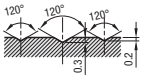
T Slot Dimentions

Details of slot bottom (HFS Series)



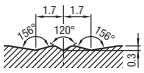
Enlarged View of A

(GFS Series)



Enlarged View of A

(EFS Series)

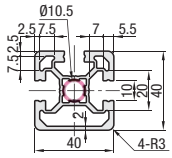


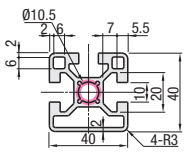
Enlarged View of A

Features of Extrusions

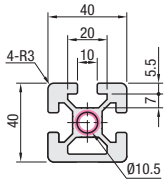
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

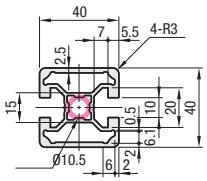
HFSF8-4040
HFSFB8-4040 (Black Anodize)



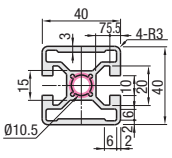


GFSF8-4040 (High Rigidity)



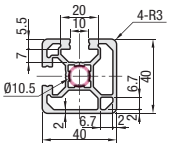


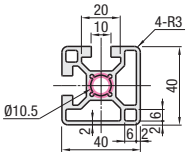
HFSH8-4040



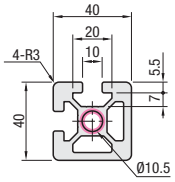
HFST8-4040
HFSTB8-4040 (Black Anodize)

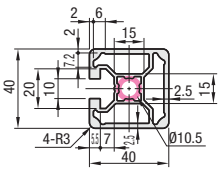
(New Shape / Black Anodize)



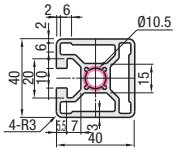


GFST8-4040 (High Rigidity)





HFSC8-4040



Configurable Length Extrusions

Part Number	L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
	4040 50~4000	1.53	568	9.96x10⁴	10.12x10⁴						
HFSF8		1.63	601	9.63x10⁴	9.94x10⁴						
HFSFB8 (Black Anodize)											
GFSF8 (High Rigidity)		2.21	820	14.61x10⁴	13.6x10⁴						
		1.51	558	9.92x10⁴	9.92x10⁴						
HFST8		1.61	596	9.86x10⁴	9.82x10⁴						
HFSTB8 (Black Anodize)											
GFST8 (High Rigidity)		2.28	846	14.57x10⁴	14.57x10⁴						
		1.56	579	10.37x10⁴	10.57x10⁴						
HFSH8		1.65	612	9.74x10⁴	10.44x10⁴						
		1.54	571	10.22x10⁴	10.52x10⁴						
HFSC8		1.66	617	9.97x10⁴	10.51x10⁴						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number	L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
	4040 4000	586	9.96x10⁴	10.12x10⁴		
KHFSF8		601	9.63x10⁴	9.94x10⁴		
KHFSFB8 (Black Anodize)		601	9.63x10⁴	9.94x10⁴		
KGFSF8 (High Rigidity)		820	14.61x10⁴	13.6x10⁴		
		558	9.92x10⁴	9.92x10⁴		
KHFST8		596	9.86x10⁴	9.82x10⁴		
KHFSTB8 (Black Anodize)		596	9.86x10⁴	9.82x10⁴		
KGFST8 (High Rigidity)		846	14.57x10⁴	14.57x10⁴		
		579	10.37x10⁴	10.57x10⁴		
KHFSH8		612	9.74x10⁴	10.44x10⁴		
		571	10.22x10⁴	10.52x10⁴		
KHFSC8		617	9.97x10⁴	10.51x10⁴		

Order Example

Part Number	-	L
HFSF8-4040	-	800
KHFSF8-4040	-	4000

Price

When L is less than 300 - Unit prices are indicated in the table regardless of the length.
ex: HFSF8-4040-180=4,40 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFSF8-4040-600
14,80x0.6m=4,40 EUR (Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days P.87
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
(KHFSF8-4040-4000)
For orders of 20 or more identical pieces, please request a quotation.

Alterations

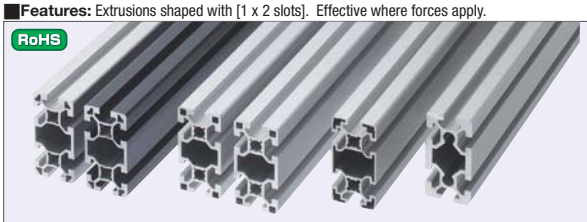
Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

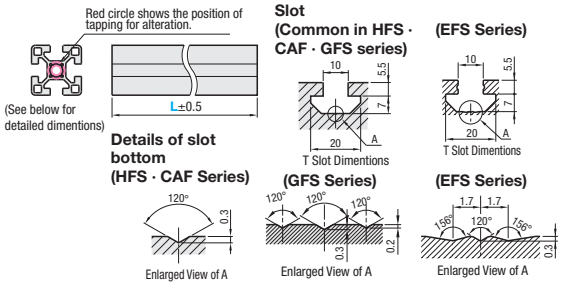
HFS8 Series Aluminum Frames 40 · 80mm Square
-2 Slots-

Features: Extrusions shaped with [1 x 2 slots]. Effective where forces apply.



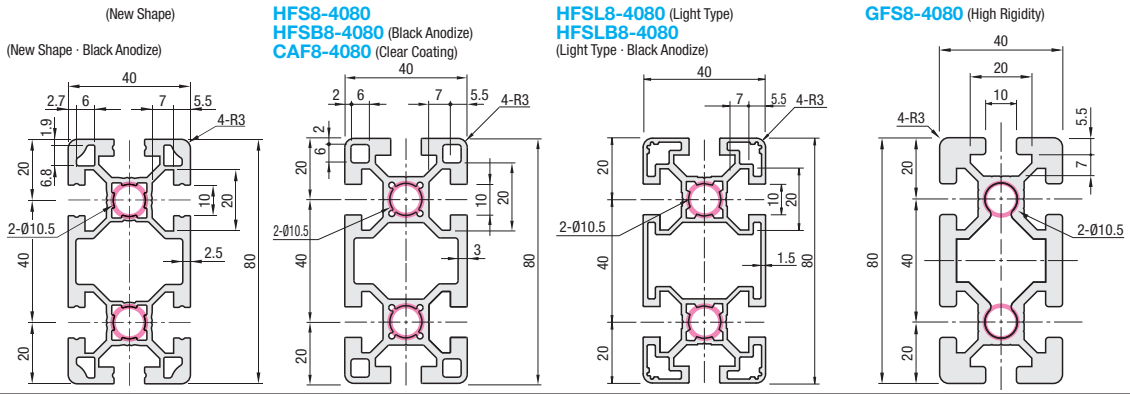
Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
GFS8	KGFS8	EN AW-6061-T6	Clear Anodize
HFSL8	KHFSL8	EN AC-51400/ AlMgSi0,7-T5	
HFSB8 HFSLB8	KHFSB8 KHFSLB8		Black Anodize
CAF8	-		Clear Coating (Clear Anodize + Clear Painting)

Cut surface and altered parts are not surface treated.



Features of Extrusions

Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	Volume Discount Less than 300mm 50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	Volume Discount/m 300mm or more 50~
(New Shape)		4080	50~4000	2.79	1034	19.9x10⁴	72.6x10⁴					
(New Shape · Black Anodize)												
HFS8				3.00	1109	19.8x10⁴	71.9x10⁴					
HFSB8	(Black Anodize)											
CAF8	(Clear Coating)											
HFSL8	(Light Type)			2.12	785	13.4x10⁴	52.9x10⁴					
HFSLB8	(Light Type · Black Anodize)											
GFS8	(High Rigidity)			3.62	1340	25.21x10⁴	90.87x10⁴					

Fixed Length Extrusion (1000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price 1~19 pcs.	Volume Discount 20~
KHFS8	4080	1000	1109	19.8x10⁴	71.9x10⁴		

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	Cross Sectional Moment of Inertia mm⁴ ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
(New Shape)		4080	4000	1034	19.9x10⁴	72.6x10⁴		
KEFSB8	(New Shape · Black Anodize)						
KHFS8				1109	19.8x10⁴	71.9x10⁴	
KHFSB8	(Black Anodize)						
KHFSL8	(Light Type)			785	13.4x10⁴	52.9x10⁴	
KHFSLB8	(Light Type · Black Anodize)						
KGFS8	(High Rigidity)			1340	25.21x10⁴	90.87x10⁴	

Order Example

Part Number	-	L
HFS8-4080	-	800
KHFS8-4080	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex:HFS8-4080-180=8,10 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS8-4080-800
27,30x0.8m=8,10 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Alterations
Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Fixed Length Extrusion (KHFS8-4080-1000)
6 Days P87

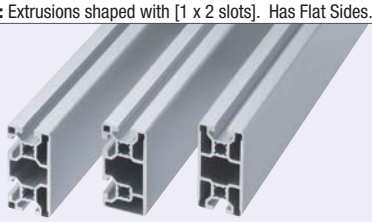
Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS8-4080-4000)

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

CAD Data

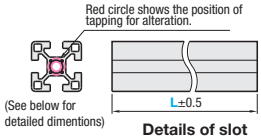
Features: Extrusions shaped with [1 x 2 slots]. Has Flat Sides.

RoHS



Type		M	S
Configurable Length	Fixed Length	Material	Surface Treatment
HFS_8	KHFS_8	EN AC-51400/ AlmgSi0,7-T5	Clear Anodize

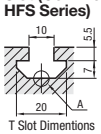
Cut surface and altered parts are not surface treated.



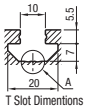
Details of slot bottom (HFS Series)



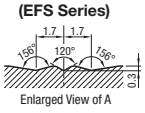
Slot (Common to HFS Series)



(EFS Series)



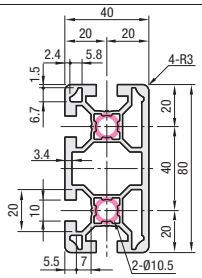
(EFS Series)

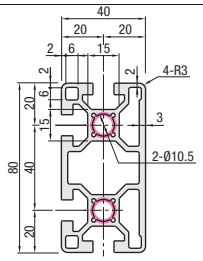


Features of Extrusions

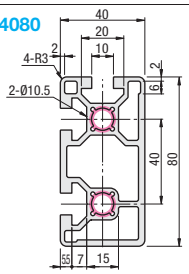
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as HFS series. Weight savings and cost reduction are realized. Transition from HFS extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
Surface Treatment	Clear Anodize	Common surface treatment.

HFSF8-4080

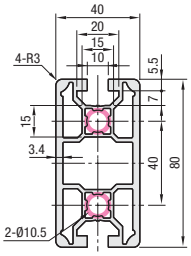


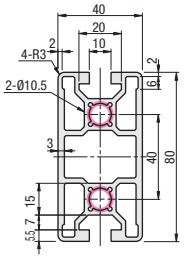


HFST8-4080



HFSH8-4080





Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
(New Shape)	4080	50~4000	2.81	1041	20.37x10⁴	72.20x10⁴						
HFSF8			2.98	1104	20.3x10⁴	70.5x10⁴						
HFST8			3.10	1149	21.18x10⁴	77.16x10⁴						
(New Shape)			2.77	1027	20.72x10⁴	70.73x10⁴						
HFSH8			3.01	1113	20.67x10⁴	70.16x10⁴						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
(New Shape)	4080	4000	1041	20.37x10⁴	72.20x10⁴		
KHFSF8			1104	20.3x10⁴	70.5x10⁴		
KHFST8			1149	21.18x10⁴	77.16x10⁴		
(New Shape)			1027	20.72x10⁴	70.73x10⁴		
KHFSH8			1113	20.67x10⁴	70.16x10⁴		

Order Example

Part Number	-	L
HFSF8-4080	-	800
KHFSF8-4080	-	4000

Days to Ship

Configurable Length Extrusions: 6 Days

Fixed Length Extrusions (Effective Length 4000 mm): 7 Days

For orders of 20 or more identical pieces, please request a quotation.

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFSF8-4080-180=9,40 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFSF8-4080-800
31,40x0.8m=9,40 EUR
(Round down to ten Cent.)

Alterations

Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.
Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

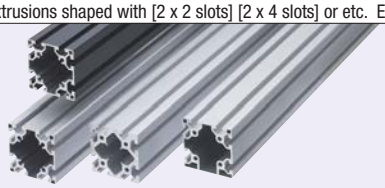
NEW

HFS8 Series Aluminum Frames 40 · 80mm Square
-2 or more slots-

Price Reduction
Up to 2%

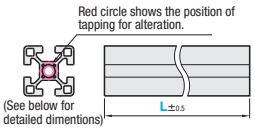
Features: Extrusions shaped with [2 x 2 slots] [2 x 4 slots] or etc. Effective for operations under high-loading environment.

RoHS

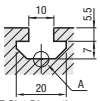


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS8 HFS_8	KHFS8 KHFS_8	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize
HFSB8	KHFSB8		Black Anodize
CAF8	-		Clear Coating (Clear Anodize + Clear Painting)

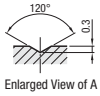
Cut surface and altered parts are not surface treated.



Details of slot (HFS · CAF Series)

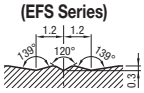


T Slot Dimentions



Enlarged View of A

(EFS Series)

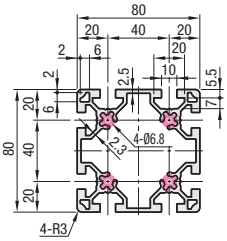


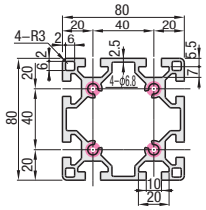
Enlarged View of A

Features of Extrusions

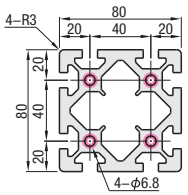
Cross Section Shape	HFS Extrusions	Standard cross section shape.
	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.

HFS8-8080
HFSB8-8080(Black Anodize)
CAF8-8080 (Clear Coating)

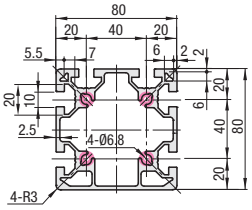


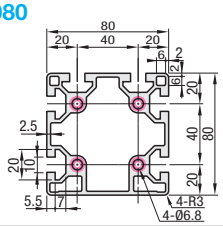


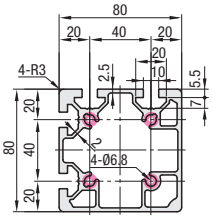
HFSH8-8080(Heavy Type)



HFSF8-8080







Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
			4.45	1649	130.0x10⁴	130.0x10⁴						
HFS8												
HFSB8(Black Anodize)			4.57	1691	129.1x10⁴	129.1x10⁴						
CAF8(Clear Coating)	8080	50~4000										
HFSH8(Heavy Type)			7.13	2641	183x10⁴	183x10⁴						
			4.39	1627	130.6x10⁴	131.6x10⁴						
HFSF8			4.66	1726	128.4x10⁴	129.6x10⁴						
			4.39	1626	134.2x10⁴	134.2x10⁴						

Fixed Length Extrusions(Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
			1649	130.0x10⁴	130.0x10⁴		
KHFS8			1691	129.1x10⁴	129.1x10⁴		
KHFSB8(Black Anodize)							
KHFSH8(Heavy Type)	8080	4000	2641	183x10⁴	183x10⁴		
			1627	130.6x10⁴	131.6x10⁴		
KHFSF8			1726	128.4x10⁴	129.6x10⁴		
			1626	134.2x10⁴	134.2x10⁴		

Order Example

Part Number	-	L
HFS8-8080	-	800
KHFS8-8080	-	4000

Price

When L =300 or less Unit prices are indicated in the table regardless of the length.
ex: HFS8-8080-180=1300 EUR
When L is 300 or more Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFS8-8080-600
43,60x0.6m=26,10 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days | 5 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces please request a quotation.

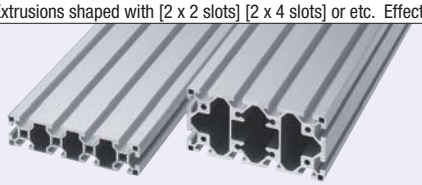
Alterations
Alterations are available for Configurable Length Extrusions.
For details refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**) and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

CAD Data

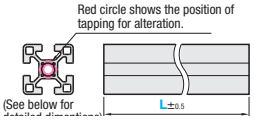
Features: Extrusions shaped with [2 x 2 slots] [2 x 4 slots] or etc. Effective for operations under high-loading environment.

RoHS

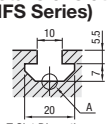


Type		Material	Surface Treatment
Configurable Length	Fixed Length		
HFS8	KHFS8	EN AC-51400/ AlMgSi0,7-T5	Clear Anodize
HFSB8	KHFSB8		Black Anodize

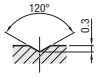
Cut surface and altered parts are not surface treated.



Details of slot (HFS Series)

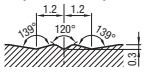


T Slot Dimentions



Enlarged View of A

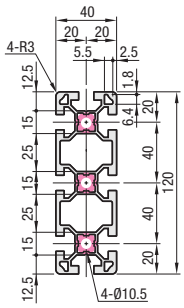
(EFS Series)

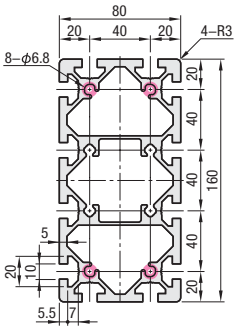


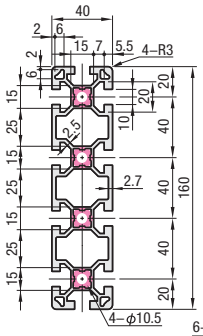
Enlarged View of A

Features of Extrusions

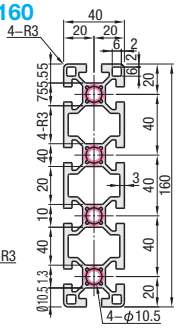
Cross Section Shape	HFS Extrusions	Standard cross section shape.
	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.



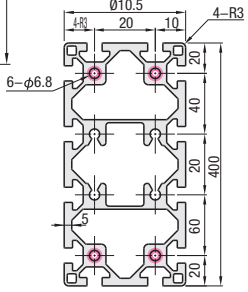




HFS8-40160



HFS8-80160
HFSB8-80160
(Black Anodize)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	Volume Discount Less than 300mm		€ Unit Price/m 300mm or more	Volume Discount/m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
(New Shape)	40120	50~4000	3.98	1474	29.0x10⁴	223.5x10⁴						
(New Shape · Black Anodize)												
(New Shape)	40160		5.25	1945	38.8x10⁴	506x10⁴						
HFS8			5.54	2049	38.6x10⁴	498x10⁴						
			9.83	3643	304.4x10⁴	1007x10⁴						
HFS8	80160		10.51	3891	295x10⁴	1001x10⁴						
HFSB8(Black Anodize)												

Fixed Length Extrusions(Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount
				ℓx	ℓy	1~9 pcs.	10~19
(New Shape)	40120	4000	1474	29.0x10⁴	222.2x10⁴		
(New Shape · Black Anodize)							
(New Shape)	40160		1945	38.8x10⁴	506x10⁴		
(New Shape · Black Anodize)							
KHFS8			2049	38.6x10⁴	498x10⁴		
(New Shape)	80160		3643	304.4x10⁴	1006x10⁴		
KHFS8			3891	295x10⁴	1001x10⁴		
KHFSB8(Black Anodize)							

Order Example

Part Number	-	L
HFS8-80160	-	800
KEFS8-40120	-	4000

Price

When L =300 or less Unit prices are indicated in the table regardless of the length.
ex: HFS8-8080-180=13,00 EUR
When L is 300 or more Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFS8-8080-600
43,60x0.6m=26,10 EUR
(Round down to ten Cent.)

Alterations

Days to Ship

Configurable Length Extrusions
6 Days
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.
Alterations are available for Configurable Length Extrusions. For details refer to P.645

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces please request a quotation.

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97) and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS8 Series Aluminum Frames 40 · 80mm Square
-Other shapes-

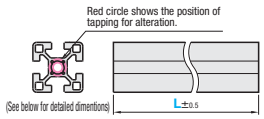
Features: Can be used when making angles or making outer surface in radius.

RoHS

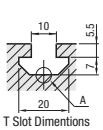


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS__A8 HFS45TR8	KHFS__A8 KHFS45TR8	EN AC-51 400/ AlMgSi0,7	Clear Anodize

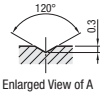
Cut surface and altered parts are not surface treated.



Details of slot (HFS · CAF Series)



T Slot Dimentions

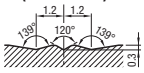


Enlarged View of A

Features of Extrusions

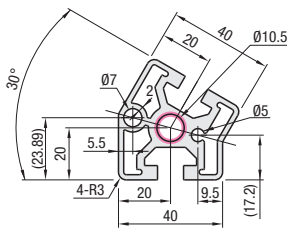
Cross Section Shape	HFS Extrusions	Standard cross section shape.
	EFS Extrusions	New shape with the same or higher rigidity as HFS series. Weight savings and cost reduction are realized. Transition from HFS extrusions realizes cost savings.
Surface Treatment	Clear Anodize	Common surface treatment.

(EFS Series)

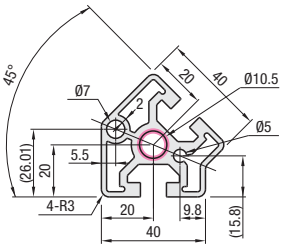


Enlarged View of A

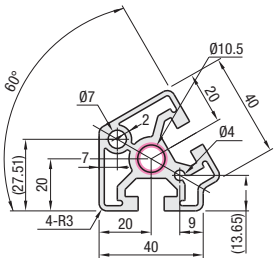
HFS30A8-40



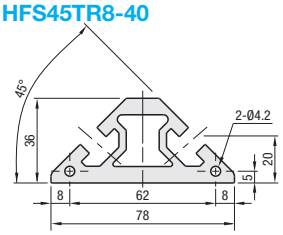
HFS45A8-40



HFS60A8-40



HFS45TR8-40



Configurable Length Extrusions

Part Number	L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount/m 300mm or more 10~49	50~
HFS30A8	40	1.88	694	9.89x10⁴	10.64x10⁴						
HFS45A8	50~4000	1.83	676	9.87x10⁴	10.37x10⁴						
HFS60A8		1.84	679	9.99x10⁴	10.53x10⁴						
HFS45TR8		2.74	1012	12.23x10⁴	38.19x10⁴						

Fixed Length Extrusions(Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number	L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount 10~19
KHFS30A8	40	694	9.89x10⁴	10.64x10⁴		
KHFS45A8	4000	676	9.87x10⁴	10.37x10⁴		
KHFS60A8		679	9.99x10⁴	10.53x10⁴		
KHFS45TR8		1012	12.23x10⁴	38.19x10⁴		

Order Example

Part Number	-	L
HFS30A8-40	-	800
KHFS30A8-40	-	4000

Price

When L =300 or less
Unit prices are indicated in the table regardless of the length.
ex: HFS30A8-40-180=6,00 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS8-808040-800
46,80x0.8m=6,00 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days P.87
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Alterations
Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS30A8-40-4000)

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

CAD Data

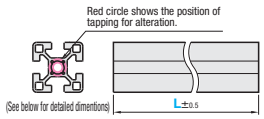
Features: Can be used when making angles or making outer surface in radius.

RoHS

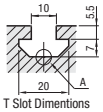


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS8 HFS_8	KHFS8 KHFS_8	EN AC-51 400/ AlMgSi0,7	Clear Anodize

Cut surface and altered parts are not surface treated.



Details of slot (HFS / CAF Series)



T Slot Dimentions

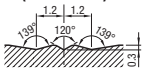


Enlarged View of A

Features of Extrusions

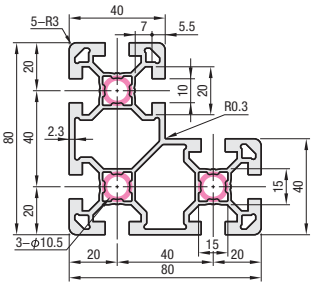
Cross Section Shape	HFS Extrusions	Standard cross section shape.
	EFS Extrusions	New shape with the same or higher rigidity as HFS series. Weight savings and cost reduction are realized. Transition from HFS extrusions realizes cost savings.
Surface Treatment	Clear Anodize	Common surface treatment.

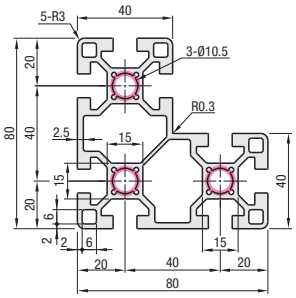
(EFS Series)



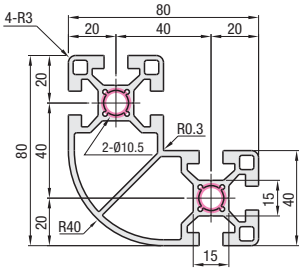
Enlarged View of A

HFS8-808040

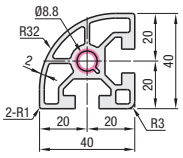




HFSR8-808040



HFSR8-4040



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	Volume Discount Less than 300mm		€ Unit Price/m 300mm or more	Volume Discount/m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
HFS8	808040	50~4000	4.00	1484	94.82x10⁴	94.82x10⁴						
HFSR8			4.19	1550	94.2x10⁴	94.2x10⁴						
HFSR8	4040		3.61	1339	80.99x10⁴	80.99x10⁴						
			1.53	564	7.79x10⁴	7.79x10⁴						

Fixed Length Extrusions(Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount
				ℓx	ℓy	1~9 pcs.	10~19
KHFS8	808040	4000	1484	94.82x10⁴	94.82x10⁴		
KHFSR8	4040		1550	94.2x10⁴	94.2x10⁴		
			564	7.79x10⁴	7.79x10⁴		

Order Example

Part Number	-	L
HFS8-808040	-	800
KHFSR8-4040	-	4000

Price

When L =300 or less
Unit prices are indicated in the table regardless of the length.
ex: HFS30A8-40-180=6,00 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex:HFS8-808040-800
46,80x0.8m=6,00 EUR
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days P.87
Up to 79 pcs.
Shipping of 2nd business day is available for orders of 80~160 pcs.

Alterations

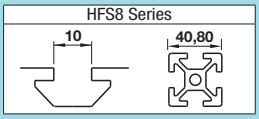
Alterations are available for Configurable Length Extrusions. For details, refer to P.645

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS30A8-40-4000)

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS8 Series
-Aluminum Extrusion with Milled Surface-

HFS8 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.563 ~ P.578	P.581 ~ P.588	P.627 ~ P.640	P.589	P.645 ~ P.658

CAD Data

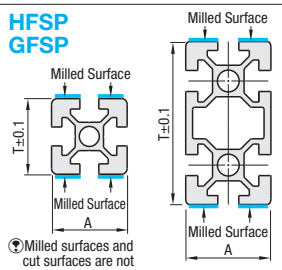
Features: Milled on surfaces. Usable for Linear Guides, etc.

Aluminum Frames with Milled Surface

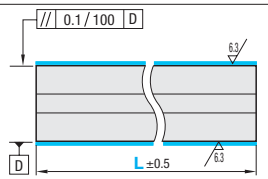


RoHS

HFSP
GFSP



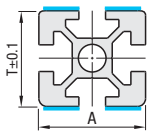
Milled surfaces and cut surfaces are not anodized.



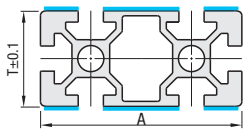
Type	M Material	S Surface Treatment
HFSP8	EN AC-51400/AlMgSi0,7-T5	Clear Anodize
GFSP8	EN AW-6061/EN AW-AlMg1SiCu-T6	

For detailed dimensions and shapes EXCEPT the slots on the milled surface, A and T dimensions, please refer to the drawing of the product of the below Part Number Without "P". (Ex.) HFSP8-4040→Ref. fig. HFS8-4040 (Refer to P.553)

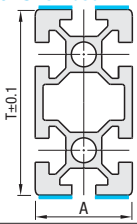
Square Type
HFSP8-4040
HFSP8-8080
HFSHP8-8080
GFSP8-4040



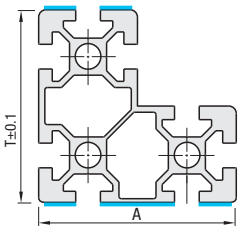
Rectangle Type (Horizontal)
HFSP8-8040
GFSP8-8040



Rectangle Type (Vertical)
HFSP8-4080
GFSP8-4080



L-Shaped Type
HFSP8-808040



Part Number		L 0.5mm Increment	Extrusions Series	T	A	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	Alteration Charge (€ Body+) Counterboring XA~XE (per row)	Alteration Charge (€ Body+) Drill Wrench Hole AV~EV (per row)	Tapping (P.647) Tap Shape	Left LTP	Right RTP	Both TPW
HFSP8	4040	100~3000	HFS8	39	40			Z6 d6.5 d11	D8 Ø8	M12 Depth 36			
	8040			39	80								
	4080			79	40								
	8080			79	80					M8 Depth 24			
	808040			79	80			Z8 d9 d14		M12 Depth 36			
HFSHP8	8080		HFS8	79	80					M8 Depth 24			
GFSP8	4040		GFS8	39	40					M12 Depth 36			
	8040			39	80								
	4080			79	40								

Order Example Part Number HFSP8-4040 - L 300

Days to Ship 8 Days

Price euros

Volume Discount P87

Qty.	1~9 pcs.	10~49	50~
Discount Rate	€ Unit Price	5%	10%
	€ Unit Price/m	5%	10%

Round down to one Cent.
Round down to ten Cent.

When L<300mm: € Unit Price = Price
When L≥300mm: € Unit Price/m x Specified Over All Length = Price
(Ex.): HFSP8-4040-600
36,70x0.6m=17,50 EUR (Round down to ten Cent.)

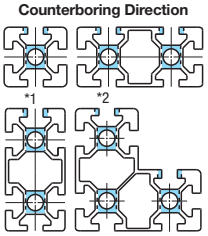
Alterations Drilling hole at a specified position can be done.

- Nuts for Extrusion
Please use nuts for aluminum extrusions.
For the nuts, refer to **P.581~P.588**

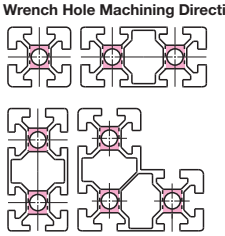
Alterations	Counterboring							Wrench Hole					
Code	Z Selection			XA	XB	XC	XD	XE	D Selection	AV	BV	CV	DV	EV
Spec.	Z	d	d1	Distance from The Left End Plane mm					D	Distance from The Left End Plane mm				
Specifications of Hole Size and Hole Position	6	6.5	11	7~L-7					8	7~L-7				
	8	9	14											

When the cross section is L-shaped, select distance from left end with lower section in front.

Counterboring Direction

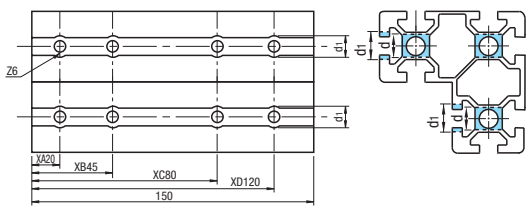


Wrench Hole Machining Direction

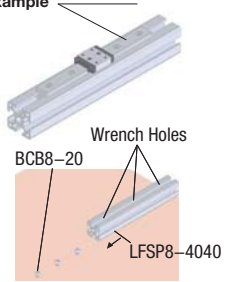


*1 When the cross section is rectangle (vertical), counterboring is not available for extrusions exceeding 60mm in the longitudinal direction.
*2 When the cross section is L-shaped, counterboring is only applicable to the lower section of extrusions exceeding 60mm in length direction.

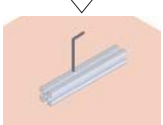
Order Example
HFSP8 - 808040 - 150 - Z6 - XA20 - XB45 - XC80 - XD120
HFSP8 - 4040 - 2000 - D8 - AV100 - BV120 - CV1000 - DV1880 - EV1900
HFSP8 - 8080 - 800 - LTP



Example Linear Guide



Installed button bolts temporarily in reference plane, then slide the frame to fixing position, passing bolt heads through frame slot.

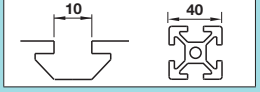


Put wrench in the wrench hole and tighten the screw.

HFS8 Series

-Curved Aluminum Frames · Slot Width Mixed Extrusions-

HFS8 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.563 ~ P.578	P.581 ~ P.588	P.627 ~ P.640	P.589	P.645 ~ P.658

CAD Data

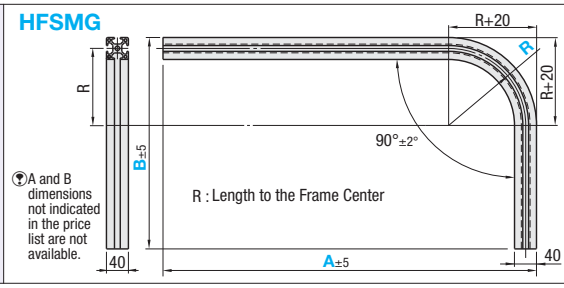
Features: Bending is applied to HFS8-4040.

Curved Aluminum Frames



RoHS

HFSMG



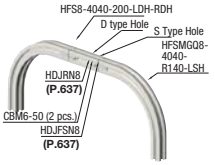
A and B dimensions not indicated in the price list are not available.

Bending is applied after anodizing; therefore, bent section may slightly discolor and becomes white.

For R=140, the frame slot may be deformed and becomes narrower in width at the spot where the frame is bent. Therefore, slot nut cannot be used.

M Material: EN AC-51 400/AlMgSi0,7-T5
S Surface Treatment: Anodize

Example



Part Number Type	Part Number No.	A 1mm Increment	B 1mm Increment	R *	Series	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy
HFSMG	8-4040	200~1500	200~1000	140 300* 500*	HFS8	1.73	640	10.4x10⁴	10.4x10⁴

* Curved panels for R300 and R500 are not available.

Days to Ship: 10 Days (For dedicated Curved Panels, refer to P.886)

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9 pcs.	10~49	50~
Discount Rate	€ Unit Price	5%	10%

Order Example: Part Number - A - B - R
HFSMG8-4040 - A350 - B700 - R140

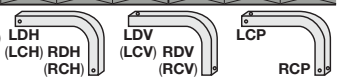
Part Number Type	Part Number No.	A	€ Unit Price R140 B 200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000	R300 B 400~500	501~600	601~700	701~800	801~900	901~1000	R500 B 600~700	701~800	801~900
HFSMG	8-4040	200~300																	
		301~400																	
		401~500																	
		501~600																	
		601~700																	
		701~800																	
		801~900																	
		901~1000																	

Alterations

Part Number - A - B - R - (LTP·RTP·TPW…etc.)
HFSMG8-4040 - A400 - B500 - R140 - LTP-RCV

10 Days

Blind Joints (Pre-Assy. Insertion Double Joint) Connecting Example



Alterations	Tap(P.647)		D type Hole(P.654)				M type Hole(P.656)				S type Hole(P.655)				Wrench Hole(P.651)			
Code	LTP	RTP	TPW	LDH	LDV	RDH	RDV	LMH	LMV	RMH	RMV	LSH	LSV	RSH	RSV	LCH	LCV	LCP	RCH	RCV	RCP
Spec.	Tapping to the center hole Tap Shape M12 Depth 36 **LTP**: Tapping on the Left End Face **RTP**: Tapping on the Bottom End Face **TPW**: Tapping on the Both Ends Ex. LTP			Adds D type hole in specified position. **LDH**,**RDH**: D hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LDH **LDV**, **RDV**: Adds D hole on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RDV				Adds M type hole in specified position. **LMH**,**RMH**: M hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LMH **LMV**, **RMV**: Adds M hole on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RMV				Adds S type hole in the specified position. **LSH**,**RSH**: D hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LSH **LSV**, **RSV**: Adds S hole on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RSV				**LCH**, **RCH**: Adds wrench hole on the left (bottom) of the extrusion from the horizontal direction. Ex. RCH **LCV**, **RCV** Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCV **LCP**, **RCP**: Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCP			
Applicable Extrusions																					
HFSMG8-4040	2,70		5,40	1,20				1,20				3,90				1,20	2,40	1,20			2,40

When the tapping and D, M S or wrench holes are specified in combination, tap depth is the distance to D · M · S or wrench holes.

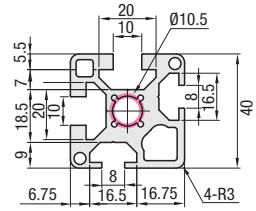
Features: Mixed Slot Width Extrusions of HFS6 and HFS8 series.

Aluminum Frames - Mixed Series (5 and 6), Mixed Base (20 and 30), Y Style

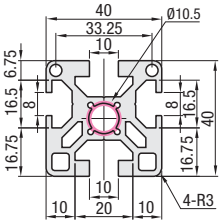


RoHS

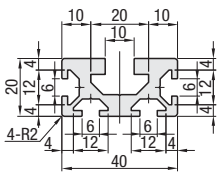
HFS8-6T-4040



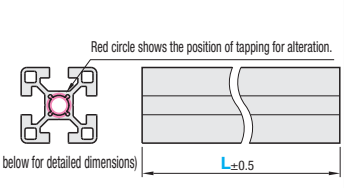
HFS8-6H-4040



HFS8-5Y-2040



HFS8-6_-4040
HFS8-5Y-2040



M Material: EN AC-51 400/AlMgSI0,7-T5
S Surface Treatment: Anodize

Cut surfaces are not anodized.

Part Number Type	Shapes	No.	L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFS8-6	T	4040	50~4000	1.86	767	11.14x10⁴	11.04x10⁴		
	H			1.90	704	10.74x10⁴	11.04x10⁴		
HFS8-5	Y	2040		1.12	418	1.70x10⁴	6.24x10⁴		

Order Example: Part Number - L
HFS8-6T-4040 - 800

When L is less than 300 Unit prices are indicated in the table regardless of the length. ex: HFS8-6T-4040-180 =6,10 EUR

Days to Ship: 6 Days

Price Volume Discount P.88

Qty.	1~9 pcs.	10~49	50~
Discount Rate	€ Unit Price	5%	10%
	€ Unit Price/m	5%	10%

Round down to one Cent.
Round down to ten Cent.

When L is 300 or more Prices are calculated as follows: € Unit Price/m x Specified Full Length = Price ex: HFS8-6T-4040-500 20,50x0.5m=10,20 EUR (Round down to ten Cent.)

Alterations: Part Number - L - Alteration Code
HFS8-6T-4040 - 800 - TPW

7 Days

Alterations Spec. Code			Tapping (€ Body+)⊗Not applicable to HFS8-5Y. Tap Shape	Left LTP	Right RTP	Both TPW
HFS8-6	T / H	4040	M12 Depth 36	2,00	2,00	4,00

For details of tapping, refer to P.647

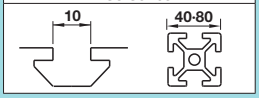
Example



Tabbed Brackets

-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-

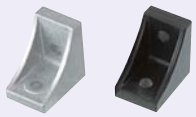
HFS8 Series



Features: Brackets with tabs to fit in slots of extrusions and stop rotating when tightening. Excels in work efficiency.

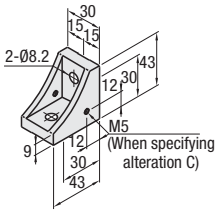
Tabbed Brackets

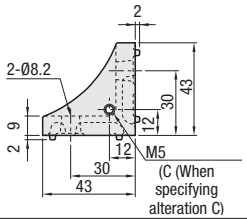
RoHS



Type	M Material	S Surface Treatment
HBLFS8	EN AC-46100/ G-AlSi12Cu	-
HBLFSB8		Cathodic Electrodeposition Coating: Black

HBLFS8
HBLFSB8
(Cathodic Electrodeposition Coating: Black)





Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFS8 HBLFSB8* (Cathodic Electrodeposition Coating: Black)	54	CBM8-20	2	HNTT8-8	2	2058		

* For repairing black anodizing, refer to **P.748**

ex Example

Used for L connection.



Features: Tabbed Brackets to be connected by both L and Cross-Connections.

Reversal Tabbed Brackets

RoHS

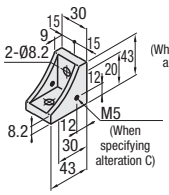


Type	M Material	S Surface Treatment
HBLFSN8	EN AC-46100/ G-AlSi12Cu	-
HBLFSNB8		Black Anodize
HBLFSNM8		Electroless Nickel Plating
CHBLFSN8		Baked-on Finish (Silver)
HBLFSNF8		-

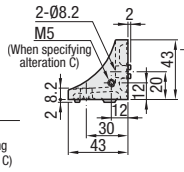
* Baked-on Finish (Silver) is color coordinated with Clear Coating Extrusions.

Reversal Tabbed Brackets

HBLFSN8
HBLFSNB8(Black Anodize)

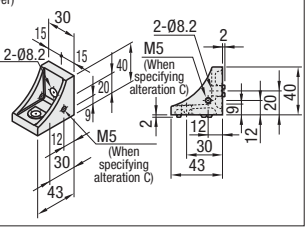


HBLFSNM8(Electroless Nickel Plating)
CHBLFSN8(Baked-on Finish · Silver)



Reversal Brackets with Tab (Depth 40mm)

HBLFSNF8

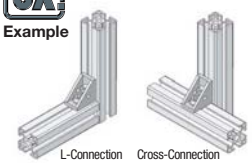


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSN8	50	CBM8-20	2	HNTT8-8	2	2058		
HBLFSNB8* (Black Anodize)								
HBLFSNM8 (Electroless Nickel Plating)								
CHBLFSN8 (Baked-on Finish · Silver)								
HBLFSNF8	48							

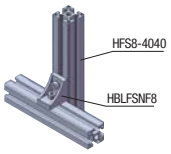
* For repairing black anodizing, refer to **P.748**

ex Example

Can be installed in either direction.



HBLFSNF8 prevents brackets from protruding from extrusions when cross connected.



Features: One-Sided Tabbed Rib Brackets. Easy to work with wrenches.

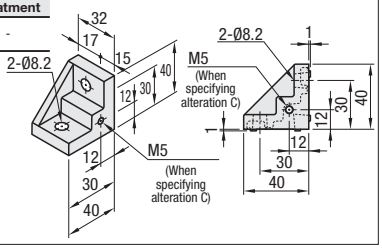
One-Side Rib Brackets

RoHS

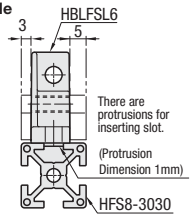


Type	M Material	S Surface Treatment
HBLFSL8	EN AC-46100/ G-AlSi12Cu	-

HBLFSL8



ex Example



Can be combined with both cover plates of 5mm and 3mm thickness.

Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSL8	46	CBM8-20	2	HNTT8-8	2	2058		

Features: Brackets with single side tabs. Plates can be mounted on the side with no tabs.

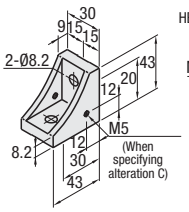
Brackets with Single Side Tab

RoHS

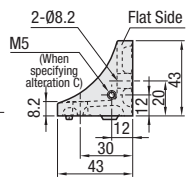


Type	M Material	S Surface Treatment
HBLFSNK8	EN AC-46100/ G-AlSi12Cu	-
HBLFSNE8		

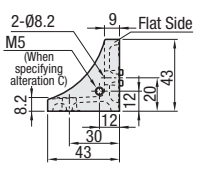
HBLFSNK8
HBLFSNE8



HBLFSNK8 Side View



HBLFSNE8 Side view

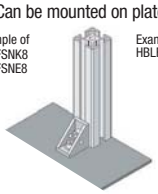


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSNK8 HBLFSNE8	50	CBM8-20	2	HNTT8-8	2	2058		

ex Example

Can be mounted on plates directly.

Example of HBLFSNK8 HBLFSNE8



Example of HBLFSNE8



NEW

CAD Data

Features: Brackets with Slotted Hole on one side. Hexagon Socket Head Cap Screws with Captured Washers can be used for mounting without interference between screw heads.

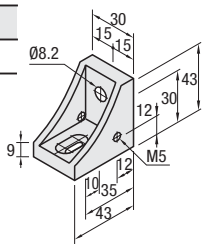
Brackets with Slotted Hole on one side

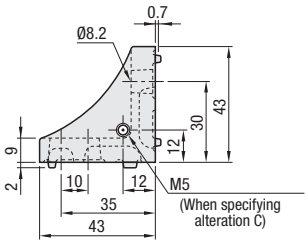
RoHS



Type	Material	Surface Treatment
HBLFSH8	EN AC-46100/ G-AlSi12Cu	-

HBLFSH8





Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSH8	52	CBM8-20	2	HNTT8-8	2	2058		

Features: Pressing nuts against the long tabs makes cumbersome hole positioning unnecessary.

Nut-Fixing Brackets

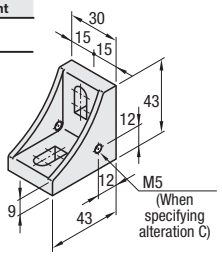
RoHS

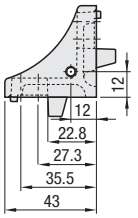


Type	Material	Surface Treatment
HBLFSR8	EN AC-46100/G-AlSi12Cu	-

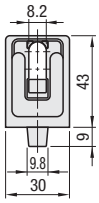
HBLFSR8

- Slotted holes are for various nut hole positions.
- Bracket tabs may be damaged when nuts are fallen on them.
- Use of washers are recommended. (Alteration SEC below)





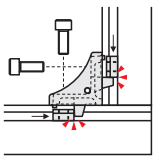
<Back View>



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSR8	55	CBM8-20	2	HNTT8-8	2	2058		

Example

When nuts are wedged through until the tab, hole positions of bracket and nuts are aligned and fine adjustment becomes unnecessary.
⊗Short Nuts, HNTM, HNTAM are not applicable.



Features: Reversal Tabbed Brackets with Cover. Designed to prevent dust build-up.

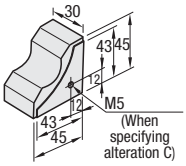
Brackets with Caps

RoHS

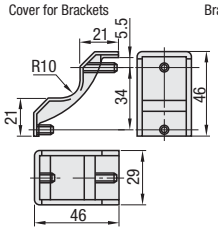


Type	Material	Surface Treatment
HBLFSNT8	Cover for Brackets: Polyamide (Black) Bracket: EN AC-46100/G-AlSi12Cu	-

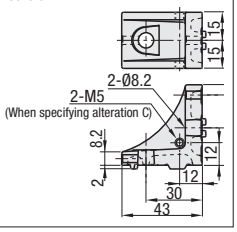
HBLFSNT8



Cover for Brackets



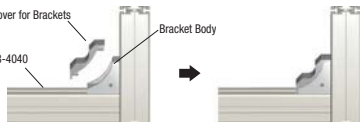
Bracket for Covers



Part Number	Mass (g)	Applicable Screw · T Nut				Accessory Components				Allowable Load (N)	€ Unit Price	Volume Discount
		Screw	Qty.	T Nut	Qty.	(1)	Qty.	(2)	Qty.		1~99 pcs.	100~
HBLFSNT8	56	CBM8-20	2	HNTT8-8	2	Bracket	1	Cover for Brackets	1	2058		

Example

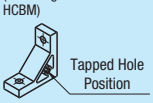
•Example of Mounting Covers to Brackets



Order Example Part Number: **HBLFSNK8**

Days to Ship: 6 Days / 2 Days P.87

Alterations: Part Number HBLFSNK8 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM) 	HBLFS8	0,30
			HBLFSB8	0,40
			HBLFSN8	0,30
			HBLFSNB8	0,40
			HBLFSNM8	0,30
			CHBLFSN8	0,45
			HBLFSNF8	0,30
			HBLFSL8	
			HBLFSNK8	
			HBLFSNE8	
			HBLFSH8	0,30
			HBLFSR8	
			HBLFSNT8	0,40

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFS8 is specified, Code: SET, Screw Fastening: CBM8-20, Nuts: HNTT8-8 / SCB8-20, HNTTSN8-8 / SEU CBM8-20, HNTU8-8 / SSU SCB8-20, SHNTU8-8 / SEP CBM8-20, HNTP8-8 / SSP SCB8-20, SHNTP8-8 / SEC HCBST8-24, HNTT8-8 ⓘWhen specifying other than HBLFS8, check for the applicable screws and nuts.	HBLFS8	1,12	1,20	1,38	2,02	1,38	1,60	1,80
			HBLFSB8	1,36	-	1,62	-	1,62	-	-
			HBLFSN8	1,12	1,20	1,38	2,02	1,38	1,60	1,80
			HBLFSNB8	1,36	-	1,62	-	1,62	-	-
			HBLFSNM8	1,15		1,41		1,41		1,83
			CHBLFSN8	1,12	1,20	1,38	2,02	1,38	1,60	1,80
			HBLFSL8							
			HBLFSNF8							
			HBLFSNK8	1,12	1,20	1,38	2,02	1,38	1,60	1,80
			HBLFSNE8							
			HBLFSH8							
			HBLFSR8							
			HBLFSNT8	1,15		1,41		1,41		-

ⓘScrews for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**
ⓘWhen -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Post-Assy. Easy Brackets / Tabbed Brackets -for 1 slot / 2 slots-

-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-

CAD Data

Features: 2 aluminum extrusions can be easily connected with tightening only 1 screw. Brackets can be mounted on the extrusion slots after assembly.

Brackets

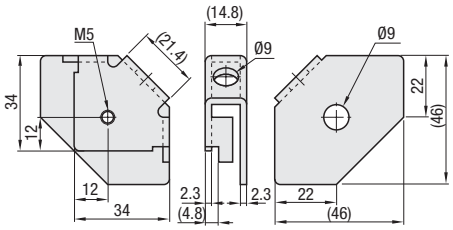
RoHS



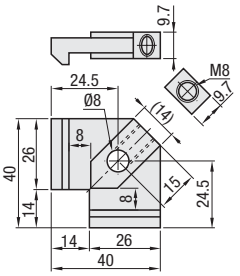
Components	Material	Surface Treatment
(1) Joint Plates	1.0330/DC01	Trivalent Chromate
(2) Joint Bracket	1.1191/C45E	
(3) Hexagon Socket Head Cap Screw	1.7220/34CrMo4	

HABL8

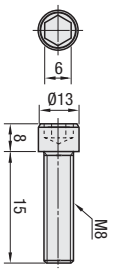
(1) Joint Plates



(2) Joint Bracket



(3) Hexagon Socket Head Cap Screw



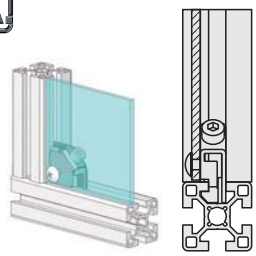
Overtightening may cause deformation of joint plates.
(Reference Tightening Torque 15N·m)

Part Number / Type	Mass (g)	Included Screw: Screw	Included Screw: Qty.	Allowable Load (N)	€ Unit Price: 1~99 pcs.	Volume Discount: 100~
HABL8	120	Hex Socket Head Cap Screws M8x15	1	800		

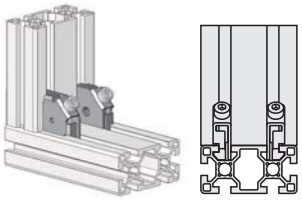
Order Example — Part Number: HABL8

Days to Ship — 6 Days / 2 Days P.87

Example

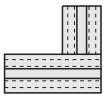
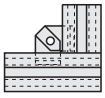
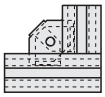
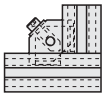


Holes are tapped on a bracket for cover mounting.



For aluminum extrusions with 2 slots, brackets can be mounted on both sides.

Connection Method

Step	Front View	Side view	Sketch Drawing
1			 Place 2 Aluminum extrusions, and adjust the frame positions.
2			 Fit the joint bracket (2) in the slot of the aluminum extrusions.
3			 Cover the joint bracket (2) on the joint plate (1).
4			 Overtightening may cause deformation of joint plates. Tighten a hexagon socket head cap screw to fix the plate. (Reference Tightening Torque 15Nm)

Features: Brackets with twice as many screws. Extrusions can be connected more securely.

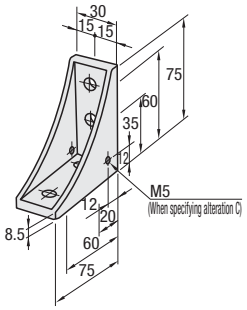
Reversal Tabbed Brackets

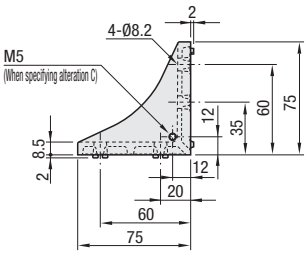
RoHS



Type	Material	Surface Treatment
HBLFSSW8	EN AC-46100/G-AlSi12Cu	-

HBLFSSW8





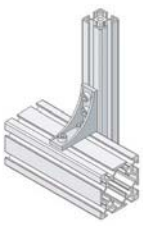
Part Number	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price: 1~99 pcs.	Volume Discount: 100~
HBLFSSW8	105	CBM8-20	4	HNTT8-8	4	3087		

Order Example — Part Number: HBLFSSW8

Days to Ship — 6 Days / 2 Days P.87

Example

Can be connected in parallel and perpendicular directions to the extrusion slot.



CAD Data

Features: Tabbed Brackets for 2-slots. Since the tabs stop rotating the brackets when tightening, improves work efficiency.

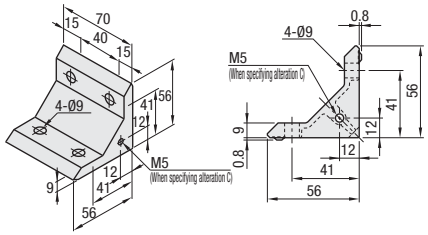
Tabbed Brackets

RoHS

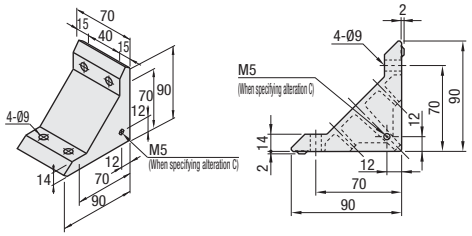


Type	Material	Surface Treatment
HBLFTD8	EN AC-46100/G-AlSi12Cu	-
HBLFUD8		

HBLFTD8



HBLFUD8



Part Number / Type	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFTD8	140	CBM8-20	4	HNTT8-8	4	3087		
HBLFUD8	370	CBM8-25				3920		

Example



Can be connected in parallel and perpendicular directions to the extrusion slot.

Features: Extrusions with 2-slots (HFS8-8080, etc.) can be connected with one bracket.

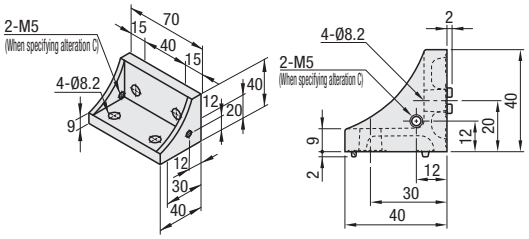
Reversal Tabbed Brackets

RoHS



Type	Material	Surface Treatment
HBLFSD8	EN AC-46100/G-AlSi12Cu	-

HBLFSD8



Part Number	Mass (g)	Applicable Screw · T Nut: Screw	Qty.	T Nut	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLFSD8	89	CBM8-20	4	HNTT8-8	4	3087		

Order Example Part Number: HBLFSD8

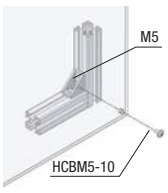
Days to Ship 6 Days / 2 Days P.87

Alterations Part Number HBLFSD8 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM) 	HBLFSSW8 HBLFSD8 HBLFTD8 HBLFUD8	0,40

Example of Cover Mounting
•Specify alteration code C.

Example



Alterations	Code	Spec.	Applicable Brackets	Price Adder: SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nut)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFSSW8 is specified,	HBLFSSW8							
			HBLFSD8	2,30	2,40			2,82	3,20	3,66
			HBLFTD8			2,82	4,04			
			HBLFUD8	2,40	2,50			2,92	3,30	3,68

Code	Screw Fastening	Nuts
SET	CBM8-20	HNTT8-8
SST	SCB8-20	HNTTSN8-8
SEU	CBM8-20	HNTU8-8
SSU	SCB8-20	SHNTU8-8
SEP	CBM8-20	HNTP8-8
SSP	SCB8-20	SHNTP8-8
SEC	HCBST8-24	HNTT8-8

When specifying other than HBLFSSW8, check for the applicable screws and nuts.

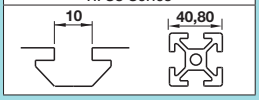
Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). P.641

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 1-slot-

-Slot type: HFS8 Series (Aluminum Frames 40, 80 Square)-

HFS8 Series

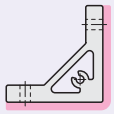


Features: Extruded Brackets with tabs to fit extrusions. Since the tabs stop rotating the brackets when tightening, improves work efficiency.

Thick Brackets (With Tab Type)

RoHS



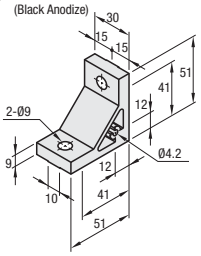


HBK _ _ series and HBLDSWT have tabs on the contact surfaces with extrusions.

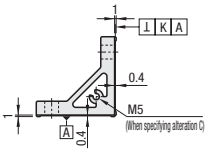
Type	Material	Surface Treatment
HBKTST8	EN AC-51400/ AlMgSi0.7	Anodize
HBKTS8		
HBKTSB8		Black Anodize

Part Number	Perpendicularity K
HBKTST8	0.03
HBKTS8	0.06
HBKTSB8 (Black Anodize)	

HBKTST8
(Perpendicularly Machined)
HBKTS8
HBKTSB8
(Black Anodize)



The Protrusion Type has a protrusion on the bracket bottom which fits into the aluminum frame extrusion groove.



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKTST8	65.8	CBM8-20	2	HNTT8-8	2	2058		
HBKTS8								
HBKTSB8 * (Black Anodize)								

* For repairing black anodizing, refer to **P.748**

Features: Aluminum Extruded Brackets. Good appearance designed to prevent dust build up.

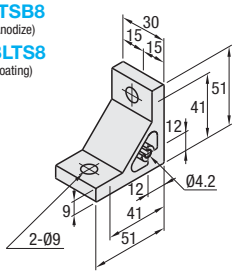
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTS8	EN AC-51400/ AlMgSi0.7	Anodize
HBLTSB8		Black Anodize
CHBLTS8		Clear Coating (Anodize + Clear+ Coating)

HBLTS8
HBLTSB8
(Black Anodize)
CHBLTS8
(Clear Coating)

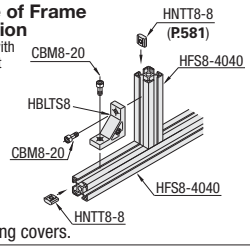


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTS8	65.8	CBM8-20	2	HNTT8-8	2	2058		
HBLTSB8* (Black Anodize)								
CHBLTS8 (Clear Coating)	66							

* For repairing black anodizing, refer to **P.748**

Example

Example of Frame Connection
Connection with Thick Bracket



Features: Hole positions are offset. Can be combined with plates of 3mm and 5mm thickness when using taps for mounting covers.

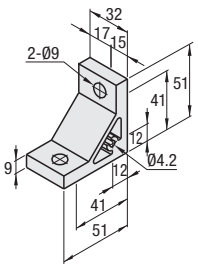
Eccentric Brackets

RoHS



Type	Material	Surface Treatment
HBLTH8	EN AC-51 400-T5	Anodize

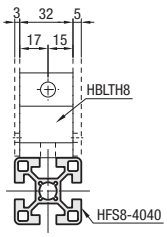
HBLTH8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~ 99 pcs.	100~
HBLTH8	68	CBM8-20	2	HNTT8-8	2	2058		

Example

They can be combined with cover plates of thickness 3mm and 5mm.



NEW

CAD Data

■**Features:** Extruded Brackets with Unequal Sides. Effective when strength is required in narrow clearances between extrusions.

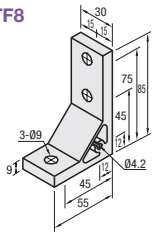
■Scalene Brackets

RoHS



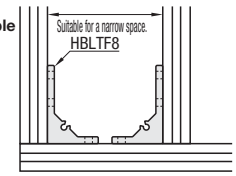
Type	Material	Surface Treatment
HBLTF8	EN AC-51400/ AlMgSi0.7	Anodize

HBLTF8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTF8	90	CBM8-20	3	HNTT8-8	3	2572		

Example



■**Features:** Numbers of screws are the same as HBLTS8. Extrusions can be connected more securely.

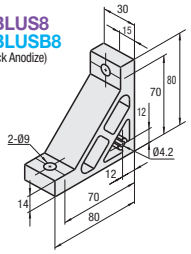
■Ultra Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLUS8	EN AC-51400/ AlMgSi0.7	Anodize
HBLUSB8		Black Anodize

HBLUS8
HBLUSB8
(Black Anodize)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUS8	151	CBM8-25	2	HNTT8-8	2	2058		
HBLUSB8* (Black Anodize)								

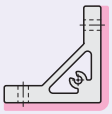
* For repairing black anodizing, refer to **P.748**

■**Features:** Numbers of screws are the same as HBLKTS8. Extrusions can be connected more securely.

■Ultra Thick Brackets (With Tabs)

RoHS

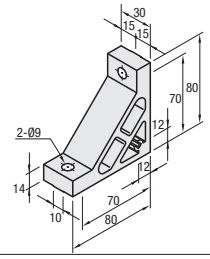




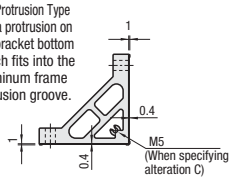
HBK__ series and HBLDSWT have tabs on the contact surfaces with extrusions.

Type	Material	Surface Treatment
HBKUS8	EN AC-51400/ AlMgSi0.7	Anodize
HBKUSB8		Black Anodize

HBKUS8
HBKUSB8
(Black Anodize)



The Protrusion Type has a protrusion on the bracket bottom which fits into the aluminum frame extrusion groove.



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKUS8	151	CBM8-25	2	HNTT8-8	2	2058		
HBKUSB8* (Black)								

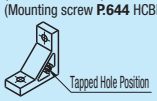
* For repairing black anodizing, refer to **P.748**

Order Example — Part Number: HBLUS8

Days to Ship: 6 Days / 2 Days

P.87

Alterations — Part Number: HBLUS8 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) — SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM) 	HBLTS8	0,30
			CHBLTS8	0,50
			HBKTS8	0,30
			HBLTH8	
			HBLTF8	
			HBLUS8	
			HBKUS8	

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTS8 is specified,	HBLTS8	1,12	1,12	1,38	1,94	1,38	1,52	1,80
			HBLTSB8	1,36	-	1,62	-	1,62	-	-
			CHBLTS8	1,12	1,20	1,38	2,02	1,38	1,60	1,80
			HBKTST8							
			HBKTS8							
			HBKTSB8							
			HBLTH8							
			HBLTF8	1,68	1,68	2,07	2,91	2,07	2,28	2,70
			HBLUS8	1,14	1,14	1,40	1,96	1,40	1,54	1,78
			HBLUSB8	1,38	-	1,64	-	1,64	-	-
			HBKUS8	1,14	1,14	1,40	1,96	1,40	1,54	1,78
			HBKUSB8	1,38	-	1,64	-	1,64	-	-

Code	Screws	Nuts
SET	CBM8-20	HNTT8-8
SST	SCB8-20	HNTTSN8-8
SEU	CBM8-20	HNTU8-8
SSU	SCB8-20	SHNTU8-8
SEP	CBM8-20	HNTP8-8
SSP	SCB8-20	SHNTP8-8
SEC	HCBST8-24	HNTT8-8

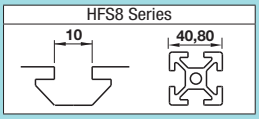
When specifying other than HBLTS8, check for the applicable screws and nuts.

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). **P.641**

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 1-slot-

-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-



CAD Data

Features: Extruded Brackets with twice as many screws. Extrusions can be connected more securely.

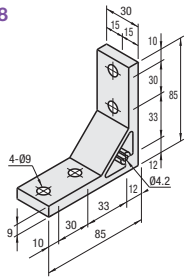
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTSW8	EN AC-51400/ AlMgSi0,7	Anodize

HBLTSW8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTSW8	113	CBM8-20	4	HNTT8-8	4	3087		

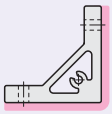
Features: Brackets with twice as many screws. Extrusions can be connected more securely.

Triangle Brackets

RoHS

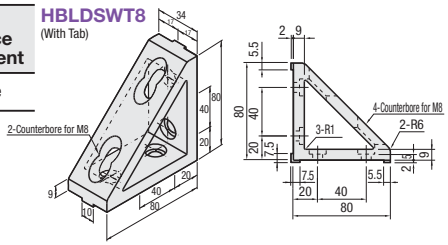


HBK_ _ series and HBLDSWT have tabs on the contact surfaces with extrusions.



Type	Material	Surface Treatment
HBLDSWT8	EN AC-51400/ AlMgSi0,7	Anodize

HBLDSWT8 (With Tab)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLDSWT8	195	CBM8-15	4	HNTT8-8	4	3087		

Features: Brackets to connect Extrusions 40 · 30 square.

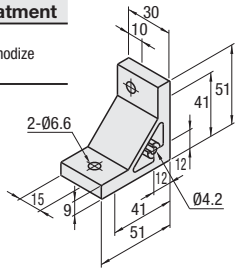
Assembly Brackets for Different Extrusion Sizes

RoHS

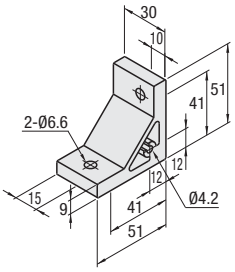


Type	Material	Surface Treatment
HBLTS8-6L HBLTS8-6R	EN AC-51400/ AlMgSi0,7	Anodize

HBLTS8-6L

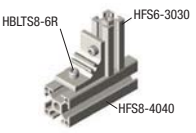


HBLTS8-6R



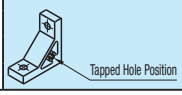
Part Number	Mass (g)	Applicable Screw · T Nut				€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.	1~99 pcs.	100~
HBLTS8-6L	66	CBM6-20	1	HNTT8-6	1		
		CBM6-15		HNTT6-6			
HBLTS8-6R		CBM6-20		HNTT8-6			
		CBM6-15		HNTT6-6			

EX



Order Example: Part Number HBLTSW8 — Days to Ship: 5 Days / 2 Days P.87

Alteration: Part Number HBLTSW8 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) - SET

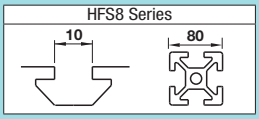
Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM) *Tapping direction: Tapping is applied on only one side which is narrowed by the eccentricity.  Tapped Hole Position	HBLTSW8	0,30
			HBLTS8-6L*	
			HBLTS8-6R*	
			HBLTD8	0,50
			CHBLTD8	
			HBLUD8	0,30
			HBLTDW8	
			HBLUDW8	

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws · Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTSW8 is specified, SET: CBM8-20 / HNTT8-8 SST: SCB8-20 / HNTTSN8-8 SEU: CBM8-20 / HNTU8-8 SSU: SCB8-20 / SHNTU8-8 SEP: CBM8-20 / HNTP8-8 SSP: SCB8-20 / SHNTP8-8 SEC: HCBST8-24 / HNTT8-8 When specifying other than HBLTSW8, check for the applicable screws and nuts.	HBLTSW8	2,24	2,40	2,76	4,04	2,76	3,20	3,60
			HBLDSWT8	2,30	2,40	2,82	4,04	2,82	3,20	-
			HBLTS8-6L	0,93	-	-	-	-	-	-
			HBLTS8-6R							

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black) **P.641**.
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 2-slots-

-Slot Type: HFS8 Series (Aluminum Frames 80 Square)-



CAD Data

Features: Brackets to connect Extrusions with 2-slots (HFS8-8080 etc.) with one bracket.

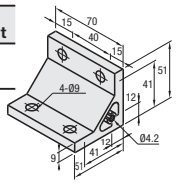
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTD8 HBLTDB8 CHBLTD8	EN AC-51400/ AlMgSi0,7	Anodize

HBLTD8
HBLTDB8
(Black Anodize)
CHBLTD8
(Clear Coating)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTD8	154	CBM8-20	4	HNTT8-8	4	3087		
HBLTDB8* (Black Anodize)								
CHBLTD8 (Clear Coating)								

* For repairing black anodizing, refer to **P.748**

Features: Numbers of screws are the same as HBLTD8. Extrusions can be connected more securely.

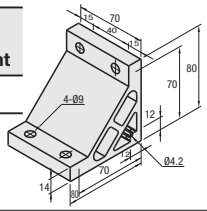
Ultra Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLUD8	EN AC-51400/ AlMgSi0,7	Anodize

HBLUD8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUD8	380	CBM8-25	4	HNTT8-8	4	3920		

Features: Brackets for 2-slots with twice as many screws. Extrusions can be connected more securely.

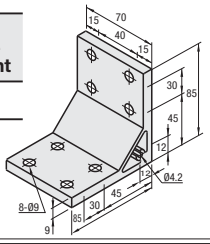
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTDW8	EN AC-51400/ AlMgSi0,7	Anodize

HBLTDW8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTDW8	267	CBM8-20	8	HNTT8-8	8	4410		

Features: Numbers of screws are the same as HBLTDW8. Extrusions can be connected more securely.

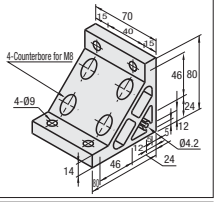
Ultra Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLUDW8	EN AC-51400/ AlMgSi0,7	Anodize

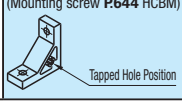
HBLUDW8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUDW8	332	CBM8-15 CBM8-25	4	HNTT8-8	8	5586		

Order Example — Part Number: HBLTD8 — Days to Ship: 5 Days / 2 Days — P.87

Alteration — Part Number: HBLTD8 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides, Depth 15mm) (Mounting screw **P.644** HCBM) 	HBLTD8	0,30
			CHBLTD8	0,50
			HBLTDW8 HBLUD8 HBLUDW8	0,30

Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Pre-assy. Insertion Spring Nuts) SEU (Pre-assy. Insertion Spring Nuts Stainless Steel) SSU (Post-Assy. Insertion Spring Nuts) SEP (Post-Assy. Insertion Spring Nuts Stainless Steel) SSP (Captured Washer Screws · Nuts) SEC	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)	HBLTD8	2,24	2,24	2,76	3,88	2,76	3,04	3,60
			HBLTDB8	2,72	-	3,24	-	3,24	-	-
			CHBLTD8	2,24	2,40	2,76	4,04	2,76	3,20	3,60
			HBLTDW8	4,60	4,88	5,64	8,16	5,64	6,48	7,32
			HBLUD8	2,28	2,28	2,80	3,92	2,80	3,08	3,56
			HBLUDW8	4,44	4,84	5,48	8,12	5,48	6,44	-

(Ex.) When HBLTD8 is specified,

Code	Screws	Nuts
SET	CBM8-20	HNTT8-8
SST	SCB8-20	HNTTSN8-8
SEU	CBM8-20	HNTU8-8
SSU	SCB8-20	SHNTU8-8
SEP	CBM8-20	HNTP8-8
SSP	SCB8-20	SHNTP8-8
SEC	HCBST8-24	HNTT8-8

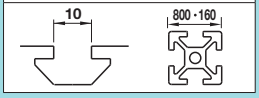
When specifying other than HBLTD8, check for the applicable screws and nuts.

-SET,-SEU,-When SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 3 or more slots-

-Slot Type: HFS8 Series (Aluminum Frames 120 · 160 Square)-

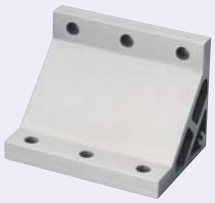
HFS8 Series



CAD Data

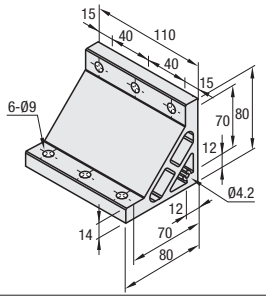
Features: Brackets to connect Extrusions with 3-slots (HFS8-40120 etc.) with one bracket.

RoHS



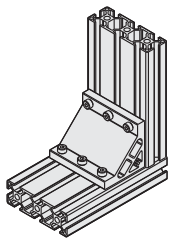
Type	M Material	S Surface Treatment
HBLUT8	EN AC-51 400/ AlMgSi0,7-T5	Anodize

HBLUT8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	€ Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUT8	564	CBM8-25	6	HNTT8-8	6	5292		

ex. Example



Features: Brackets to connect Extrusions with 4-slots (HFS8-40160 etc.) with one bracket.

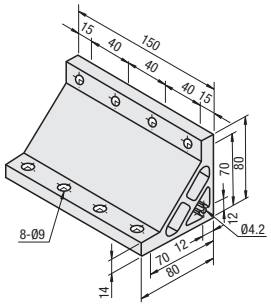
Brackets for Heavy Load

RoHS



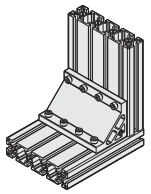
Type	M Material	S Surface Treatment
HBLUQ8	EN AC-51 400/ AlMgSi0,7-T5	Anodize

HBLUQ8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	€ Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUQ8	770	CBM8-25	8	HNTT8-8	8	7056		

ex. Example

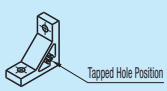


Order Example

Part Number
HBLUT8

Days to Ship 6 Days P.87

Alterations Part Number HBLUT8 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) SET

Alterations	Code	Spec.	Applicable Brackets	€ Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644** HCBM) 	HBLUT8 / HBLUQ8	0,30

Alterations	Code	Spec.	Applicable Brackets	€ Price Adder
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLUT8 is specified, Code: SET — Screws: CBM8-25 — Nuts: HNTT8-8; SST — SCB8-25 — HNTTSN8-8; SEU — CBM8-25 — HNTU8-8; SSU — SCB8-25 — SHNTU8-8; SEP — CBM8-25 — HNTP8-8; SSP — SCB8-25 — SHNTP8-8; SEC — HCBST8-29 — HNTT8-8. When specifying other than HBLUT8, check for the applicable screws and nuts.	HBLUT8	3,47 3,72 4,20 6,18 4,20 4,92 5,34
			HBLUQ8	4,56 4,96 5,60 8,24 5,60 6,56 7,12

(SET SST SEU SSU SEP SSP SEC)

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black) **P.641**.

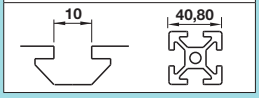
-SET,-SEU,-When SEP is specified, it is not RoHS compliant.

Brackets -Thin Brackets-

-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-

Price Reduction 10%

HFS8 Series



CAD Data

Features: Thin Extruded Brackets. Space saving design.

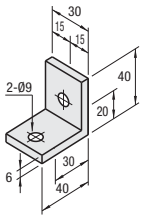
Thin Brackets

RoHS

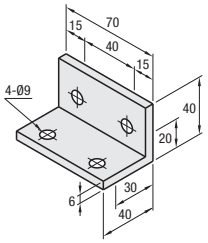


Type	Material	Surface Treatment
HBLS_8	EN AC-51 400/AlMgSi0,7-T5	Anodize
HBLSSB8		Black Anodize

HBLSS8
HBLSSB8
(Black Anodize)



HBLSD8



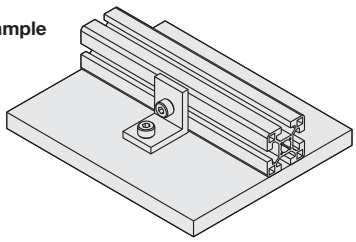
Part Number	Mass (g)	Applicable Anodize · T Nut				Allowable Load (N)	€ Unit Price	€ Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLSS8	34	CBM8-15	2	HNTT8-8	2	1666		
HBLSSB8* (Black Anodize)								
HBLSD8	80		4		4	2352		

* For repairing black anodizing, refer to **P.748**

Order Example

Part Number
HBLSS8

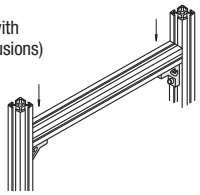
Example



Days to Ship 6 Days / 2 Days P.87

Allowable Load of Bracket

- Allowable load of one bracket is calculated with assumption that extrusion (between two extrusions) is on both ends supported with brackets.



Alterations

Part Number - (SET · SST · SEU · SSU · SEP · SSP · SEC)
HBLSS8 - SET

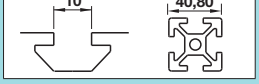
Alterations	Code	Spec.	Applicable Brackets	€ Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLSS8 is specified, SET: CBM8-15 / HNTT8-8 SST: SCB8-15 / HNTTSN8-8 SEU: CBM8-15 / HNTU8-8 SSU: SCB8-15 / SHNTU8-8 SEP: CBM8-15 / HNTP8-8 SSP: SCB8-15 / SHNTP8-8 When specifying other than HBLSS8, check for the applicable screws and nuts.	HBLSS8	1,08	1,08	1,34	1,90	1,34	1,48	1,74
			HBLSSB8	1,30	-	1,56	-	1,56	-	-
			HBLSD8	2,16	2,16	2,68	3,80	2,68	2,96	3,48

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black) **P.641**.
When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Brackets -Block Brackets · Brackets for Reinforcement-

-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-

HFS8 Series



CAD Data

Features: The brackets do not protrude from extrusion widths when used to cross connect extrusions. Can be used in smaller spaces compared to the Tabbed Reversal Brackets.

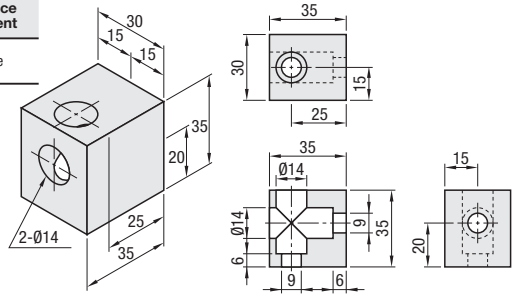
Block Brackets

RoHS



Type	M Material	S Surface Treatment
HBLBL8	EN AC-51 400/ AlMgSi0,7-T5	Anodize

HBLBL8

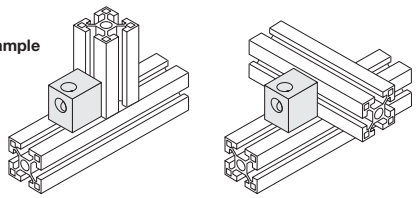


Part Number Type	Mass (g)	Applicable Screws Screw	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HBLBL8	79	CBM8-15	2	1666		

Order Example: Part Number HBLBL8

Days to Ship: 6 Days P.87

Example



Alterations

Part Number - (SET · SST · SEU · SSU · SEP · SSP)

HBLBL8 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)	HBLBL8	1,08	1,08	1,34	1,90	1,34	1,48

Code	Screws	Nuts
SET	CBM8-15	HNTT8-8
SST	SCB8-15	HNTTSN8-8
SEU	CBM8-15	HNTU8-8
SSU	SCB8-15	SHNTU8-8
SEP	CBM8-15	HNTP8-8
SSP	SCB8-15	SHNTP8-8

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Features: Reinforcement Brackets machined from extrusions. Usable on locations needing more strength after connecting with brackets.

Brackets for Reinforcement

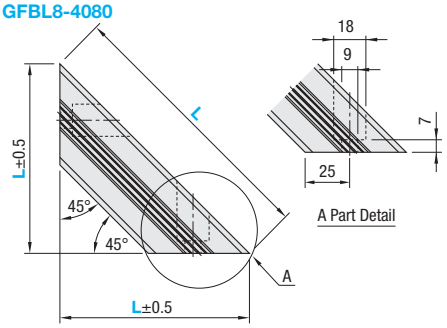
RoHS



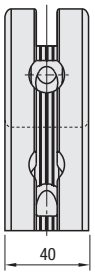
*For * part, fix with other brackets.
M Material: EN AW-6061/EN AW-AlMg1SiCu-T6 Equivalent
S Surface Treatment: Anodize
(No surface treatment on 45 ° cut ends and counterbores.)

Type	M Material	S Surface Treatment
GFBL8	EN AW-6061/EN AW-AlMg1SiCu-T6 Equivalent	Anodize

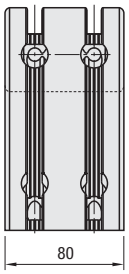
GFBL8-4040
GFBL8-4080



<Front View> GFBL8-4040



<Front View> GFBL8-4080



Use Captured Washer Screw (SCBS8-16) for connecting to extrusions.

Part Number Type	No.	L 1mm Increment	Applicable Screw · Nut Screw	Qty.	Nuts	Qty.	L100~300 € Unit Price 1~4 pcs.	L100~300 Volume Discount Rate 5~20	L301~500 € Unit Price 1~4 pcs.	L301~500 Volume Discount Rate 5~20
GFBL8	4040	100~500	SCBS8-16	2	HNTT8-8	2				
	4080			4		4				

Order Example: Part Number GFBL8-4040 - L 300

Days to Ship: 3 Days

Alterations

Part Number - L - (SET · SST · SEU · SSU · SEP · SSP)

GFBL8-4040 - 500 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-assy. Insertion Spring Nuts) SSU (Pre-assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price)	GFBL8-4040	2,38	2,20	2,64	3,02	2,64	2,60
			GFBL8-4080	3,08	2,72	3,34	3,54	3,34	3,12

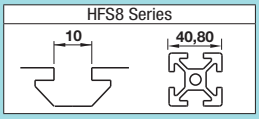
Code	Screws	Nuts
SET	SCBS8-16	HNTT8-8
SST		HNTTSN8-8
SEU		HNTU8-8
SSU		SHNTU8-8
SEP		HNTP8-8
SSP		SHNTP8-8

Screws of Brackets for Reinforcement are SCBS8-16. (Refer to P.178)

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Brackets • Thin Brackets-

-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-

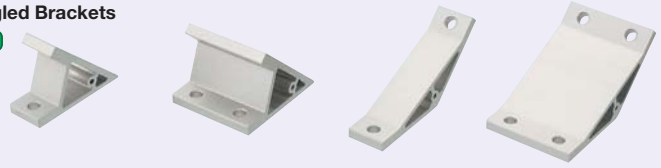


CAD Data

Features: Extruded Brackets to connect extrusions at angles.

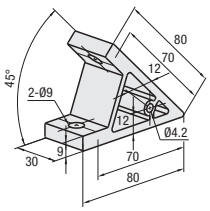
Angled Brackets

RoHS

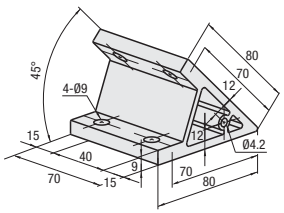


Type	Material	Surface Treatment
HBL45T_8 HBL135T_8	EN AC-51 400/ AlMgSi0,7-T5	Anodize

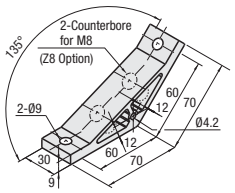
HBL45TS8



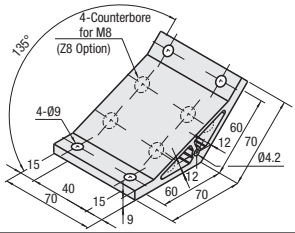
HBL45TD8



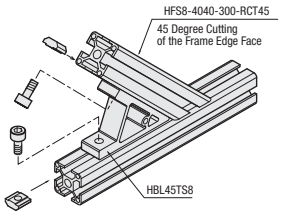
HBL135TS8



HBL135TD8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBL45TS8	88	CBM8-20	2	HNTT8-8	2	2058		
HBL45TD8	204		4		4	2940		
HBL135TS8	103		2		2	2058		
HBL135TD8	240		4		4	2940		



Order Example — Part Number: HBL45TS8

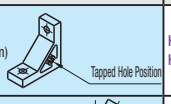
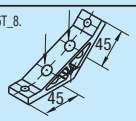
Days to Ship: 6 Days / 2 Days

P.87

Alterations — Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · Z8)

HBL45TS8 - SET

Z8 only — 8 Days (Available in stock except Z8.)

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds taps on a bracket for covermounting. (M5 on Both Sides, Depth 15mm) (Mounting screw P.644 HCBM) 	HBL45TS8 HBL135TS8	0,30
Machines 2 counterbored holes on 135 degree bracket	Z8	Adds two counterbored holes on HBL135T_8. (Applicable screw: M8)  8 8rd Day Shipping ⊗Combination with SET and SST is not available.	HBL135TS8	1,60
			HBL135TD8	3,20

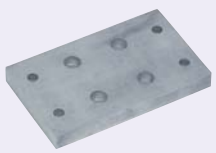
Alter-ations	Code	Spec.	Applicable Brackets	Price Adder					
				SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBL45TS8 is specified, CODE: SET (CBM8-15 / HNTT8-8), SST (SCB8-15 / HNTTSN8-8), SEU (CBM8-15 / HNTU8-8), SSU (SCB8-15 / SHNTU8-8), SEP (CBM8-15 / HNTP8-8), SSP (SCB8-15 / SHNTP8-8) ⓘWhen specifying other than HBL45TS8, check for the applicable screws and nuts.	HBL45TS8	0,88	0,98	1,14	1,84	1,14	1,38
			HBL45TD8	1,76	1,95	2,28	3,67	2,28	2,75
			HBL135TS8	0,88	0,98	1,14	1,84	1,14	1,38
			HBL135TD8	1,76	1,95	2,28	3,67	2,28	2,75

ⓘWhen -SET, -SEU or -SEP is specified, it is not RoHS compliant..

Features: Direct bolt-on brackets to use on tapped extrusions.

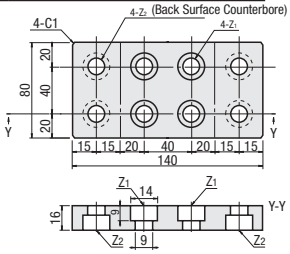
Plate Brackets

RoHS



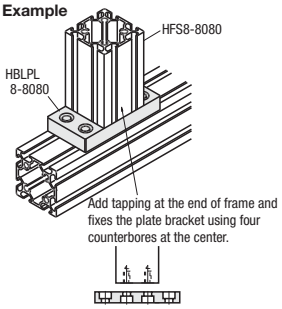
Type	Material	Surface Treatment
HBLPL8	1.0038/S235JR	Electroless Nickel Plating

HBLPL8



* Screws are not included.

Example



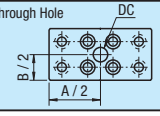
Part Number	Extrusions	Z1	Z2	Mass (g)	€ Unit Price	Volume Discount Rate
		Applicable Screw			1~9 pcs.	10~
HBLPL8	8080	M8	M8	1240		

Order Example — Part Number: HBLPL8 - Extrusions: 8080

Days to Ship: 8 Days

Alterations — Part Number: HBLPL8 - Extrusions: 8080 - (DC)

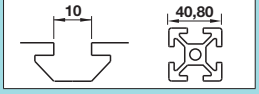
10 Days

Alteration	Code	Spec.	Price Adder
Through Hole 	DC	Add a through hole. DC=Hole Dia. 1 mm Increment ⓘ10≤DC≤20 Ordering Code DC12	6,00

Brackets -Corner Brackets-

-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-

HFS8 Series



Features: Brackets to connect end-tapped extrusions in an L-shape, including function as frame end caps.

RoHS

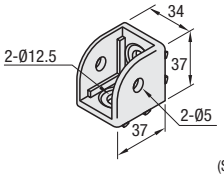


Type	Material	Surface Treatment
HBLCS8-B	(1) EN AC-46100/G-AlSi12Cu	-
	(2) Polyamide	-

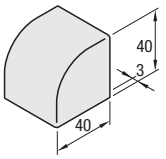
Corner Bracket Set((1)+(2))

HBLCS8-B

(1)



(2)Extrusion End Caps



(Socket Head Cap Screw 2 pcs. included)

Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLCS8-B	64	SCB-12-30 (included)	2	-	-	800		

Example

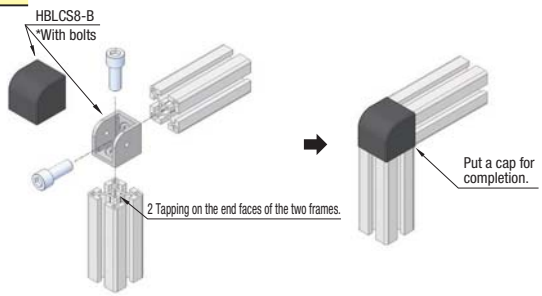
Order Example

Part Number

HBLCS8-B

Days to Ship

6 Days P.87



Features: Formed Aluminum Frames with a 140mm radius.

90-degreee Curved Aluminum Frames for Corner

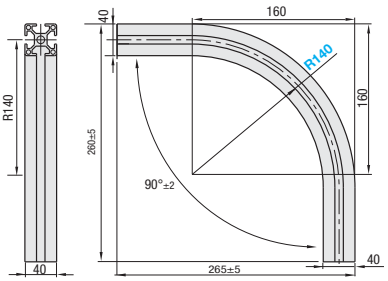
RoHS



※The slot shape may change during the bending process, resulting in narrow slot width.

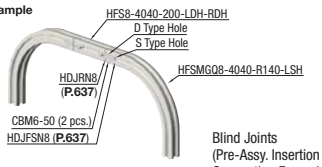
Type	Material	Surface Treatment
HFSMGQ8-4040	EN AC-51 400/ AlMgSi0,7-T5	Anodize

HFSMGQ8-4040



Part Number	R	Slot Width	Mass kg	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount Rate
					ℓx	ℓy	1~8 pcs.	9~
HFSMGQ8-4040	140	10	1.2	640	10.4x10⁴	10.4x10⁴		

Example



Order Example

Part Number - R

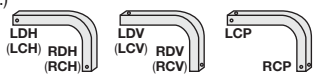
HFSMGQ8-4040 - R140

Days to Ship

6 Days P.87

Blind Joints
(Pre-Assy. Insertion Double Joint)
Connecting Example

(Ex.)

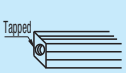
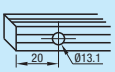
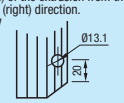
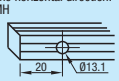
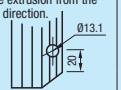
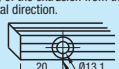
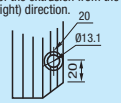
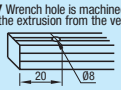
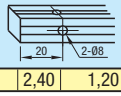


Alterations

Part Number - R - (LTP · RTP · TPW…etc.)

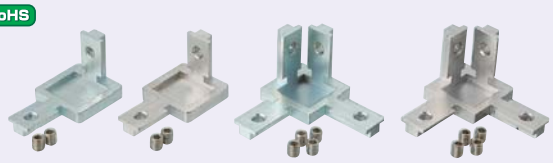
HFSMGQ8-4040 - R140 - LTP-RCV

8 Days

Alterations Code	Tap (P.647)			D Type Hole (P.654)				M Hole (P.656)				S Type Hole (P.655)				Wrench Hole (P.651)			
	LTP	RTP	TPW	LDH	LDV	RDH	RDV	LMH	LMV	RMH	RMV	LSH	LSV	RSH	RSV	LCH	LCV	LCP	RCH	RCV	RCP
Spec.	Tapping to the center hole Tap Shape M12 Depth 36 **LTP**: Tapping on the Left End Face **RTP**: Tapping on the Bottom End Face **TPW**: Tapping on the Both Ends Ex. LTP 			Adds D type hole in specified position. **LDH**, **RDH**: D hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LDH  **LDV**, **RDV**: D hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RDV 			Adds M type hole in specified position. **LMH**, **RMH**: M hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LMH  **LMV**, **RMV**: M hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RMV 			Adds S type hole in the specified position. **LSH**, **RSH**: S hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. LSH  **LSV**, **RSV**: S hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. RSV 			**LCH**, **RCH** Wrench hole is machined on the left (bottom) of the extrusion from the horizontal direction. Ex. RCH  **LCV**, **RCV** Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCV  **LCP**, **RCP**: Wrench hole is machined on the left (bottom) of the extrusion from the vertical (right) direction. Ex. LCP 			
※When the tapping and D · M S or wrench holes are specified in combination, tap depth is the distance to D · M · S or wrench holes.																					
Applicable Extrusions																					
HFSMGQ8-4040	2,70		5,40	1,20				1,20				3,90				1,20		2,40	1,20		2,40

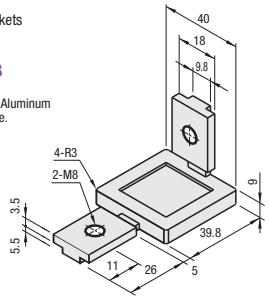
Features: Brackets for internal connection without alterations, including function as frame end caps.

RoHS

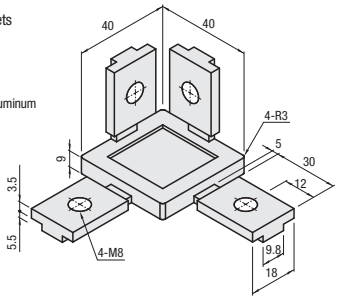


Type	M Material	S Surface Treatment
HBLBCA8	1.1191/C45E	Trivalent Chromate
SHBLBCA8	1.4308/G-X6CrNi18-9	-
HBLBCB8	1.1191/C45E	Trivalent Chromate
SHBLBCB8	1.4308/G-X6CrNi18-9	-

Corner Blind Brackets
(Two-Way Type)
HBLBCA8
SHBLBCA8
(Stainless Steel)
Not applicable to Aluminum Frames 80 square.



Corner Blind Brackets
(Three-Way Type)
HBLBCB8
SHBLBCB8
(Stainless Steel)
Not applicable to Aluminum Frames 80 square.



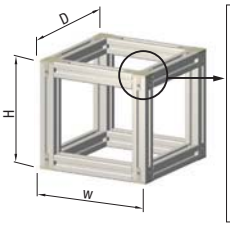
Part Number	Mass (g)	Included Screw		Allowable Load (N)	Unit Price	Volume Discount Rate
		Screw	Qty.		1~99 pcs.	100~
HBLBCA8	128	Set Screw M8 x 10	2	700		
SHBLBCA8 (Stainless Steel)						
HBLBCB8	180	Set Screw M8 x 10	4	1400		
SHBLBCB8 (Stainless Steel)						

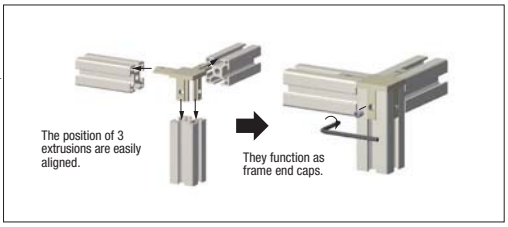
Order Example
Part Number
HBLBCA8

Days to Ship
8 Days
2 Days
P.87

Example of use: Corner Blind Brackets

Length of extrusion fitted as shown on the right (mm)
- Extrusion length L used for W
  L=W-(Extrusion Thickness x 2
- Extrusion length L used for D
  L=D-L=D-(Extrusion Thickness x2)X
- Extrusion length L used for H
  L=H-18
  (Thickness of corner blind brackets x Upper and Lower 2 pcs.)





Other Connecting Parts

Mounting Method	Name	Applicable Extrusions HFS5 (x 20)	HFS6 (x 30)	HFS8 (x 40)	HFS8 (40, 50, 60 sq.)	Price Low: ◎⇒○⇒Δ: High (*1)	Screw Fastening Locations (*2)	Extrusions Alteration	Materials	Example	How to Mount Listed Page
Blind Joints	Simple Joint	X		X	X	○	One	Provided	1.1191/C45E 1.7220/34CrMo4		P.633
	Center Joint	●			●	Δ					P.629
	Tapping Joint				X	◎			JIS SWCH-18A		P.627
	Screw Joint	X	●	●	●	○			1.7220/34CrMo4 1.0330/DC01		P.628
	Single Joint					○			1.0038/S235JR 1.44012/X5CrNiMo17-12-2 Equivalent 1.0330/DC01 1.4301/X5CrNi18-10		P.635
	Post-Assembly Insertion Double Joint	●				Δ			1.4308/G-X6CrNi18-9 1.4301/X5CrNi18-10 Equivalent		P.631
	Pre-Assembly Insertion Double Joint	X				Δ	Two		1.4401/X5CrNiMo17-12-2 Equivalent 1.4301/X5CrNi18-10		P.637
	Parallel Joint	Appli-cable	Appli-cable	Appli-cable	-	Δ	One		1.4308/G-X6CrNi18-9 1.7220/34CrMo4		P.639

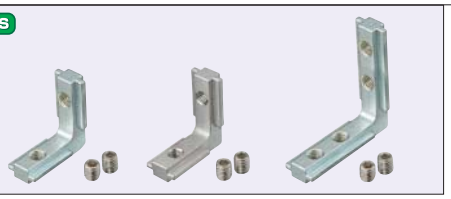
●: Available x: Not Available

*1 The price is a sum of bracket (blind joint) +bolt+pre-assembly insertion nut+alteration.
*2 The number of bolt tightening are compared on basis of each bracket (blind joint) under the connection of HFS6-3030 parts.

Brackets - Blind Brackets · Free Angle Brackets

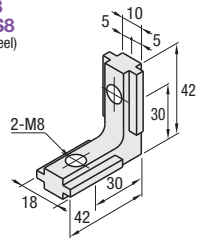
-Slot Type: HFS8 Series (Aluminum Frames 40 · 80 Square)-

Features: No need for alterations to hide brackets inside of the slot.

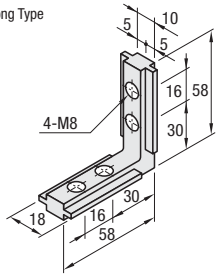


Type	Material	Surface Treatment
HBLBS8	1.1191/C45E	Trivalent Chromate
SHBLBS8	1.4308/G-XCrNi18-9	-
HBLBSL8	1.1191/C45E	Trivalent Chromate

Blind Brackets
HBLBS8
SHBLBS8
(Stainless Steel)



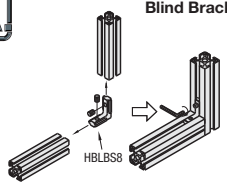
Blind Brackets · Long Type
HBLBSL8



Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.		1~99 pcs.	100~
HBLBS8	70	Set Screw M8 x 10	2	1274		
SHBLBS8 (Stainless Steel)						
HBLBSL8	87		4	1554		

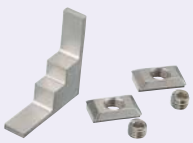
Example

How to Use Blind Brackets



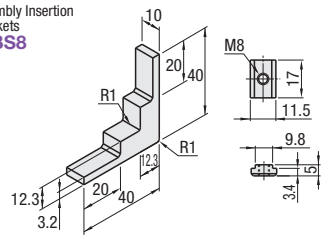
Features: Blind Brackets Post Assy. Insertion Type.

Post-Assembly Insertion Blind Brackets



Type	Components	Material
HABLBS8	Post-Assembly Insertion BB Body	1.4308/G-XCrNi18-9
	Post-Assembly Insertion BB Nut	1.4301/X5CrNi18-10 Sintered Alloy
	Set Screw	1.4301/X5CrNi18-10

Post-Assembly Insertion Blind Brackets
HABLBS8



Part Number / Type	Mass (g)	Accessory	Qty.	Allowable Load (N)	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HABLBS8	47	Nut · Set Screw M8x6	2	700		

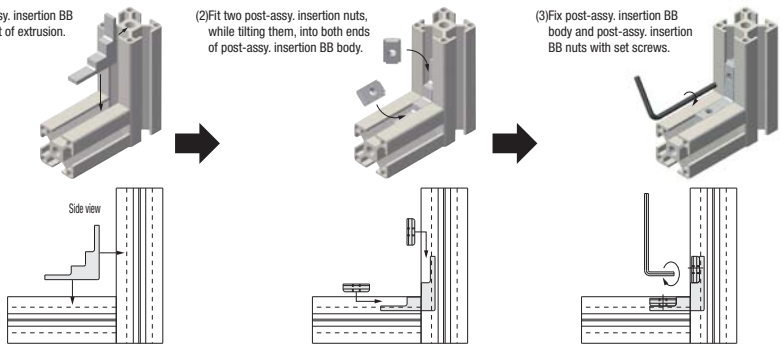
Example

How to Use Post-Assembly Insertion Blind Brackets

(1)Fit the post-assy. insertion BB body in the slot of extrusion.

(2)Fit two post-assy. insertion nuts, while tilting them, into both ends of post-assy. insertion BB body.

(3)Fix post-assy. insertion BB body and post-assy. insertion BB nuts with set screws.

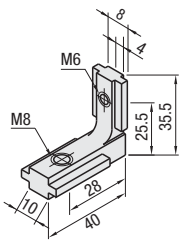


Features: Blind Brackets to connect Extrusions 40 / 30 square.



Type	Material	Surface Treatment
HBLBS8-6	1.1191/C45E	Trivalent Chromate

Blind Brackets for 40 and 30 square
HBLBS8-6



Part Number	Mass (g)	Connectable Extrusion Series	Included Set Screw	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HBLBS8-6	50	HFS8 and HFS6 HFS8-45 and HFS6	M6x8 1 pc. M8x10 1pc.		

Order Example

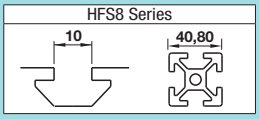
Part Number
HBLBS8

Days to Ship

6 Days

2 Days

P.87



CAD Data

Features: Extrusions can be connected at any arbitrary angles.

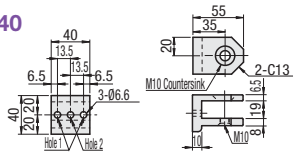
Free Angle Brackets

RoHS

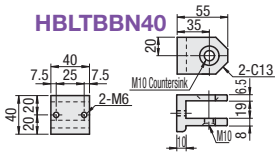


Type	Material	Surface Treatment
HBLTBA40 HBLTBBN40 HBLTBC40 HBLTBD40	EN AC-51 400/ AlMgSi0,7-T5	Anodize
Included Screws	1.7220/34CrMo4	Trivalent Chromate

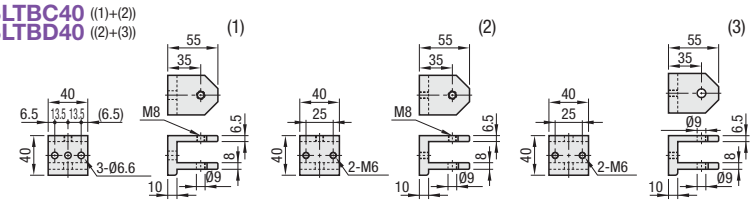
HBLTBA40



HBLTBBN40



HBLTBC40 ((1)+(2))
HBLTBD40 ((2)+(3))



Part Number Type	No.	Applicable Extrusion	Mass (g)	A Accessory	Qty.	Unit Price 1~14 pcs.	Volume Discount Rate 15~
HBLTBA	40	40 square (HFS8)	97	M10x16	1		
HBLTBBN			98				
HBLTBC			267	CLDM8-40-M	1		
HBLTBD			269				

Order Example — Part Number: HBLTBA40

Days to Ship: 6 Days P.87 / 2 Days

Example

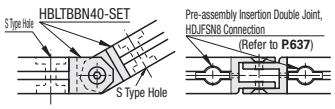
Alterations — Part Number - (SET · SET1 · SET2 · SET3 · SET4 · SET5)
HBLTBA40 - SET2
HBLTBBN40 - SET

Alterations	Code	How to Use	Part Number Type	No.	A Accessory Screw	Qty.	Nuts · Pre-Assy. Insertion Double Joints	Qty.	Price Adder
Applicable Screws and Nuts come as a set.	SET		HBLTBBN	40	CBM6-35	2	HDJFSN8	1	1,80
	SET1	Use the hole 1.	HBLTBA		CBM6-20	2	HNTT8-6	2	1,00
	SET2	Use the hole 2.			CBM6-20	1	HNTT8-6	1	0,50
	SET3	Use the hole 1.	HBLTBC		CBM6-35	2	HDJFSN8	1	2,80
					CBM6-20	2	HNTT8-6	2	
	SET4	Use the hole 2.	HBLTBC		CBM6-35	2	HDJFSN8	1	2,30
					CBM6-20	1	HNTT8-6	1	
	SET5		HBLTBD		CBM6-35	4	HDJFSN8	2	3,60

When connecting with Pre-Assy. Insertion Double Joints, S type hole machining is required on extrusions. (Refer to P.598)
When -SET_ is specified, it is not RoHS compliant.

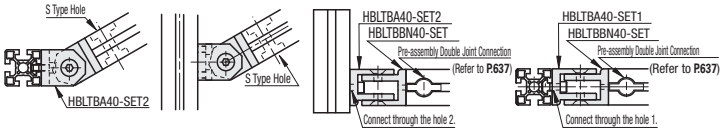
(1) Connection of Two End Sections

Two pieces of HBLTBBN are used to connect two end sections using Pre-Assy. Insertion Double Joints. (P.637)



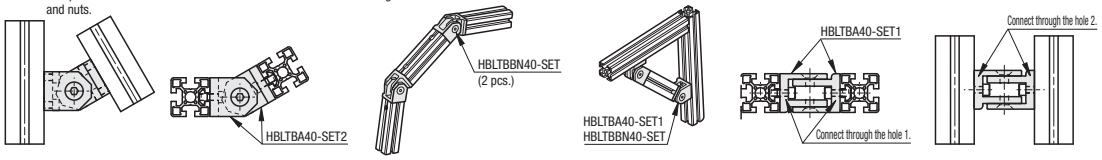
(2) Connection of Two Side Faces

One piece of HBLTBA and one piece of HBLTBBN are used to connect HBLTBA with the frame side face using a bolt and a nut, and to connect HBLTBBN with the frame end section using the pre-assembly double joint.



(3)Connection of Two Side Faces

Two pieces of HBLTBA are used to connect them with frame side using bolts and nuts.



Features: Sheet Metal Brackets to fix at arbitrary positions.

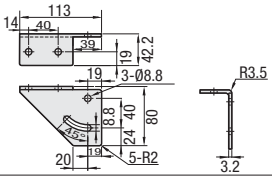
Free Angle Sheet Metal Brackets

RoHS

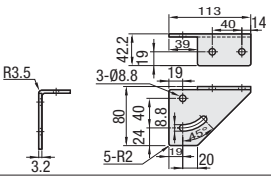


Type	Material	Surface Treatment
HBLPBL8 HBLPBR8	1.0330/DC01	Trivalent Chromate

HBLPBL



HBLPBR



Part Number Type	No.	Applicable Extrusion	Applicable Screw · Nut Hexagon Socket Head Cap Screws with Captured Washers	Qty.	Nuts	Qty.	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HBLPBL HBLPBR	8	40 square (HFS8)	CBST8-15	4	HNTT8-6	4		

Part Number: HBLPBL8

Days to Ship: 6 Days P.87 / 2 Days

Part Number - (SET · SET1): HBLPBL8 - SET

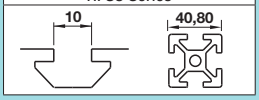
Example



Alterations	Code	Spec.	Applicable Brackets	Price Adder
Applicable Screws and Nuts come as a set.	SET	Supplies a set of applicable bolts and nuts for fixing the bracket to a extrusion.	HBLPBL8 HBLPBR8	3,80
Set with applicable screws, nuts and clamp levers	SET1	Applicable Bolts 3 pcs. Clamp Lever (LNP) 1 Pc. Flat Washer (PWF) 1 Pc. Applicable Nuts 4 Pcs. Set with the above items.	HBLPBL8 HBLPBR8	8,20

Sheet Metal Plates -HFS8 Series-

HFS8 Series



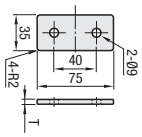
Features: Can be used for reinforcement of aluminum extrusions.



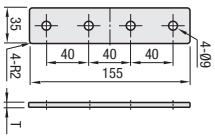
Type	Material	Surface Treatment
HPTSS HPTSSL HPTSD	1.0320/St.22	Carbon Steel Bright Chromate Plating
SHPTSS SHPTSSL SHPTSD	1.4301/ X5CrNi18-10	-

RoHS

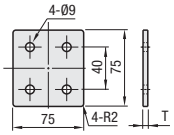
HPTSS8 SHPTSS8



HPTSSL8 SHPTSSL8



HPTSD8 SHPTSD8



Part Number	Mass (g)	T	Applicable Screw · Nut				Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTSS8	61	3.2	M8-15	2	M8	2		
SHPTSS8		3						
HPTSSL8	122	3.2		4		4		
SHPTSSL8		3						
HPTSD8	131	3.2						
SHPTSD8		3						

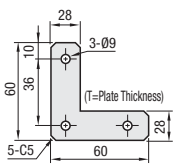


Type	Material	Surface Treatment
HPTLN	1.0320/St.22	Trivalent Chromate
HPTLS HPTLD	1.0320/St.22	Carbon Steel Bright Chromate Plating
SHPTLN	1.4301/ X5CrNi18-10	-
SHPTLS		

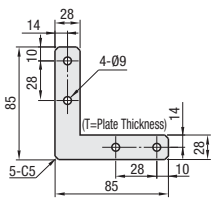
Not RoHS compliant

RoHS

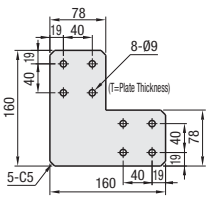
HPTLN8 (Trivalent Chromate) SHPTLN8



HPTLS8 SHPTLS8



HPTLD8



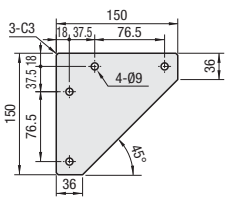
Part Number	Mass (g)	T	Applicable Screw · Nut				Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTLN8	50	3.2	M8-15	3	M8	3		
SHPTLN8		3						
HPTLS8	89	3.2		4		4		
SHPTLS8		3						
HPTLD8	445	3.2		8		8		

RoHS

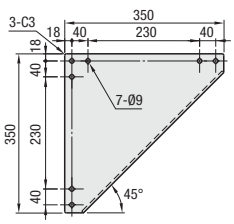


Type	Material	Surface Treatment
HPTCUL HPTUL HPTWUL	1.0320/St.22	Trivalent Chromate
SHPTCUL	1.4301/ X5CrNi18-10	-

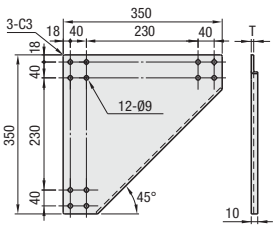
HPTCUL8 (Trivalent Chromate) SHPTCUL8



HPTUL8 (Trivalent Chromate)



HPTWUL8 (Trivalent Chromate)



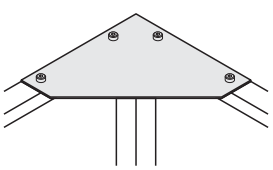
Part Number	Mass (g)	T	Applicable Screw · Nut				Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTCUL8	360	3.2	M8-15	4	M8	4		
SHPTCUL8		3						
HPTUL8	1760	3.2		7		7		
HPTWUL8	1758			12		12		

Order Example

Part Number
HPTSS8

Days to Ship 6 Days P.87

Example



Alterations

Part Number - (SET)
HPTSS8 - SET

When -SET is specified, it is not RoHS compliant.

Alteration	Code	Spec.		Part Number	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.		HPTSS8	1,20
				SHPTSS8	1,35
				HPTSSL8	2,40
				SHPTSSL8	2,70
				HPTSD8	2,40
				SHPTSD8	2,70
		Materials	Set	HPTLN8	1,80
		1.0320/ St.22	Screws: CBM Nuts: HNTT	SHPTLN8	2,00
				HPTLS8	2,40
				SHPTLS8	2,70
				HPTLD8	4,80
		1.4301/ X5CrNi 18-10	Screws: SCB Nuts: HNTTSN	HPTCUL8	2,40
				SHPTCUL8	2,70
				HPTUL8	4,20
				HPTWUL8	5,25

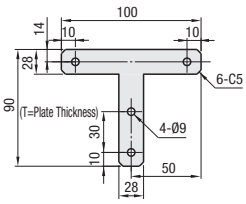
CAD Data



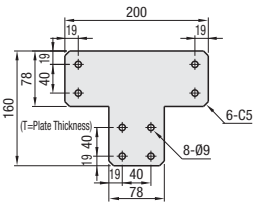
Type	Material	Surface Treatment
HPTTS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTTD		
HPTPS		
SHPTTS	1.4301/ X5CrNi18-10	-

Not RoHS compliant RoHS

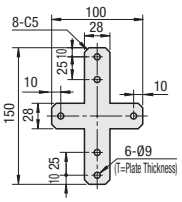
HPTTS8 SHPTTS8



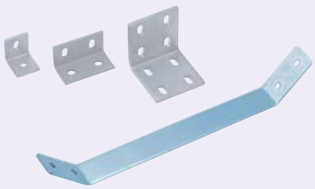
HPTTD8



HPTPS8



Part Number	Mass (g)	T	Applicable Screw · Nut				Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTTS8	103	3.2	M8-15	4	M8	4		
SHPTTS8		3						
HPTTD8	514	3.2		8		8		
HPTPS8	135			6		6		

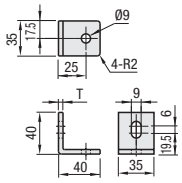


Type	Material	Surface Treatment
HPTBS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTBD		
HPTBDW		
HPTGS		
SHPTBS	1.4301/ X5CrNi18-10	-
SHPTBD		

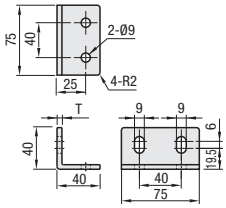
RoHS

Not RoHS compliant

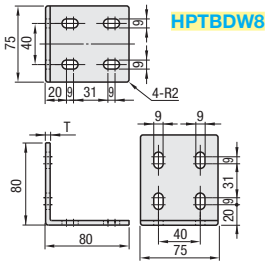
HPTBS8 SHPTBS8



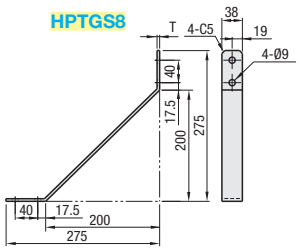
HPTBD8 SHPTBD8



HPTBDW8



HPTGS8

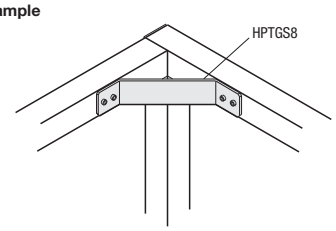


Part Number	Mass (g)	T	Applicable Screw · Nut				Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTBS8	83	4.5	M8-15	2	M8	2		
SHPTBS8		4						
HPTBD8	179	4.5		4		4		
SHPTBD8		4						
HPTBDW8	461	6		8		8		
HPTGS8	560	4.5		4		4		

Order Example | Part Number | HPTBS8

Days to Ship | 6 Days | P.87

Example



Alterations | Part Number | - | (SET) | HPTBS8 | - | SET

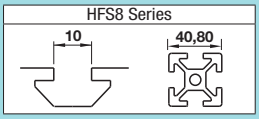
When -SET is specified, it is not RoHS compliant.

Alteration	Code	Spec.		Part Number	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.		HPTTS8	2,40
				SHPTTS8	2,70
				HPTTD8	4,80
				HPTPS8	2,40
		Materials	Set	HPTBS8	1,10
		1.0320/ St.22	Screws: CBM Nuts: HNTT	SHPTBS8	1,35
				HPTBD8	2,40
		1.4301/ X5CrNi 18-10	Screws: SCB Nuts: HNTTSN	SHPTBD8	2,70
				HPTBDW8	4,80
				HPTGS8	2,40

Pre-Assy. Insertion Nuts · Stoppers for Aluminum Frames - Standard

-For HFS8 Series Aluminum Frames 40 · 80 Square-

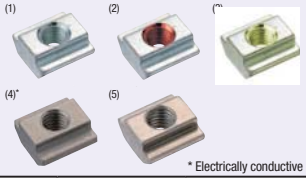
HFS8 Series



CAD Data

Tightening Torque P.676

Pre-Assembly Insertion Nuts RoHS

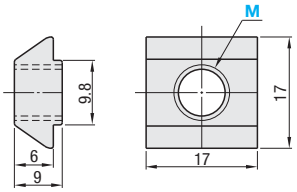


* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTT8	1.0301/C10	Trivalent Chromate
(2)HNTTV8		
(3)HNTTZ8		
(4)HNTTSN8*	1.4401 Equivalent (Sintering)	-
(5)HNTTSS8	1.4305	

HNTT8 (1.0301 Equivalent)
HNTTV8 (Thread Locking Adhesive · 1.0301 Equivalent)
HNTTZ8 (Thread Locking Resin Coating · 1.0301 Equivalent)
HNTTSN8 (1.4401 Equivalent, Sintering)
HNTTSS8 (1.4305)

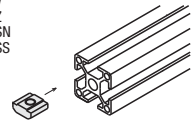
Reference Tightening Torque (N · m)	
M	1.0301 Equivalent · 1.4401 Equivalent (Sintering) · 1.4305
8	23.5



Example

-Pre-Assembly Insertion Nuts
Pre-insert the nut into the aluminum extrusion.

HNTU
HNTUV
HNTUZ
SHNTU
HNTT
HNTTV
HNTTZ
HNTTSN
HNTTSS
HNTM



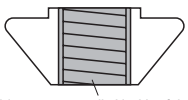
Part Number	M	€Unit Price 1~499 pcs.	Volume Discount Rate 500~749	750~999	1000~
HNTT8 (1.0301 Equivalent)	4 5 6 8				
HNTTV8 (Thread Locking ·1.0301 Equivalent)	8				
HNTTZ8 (Thread Locking ·1.0301 Equivalent)					
HNTTSN8 (1.4401 Equivalent, Sintering)	4 5 6 8				
HNTTSS8 (1.4305)	8				

Order Example: Part Number HNTT8 - M 8

Days to Ship: 6 Days P.87 / 2 Days

Bulk-packages are cost effective for in-house stock and large qty. uses. (P.508)

Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.
Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.
Resin Coating ---Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

Effect of Thread Locker (Reference) Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

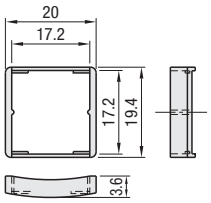
	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	17.9N • m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	25.6N • m	Test Conditions: Measured value (HNTTV8-8) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 23.5N • m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	21.8N • m	Thread locking effect decreases after repeated use. 5th loosening torque: 20.3N • m Measurement at HNTTZ8-8

Pre-Assembly Insertion Stoppers RoHS

HNST8



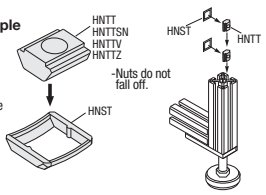
M Material: Polyamide



Order Example: Part Number HNST8

Days to Ship: 2 Days P.87

Example

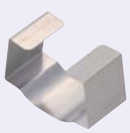


- Hold pre-assembly insertion nuts temporarily in the extrusion.
-Nuts do not fall off.

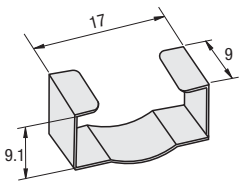
Part Number	Applicable Pre-Assembly Insertion Nuts	Color	€Unit Price 1~499 pcs.	Volume Discount Rate 500~999	1000~
HNST8	HNTT8 HNTTV8 HNTTZ8 HNTTSN8 HNTTSS8	Black			

Pre-Assembly Insertion Metal Stoppers RoHS

SHNST8



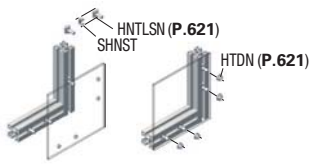
M Material: 1.4319/X3CrNiN17-8



Order Example: Part Number SHNST8

Days to Ship: 2 Days P.87

Example



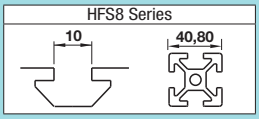
*Can also be used with Pre-Assembly Insertion Bolts.

Part Number	Applicable Pre-Assembly Insertion Nuts	€Unit Price 1~499 pcs.	Volume Discount Rate 500~999	1000~
SHNST8	HNTT8 HNTTV8 HNTTZ8 HNTTSN8 HNTTSS8			

NEW

Pre-Assembly Insertion Nuts for Aluminum Frames

-For HFS8 Series Aluminum Frames 40 · 80 Square-



CAD Data

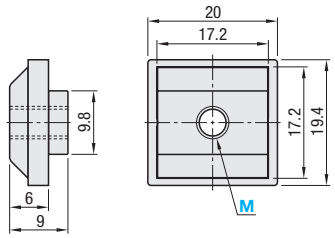
■Stopper Integrated Nuts

RoHS



M Material: Body: 1.0301/C10 Equivalent Stopper: Polyamide
S Surface Treatment: Trivalent Chromate Plating

HNTE8



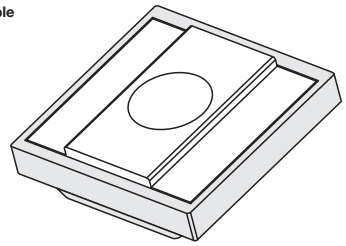
Reference Tightening Torque (N · m)	
M	1.0301 Equivalent
8	23.5

Part Number	M	€Unit Price	Volume Discount Rate		
		1~499 pcs.	500~749	750~999	1000~
HNTE8	4 5 6 8				

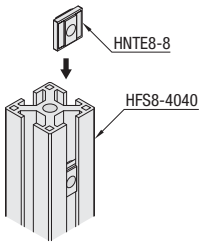
Order Example: Part Number HNTE8 - M 8

Days to Ship: 6 Days P.87

Example



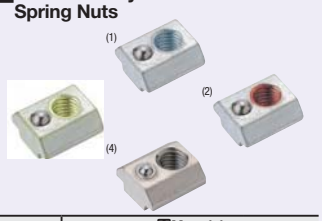
Integrated Pre-Assembly Insertion Nuts and Stoppers.



The nuts do not slip off even inserted into the vertically-placed extrusions.

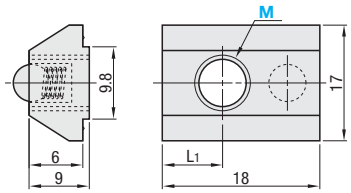
■Pre-Assembly Insertion Spring Nuts

RoHS



Type	M Material			S Surface Treatment
	Body	Ball	Springs	
(1)HNTU8 (2)HNTUV8 (3)HNTUZ8	1.0301 Equivalent	1.4301	JIS SWP-A	Trivalent Chromate
(4)SHNTU8	1.4301	1.4301	1.4301	-

HNTU8 (1.0301 Equivalent)
HNTUV8 (Thread Locking Adhesive · 1.0301 Equivalent)
HNTUZ8 (Thread Locking Resin Coating · 1.0301 Equivalent)
SHNTU8 (1.4301 Equivalent)



Reference Tightening Torque (N · m)	
M	1.0301 Equivalent / 1.4301 Equivalent (Sintering)
8	23.5

Part Number	M	L1	€Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTU8 (1.0301 Equivalent)	4 5 6 8	6				
HNTUV8 (Thread Locking ·1.0301 Equivalent)	8					
HNTUZ8 (Thread Locking·1.0301 Equivalent)						
SHNTU8 (1.4301 Equivalent)	4 5 6 8	5.5				

Order Example: Part Number HNTU8 - M 8

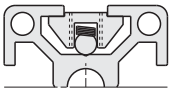
Days to Ship: 6 Days P.87 / 2 Days

Bulk-packages are cost effective for in-house stock and large qty. uses. (P.508)

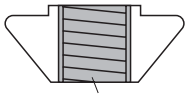
Example

-Does not fall even if a extrusion is placed vertically.

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.



■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.

Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening.
Note that it requires a hardening time (72 hours at room temperature 25°C).
The adhesive property is lost once loosened.

Resin Coating ---Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

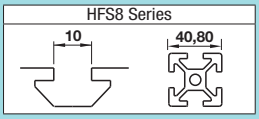
■Effect of Thread Locker (Reference) Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	17.9N • m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	25.6N • m	Test Conditions: Measured value (HNTTV8-8) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 23.5N • m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	21.8N • m	Thread locking effect decreases after repeated use. 5th loosening torque: 20.3N • m Measurement at HNTTZ8-8

Pre-Assembly Insertion Nuts · Stoppers for Aluminum Frames Others

-For HFS8 Series Aluminum Frames 40 · 80 Square-

HFS8 Series



CAD Data

■ Pre-Assembly Insertion Lock Nuts

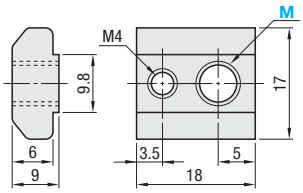
RoHS



M Material: 1.0301/C10 Equivalent
S Surface Treatment: Trivalent Chromate

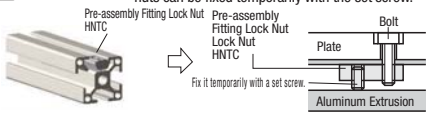
HNTC8

Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent
8	23.5



Example -Pre-Assembly Insertion Lock Nuts

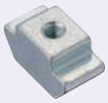
The position of post-assembly insertion lock nuts can be fixed temporarily with the set screw.



Part Number	M	A Accessory	€ Unit Price 1~499 pcs.	€ Volume Discount Rate 500~749	750~999	1000~
HNTC8	8	M4 Set screw 1 pc.				

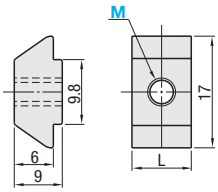
■ Pre-Assembly Insertion Short Nuts

RoHS



M Material: 1.0301/C10 Equivalent
S Surface Treatment: Trivalent Chromate

HNTJ8

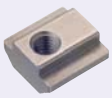


-Overall length is shorter than Pre-Assembly Insertion Nuts HNTT. Suitable for installing sensors or other components closely together.
-Stopper is not included.

Part Number	M	L	€ Unit Price 1~499 pcs.	€ Volume Discount Rate 500~749	750~999	1000~
HNTJ8	3 4	8				
	8	12				

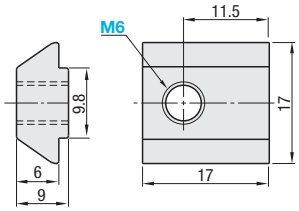
■ Pre-Assy. Insertion Eccentric Nuts

RoHS



* Electrically conductive
M Material: 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)

HNTHSN8

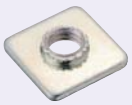


-The pre-assy. insertion offset nut, used in combination with a post-assy. insertion double joint, can be fixed in such a way that the nut, even if connected at the corner of the extrusion, does not protrude from the extrusion (frame).

Part Number	€ Unit Price 1~99 pcs.	€ Volume Discount Rate 100~
HNTHSN8		

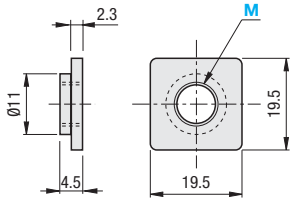
■ Pre-Assembly Insertion Square Nuts

RoHS



M Material: 1.0330/DC01
S Surface Treatment: Trivalent Chromate

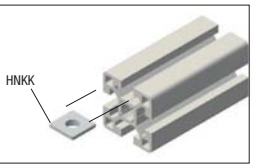
HNKK8



100 pcs. per package Insert it into the extrusion upside down.

Example

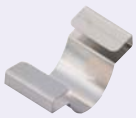
- Pre-Assembly Insertion Nuts HNKK



Part Number	M	€ Unit Price 1~9 package	€ Volume Discount Rate 10~19	20~29
HNKK8	4 5 6 8			

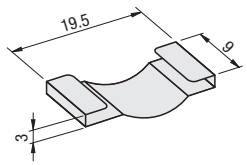
■ Metal Stoppers for Pre-Assembly Insertion Square Nuts

RoHS



M Material: 1.0330/DC01

HNKKST8



100 pcs. per package

Example



Part Number	Applicable Pre-Assembly Insertion Nuts	€ Unit Price 1~9 package	€ Volume Discount Rate 10~19	20~29
HNKKST8	HNKK8			

Order Example

Part Number	-	M
HNTC8	-	8
HNTJ8	-	8
HNTHSN8		
HNKK8	-	8
HNKKST8		

- Applicable Extrusions and Brackets
The number of a Part Number corresponds to each frame or bracket of the same number.

(Ex.)
Pre-Assy. Insertion Nut
Pre-Assembly Insertion Stoppers
Extrusions
Brackets

Part Number
HNTT8 - _
HNST8
HFS8 - _ _ _ _
HBLFSN8

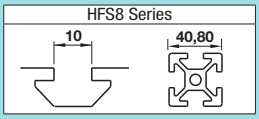
Days to Ship
6 Days
2 Days
P87

Add. Spec.

Post-Assy. Insertion Nuts · Stoppers for Aluminum Frames Standard

-For HFS8 Series Aluminum Frames 40 · 80 Square-

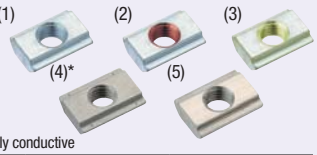
HFS8 Series



CAD Data

■ Post-Assembly Insertion Stopper Nuts

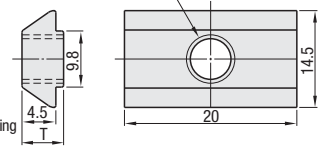
RoHS



* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTA8	1.0301/C10 Equivalent	Trivalent Chromate
(2)HNTAV8		
(3)HNTAZ8		
(4)HNTASN8*	1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)	-
(5)HNTASS8	1.4305/X10CrNiS18-9	-

HNTA8 (1.0301/C10 Equivalent)
HNTAV8 (Thread Locking Adhesive · 1.0301/C10 Equivalent)
HNTAZ8 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTASN8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)
HNTASS8 (1.4305/X10CrNiS18-9)



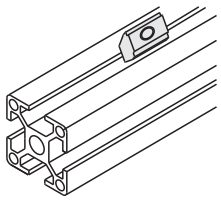
Details of Thread Locking Type P.585

Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent / 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering) / 1.4305/X10CrNiS18-9
8	23.5

Example

- Post-Assy. Insertion Stopper Nuts

HNTA
HNTAV
HNTAZ
HNTASN
HNTASS



Part Number / Type	M	T	€ Unit Price	€ Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTA8 (1.0301/C10 Equivalent)	4 5 6 8	6.5				
HNTAV8 (Thread Locking · 1.0301/C10 Equivalent)	8					
HNTAZ8 (Thread Locking · 1.0301/C10 Equivalent)						
HNTASN8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)	4 5 6 8	6.0				
HNTASS8 (1.4305/X10CrNiS18-9)	8	6.5				

Bulk-packages are cost effective for in-house stock and large qty. uses. (P.508)

Order Example

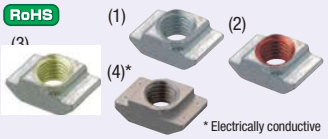
Part Number	-	M
HNTA8	-	8

Days to Ship

6 Days P.87
2 Days

■ Post-Assembly Insertion Nuts

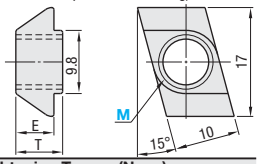
RoHS



* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTF8	1.0301/C10 Equivalent	Trivalent Chromate
(2)HNTFV8		
(3)HNTFZ8		
(4)HNTFSN8*	1.4401/ X5CrNiMo17-12-2 Equivalent (Sintering)	-

HNTF8 (1.0301/C10 Equivalent)
HNTFV8 (Thread Locking Adhesive · 1.0301/C10 Equivalent)
HNTFZ8 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTFSN8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)



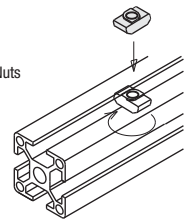
Details of Thread Locking Type P.585

Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent / 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)
8	23.5

Example

- Post-Assy. Insertion Nuts

HNTF
HNTFV
HNTFZ
HNTFSN



Order Example

Part Number	-	M
HNTF8	-	8

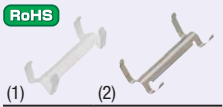
Days to Ship

6 Days P.87
2 Days

Part Number / Type	M	E	T	€ Unit Price	€ Volume Discount Rate		
				1~499 pcs.	500~749	750~999	1000~
HNTF8 (1.0301/C10 Equivalent)	4 5 6 8	6.0	9.0				
HNTFV8 (Thread Locking · 1.0301/C10 Equivalent)	8						
HNTFZ8 (Thread Locking · 1.0301/C10 Equivalent)							
HNTFSN8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)	4 5 6 8	6.4	8.9				

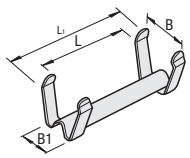
■ Post-Assembly Insertion Stoppers

RoHS



Type	M Material
(1) HNAST8	Polypropylene
(2) HNBST8	1.4319/X3CrNiN17-8

HNAST8 (Polypropylene)
HNBST8 (1.4319/X3CrNiN17-8)



Part Number / Type	Applicable Stopper Nuts	Color	L	B	L1	B1	€ Unit Price	€ Volume Discount Rate	
							1~499 pcs.	500~999	1000~
HNAST8	HNTA8 HNTAV8 HNTAZ8 HNTASN8 HNTASS8	White	21	11.1	26	9.8			
HNBST8		-	23	12.5	28	8			

■ Post-Assembly Insertion Nut · Stopper Set

RoHS



HNTAT8 (1.0301/C10 Equivalent Set)
HNTATSN8 (1.4401/X5CrNiMo17-12-2 Equivalent Set)

Type	(B) Stopper Nuts	(A) Stoppers
HNTAT8	HNTA8	HNAST8
HNTATSN8*	HNTASN8	

* Electrically conductive

Part Number / Type	M	€ Unit Price	€ Volume Discount Rate		
		1~499 pcs.	500~749	750~999	1000~
HNTAT8	4 5 6 8				
HNTATSN8	4 5 6 8				

■ Post-Assembly Insertion Nut · Metal Stopper Set

RoHS



HNTBT8(1.0301/C10 Set)
HNTBTSN8(1.4401/X5CrNiMo17-12-2 Set)

Type	(B) Stopper Nuts	(A) Stoppers
HNTBT8	HNTA8	HNBST8
HNTBTSN8*	HNTASN8	

* Electrically conductive

Part Number / Type	M	€ Unit Price	€ Volume Discount Rate		
		1~499 pcs.	500~749	750~999	1000~
HNTBT8	4 5 6 8				
HNTBTSN8	4 5 6 8				

Order Example

Part Number	-	M
HNTA8 HNAST8	-	8

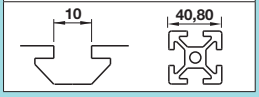
Days to Ship

6 Days P.87
2 Days

Post-Assy. Insertion Nuts for Aluminum Frames With Temporary Holding Function

-For HFS8 Series Aluminum Frames 40 · 80 Square-

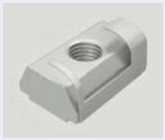
HFS8 Series



CAD Data

■Post-Assembly Insertion Nuts with Leaf Springs

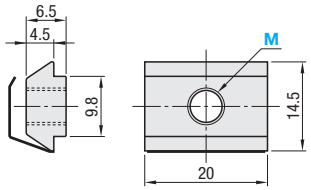
RoHS



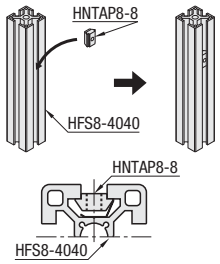
Part	M Material	S Surface Treatment
Body	1.0301/C10 Equivalent	Trivalent Chromate
Wing Part	1.4301/X5CrNi18-10	-

HNTAP8

Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent
8	23.5



Example



Welded Leaf Springs prevent the nuts from slipping off even inserted into the vertically-placed extrusions.

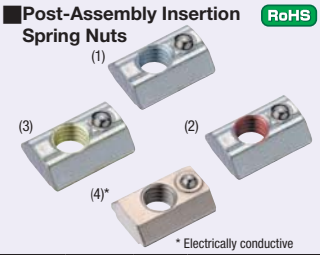
Part Number	M	€ Unit Price	Volume Discount Rate		
		1~499 pcs.	500~749	750~999	1000~
HNTAP8	4 5 6 8				

Order Example: Part Number **HNTAP8** - M **8**

Days to Ship: **6 Days** P.87

■Post-Assembly Insertion Spring Nuts

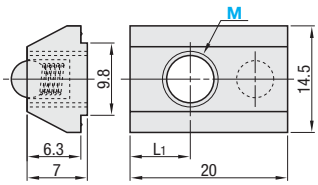
RoHS



* Electrically conductive

Type	M Material			S Surface Treatment
	Body	Ball	Springs	
(1)HNTP8 (2)HNTPV8 (3)HNTPZ8	1.0301/C10 Equivalent	1.4301	JIS SWP-A	Trivalent Chromate
(4)SHNTP8*	1.4401 Equivalent (Sintering)	1.4301	1.4301 -WP8	-

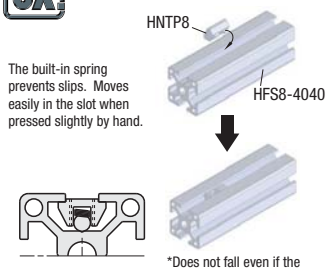
HNTP8 (1.0301/C10 Equivalent)
HNTPV8 (Thread Locking Adhesive · 1.0301/C10 Equivalent)
HNTPZ8 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
SHNTP8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)



Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent / 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)
8	23.5

Example

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.



*Does not fall even if the extrusion is placed vertically.

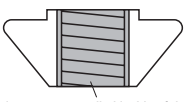
Part Number / Type	M	L1	Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTP8 (1.0301/C10 Equivalent)	4 5 6 8	8				
HNTPV8 (Thread Locking · 1.0301/C10 Equivalent)	8					
HNTPZ8 (Thread Locking · 1.0301/C10 Equivalent)	8					
SHNTP8 (1.4401/X5CrNiMo17-12-2 Equivalent, Sintering)	4 5 6 8	8.5				

Bulk-packages are cost-saving for in-house stock or large quantities. (**P.508**)

Order Example: Part Number **HNTP8** - M **8**

Days to Ship: **6 Days** P.87 **2 Days**

■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.

Thread Locking Adhesive is ---- A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.

Resin Coating ---------- Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

■Effect of Thread Locker (Reference)

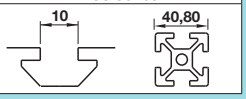
Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	17.9N • m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	25.6N • m	Test Conditions Measured value (HNTPV8-8) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 23.5N • m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	20.3N • m	Thread locking effect decreases after repeated use. 5th loosening torque: 19.1N • m Measurement with HNTAZ8-8

Post-Assy. Insertion Nuts for Aluminum Frames Others

-For HFS8 Series Aluminum Frames 40 · 80 Square-

HFS8 Series



CAD Data

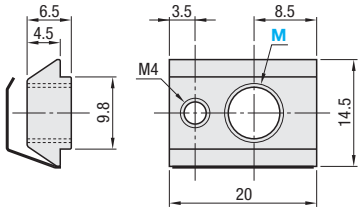
■Post-Assembly Insertion Lock Nuts with Leaf Springs RoHS



Part	M Material	S Surface Treatment
Body	1.0301/C10 Equivalent	Trivalent Chromate
Wing Part	1.4301/ X5CrNi18-10	-

HNTRP8

Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent
8	23.5



Part Number	M	M Accessory	€ Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTRP8	8	M4 set screw for locking				

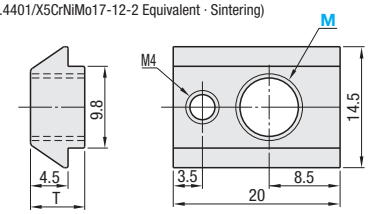
■Post-Assembly Insertion Lock Nuts RoHS



Type	M Material	S Surface Treatment
HNTR8	1.0301/C10 Equivalent	Trivalent Chromate
HNTRSN8	1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)	-

HNTR8 (1.0301/C10 Equivalent)
HNTRSN8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)

Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent / 1.4401 /X5CrNiMo17-12-2 Equivalent (Sintering)
8	23.5



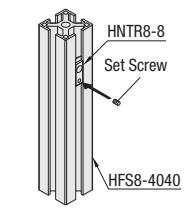
Part Number / Type	M	T	Accessories	€ Unit Price	Volume Discount Rate		
				1~499 pcs.	500~749	750~999	1000~
HNTR8 (1.0301/C10 Equivalent)	4 5 6 8	6.5	M4 Set screw 1 pc.				
HNTRSN8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)		6.0					

Order Example: Part Number HNTR8 - M 8

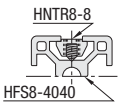
Days to Ship: 6 Days P.87 2 Days

Example

■Post-Assembly Insertion Lock Nuts

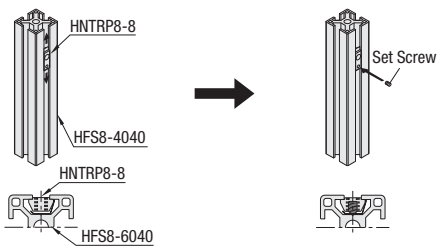


The nut can be fixed in place by itself by tightening the included set screw.



Suitable for use where high repeatability is required. Usable for use when mounting sensor or removing panels repeatedly.

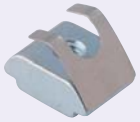
■Post-Assembly Insertion Lock Nuts with Leaf Springs



Welded Leaf Springs prevents nuts from slipping off even inserted into the vertically-placed extrusions, leading to easy locating.

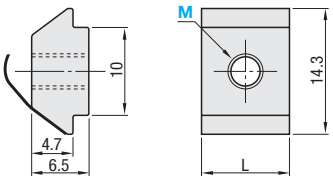
Also, the nut can be fixed in place by tightening the included set screw.

■Post-Assembly Insertion Short Nuts RoHS



Part	M Material	S Surface Treatment
Body	1.0301/C10 Equivalent	Trivalent Chromate
Wing Part	1.4301/ X5CrNi18-10	-

HNTAJ8



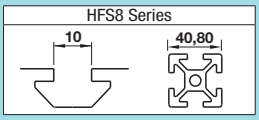
•Overall length is shorter than the Pre-Assembly Insertion Nuts HNTT. Convenient for installing sensors or other components closely in combination.

Part Number	M	L	€ Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTAJ8	3 4	10				
	8	12				

Order Example: Part Number HNTAJ8 - M 8

Days to Ship: 6 Days P.87

Pre-Assy. Insertion Bolts / Post-Assy. Insertion Bolts / Conductive Washers / Toothed Washer / Flanged Nuts
-For HFS8 Series Aluminum Frames 40 · 80 Square-



CAD Data

Tightening Torque P.676

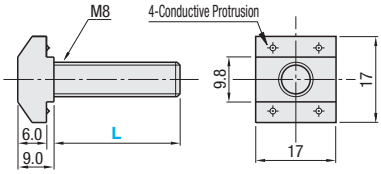
■Pre-Assembly Insertion Bolts

RoHS



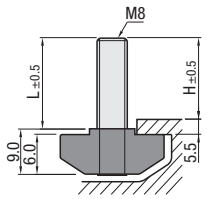
Material: Nuts: 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)
Bolts: 1.4301/X5CrNi18-10

HNTLSN8-8



* Electrically conductive

■Effective Length of Pre-Assy. Insertion Bolts



Slot of Aluminum Extrusion

Part Number	L	H	Applicable Extrusion (Series)	Reference Tightening Torque (N · m)	€ Unit Price 1~299 pcs.	Volume Discount Rate 300~499	Volume Discount Rate 500~
HNTLSN8-8	20	17.5	HFS8	23.5			
	25	22.5					

Order Example: Part Number HNTLSN8-8 - L 20
Days to Ship: 2 Days P.87

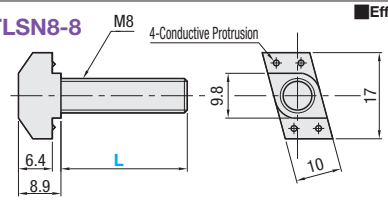
■Post-Assembly Insertion Bolts

RoHS



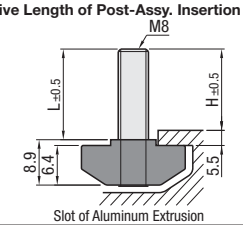
Material: Nuts: 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)
Bolts: 1.4301/X5CrNi18-10

HATLSN8-8



* Electrically conductive

■Effective Length of Post-Assy. Insertion Bolts



Slot of Aluminum Extrusion

Part Number	L	H	Applicable Extrusion (Series)	Reference Tightening Torque (N · m)	€ Unit Price 1~299 pcs.	Volume Discount Rate 300~499	Volume Discount Rate 500~
HATLSN8-8	20	17.0	HFS8	23.5			
	25	22.0					

Order Example: Part Number HATLSN8-8 - L 20
Days to Ship: 2 Days P.87

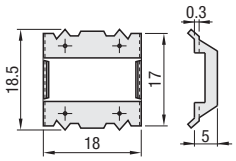
■Conductive Washers

RoHS



Material: 1.4301/X5CrNi18-10

HDW8



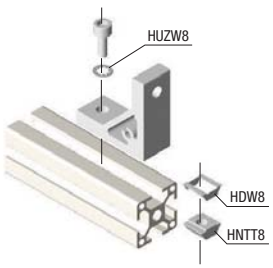
⚠ Becareful not to injure your hand when fitting onto nut.

Part Number / Type	Applicable Pre-Assy. Insertion Nut	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HDW8	HNTT8		

Order Example: Part Number HDW8
Days to Ship: 2 Days P.87

Example

Conductivity between extrusions is achieved by combining HDW and HUZW.



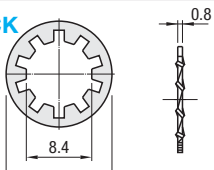
■Toothed Washer for Aluminum Frames

RoHS



Material: 1.4301/X5CrNi18-10

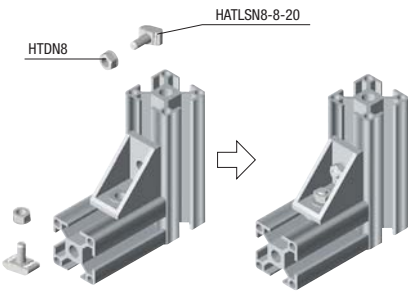
HUZW8PACK



100 pcs. per package

Part Number	€ Unit Price 1~4 package	Volume Discount Rate 5~
HUZW8PACK		

Order Example: Part Number HUZW8PACK
Days to Ship: 6 Days P.87



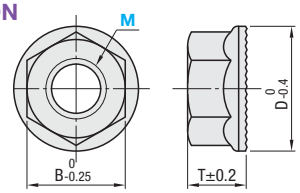
■Flanged Nuts

RoHS



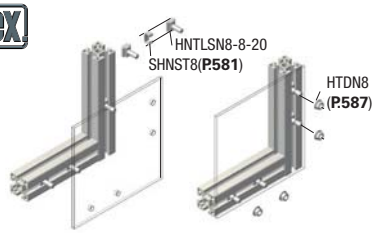
Material: 1.4301/X5CrNi18-10

HTDN



Part Number Type	M	B	T	D	€ Unit Price 1~499 pcs.	Volume Discount Rate 500~999	Volume Discount Rate 1000~
HTDN (Stainless Steel)	4	7	4.2	10			
	5	8	5.5	12			
	6	10	6.0	13			
	8	12	7.5	17			

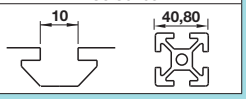
Example



Order Example: Part Number HTDN6
Days to Ship: 2 Days P.87

Long Nuts
-For HFS8 Series Aluminum Frames 40 · 80 Square-

HFS8 Series

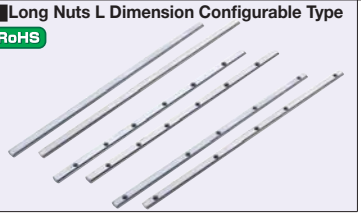


CAD Data

Tightening Torque P.676

Long Nuts L Dimension Configurable Type

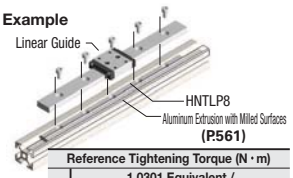
RoHS



Type		Material	Surface Treatment	Reference Tightening Torque
Pre-Assy. Insertion	Post-Assy. Insertion			
HNTLF8	HNTALF8	1.0301/C10 Equivalent	Trivalent Chromate	23.5
HNTLP8	HNTALP8			
HNTLS8	HNTALS8			
SHNTLF8	-	1.4305/ X10CrNiS18-9	-	
SHNTLP8	SHNTALP8			
SHNTLS8	SHNTALS8			

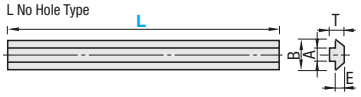
Cross Section Shape	A	B	E	T
Pre-Assy. Insertion	9.8	17	6	9
Post-Assy. Insertion	9.8	14.5	4.5	6.5

Example

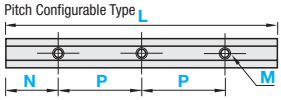


Reference Tightening Torque (N · m)	
M	1.0301 Equivalent / 1.4401 Equivalent (Sintering)
8	23.5

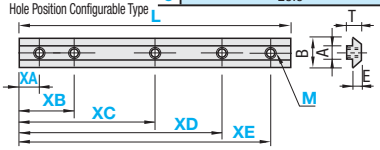
L No Hole Type



Pitch Configurable Type



Hole Position Configurable Type



No Hole Type

Part Number		L 1mm Increment	HNTLF		SHNTLF		HNTALF	
			€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit PriceLess than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion)	(Post-Assembly Insertion)	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000						
HNTLF8	HNTALF8							
SHNTLF8								

Pitch Configurable Type

Part Number		L 1mm Increment	M	N 1mm Increment	P 1mm Increment	Number of Taps S	HNTLP		SHNTLP		HNTALP		SHNTALP	
							€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion)	(Post-Assembly Insertion)	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000	4 5 6 8	5≤N≤L-5	2M≤P≤L-2M	2≤S≤20								
HNTLP8	HNTALP8													
SHNTLP8	SHNTALP8													

Hole Position Configurable Type

Part Number		L 1mm Increment	M	XA~XE 1mm Increment	HNTLS		SHNTLS		HNTALS		SHNTALS	
					€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion)	(Post-Assembly Insertion)	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000	4 5 6 8	5~L-5								
HNTLS8	HNTALS8											
SHNTLS8	SHNTALS8											

Number of tapped holes can be specified between 1 to 5.

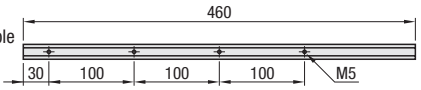
Order Example

Part Number	-	L
HNTLF8	-	1800
HNTALF8	-	400

Part Number	-	L	-	M	-	N	-	P	-	S
HNTLP8	-	460	-	M5	-	N30	-	P100	-	4
HNTALP8	-	210	-	M8	-	N8	-	P16	-	8

Part Number	-	L	-	M	-	XA	-	XB	-	XC	-	XD	-	XE
HNTLS8	-	1050	-	M8	-	XA20	-	XB105						
SHNTLS8	-	1050	-	M8	-	XA20	-	XB105	-	XC250	-	XD500	-	XE755
HNTALS8	-	1000	-	M8	-	XA25	-	XB55	-	XC78	-	XD975	-	XE992

(Ex.) Pitch Configurable Type



Days to Ship: 8 Days | Express A € 500/ piece | P.88

A flat charge of €13,50 for 3 or more identical pieces.

Hole Machining Charge

Pitch Configurable Type	€ Unit Price / 1 Hole	Hole Position Configurable Type	€ Unit Price / 1 Hole
HNTLP · HNTALP		HNTLS · HNTALS	
SHNTLP · SHNTALP		SHNTLS · SHNTALS	

Price

The prices of Pitch Configurable Type and Hole Position Configurable Type are found by adding the unit prices in the table to the hole machining charges.

(Ex.)

Part Number	-	L	-	M	-	XA	-	XB
HNTLS8	-	400	-	M8	-	XA10	-	XB70

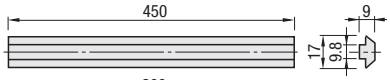
(€ Unit Price/m x Specified Full Length) + (Hole Machining Charge) = Price
7,70x0.4 + 3,20x2 = 9,40 EUR
(Round down to ten cent.)

Long Nuts L Dimension Fixed Type

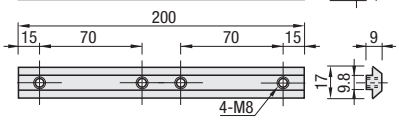
RoHS



L Dimension Fixed without Holes **HNTK8**



L Dimension Fixed with Holes **HNTLG8** **SHNTLG8**



Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent / 1.4305/X10CrNiS18-9
8	23.5

Type	Material	Surface Treatment
HNTK8	1.0301/C10 Equivalent	Trivalent Chromate
HNTLG8		
SHNTLG8	1.4305/ X10CrNiS18-9	-

L Dimension Fixed without Holes

Part Number	€ Unit Price	Volume Discount Rate	
	1~499 pcs.	500~999	1000~
HNTK8			

Order Example: Part Number HNTLG8 | Days to Ship: 6 Days | P.87

Alter-ations: Part Number HNTLG8 - (SET) SET

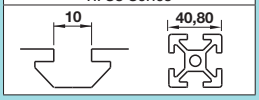
L Dimension Fixed with Holes

Part Number	€ Unit Price	Volume Discount Rate	
	1~499 pcs.	500~999	1000~
HNTLG8			
SHNTLG8 (Stainless Steel)			

Alteration	Code	Spec.	Type	Price Adder
Hexagon Socket Set Screw Set	SET	Hexagon socket set screws come as a set.	HNTLG8	0,50
		Type / Qty.: HNTLG MSSK 4; SHNTLG MSSU 4	SHNTLG8	0,85

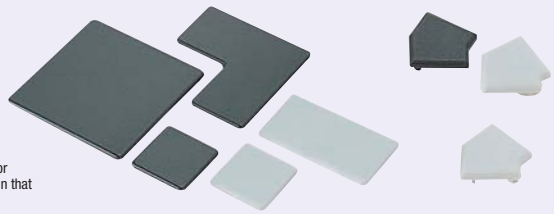
Extrusion End Caps
-HFS8 Series-

HFS8 Series



Features: Standard caps for protecting frame end faces. Alterations are not required. When the cap is hard to insert, tap with a wooden or plastic hammer.

RoHS

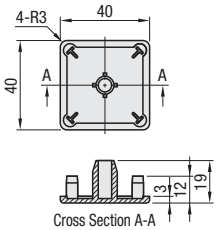


Type	M Material
HFC	Polyamide
HFCL	Low Density Polyethylene

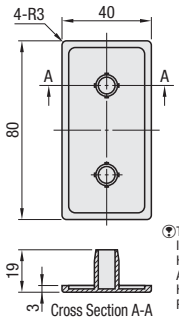
Some products are not required to specify colors, since there was no color configuration in the former catalogs. In that case, color is black.

The pin shape and numbers of extrusion caps may be changed to prevent caps from easily falling off.

HFC8-4040
HFCL8-4040

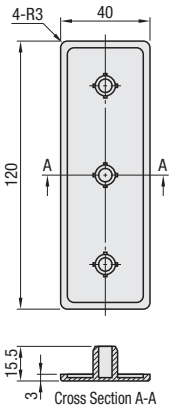


HFC8-4080
HFCL8-4080

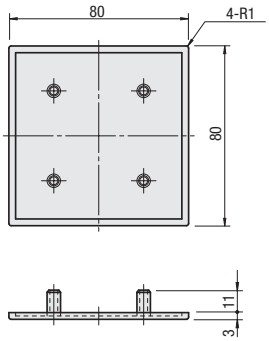


The shapes are changed to be less likely to fall off.
HFC type:
A tool is required to remove.
HFCL type:
Removable by hand.

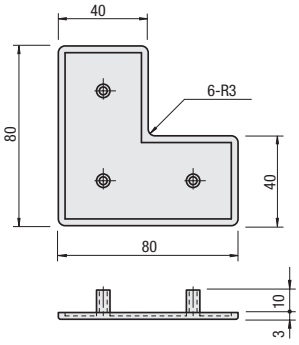
HFC8-40120



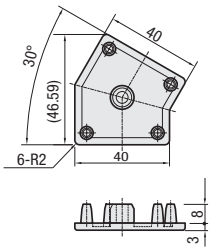
HFC8-8080



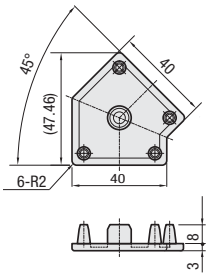
HFC8-808040



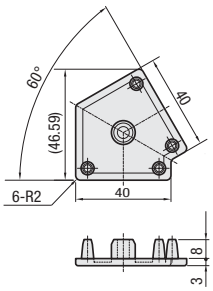
HFC30A8



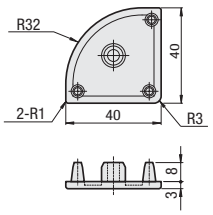
HFC45A8



HFC60A8



HFCR8-4040



Part Number Type	Part Number No.	Color	€ Unit Price 1~14 pcs.	Volume Discount Rate 15~19	Volume Discount Rate 20~	*Applicable Extrusion
HFC8	4040	B (Black)				HFS8-4040
	4080					HFS8-4080
	8080					HFS8-8080
	808040					HFS8-808040
HFCL8	4040					HFS8-4040
	4080					HFS8-4080
HFC30A8		S (Light Gray)				HFS30A8-40
HFC45A8						HFS45A8-40
HFC60A8						HFS60A8-40
HFCR8-4040						HFSR8-4040

* For Aluminum Frame EFS Series, the same frame caps as of HFS Series can be used.

Order Example

Part Number	-	Color
HFC30A8	-	B

Days to Ship

6 Days | 2 Days P87

Example

When using Aluminum Extrusion HFS8-80160, please use 2 pieces of HFC8-8080.



NEW

CAD Data

Features: Frame Caps for protecting 3 sides at corners.

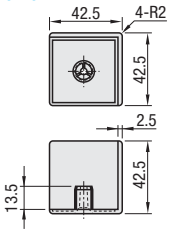
Three-Sided Caps for Corners

RoHS



M Material: Polyamide

HFCK8-4040



The shape and the number of extrusion end cap pin may be changed to prevent caps from easily falling off.

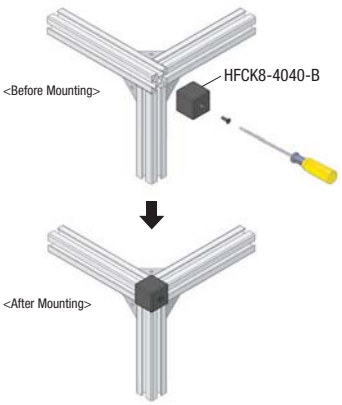
Part Number	Color	A Accessory	*Applicable Extrusion	€ Unit Price	Volume Discount Rate	
				1~14 pcs.	15~19	20~
HFCK8-4040	B (Black)	HFBMB5-15	HFS8-4040			

* For Aluminum Frame EFS Series, the same frame caps as of HFS Series can be used.

Order Example — Part Number: HFCK8-4040-B

Days to Ship: 6 Days P.87

ex



Tapping on extrusion is not required.

Features: Frame End Caps Screw Mounting Type. Requires no alteration, stays on well for better safety.

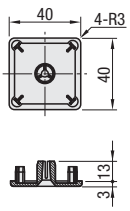
Screw Mounted

RoHS

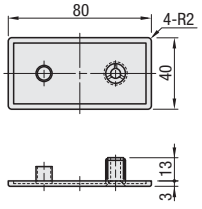


M Material: Polyamide (Black · Light Gray · Yellow)

HFCB8-4040 (Screw Fixing Type)



HFCB8-4080 (Screw Fixing Type)



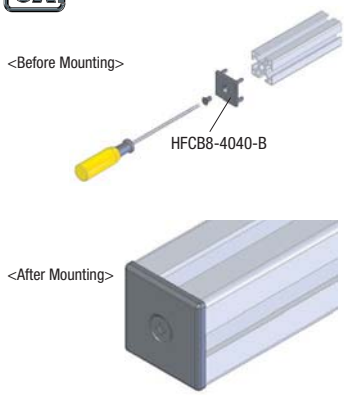
Part Number		Color	€ Unit Price	Volume Discount Rate		*Applicable Extrusion
Type	No.		1~14 pcs.	15~19	20~	
HFCB8	4040	B(Black) S(Light Gray) Y(Yellow) Yellow Type is available for 4040 only.				HFS8-4040
	4080					HFS8-4080

* For Aluminum Frame EFS Series, the same frame caps as of HFS Series can be used.
For Screw Retained Type, flat head screw is included. (Black: HFBMB5-15, Light Gray, Yellow: SHFBS5-15)

Order Example — Part Number: HFCB8-4040-S

Days to Ship: 6 Days / 2 Days P.87

ex Example



Tapping on extrusion is not required.

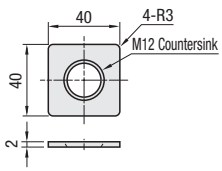
Features: Frame caps only for GFS8-4040 and GFS8-4080. Alterations are required.

Plates for High Rigidity Type

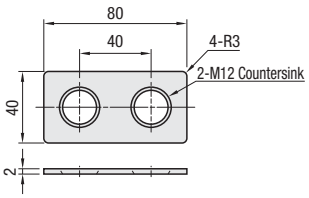


RoHS

HFCD8-4040



HFCD8-4080



Order Example — Part Number: HFCD8-4040

Days to Ship: 10 Days

Special alteration is required on cross sections of extrusions to mount frame caps.(Refer to **P.658**)

Part Number		Applicable Screw	Applicable Extrusion	€ Unit Price	Volume Discount Rate
Type	No.			1~9 pcs.	10~
HFCD8	4040	SHFBS12-20 (Not included)	GFS8-4040		
	4080		GFS8-4080		

HFS8-45 Series Aluminum Frames 45 · 90mm Square
-1 Slot-

NEW

Price Reduction
Up to 2.1%

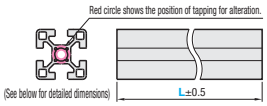
Features: Standard extrusions for equipment bases or etc.

RoHS

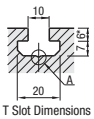


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
GFS8	KGFS8	EN AW-6061/ EN AW-AlMg1SiCu Equivalent	Clear Anodize
HFS8 HFSL8	KHFS8 KHFSL8	EN AC-51400/ AlMgSi0,7	
HFSB8	KEFSB8 KHFSB8		Black Anodize
CAF8	-		Clear Coating (Clear Anodize+ Clear Painting)

Cut surface and altered parts are not surface treated.

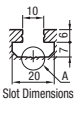


Slot
(Common in HFS · CAF · GFS series)



T Slot Dimensions

(EFS Series)



T Slot Dimensions

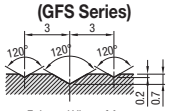
** 5.5 for Light Type (HFSL, HFSLF, HFSLT).

Details of slot bottom
(HFS · CAF Series)



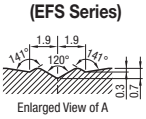
Enlarged View of A

(GFS Series)



Enlarged View of A

(EFS Series)

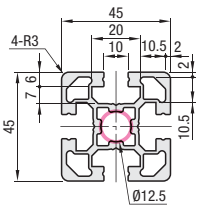


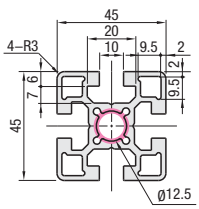
Enlarged View of A

Features of Extrusions

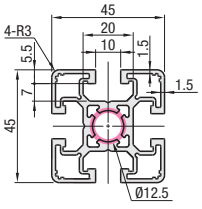
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.

HFS8-4545
HFSB8-4545 (Black Anodize)
CAF8-4545 (Clear Coating)

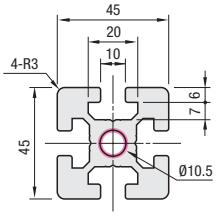




HFSL8-4545 (Light Type)
For Slot Covers for HFSL8-4545, use HSCA8. (Refer to **P.687**)



GFS8-4545 (High Rigidity)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	Volume Discount Rate Less than 300mm		€ Unit Price · m 300mm or more	Volume Discount Rate·m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
	4545	50~4000	1.93	713	15.42x10⁴	15.42x10⁴						
HFS8												
HFSB8 (Black Anodize)			2.10	777	15.13x10⁴	15.13x10⁴						
CAF8 (Clear Coating)												
HFSL8 (Light Type)			1.70	628	11.73x10⁴	11.73x10⁴						
GFS8 (High Rigidity)			3.16	1171	23.64x10⁴	23.64x10⁴						

Fixed Length Extrusion (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount Rate
				ℓx	ℓy	1~9 pcs.	10~19
(New Shape)	4545	4000	713	15.42x10⁴	15.42x10⁴		
(New Shape · Black Anodize)							
KHFS8			777	15.13x10⁴	15.13x10⁴		
KHFSB8 (Black Anodize)							
KHFSL8 (Light Type)			628	11.73x10⁴	11.73x10⁴		
KGFS8 (High Rigidity)			1171	23.64x10⁴	23.64x10⁴		

Order Example

Part Number	-	L
HFS8-4545	-	800
KHFS8-4545	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS8-4545-185=EUR5,80
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex: HFS8-4545-500
19,50x0.5m=9,70 EUR
(Round down to ten cent.)

Days to Ship

Configurable Length Extrusions
6 Days P.88
5 Days

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS8-4545-4000)

Alterations

Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**),
and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

CAD Data

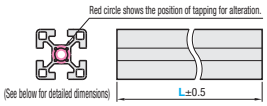
Features: 1 slotted Aluminum Frames 45mm Square with a Flat Side

RoHS



Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
GFSF8	KGFSF8	EN AW-6061/ EN AW-AlMg1SiCu Equivalent	Clear Anodize
HFSF8 HFSLF8	KHFSF8 KHFSLF8	EN AC-51400/ AlMgSi0,7	
HFSFB8	KHFSFB8		Black Anodize

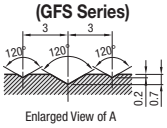
Cut surface and altered parts are not surface treated.



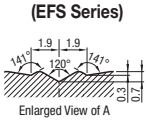
Details of slot bottom (HFS · CAF Series)



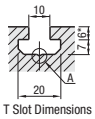
(GFS Series)



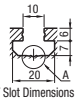
(EFS Series)



Slot (Common in HFS · CAF · GFS series)



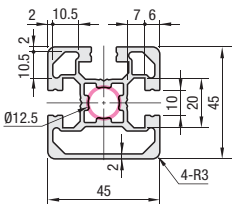
(EFS Series)



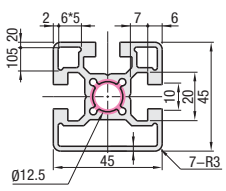
** 5.5 for Light Type (HFSL, HFSLF, HFSLT).

Features of Extrusions

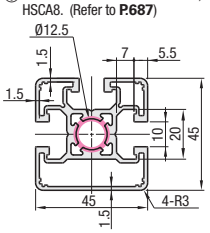
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.



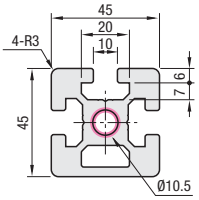
HFSF8-4545
HFSFB8-4545 (Black Anodize)



HFSLF8-4545 (Light Type)
For Slot Covers for HFSLF8-4545, use HSCA8. (Refer to **P.687**)



GFSF8-4545 (High Rigidity)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Rate Less than 300mm 10~49	50~	€ Unit Price · m 300mm or more 1~9 pcs.	Volume Discount Rate/m 300mm or more 10~49	50~
HFSF8	4545	50~4000	1.83	677	14.58x10⁴	15.00x10⁴						
HFSFB8 (Black Anodize)			1.97	730	13.88x10⁴	14.58x10⁴						
HFSLF8 (Light Type)			1.60	590	10.88x10⁴	11.33x10⁴						
GFSF8 (High Rigidity)			3.16	1172	24.54x10⁴	23.36x10⁴						

Fixed Length Extrusion (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount Rate 10~19
(New Shape)	4545	4000	677	14.58x10⁴	15.00x10⁴		
KHFSF8			730	13.88x10⁴	14.58x10⁴		
KHFSFB8 (Black Anodize)							
KHFSLF8 (Light Type)			590	10.88x10⁴	11.33x10⁴		
KGFSF8 (High Rigidity)			1172	24.54x10⁴	23.36x10⁴		

Order Example

Part Number	-	L
HFSF8-4545	-	800
KHFSF8-4545	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFSF8-4545-185=EUR 5,60
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFSF8-4545-500
18,80x0.5m=9,40 EUR
(Round down to ten cent.)

Days to Ship

Configurable Length Extrusions
6 Days P.88

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFSF8-4545-4000)

Alterations
Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

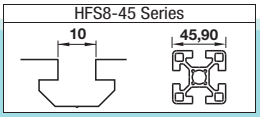
Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS8-45 Series Aluminum Frames 45 · 90mm Square -1 Slot-

NEW

Price Reduction Up to 2.2%

HFS8-45 Series

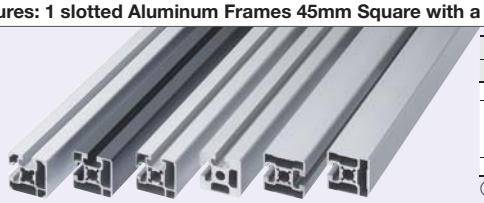


CAD Data

Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.601 ~ P.612	P.615 ~ P.622	P.627 ~ P.640	P.623	P.645 ~ P.658

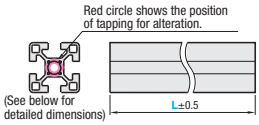
Features: 1 slotted Aluminum Frames 45mm Square with a Flat Side

RoHS

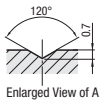


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
GFS_8	KGFS_8	EN AW-6061-T6 Equivalent	Clear Anodize
HFS_8 HFSL_8	KHFS_8 KHFSL_8	EN AC-51 400/ AlMgSio,7-T5	
HFS_B8	KHFS_B8		Black Anodize

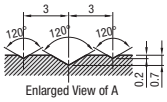
Cut surface and altered parts are not surface treated.



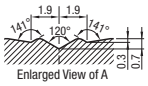
Details of slot bottom (HFS · CAF Series)



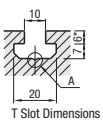
(GFS Series)



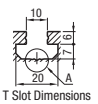
(EFS Series)



Slot (Common in HFS · CAF · GFS series)



(EFS Series)

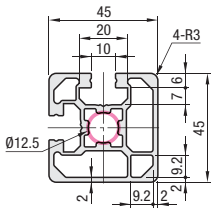


** 5.5 for Light Type (HFSL, HFSLF, HFSLT).

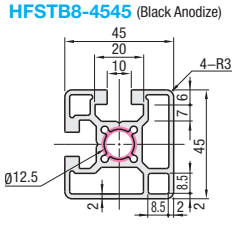
Features of Extrusions

Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	HFSL Extrusions	Although having thin walls lowers the allowable load, excels in cost savings offered.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

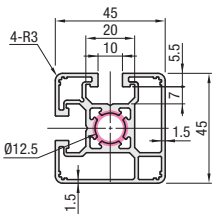
(New Shape)



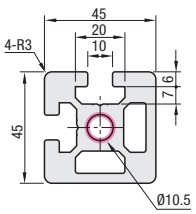
HFST8-4545
HFSTB8-4545 (Black Anodize)



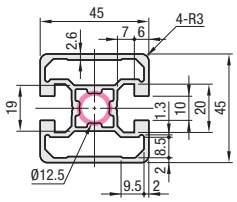
HFSLT8-4545 (Light Type)



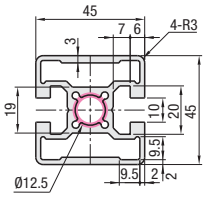
GFST8-4545 (High Rigidity)



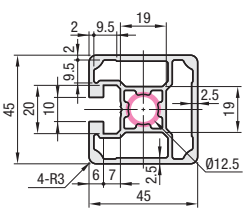
(New Shape)



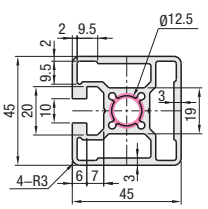
HFSH8-4545



(New Shape)



HFSC8-4545



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Rate Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount Rate/m 300mm or more 10~49	50~
(New Shape)			1.80	667	14.67x10⁴	14.67x10⁴						
HFST8			1.92	713	14.00x10⁴	14.00x10⁴						
HFSTB8 (Black Anodize)												
HFSLT8 (Light Type)			1.58	585	11.13x10⁴	11.13x10⁴						
GFST8 (High Rigidity)	4545	50~4000	3.22	1195	24.46x10⁴	24.46x10⁴						
(New Shape)			1.82	674	14.60x10⁴	14.86x10⁴						
HFSH8			1.97	731	14.30x10⁴	14.71x10⁴						
(New Shape)			1.82	675	14.93x10⁴	15.27x10⁴						
HFSC8			1.98	735	14.41x10⁴	15.02x10⁴						

Fixed Length Extrusion (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount Rate 10~19
(New Shape)			667	14.67x10⁴	14.67x10⁴		
KHFST8			713	14.00x10⁴	14.00x10⁴		
KHFSTB8 (Black Anodize)							
KHFSLT8 (Light Type)			585	11.13x10⁴	11.13x10⁴		
KGFST8 (High Rigidity)	4545	4000	1195	24.46x10⁴	24.46x10⁴		
(New Shape)			674	14.60x10⁴	14.86x10⁴		
KHFSH8			731	14.30x10⁴	14.71x10⁴		
(New Shape)			675	14.93x10⁴	15.27x10⁴		
KHFSC8			735	14.41x10⁴	15.02x10⁴		

Order Example

Part Number	-	L
HFST8-4545	-	800
KHFST8-4545	-	4000

Days to Ship

Configurable Length Extrusions: 6 Days P.88

Fixed Length Extrusions (Effective Length 4000mm): 7 Days (KHFST8-4545-4000)

For orders of 20 or more identical pieces, please request a quotation.

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFST8-4545-185=EUR 5,50
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFST8-4545-500
18,50x0.5m=9,20 EUR (Round down to ten cent.)

Alterations

Alterations are available for Configurable Length Extrusions.
For details, refer to P.645

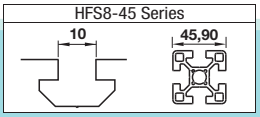
Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

NEW

HFS8 Series Aluminum Frames
45 · 90mm Square
-2 Slots-

HFS8-45 Series

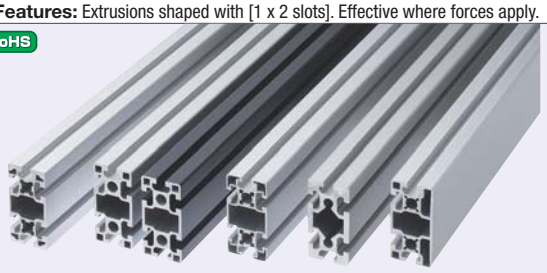


Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusions Extrusion End Caps	Alteration
P.601 ~ P.612	P.615 ~ P.622	P.627 ~ P.640	P.623	P.645 ~ P.658

CAD Data

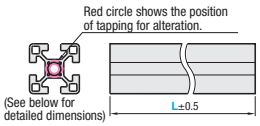
Features: Extrusions shaped with [1 x 2 slots]. Effective where forces apply.

RoHS



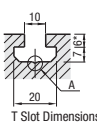
Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
GFS8	KGFS8	EN AW-6061/EN AW-AlMg 1SiCu-T6 Equivalent	Clear Anodize
EFS8 HFS8 EFSF8 HFS_8	KEFS8 KHFS8 KEFSF8 KHFS_8	EN AC-51 400/ AlMgSio,7-T5	Clear Anodize
EFSB8 HFSB8	KEFSB8 KHFSB8	EN AC-51 400/ AlMgSio,7-T5	Black Anodize
CAF8	-	EN AC-51 400/ AlMgSio,7-T5	Clear Coating (Clear Anodize + Clear Painting)

Cut surface and altered parts are not surface treated.



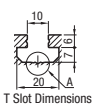
* 5.5 for Light Type (HFSL).

Slot (Common in HFS · CAF · GFS series)



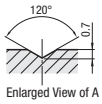
T Slot Dimensions

(EFS Series)



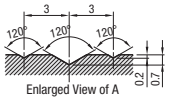
T Slot Dimensions

Details of slot bottom (HFS · CAF Series)



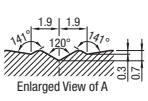
Enlarged View of A

(GFS Series)



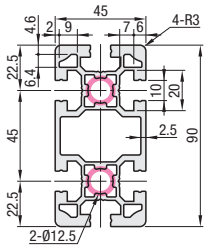
Enlarged View of A

(EFS Series)

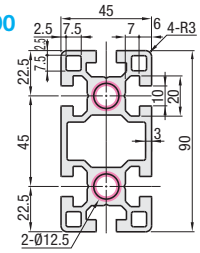


Enlarged View of A

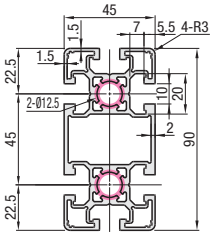
EFS8-4590
(New)
EFSB8-4590
(New · Black Anodize)



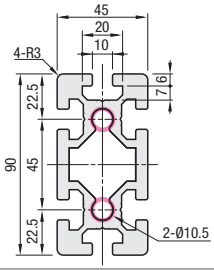
HFS8-4590
HFSB8-4590
(Black Anodize)
CAF8-4590
(Clear Coating)



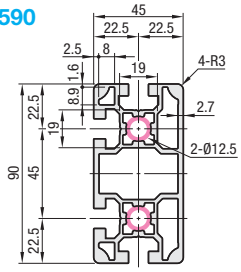
HFSL8-4590
(Light Type)
Use HSCA8 as a slot cover for HFSL8-4590. (Refer to **P.617**)



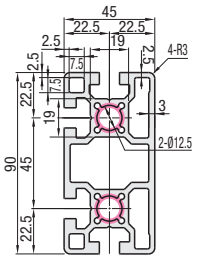
GFS8-4590
(High Rigidity)



EFSF8-4590



HFSF8-4590



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Rate Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount Rate/m 300mm or more 10~49	50~
EFS8 (New Shape)	4590	50~4000	3.75	1390	32.67x10⁴	125.3x10⁴						
EFSB8 (New Shape · Black Anodize)												
HFS8			4.14	1534	32.29x10⁴	124.7x10⁴						
HFSB8 (Black Anodize)												
CAF8 (Clear Coating)												
HFSL8 (Light Type)			2.98	1101	22.87x10⁴	87.16x10⁴						
GFS8 (High Rigidity)			5.22	1935	42.99x10⁴	163.4x10⁴						
EFSF8			3.60	1335	32.14x10⁴	117.9x10⁴						
HFSF8			3.80	1408	30.92x10⁴	116.8x10⁴						

Fixed Length Extrusion (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount Rate 10~19
KEFS8 (New Shape)	4590	4000	1390	32.67x10⁴	125.3x10⁴		
KEFSB8 (New Shape / Black Anodize)							
KHFS8			1534	32.29x10⁴	124.7x10⁴		
KHFSB8 (Black Anodize)							
KHFSL8 (Light Type)			1101	22.87x10⁴	87.16x10⁴		
KGFS8 (High Rigidity)			1935	42.99x10⁴	163.4x10⁴		
KEFSF8			1335	32.14x10⁴	117.9x10⁴		
KHFSF8			1408	30.92x10⁴	116.8x10⁴		

Order Example

Part Number	-	L
HFS8-4590	-	800
KHFS8-4590	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS8-4590-185= EUR 11,90
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFS8-4590-500
39,80x0.5m=19,90 EUR (Round down to ten cent.)

Days to Ship

Configurable Length Extrusions
6 Days P.88

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS8-4590-4000)

Alterations

Alterations are available for Configurable Length Extrusions.
For details, refer to **P.645**

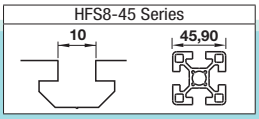
Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS8 Series Aluminum Frames
45 · 90mm Square
-2 or More Slots-

Price Reduction
Up to 1.7%

HFS8-45 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.601 ~ P.612	P.615 ~ P.622	P.627 ~ P.640	P.623	P.645 ~ P.658

CAD Data

Features: Extrusions shaped with [2 x 2 slots], [2 x 4 slots].

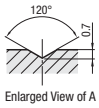
RoHS



Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
GFS8	KGFS8	EN AW-6061/-T6 Equivalent	Clear Anodize
HFS8 HFS_8	KHFS8 KHFS_8	EN AC-51400/AlMgSi0,7	
HFSB8	KHFSB8		Black Anodize
CAF8	-		Clear Coating (Clear Anodize + Clear Painting)

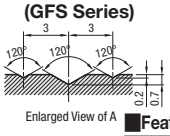
Cut surface and altered parts are not surface treated.

Details of slot (HFS · CAF Series)



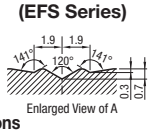
Enlarged View of A

(GFS Series)

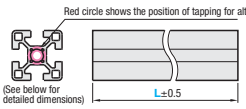


Enlarged View of A

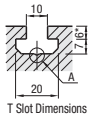
(EFS Series)



Enlarged View of A

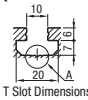


Slot (Common in HFS · CAF · GFS Series)



T Slot Dimensions

(EFS Series)



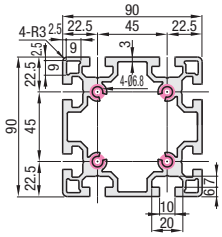
T Slot Dimensions

* 5.5 for Light Type (HFSL).

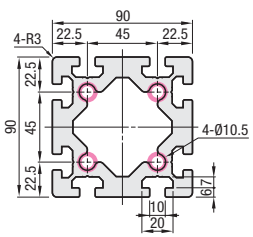
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard cross section shape.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.
	Clear Coating	More luster and better appearance than anodizing.

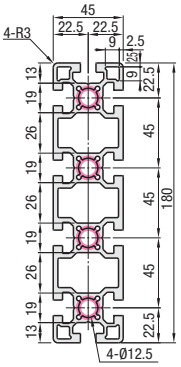
HFS8-9090
HFSB8-9090 (Black Anodize)
CAF8-9090 (Clear Coating)



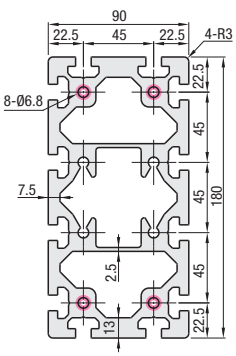
GFS8-9090 (High Rigidity)



HFS8-45180
HFSB8-45180 (Black Anodize)



HFS8-90180
HFSB8-90180 (Black Anodize)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Rate Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount Rate/m 300mm or more 10~49	50~
HFS8												
HFSB8 (Black Anodize)	9090		5.80	2162	209.2x10⁴	209.2x10⁴						
CAF8 (Clear Coating)												
GFS8 (High Rigidity)		50~4000	9.60	3592	320.2x10⁴	320.2x10⁴						
HFS8	45180		7.12	2636	60.8x10⁴	804x10⁴						
HFSB8 (Black Anodize)												
HFS8	90180		17.07	6320	599x10⁴	2136x10⁴						
HFSB8 (Black Anodize)												

Fixed Length Extrusion (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount Rate 10~19
KHFS8							
KHFSB8 (Black Anodize)	9090		2162	209.2x10⁴	209.2x10⁴		
KGFS8 (High Rigidity)			3592	320.2x10⁴	320.2x10⁴		
KHFS8	45180	4000	2636	60.8x10⁴	804x10⁴		
KHFSB8 (Black Anodize)							
KHFS8	90180		6320	599x10⁴	2136x10⁴		
KHFSB8 (Black Anodize)							

Order Example

Part Number	-	L
HFS8-90180	-	800
KHFS8-9090	-	4000

Days to Ship

Configurable Length Extrusions: 6 Days P.88

Fixed Length Extrusions (Effective Length 4000mm): 7 Days (KHFS8-9090-4000)
For orders of 20 or more identical pieces, please request a quotation.

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS8-9090-185=EUR 17,90
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFS8-9090-800
59,80x0.8m=EUR 47,80
(Round down to ten cent.)

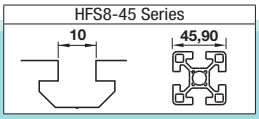
Alteration

Alterations are available for Configurable Length Extrusions. For details, refer to P.645

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS8-45 Series Aluminum Frames
45 · 90mm Square
-Other Shapes-

HFS8-45 Series



Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.601 ~ P.612	P.615 ~ P.622	P.627 ~ P.640	P.623	P.645 ~ P.658

CAD Data

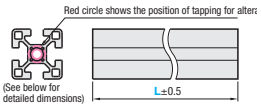
Features: Can be used when making angles or making outer surface in radius.

RoHS

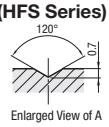


Type		M Material	S Surface Treatment
Configurable Length	Fixed Length		
HFS8 EFS8 HFS_8 HFS_ _A8	KHFS8 KEFS8 KHFS_8 KHFS_ _A8	EN AC-51400/ AlMgSi0,7	Clear Anodize

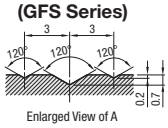
Cut surface and altered parts are not surface treated.



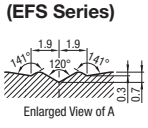
Details of slot (HFS Series)



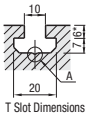
(GFS Series)



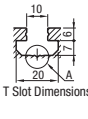
(EFS Series)



Slot
(Common in HFS · CAF · GFS Series)



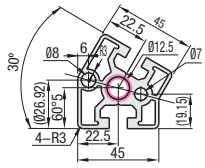
(EFS Series)



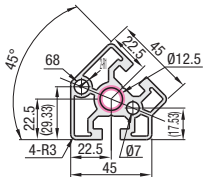
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard cross section shape.
Surface Treatment	Clear Anodize	Common surface treatment.

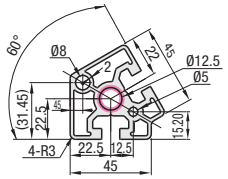
HFS30A8-45



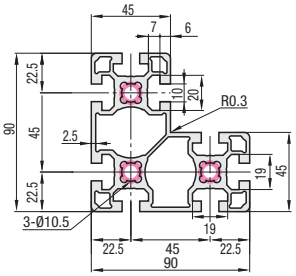
HFS45A8-45



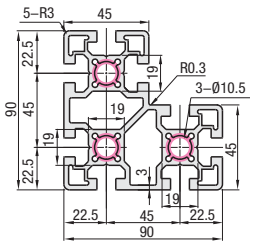
HFS60A8-45



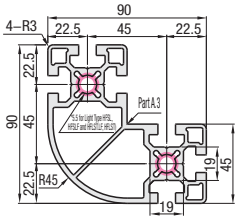
EFS8-909045 (New Shape)



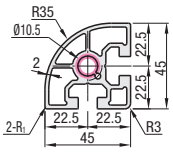
HFS8-909045



HFSR8-909045



HFSR8-4545



Configurable Length Extrusions

Part Number	L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Rate Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount Rate/m 300mm or more 10~49	50~
HFS30A8	45	2.30	851	14.91x10⁴	15.95x10⁴						
HFS45A8	45	2.22	821	14.73x10⁴	15.49x10⁴						
HFS60A8	45	2.26	834	14.94x10⁴	15.93x10⁴						
EFS8 (New Shape)	50~4000	5.36	1988	149.72x10⁴	149.72x10⁴						
HFS8	909045	5.55	2053	149.6x10⁴	149.6x10⁴						
HFSR8	909045	4.67	1731	128.2x10⁴	128.2x10⁴						
HFSR8	4545	1.79	662	11.30x10⁴	11.30x10⁴						

Fixed Length Extrusion (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number	L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount Rate 10~19
KHFS30A8	45	851	14.91x10⁴	15.95x10⁴		
KHFS45A8	45	821	14.73x10⁴	15.49x10⁴		
KHFS60A8	45	834	14.94x10⁴	15.93x10⁴		
KEFS8 (New Shape)	909045	1988	149.72x10⁴	149.72x10⁴		
KHFS8	909045	2053	149.6x10⁴	149.6x10⁴		
KHFSR8	4545	662	11.30x10⁴	11.30x10⁴		

Order Example

Part Number	-	L
HFS30A8-45	-	800
KHFS30A8-45	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS8-909045-185=EUR 18,30
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex: HFS8-909045-800
61,20x0.8m=EUR 48,90
(Round down to ten cent.)

Days to Ship

Configurable Length Extrusions
6 Days P.88

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS30A8-45-4000)

Alteration

Alterations are available for Configurable Length Extrusions. For details, refer to P.645

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS8-45 Series Aluminum Frames 50 · 100mm Square

Add. Spec.

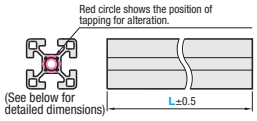
Price Reduction
Up to 2.8%

Features: Convenient for switching from Cut-and-Weld tubing methods.

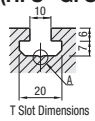


Type		Material	Surface Treatment
Configurable Length	Fixed Length		
GFS8	KGFS8	EN AW-6061-T6 Equivalent	Clear Anodize
HFS8 HFS_8	KHFS8 KHFS_8	EN AC-51 400/ AlMgSi0,7-T5	
HFSB8	KHFSB8		Black Anodize

Cut surface and altered parts are not surface treated.

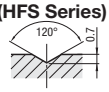


Details of slot (HFS · GFS)



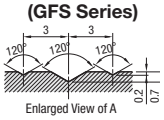
T Slot Dimensions

Details of slot bottom (HFS Series)



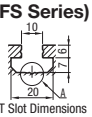
Enlarged View of A

(GFS Series)



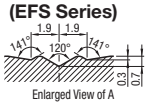
Enlarged View of A

(EFS Series)



T Slot Dimensions

(EFS Series)



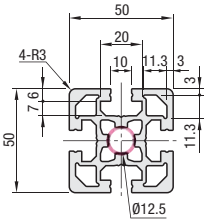
Enlarged View of A

Features of Extrusions

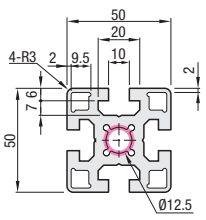
Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

(New Shape)

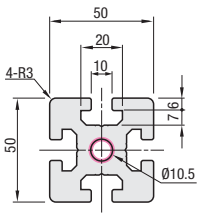
(New Shape · Black Anodize)



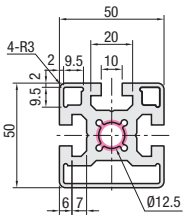
HFS8-5050
HFSB8-5050
(Black Anodize)



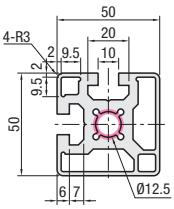
GFS8-5050 (High Rigidity)



HFSF8-5050



HFST8-5050



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	Volume Discount Rate Less than 300mm		€ Unit Price/m 300mm or more	Volume Discount Rate/m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
(New Shape)	5050	50~4000	2.84	1053	26.98x10⁴	26.98x10⁴						
(New Shape · Black Anodize)												
HFS8			3.43	1150	26.64x10⁴	26.64x10⁴						
HFSB8 (Black Anodize)												
GFS8 (High Rigidity)			4.4	1633	38.16x10⁴	38.16x10⁴						
HFSF8			3.11	1165	23.82x10⁴	25.95x10⁴						
HFST8			2.97	1114	23.74x10⁴	23.74x10⁴						

Fixed Length Extrusions(Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price	Volume Discount Rate
				ℓx	ℓy	1~9 pcs.	10~19
(New Shape)	5050	4000	1053	26.98x10⁴	26.98x10⁴		
(New Shape / Black Anodize)							
KHFS8			1150	26.64x10⁴	26.64x10⁴		
KHFSB8 (Black Anodize)							
KGFS8 (High Rigidity)			1633	38.16x10⁴	38.16x10⁴		
KHFSF8			1165	23.82x10⁴	25.95x10⁴		
KHFST8			1114	23.74x10⁴	23.74x10⁴		

Order Example

Part Number	-	L
HFS8-5050	-	800
KHFS8-5050	-	4000

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS8-5050-185=EUR 9,60
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFS8-5050-500
32,20x0.5m=EUR 16,10
(Round down to ten Cent.)

Days to Ship

Configurable Length Extrusions
6 Days

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS8-5050-4000)

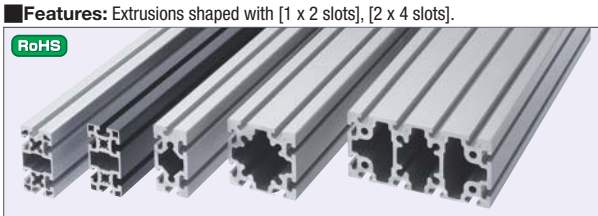
Alterations

Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**),
and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

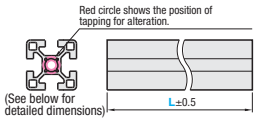
CAD Data

Features: Extrusions shaped with [1 x 2 slots], [2 x 4 slots].

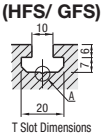


Type		Material	Surface Treatment
Configurable Length	Fixed Length		
GFS8	KGFS8	EN AW-6061-T6 Equivalent	Clear Anodize
HFS8	KHFS8	EN AC-51 400/ AlMgSi0,7-T5	
HFSB8	KHFSB8		Black Anodize

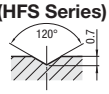
Cut surface and altered parts are not surface treated.



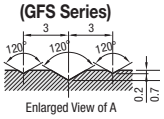
Details of slot (HFS/ GFS)



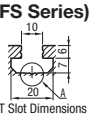
Details of slot bottom (HFS Series)



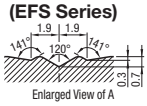
(GFS Series)



(EFS Series)



(EFS Series)



Features of Extrusions

Cross Section Shape	EFS Extrusions	New shape with the same or higher rigidity as conventional HFS series. Weight saving and price reduction realized. Migration from HFS Series extrusions realizes cost savings.
	HFS Extrusions	Standard cross section shape.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.
	Black Anodize	Effective in where light reflection is not desirable.

(New Shape)

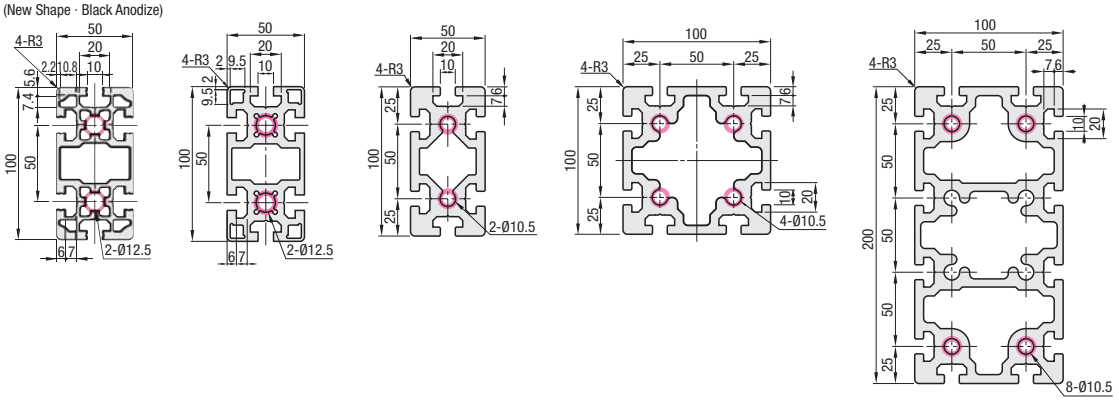
HFS8-50100
HFSB8-50100
(Black Anodize)

GFS8-50100 (High Rigidity)

GFS8-100100 (High Rigidity)

GFS8-100200 (High Rigidity)

(New Shape · Black Anodize)



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm 1~9 pcs.	Volume Discount Rate Less than 300mm 10~49	50~	€ Unit Price/m 300mm or more 1~9 pcs.	Volume Discount Rate/m 300mm or more 10~49	50~
(New Shape)												
(New Shape · Black Anodize)												
HFS8	50100	50~4000	5.39	1996	53.0x10⁴	211.21x10⁴						
HFSB8 (Black Anodize)			5.96	2206	51.67x10⁴	211.19x10⁴						
			7.0	2593	68.08x10⁴	273.12x10⁴						
GFS8 (High Rigidity)	100100		10.68	3957	465.8x10⁴	465.8x10⁴						
	100200		20.45	7574	874.3x10⁴	3179.53x10⁴						

Fixed Length Extrusions(Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price 1~9 pcs.	Volume Discount Rate 10~19
(New Shape)							
(New Shape / Black Anodize)							
KHFS8	50100	4000	1996	53.0x10⁴	211.21x10⁴		
KHFSB8 (Black Anodize)			2206	51.67x10⁴	211.19x10⁴		
			2593	68.08x10⁴	273.12x10⁴		
KGFS8 (High Rigidity)	100100		3957	465.8x10⁴	465.8x10⁴		
	100200		7574	874.3x10⁴	3179.53x10⁴		

Order Example

Part Number	-	L
HFS8-50100	-	800
KHFS8-50100	-	4000

Days to Ship

Configurable Length Extrusions
6 Days

Fixed Length Extrusions (Effective Length 4000mm)
7 Days
For orders of 20 or more identical pieces, please request a quotation.
(KHFS8-50100-4000)

Price

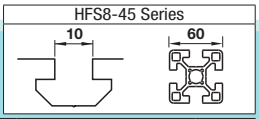
When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFS8-50100-185=EUR 18,60
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFS8-50100-500
62,30x0.5m=EUR 31,10
(Round down to ten Cent.)

Alterations

Alterations are available for Configurable Length Extrusions. For details, refer to **P.645**

Aluminum Frames with 4000mm or more
Applicable to 6000mm depending on products.
Refer to Information of Special Orders (**P.97**), and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

HFS8-45 Series Aluminum Frames 60 mm Square

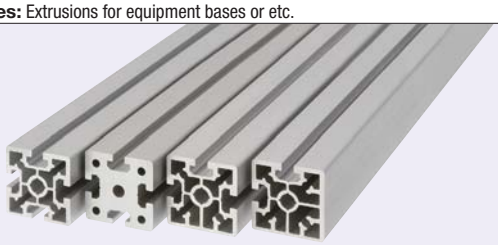


Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.601 ~ P.612	P.615 ~ P.622	P.627 ~ P.640	P.623	P.645 ~ P.658

CAD Data

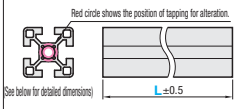
Features: Extrusions for equipment bases or etc.

RoHS

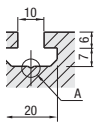


Type		Material	Surface Treatment
Configurable Length	Fixed Length		
GFS8	KGFS8	EN AW-6061/ EN AW-AlMg1SiCu-T6 Equivalent	Clear Anodize
HFS8 HFS_8	KHFS8 KHFS_8	EN AC-51400/ AlMgSi0,7SS-T5	

Cut surface and altered parts are not surface treated.

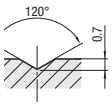


Slot (HFS · GFS)



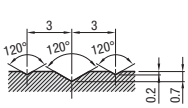
T Slot Dimensions

Details of slot (HFS - Series)



Enlarged View of A

(GFS - Series)

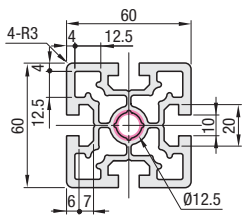


Enlarged View of A

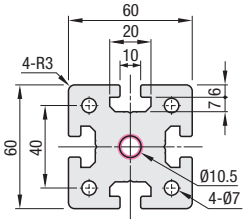
Features of Extrusions

Cross Section Shape	HFS Extrusions	Standard Cross Section Shape.
	GFS Extrusions	Suitable for heavier devices due to the thick walls.
Surface Treatment	Clear Anodize	Common surface treatment.

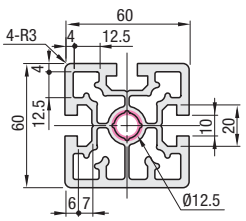
HFS8-6060



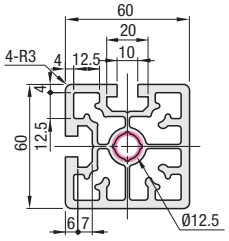
GFS8-6060 (High Rigidity)



HFSF8-6060



HFST8-6060



Configurable Length Extrusions

Part Number		L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		Unit Price Less than 300mm	Volume Discount Rate Less than 300mm		Unit Price/m 300mm or more	Volume Discount Rate/m 300mm or more	
					ℓx	ℓy	1~9 pcs.	10~49	50~	1~9 pcs.	10~49	50~
HFS8	6060	50~4000	4.17	1478	56.44x10⁴	56.44x10⁴						
GFS8 (High Rigidity)			6.96	2577	79.86x10⁴	79.86x10⁴						
HFSF8			4.16	1509	58.16x10⁴	56.19x10⁴						
HFST8			4.14	1519	57.90x10⁴	57.90x10⁴						

Fixed Length Extrusions (Effective Length 4000mm)

Part numbers beginning with the character "K" indicate Fixed Length Extrusion.

Part Number		L mm	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		Unit Price	Volume Discount Rate
				ℓx	ℓy	1~9 pcs.	10~19
KHFS8	6060	4000	1478	56.44x10⁴	56.44x10⁴		
KGFS8 (High Rigidity)			2577	79.86x10⁴	79.86x10⁴		
KHFSF8			1509	58.16x10⁴	56.19x10⁴		
KHFST8			1519	57.90x10⁴	57.90x10⁴		

Order Example: Part Number HFS8-6060 - L 800

Days to Ship

Configurable Length Extrusions: 6 Days P.88

Fixed Length Extrusions (Effective Length 4000mm): 7 Days (KHFS8-6060-4000)

For orders of 20 or more identical pieces please request a quotation.

Price

When L is less than 300 Unit prices are indicated in the table regardless of the length.
ex: HFS8-6060-185 = 11,70 EUR
When L is 300 or more Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex: HFS8-6060-600
39,30 x 0.6m = 23,50 EUR
(Round down to ten cent.)

Alterations

Alterations are available for Configurable Length Extrusions. For details refer to P.645

Aluminum Frames with 4000mm or more

Applicable to 6000mm depending on products.
Refer to Information of Special Orders (P.97) and contact the person in charge of Special Orders at MISUMI QCT Center.
Some extrusions are not applicable.

Measure of Allowable Load

Extrusions	Height X Width (mm)	HFS Series Allowable Load		GFS Series Allowable Load		Difference of Allowable Load from HFS Series
		(N)	(kgf)	(N)	(kgf)	
60 sq. 60 sq.	60x60	1743	177	2682	273	1.54 times

The value indicates the concentrated load of the extrusion on the center when the 1000mm long extrusion is supported at both ends.

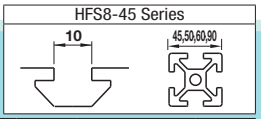
Mechanical Characteristics

(Reference Actual Measurement)

Series	HFS Series	GFS Series
Materials (JIS Symbol)	EN AC-51400/ AlMgSi0,7SS-T5	EN AW-6061/EN AW-AlMg1SiCu-T6 Equivalent
Tensile Strength (N/mm²)	245 or More	265 or more (Actual Measurement 278)
Yield Stress (N/mm²)	205 or More	245 or more (Actual Measurement 247)
Young's Modulus (N/mm²)	69972	69972
Brinell Hardness (HB)	88	88
Surface Treatment	Anodize 9μm or More	

Special Use: HFS8-45 Series Aluminum Frames
-Aluminum Extrusion with Milled Surfaces-

HFS8-45 Series



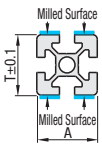
Fixing Parts			Others	
Brackets	Nuts	Joints	Extrusion End Caps	Alteration
P.601 ~ P.612	P.615 ~ P.622	P.627 ~ P.640	P.623	P.645 ~ P.658

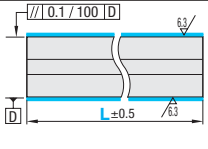
CAD Data

Features: Milled on upper and lower surfaces. Usable for Linear Guides. Refer to P.1495



HFSP
GFSP



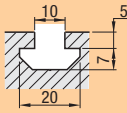


Milled and cut end surfaces are not anodized.

Type	Material	Surface Treatment
HFSP8	EN AC-51400/ AlMgSi0.7SS-T5	Clear Anodize
GFSP8	EN AW-6061/EN AW-AlMg1SiCu-T6 Equivalent	

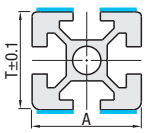
For detailed dimensions and shapes EXCEPT the slots on the milled surface A and T dimensions please refer to the drawing of the product of the below Part Number Without "P". (HFS8-45 series (Ex.)HFSP8-45450 → Ref. fig. HFS8-4545 (refer to P.591)

Details of slot on milled surface

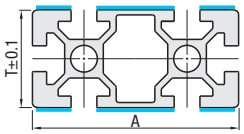


*Due to the extrusion tolerance the thickness tolerance of the slot on the milled surface becomes as shown above while T dimension tolerance is ±0.1.

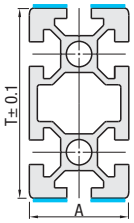
Square Type
HFSP8-4545
HFSP8-5050
HFSP8-6060
HFSP8-9090
GFSP8-4545
GFSP8-5050
GFSP8-6060
GFSP8-9090



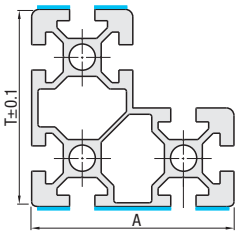
Rectangle Type (Horizontal)
HFSP8-9045
HFSP8-10050
GFSP8-9045
GFSP8-10050



Rectangle Type (Vertical)
HFSP8-4590
HFSP8-50100
GFSP8-4590
GFSP8-50100



L-Shaped Type
HFSP8-909045



Part Number		L 0.5mm Increment	Extrusions Series	T	A	Unit Price Less than 300mm	Unit Price/m 300mm or more	Alteration Charge (Body+) Counterboring XA~XE (per Row)		Alteration Charge (Body+) Drill Wrench Hole AV~EV (per Row)		Tapping (Refer to P.647) Tap Shapes	Left LTP	Right RTP	Both TPW
HFSP8	4545	100~3000	HFS8-45	44	45			Z6 d6.5 d111	250	D8 Ø8	150	M12 Depth 18 (Heli-coil is inserted to Ø12.5)	400	400	800
	5050			49	50				500		300		800	800	1600
	10050				100				-		150				
	50100			99	50				250				400	400	800
	6060			59	60				500		300		800	800	1600
	9045			44	90			Z8 d9 d114	-		150				
	4590			89	45						300	M8 Depth 24			
	9090				90				250		150	M12 Depth 18 (Heli-coil is inserted to Ø12.5)	1200	1200	2400
	909045														
GFSP8	4545		GFS8-45	44	45			Z6 d6.5 d111	250	D8 Ø8	150	M12 Depth 18 (Heli-coil is inserted to Ø12.5)	400	400	800
	5050			49	50				500		300		800	800	1600
	10050				100				-		150				
	50100			99	50				250				400	400	800
	6060			59	60				500		300		800	800	1600
	9045			44	90			Z8 d9 d114	-		150				
	4590			89	45						300	M12 Depth 36			
	9090				90										

Order Example: Part Number HFSP8-4545 - L 300

Days to Ship: 8 Days

Price

Volume Discount Rate P87

Qty.	1~9	10~49	50~
Discount Rate	Unit Price	5%	10%
	Unit Price/m	5%	10%

(Round down to one cent.)
(Round to the nearest ten cent)

When L<300mm: Unit Price = Price
When L≥300mm: Unit Price/m x Specified Full Length = Price

(ex.): HFSP8-4545-600
41,50 x 0.6m = 24,90 EUR
(Round down to ten cent.)

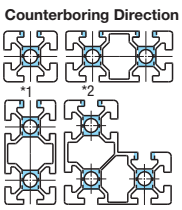
Alterations

Drilling hole at a specified position can be done.
For details of tapping refer to P.645

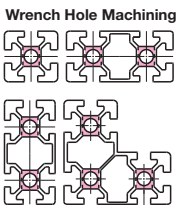
- Nuts for Extrusion
  Please use nuts for aluminum extrusions.
  For the nuts refer to P.615~620

Alterations	Counterboring							Wrench Hole					
Code	Z Selection			XA	XB	XC	XD	XE	D Selection	AV	BV	CV	DV	EV
Spec.	Z	d	d1	Distance from The Left End Plane mm					D	Distance from The Left End Plane mm				
Specifications of Hole Size and Hole Position	6	6.5	11	7~L-7					8	7~L-7				
	8	9	14											

Counterboring Direction



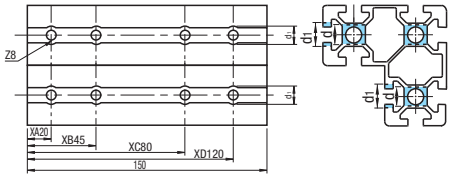
Wrench Hole Machining Direction



*1 When the cross section is rectangle (vertical) counterboring is not available for extrusions exceeding 60mm in the longitudinal direction.
*2 When the cross section is L-shaped counterboring is only applicable to the lower section of extrusions exceeding 60mm in length direction.

Order Example

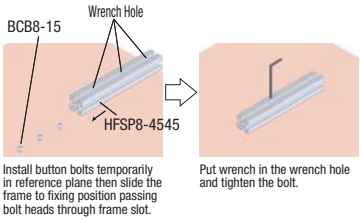
HFSP8 - 909045 - 150 - Z8 - XA20 - XB45 - XC80 - XD120
HFSP8 - 4545 - 2000 - D8 - AV100 - BV120 - CV1000 - DV1880 - EV1900
HFSP8 - 9090 - 800 - LTP



When the cross section is L-shaped select distance from left end with lower portion in front.

Example





Install button bolts temporarily in reference plane then slide the frame to fixing position passing bolt heads through frame slot.

Put wrench in the wrench hole and tighten the bolt.

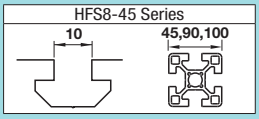
Being extruded sections products can twist. It is recommended to support overall
For Aluminum Extrusion Tolerance Data refer to P.476

NEW

Tabbed Brackets

-Slot Type: HFS8-45 Series (Aluminum Frames 45 · 90 · 100 Square)-

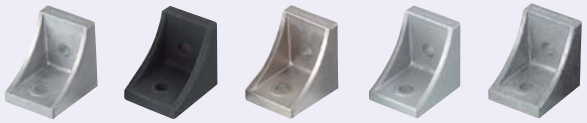
HFS8-45 Series



Features: Tabbed Brackets to be connected by both L and Cross-Connections.

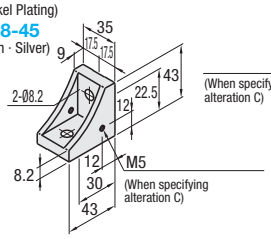
Reversal Tabbed Brackets

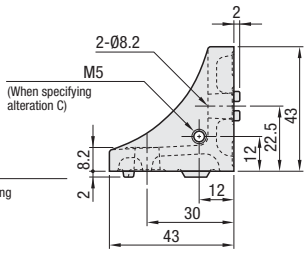
RoHS



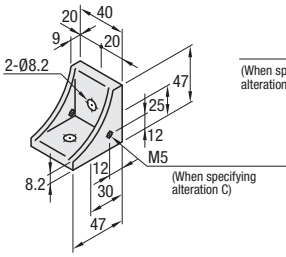
Type	M Material	S Surface Treatment
HBLFSN8-45	EN AC-46100/ G-AlSi12Cu	-
HBLFSNB8-45		Black Anodize
HBLFSNM8-45		Electroless Nickel Plating
CHBLFSN8-45		Baked-on Finish (Silver)
HBLFSN8-50		-

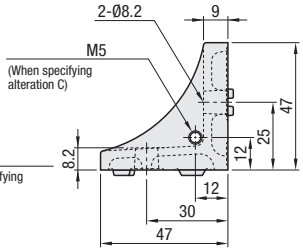
Reversal Tabbed Brackets
HBLFSN8-45
HBLFSNB8-45
(Black Anodize)
HBLFSNM8-45
(Electroless Nickel Plating)
CHBLFSN8-45
(Baked-on Finish · Silver)





For 50 Sq.
Reversal Tabbed Brackets
HBLFSN8-50





Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSN8-45	55	CBM8-20	2	HNTT8-8	2	2058		
HBLFSNB8-45* (Black Anodize)								
HBLFSNM8-45 (Electroless Nickel Plating)								
CHBLFSN8-45 (Baked-on Finish · Silver)								
HBLFSN8-50	78							

* For repairing black anodizing, refer to **P.748**

Features: Brackets with single side tabs. Plates can be mounted on the side with no tabs.

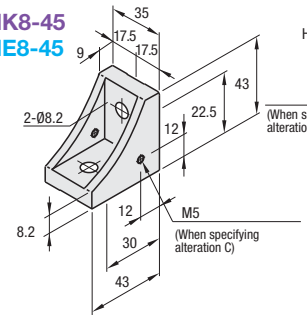
Brackets with Single Side Tab

RoHS

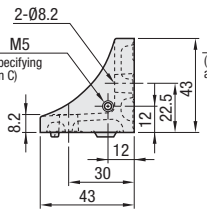


Type	M Material	S Surface Treatment
HBLFSNK8-45	EN AC-46100/G-AlSi12Cu	-
HBLFSNE8-45		

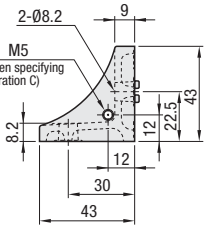
HBLFSNK8-45
HBLFSNE8-45



HBLFSNK8-45 Side view



HBLFSNE8-45 Side view

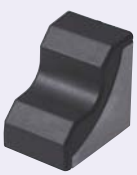


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSNK8-45	55	CBM8-20	2	HNTT8-8	2	2058		
HBLFSNE8-45								

Features: Reversal Tabbed Brackets with Cover. Designed to prevent dust build-up.

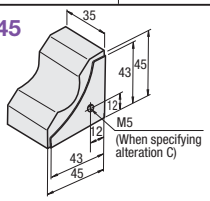
Brackets with Caps

RoHS

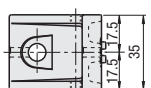


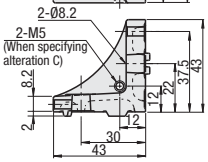
Type	M Material	S Surface Treatment
HBLFSNT8-45	Cover for Brackets: Polyamide (Black) Bracket: EN AC-64100/ G-AlSi12Cu	-

HBLFSNT8-45

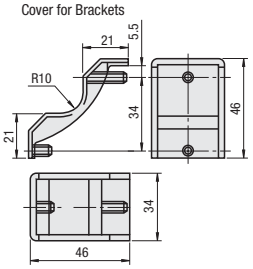


Bracket for Covers





Cover for Brackets



Part Number	Mass (g)	Accessory Components				Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		(1)	Qty.	(2)	Qty.	Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSNT8-45	62	Bracket	1	Cover for Brackets	1	CBM8-20	2	HNTT8-8	2	2058		

NEW

CAD Data

Features: Brackets with twice as many screws. Extrusions can be connected more securely.

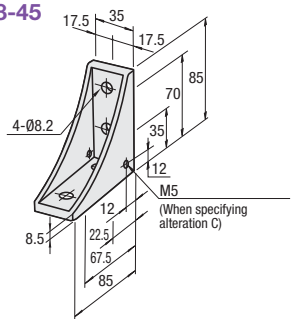
Reversal Tabbed Brackets

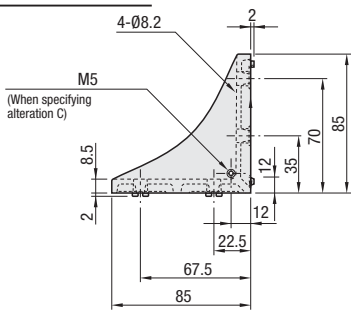
RoHS



Type	Material	Surface Treatment
HBLFSSW8-45	EN AC-46100/G-AlSi12Cu	-

HBLFSSW8-45



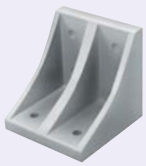


Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSSW8-45	136	CBM8-20	4	HNTT8-8	4	3087		

Features: Ribbed Brackets for 2-slots with twice as many screws. Extrusions can be connected more securely.

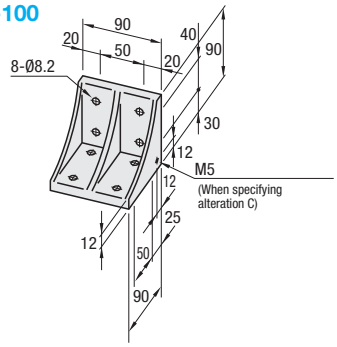
Reversal Tabbed Brackets

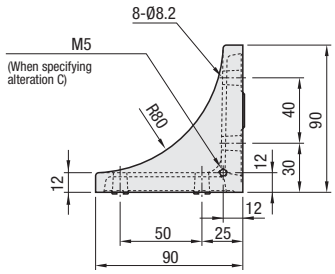
RoHS



Type	Material	Surface Treatment
HBLFSDW8-100	EN AC-46100/G-AlSi12Cu	-

HBLFSDW8-100





Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLFSDW8-100	450	SCB8-22	8	HNTT8-8	8	5586		

Order Example — Part Number: HBLFSNK8-45

Days to Ship — 6 Days / 2 Days

P.87

Alterations — Part Number: HBLFSNK8-45 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) → HBLFSNK8-45 - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM) 	HBLFSN8-45	0,40
			HBLFSNB8-45	
			HBLFSNM8-45	
			CHBLFSN8-45	0,45
			HBLFSN8-50	0,40
			HBLFSNK8-45	
			HBLFSNE8-45	
			HBLFSNT8-45	
			HBLFSSW8-45	
			HBLFSDW8-100	

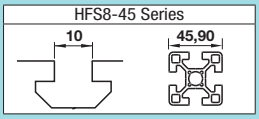
Alterations	Code	Spec.	Applicable Brackets	Price Adder
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws · Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLFSN8-45 is specified, Code | Screws | Nuts SET | CBM8-20 | HNTT8-8 SST | SCB8-20 | HNTTSN8-8 SEU | CBM8-20 | HNTU8-8 SSU | SCB8-20 | SHNTU8-8 SEP | CBM8-20 | HNTP8-8 SSP | SCB8-20 | SHNTP8-8 SEC | HCBST8-24 | HNTT8-8 When specifying other than HBLFSN8-45, check for the applicable screws and nuts.	HBLFSN8-45 HBLFSNB8-45 HBLFSNM8-45 CHBLFSN8-45 HBLFSN8-50 HBLFSNK8-45 HBLFSNE8-45 HBLFSNT8-45 HBLFSSW8-45 HBLFSDW8-100	SET SST SEU SSU SEP SSP SEC

Screws for black anodized parts are HCBMTB (Trivalent Chromate Black). P.641

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 1-slot-

-Slot Type: HFS8-45 Series (Aluminum Frames 45 · 90 Square)-



Features: Extruded Brackets with tabs to fit extrusions. Since the tabs stop rotating the brackets when tightening, improves work efficiency.

Thick Brackets (With Tab Type)

RoHS

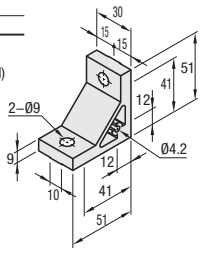


Type	Material	Surface Treatment
HBKTST8	EN AC-51400/ AlMgSi0,7	Anodize
HBKTS8		
HBKTSB8		Black Anodize

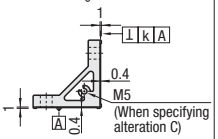
HBKTST8
(Perpendicularly Machined)

HBKTS8
HBKTSB8
(Black Anodize)

Part Number	Perpendicularity K
HBKTST8	0.03
HBKTS8	0.06
HBKTSB8 (Black Anodize)	



There is a protrusion on the bracket bottom which fits into the aluminum frame extrusion groove.



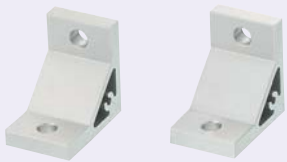
Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKTST8	65.8	CBM8-20	2	HNTT8-8	2	2058		
HBKTS8								
HBKTSB8* (Black Anodize)								

* For repairing black anodizing, refer to **P.748**

Features: Aluminum Extruded Brackets. Good appearance designed to prevent dust build up.

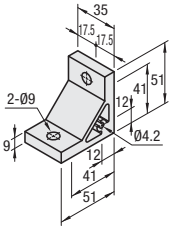
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTS8-45	EN AC-51400/ AlMgSi0,7	Anodize
CHBLTS8-45		Clear Coating (Anodize + Clear Coating) + Clear Coating)

HBLTS8-45
CHBLTS8-45
(Clear Coating)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTS8-45	80	CBM8-20	2	HNTT8-8	2	2058		
CHBLTS8-45 (Clear Coating)								

Features: Extruded Brackets with Unequal Sides. Effective when strength is required in narrow clearances between extrusions.

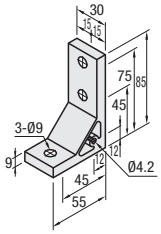
Scalene Brackets

RoHS



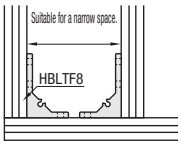
Type	Material	Surface Treatment
HBLTF8	EN AC-51400/AlMgSi0,7	Anodize

HBLTF8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTF8	90	CBM8-20	3	HNTT8-8	3	2572		

ex Example



■Features: Numbers of screws are the same as HBLTS8-45. Extrusions can be connected more securely.

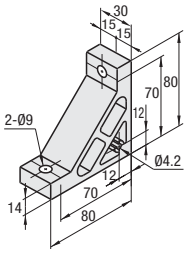
■Ultra Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLUS8	EN AC-51400/ AlMgSi0,7	Anodize
HBLUSB8		Black Anodize

HBLUS8
HBLUSB8
(Black Anodize)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUS8	151	CBM8-25	2	HNTT8-8	2	2058		
HBLUSB8* (Black Anodize)								

* For repairing black anodizing, refer to **P.748**

■Features: Numbers of screws are the same as HBKTS8. Extrusions can be connected more securely.

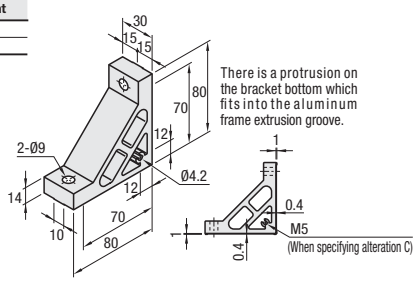
■Ultra Thick Brackets (With Tabs)

RoHS



Type	M Material	S Surface Treatment
HBKUS8	EN AC-51400/ AlMgSi0,7	Anodize
HBKUSB8		Black Anodize

HBKUS8
HBKUSB8
(Black Anodize)



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBKUS8	151	CBM8-25	2	HNTT8-8	2	2058		
HBKUSB8* (Black Anodize)								

* For repairing black anodizing, refer to **P.748**

Order Example | Part Number: HBLUS8 | Days to Ship: 6 Days / 2 Days | P.87

Alterations | Part Number: HBLUS8 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) | HBLUS8 - SET

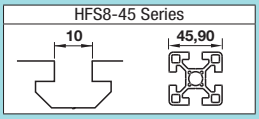
Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P.644**) 	HBLTS8-45	0,30
			CHBLTS8-45	0,50
			HBKTS8	0,30
			HBLTF8	0,30
			HBKUS8	0,30
			HBLUS8	0,30

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws · Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTS8-45 is specified, Code: SET · Screws: CBM8-20 · Nuts: HNTT8-8; SST: SCB8-20 · HNTTSN8-8; SEU: CBM8-20 · HNTU8-8; SSU: SCB8-20 · SHNTU8-8; SEP: CBM8-20 · HNTP8-8; SSP: SCB8-20 · SHNTP8-8; SEC: HCBST8-24 · HNTT8-8. ※When specifying other than HBLTS8-45, check for the applicable screws and nuts.		SET SST SEU SSU SEP SSP SEC
			HBLTS8-45	○ ○ ○ ○ ○ ○ ○
			CHBLTS8-45	○ ○ ○ ○ ○ ○ ○
			HBKTS8	○ ○ ○ ○ ○ ○ ○
			HBKTST8	○ ○ ○ ○ ○ ○ ○
			HBLTF8	○ ○ ○ ○ ○ ○ ○
			HBKUS8	○ ○ ○ ○ ○ ○ ○
			HBKUSB8	○ × ○ × ○ × ×
			HBLUS8	○ ○ ○ ○ ○ ○ ○
			HBLUSB8	○ × ○ × ○ × ×

※Screws for black anodized parts are HCBMTB (Trivalent Chromate Black) **P.641**.
※When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 1-slot-

-Slot Type: HFS8-45 Series (Aluminum Frames 45 · 90 Square)-



CAD Data

Features: Extruded Brackets with twice as many screws. Extrusions can be connected more securely.

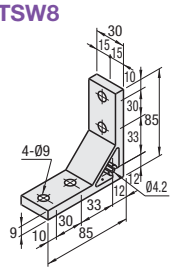
Thick Brackets

RoHS



Type	Material	Surface Treatment
HBLTSW8	EN AC-51 400/ AlMgSi0,7-T5	Anodize

HBLTSW8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTSW8	113	CBM8-20	4	HNTT8-8	4	3087		

Features: Extruded Brackets with twice as many screws. Extrusions can be connected more securely.

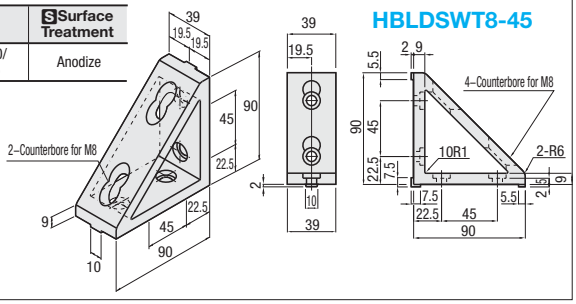
Triangle Brackets

RoHS



Type	Material	Surface Treatment
HBLDSWT8-45	EN AC-51 400/ AlMgSi0,7-T5	Anodize

HBLDSWT8-45



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLDSWT8-45	235	CBM8-15	4	HNTT8-8	4	3087		

Features: Brackets to connect Extrusions 45 · 30 square.

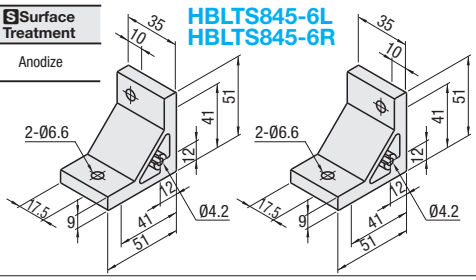
Assembly Brackets for Different Extrusion Sizes

RoHS



Type	Material	Surface Treatment
HBLTS845	EN AC-51 400/ AlMgSi0,7-T5	Anodize

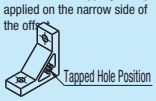
HBLTS845-6L
HBLTS845-6R



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTS845-6L	78	CBM6-20	1	HNTT8-6	1	-		
		CBM6-15		HNTT6-6				
HBLTS845-6R		CBM6-20		HNTT8-6				
		CBM6-15		HNTT6-6				

Order Example — Part Number: HBLTS845-6L — Days to Ship: 6 Days P.87

Alterations — Part Number: HBLTS845-6L - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) - SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw **P644** HCBM) *Tapping direction: For HBLTS845-6_, tapping is only applied on the narrow side of the off. 	HBLTSW8	0,30
			HBLTS845-6L*	0,93
			HBLTS845-6R*	

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Applicable Screws and Nuts come as a set.	SET (Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTSW8 is specified,		SET SST SEU SSU SEP SSP SEC
	SST (Stainless Steel)		HBLTSW8	
	SEU (Pre-Assy. Insertion Spring Nuts)		HBLTS845-6L*	
	SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel)		HBLTS845-6R*	
	SEP (Post-Assy. Insertion Spring Nuts)			
	SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)			
	SEC (Captured Washer Screws · Nuts)			

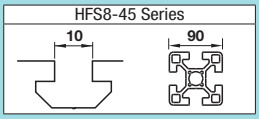
Code	Screws	Nuts
SET	CBM8-20	HNTT8-8
SST	SCB8-20	HNTTSN8-8
SEU	CBM8-20	HNTU8-8
SSU	SCB8-20	SHNTU8-8
SEP	CBM8-20	HNTP8-8
SSP	SCB8-20	SHNTP8-8
SEC	HCBST8-24	HNTT8-8

When specifying other than HBLTSW8, check for the applicable screws and nuts.

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -for 2 or more slots-

-Slot Type: HFS8-45 Series (Aluminum Frames 90 Square)-



CAD Data

Features: Extruded Brackets to connect Extrusions with 2-slots (HFS8-9090 etc.) with one bracket.

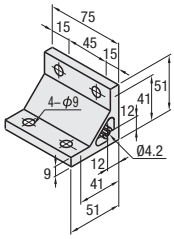
Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLTD8-45	EN AC-51 400/ AlMgSi0,7-T5	Anodize

HBLTD8-45



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTD8-45	163	CBM8-20	4	HNTT8-8	4	2940		

Features: Numbers of screws are the same as HBLTD8-45. Extrusions can be connected more securely.

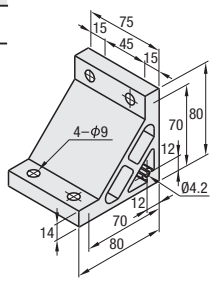
Ultra Thick Brackets

RoHS



Type	M Material	S Surface Treatment
HBLUD8-45	EN AC-51 400/ AlMgSi0,7-T5	Anodize

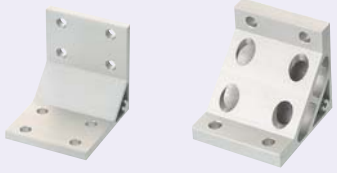
HBLUD8-45



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUD8-45	387	CBM8-25	4	HNTT8-8	4	3920		

Features: Brackets for 2-slots with twice as many screws. Extrusions can be connected more securely.

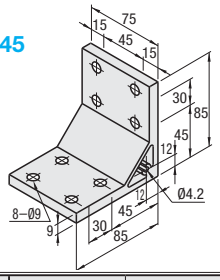
RoHS



Type	M Material	S Surface Treatment
HBLTDW8-45	EN AC-51 400/ AlMgSi0,7-T5	Anodize
HBLUDW8-45		

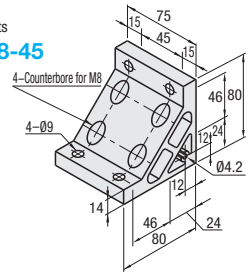
Thick Brackets

HBLTDW8-45



Ultra Thick Brackets

HBLUDW8-45



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTDW8-45	287	CBM8-20	8	HNTT8-8	8	4410		
HBLUDW8-45	359	CBM8-15 CBM8-25	4		8	5586		

Order Example: Part Number HBLTD8-45 — Days to Ship: 6 Days — P87

Alterations: Part Number HBLTD8-45 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM) 	HBLTD8-45	0,30
			HBLUD8-45	0,30
			HBLTDW8-45	0,30
			HBLUDW8-45	0,30

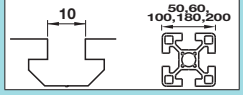
Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Pre-Assy. Insertion Spring Nuts) SEU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SSU (Post-Assy. Insertion Spring Nuts) SEP (Post-Assy. Insertion Spring Nuts Stainless Steel) SSP (Captured Washer Screws Nuts) SEC	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTD8-45 is specified, Code: SET — Screws: CBM8-20 — Nuts: HNTT8-8 SST — SCB8-20 — HNTTSN8-8 SEU — CBM8-20 — HNTU8-8 SSU — SCB8-20 — SHNTU8-8 SEP — CBM8-20 — HNTP8-8 SSP — SCB8-20 — SHNTP8-8 SEC — HCBST8-24 — HNTT8-8 When specifying other than HBLTD8-45, check for the applicable screws and nuts.	HBLTD8-45							
			HBLUD8-45							
			HBLTDW8-45							
			HBLUDW8-45							

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Extruded Brackets -For High Strength Extrusions-

-Slot Type: HFS8-45 Series (Aluminum Frames 50 · 60 · 100 · 180 · 200 Square)-

HFS8-45 Series



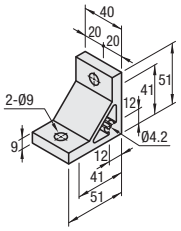
Features: Extruded Brackets to connect Extrusions 50 square.

RoHS



Type	M Material	S Surface Treatment
HBLTS8-50	EN AC-51400/AlMgSi0,7-T5	Anodize

For 50 Sq.
HBLTS8-50



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTS8-50	89	CBM8-20	2	HNTT8-8	2	2058		

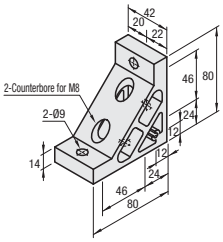
Features: Extruded Brackets for 50 square extrusions with twice as many screws.

RoHS



Type	M Material	S Surface Treatment
HBLUW8-50	EN AC-51400/AlMgSi0,7-T5	Anodize

For 50 Sq.
HBLUW8-50



Part Number	Mass (g)	Applicable Extrusion Series	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
			Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUW8-50	223	HFS8-5050	CBM8-15 CBM8-25	2	HNTT8-8	4	2793		

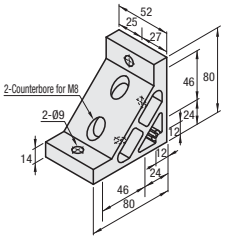
Features: Extruded Brackets to connect Extrusions 60 square.

RoHS



Type	M Material	S Surface Treatment
HBLUW8-60	EN AC-51400/AlMgSi0,7-T5	Anodize

For 60 Sq.
HBLUW8-60



Part Number	Mass (g)	Applicable Extrusion Series	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
			Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUW8-60	275	HFS8-6060	CBM8-15 CBM8-25	2	HNTT8-8	4	2793		

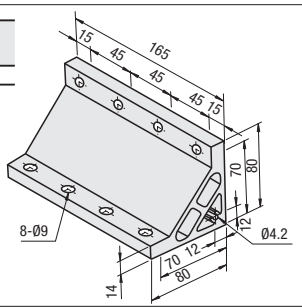
Features: Brackets to connect Extrusions with 4-slots (HFS8-45180 etc.) with one bracket.

RoHS



Type	M Material	S Surface Treatment
HBLUQ8-45	EN AC-51400/AlMgSi0,7-T5	Anodize

For 180 Sq.
HBLUQ8-45



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUQ8-45	846	CBM8-25	8	HNTT8-8	8	7056		

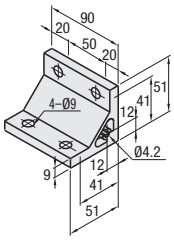
Features: Extruded Brackets for 2-slots (100 square).

RoHS



Type	M Material	S Surface Treatment
HBLTD8-100	EN AC-51400/AlMgSi0,7-T5	Anodize

For 100 Sq.
HBLTD8-100



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	Unit Price	Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLTD8-100	181	CBM8-20	4	HNTT8-8	4	2940		

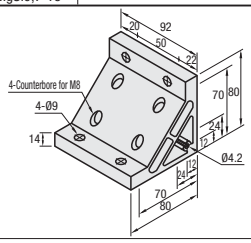
Features: Brackets for 100 square extrusions with twice as many screws.

RoHS

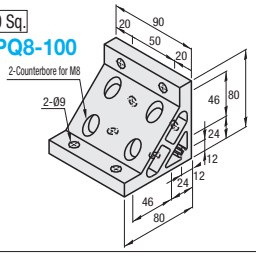


Type	M Material	S Surface Treatment
HBLUW8-100 HBLPQ8-100	EN AC-51400/ AlMgSi0,7-T5	Anodize

For 100 Sq.
HBLUW8-100



For 100 Sq.
HBLPQ8-100



Part Number	Mass (g)	Applicable Extrusion Series	Applicable Screw · T Nut				Allowable Load (N)	Unit Price	Volume Discount Rate
			Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLUW8-100	440	HFS8-50100	CBM8-15 CBM8-25	4	HNTT8-8	8	5586		
HBLPQ8-100	470	GFS8-50100	CBM8-15 CBM8-25						

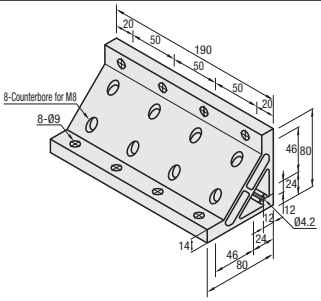
Features: Brackets for GFS8-100200.

RoHS



Type	M Material	S Surface Treatment
HBLPQ8-200	EN AC-51400/ AlMgSi0,7-T5	Anodize

For 200 Sq.
HBLPQ8-200



Part Number	Mass (g)	Applicable Extrusion Series	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
			Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLPQ8-200	910	GFS8-100200	CBM8-15 CBM8-25	8	HNTT8-8	16	11172		

Order Example — Part Number: HBLUW8-50

Days to Ship: 6 Days P87

Alterations — Part Number: HBLUW8-50 - (C · SET · SST · SEU · SSU · SEP · SSP · SEC) SET

Alterations	Code	Spec.	Applicable Brackets	Price Adder
Mounting Holes for Cover	C	Adds taps on a bracket for cover mounting. (M5 on Both Sides) (Mounting screw P.644 HCBM)	HBLTS8-50 HBLUW8-50 HBLUW8-60 HBLUQ8-45 HBLTD8-100 HBLUW8-100 HBLPQ8-100 HBLPQ8-200	30

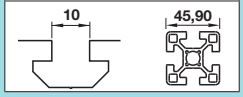
Alterations	Code	Spec.	Applicable Brackets	Price Adder						
				SET	SST	SEU	SSU	SEP	SSP	SEC
Applicable Screws and Nuts come as a set.	SET (Stainless Steel) SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel) SEC (Captured Washer Screws Nuts)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLTS8-50 is specified, Code: SET — Screws: CBM8-20 — Nuts: HNTT8-8 SST — SCB8-20 — HNTTSN8-8 SEU — CBM8-20 — HNTU8-8 SSU — SCB8-20 — SHNTU8-8 SEP — CBM8-20 — HNTP8-8 SSP — SCB8-20 — SHNTP8-8 SEC — HCBST8-24 — HNTT8-8 When specifying other than HBLTS8-50, check for the applicable screws and nuts.	HBLTS8-50							
			HBLUW8-50							
			HBLUW8-60							
			HBLUQ8-45							
			HBLTD8-100							
			HBLUW8-100							
			HBLPQ8-100							
			HBLPQ8-200							

When -SET, -SEU or -SEP is specified, it is not RoHS complaint.

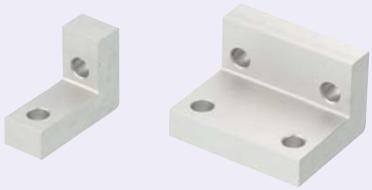
Brackets -Block Brackets · Brackets for Reinforcement-

-Slot Type: HFS8-45 Series (Aluminum Frames 45 · 90 Square)-

HFS8-45 Series

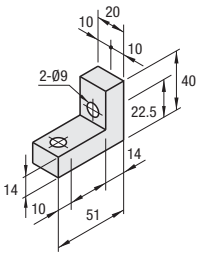


Features: The brackets do not protrude from extrusion widths when used to cross connect extrusions. Can be used in smaller spaces compared to the Tabbed Reversal Brackets.

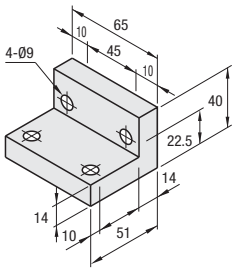


Type	Material	Surface Treatment
HBLSS8-45 HBLSD8-45	EN AC-51 400/AlMgSi0,7-T5	Anodize

Thin Brackets
HBLSS8-45



Thin Brackets
HBLSD8-45



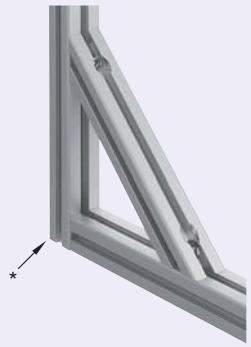
Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	€ Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBLSS8-45	52	CBM8-25	2	HNTT8-8	2	1666		
HBLSD8-45	175		4		4	2352		

Order Example — Part Number: HBLSS8-45

Days to Ship: 6 Days / 2 Days P.87

Features: Reinforcement Brackets machined from extrusions. Usable on locations needing more strength after connecting with brackets.

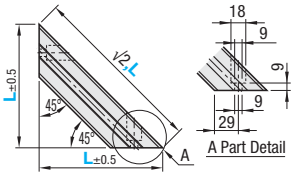
Brackets for Reinforcement

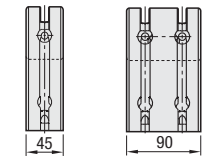


*For * part, fix with other brackets.
M Material: EN AW-6061/EN AW-AlMg1SiCu-T6 Equivalent
S Surface Treatment: Anodize
(No surface treatment on 45 ° cut ends and counterbores.)

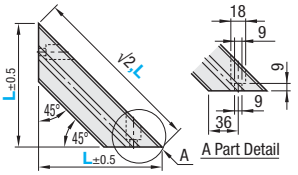
Type	Material	Surface Treatment
GFBL8-4545 GFBL8-4590 GFBL8-5050 GFBL8-50100	EN AW-6061/EN AW-AlMg1SiCu-T6 Equivalent	Anodize

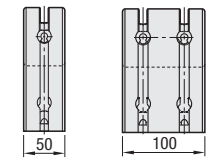
GFBL8-4545
GFBL8-4590





GFBL8-5050
GFBL8-50100





Use Captured Washer Screw (HCBST8-20) for connecting to extrusions.

Part Number		L	Applicable Screw · Nut				L100~300		L301~500	
Type	No.	1mm Increment	Screw	Qty.	Nuts	Qty.	€ Unit Price	€ Volume Discount Rate	€ Unit Price	€ Volume Discount Rate
							1~4 pcs.	5~20	1~4 pcs.	5~20
GFBL8	4545	100~500	HCBST8-20	2	HNTT8-8	2				
	4590			4		4				
	5050			2		2				
	50100			4		4				

Alterations — Part Number: HBLSS8-45 - (SET · SST · SEU · SSU · SEP · SSP) SET

Order Example — Part Number: GFBL8-4545 - L: 300

Days to Ship: 8 Days / 8 Days

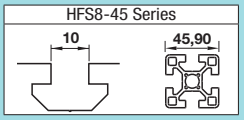
Alterations	Code	Spec.	Applicable Brackets	€ Price Adder					
				SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) When HBLSS is specified, <When SET is specified> Screws: CBM8-25, Nuts: HNTT8-8 <When SST is specified> Screws: SCB8-25, Nuts: HNTTSN8-8 <When SEU is specified> Screws: CBM8-25, Nuts: HNTU8-8 <When SSU is specified> Screws: SCB8-25, Nuts: SHNTU8-8 <When SEP is specified> Screws: CBM8-25, Nuts: HNTP8-8 <When SSP is specified> Screws: SCB8-25, Nuts: SHNTP8-8	HBLSS8-45	1,15	1,15	1,41	1,97	1,41	1,55
			HBLSD8-45	2,30	2,33	2,82	3,97	2,82	3,13
			GFBL8-4545	2,40	-	2,66	-	2,66	-
			GFBL8-4590	2,84	-	3,36	-	3,36	-
			GFBL8-5050	2,40	-	2,66	-	2,66	-
			GFBL8-50100	2,84	-	3,36	-	3,36	-

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

Brackets -Thin Brackets-

-Slot Type: HFS8-45 Series (Aluminum Frames 45 · 90 Square)-

HFS8-45 Series



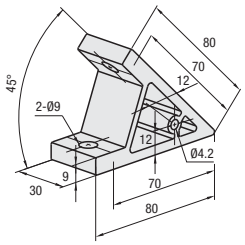
Features: Brackets to connect extrusions at angles.

RoHS

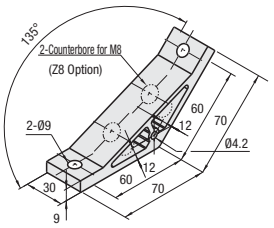


Type	Material	Surface Treatment
HBL45TS8 HBL135TS8	EN AC-51 400/AlMgSi0,7-T5	Anodize

HBL45TS8

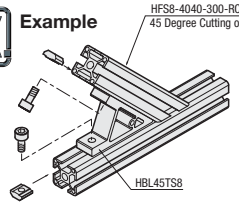


HBL135TS8



Part Number	Mass (g)	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	€ Volume Discount Rate
		Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HBL45TS8	88	CBM8-20	2	HNTT8-8	2	2058		
HBL135TS8	103							

Example



Order Example

Part Number
HBL45TS8

Days to Ship

6 Days P.87 2 Days

Alterations

Part Number - (C · SET · SST · SEU · SSU · SEP · SSP · Z8)

HBL135TS8 - SET

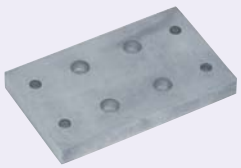
Alterations	Code	Spec.	Applicable Brackets	€ Price Adder
Mounting Holes for Cover	C	Adds a tap for a bracket for cover mounting. (M5 on Both Sides, Depth 15mm) (Mounting screw P.644 HCBM)	HBL45TS8 HBL135TS8	0,30

Alterations	Code	Spec.	Applicable Brackets	€ Price Adder					
				SET	SST	SEU	SSU	SEP	SSP
Applicable Screws and Nuts come as a set.	SET SST (Stainless Steel) SEU (Pre-Assy. Insertion Spring Nuts) SSU (Pre-Assy. Insertion Spring Nuts Stainless Steel) SEP (Post-Assy. Insertion Spring Nuts) SSP (Post-Assy. Insertion Spring Nuts Stainless Steel)	Supplies a set of applicable screws and nuts for fixing the bracket to a extrusion. (Adds to the bracket price) (Ex.) ‹When SET is specified› Bolt: CBM8-25 Nut: HNTT8-8 ‹When SST is specified› Bolt: SCB8-25 Nut: HNTTSN8-8 ‹When SEU is specified› Bolt: CBM8-25 Nut: HNTU8-8 ‹When SSU is specified› Bolt: SCB8-25 Nut: SHNTU8-8 ‹When SEP is specified› Bolt: CBM8-25 Nut: HNTP8-8 ‹When SSP is specified› Bolt: SCB8-25 Nut: SHNTP8-8	HBL45TS8	1,12	1,20	1,38	2,02	1,38	1,60
			HBL135TS8	1,12	1,20	1,38	2,02	1,38	1,60
Machines 2 counterbored holes on 135 degree bracket HBL135T_5. Counterboring	Z8	Machines 2 counterbored holes on 135 degree bracket HBL135T_5. 2 Counterbore holes for HBL135TS8 (Applicable screw: M8) 8 Days ⊗Combination with SET and SST is not available.	HBL135TS8	1,60					

When -SET, -SEU or -SEP is specified, it is not RoHS compliant.

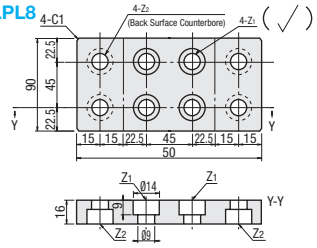
Features: Direct bolt-on brackets to use on tapped extrusions.

Plate Brackets RoHS

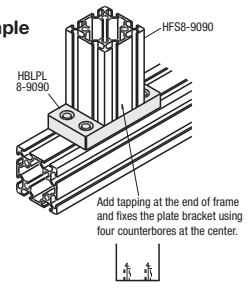


Type	Material	Surface Treatment
HBLPL8	1.0038/S235JR	Electroless Nickel Plating

HBLPL8



Example



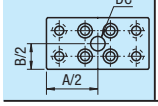
Alterations

Part Number - Extrusions - (DC)

HBLPL8 - 9090 - DC20

10 Days

Part Number / Type	Extrusions	Applicable Screw Z_1	Applicable Screw Z_2	Mass (g)	€ Unit Price 1~9 pcs.	€ Volume Discount Rate 10~
HBLPL8	9090	M8	M8	1,490		

Alteration	Code	Spec.	€ Price Adder
Through Hole 	DC	Add a through hole. DC=Hole Dia. 1 mm Increment 10≤DC≤20 Ordering Code DC12	6,00

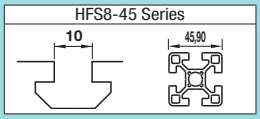
Days to Ship 8 Days

Order Example

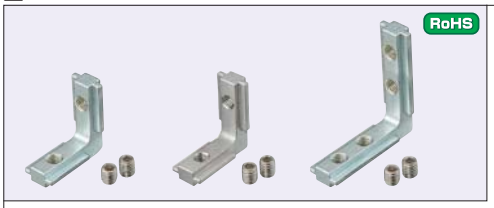
Part Number	-	Extrusions
HBLPL8	-	9090

Brackets – Blind Brackets · Free Angle Brackets

-Slot Type: HFS8-45 Series (Aluminum Frames 45 · 90 Square)-

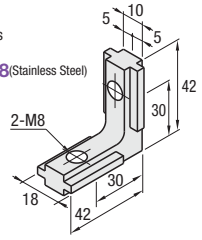


Features: No need for alterations to hide brackets inside of the slot.

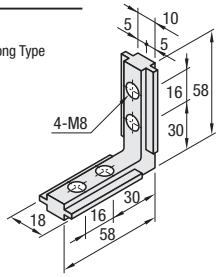


Type	Material	Surface Treatment
HBLBS8	1.1191/C45E	Trivalent Chromate
HBLBSL8		
SHBLBS8	1.4308/G-X6CrNi18-9	-

Blind Brackets
HBLBS8
SHBLBS8(Stainless Steel)



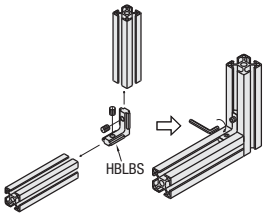
Blind Brackets · Long Type
HBLBSL8



Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.		1~99 pcs.	100~
HBLBS8	70	Set Screw M8 x 10	2	1274		
SHBLBS8						
HBLBSL8	87		4	1554		

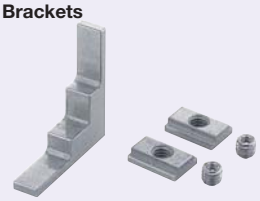
Example

How to Use Blind Brackets



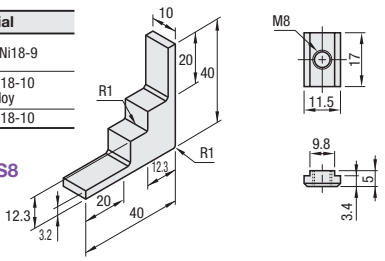
Features: Blind Brackets Post Assy. Insertion Type.

Post-Assembly Insertion Blind Brackets



Type	Components	Material
HABLBS8	Post-Assembly Insertion BB Body	1.4308/G-X6CrNi18-9
	Post-Assembly Insertion BB Nut	1.4301/X5CrNi18-10 Sintered Alloy
	Set Screw	1.4301/X5CrNi18-10

HABLBS8

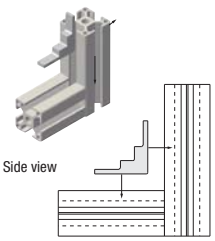


Part Number	Mass (g)	Included Screw		Allowable Load (N)	€ Unit Price	Volume Discount Rate
		Screw	Qty.		1~99 pcs.	100~
HABLBS8	47	Nut · Set Screw M8x6	2	700		

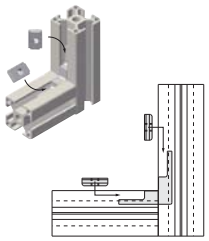
Example

How to Use Post-Assembly Insertion Blind Brackets

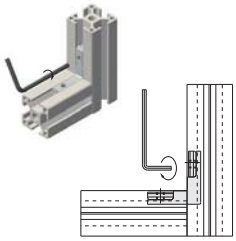
(1)Fit the post-assy. insertion BB body in the slot of extrusions.



(2)Tilt two pieces of post-assy. insertion nut and fit them in both ends of post-assembly insertion BB body.



(3)Fix post-assy. insertion BB body and post-assy. insertion BB nuts with set screws.

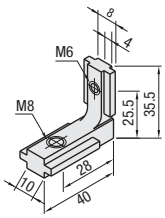


Features: Blind Brackets to connect Extrusions 45 / 30 square.



Type	Material	Surface Treatment
HBLBS8-6	1.1191/C45E	Trivalent Chromate

For 40-30 square connection
HBLBS8-6



Part Number	Mass (g)	Connectable Extrusion Series	Included Set Screw	€ Unit Price	Volume Discount Rate
				1~99 pcs.	100~
HBLBS8-6	50	HFS8 and HFS6 HFS8-45 and HFS6	M6x8 1 pc. M8x10 1pc.		

Order Example

Part Number
HBLBS8

Days to Ship

6 Days P.87 2 Days

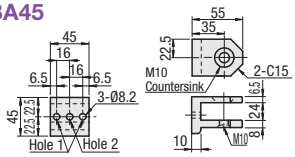
Features: Extrusions can be connected at any arbitrary angle.

Free Angle Brackets RoHS

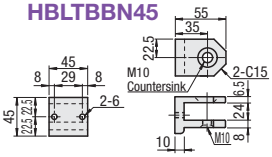


Type	M Material	S Surface Treatment
HBLTBA45 HBLTBBN45 HBLTBC45 HBLTBD45	EN AC-51400/ AlMgSi0,7-SS-T5	Anodize
Included Screws	1.7220/34CrMo4	Trivalent Chromate

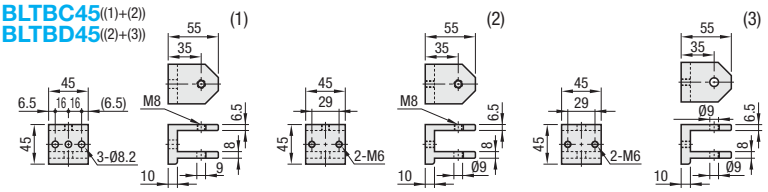
HBLTBA45



HBLTBBN45



HBLTBC45((1)+(2)) HBLTBD45((2)+(3))



Part Number Type	No.	Applicable Extrusion	Mass (g)	Accessories	Qty.	€ Unit Price 1~14 pcs.	Volume Discount Rate 15~
HBLTBA	45	45 Square (HFS8-45)	113	M10x16	1		
HBLTBBN			116				
HBLTBC			299	CLDMC8-40-M	1		
HBLTBD			301				

Order Example — Part Number: HBLTBA45

Days to Ship: 6 Days P.87 — 2 Days

Example

Alterations

Part Number: HBLTBA45 - SET2; HBLTBBN45 - SET (SET · SET1 · SET2 · SET3 · SET4 · SET5)

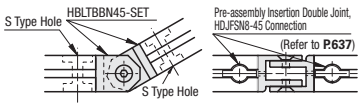
Alterations	Code	How to use	Part Number Type	No.	Accessories Screw	Qty.	Nuts · Pre-Assy. Insertion Double Joints	Qty.	Price Adder
Applicable Screws and Nuts come as a set.	SET		HBLTBBN	45	CBM6-35	2	HDJFSN8-45	1	2,15
	SET1	Use the hole 1.	HBLTBA		CBM6-20	2	HNTT8-8	2	1,20
	SET2	Use the hole 2.			CBM8-20	1	HNTT8-8	1	0,60
	SET3	Use the hole 1.	HBLTBC		CBM6-35	2	HDJFSN8-45	1	3,35
					CBM6-20	2	HNTT8-8	2	
	SET4	Use the hole 2.	HBLTBC		CBM6-35	2	HDJFSN8-45	1	2,75
					CBM8-20	1	HNTT8-8	1	
	SET5		HBLTBD		CBM6-35	4	HDJFSN8-45	2	4,30

When connecting with Pre-Assy. Insertion Double Joints, S type hole machining is required on extrusions. (Refer to P.598)

When -SET_ is specified, it is not RoHS compliant.

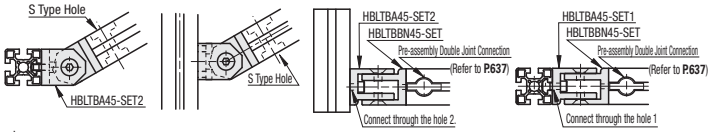
(1) Connection of Two End Sections

Two pieces of HBLTBBN are used to connect two end sections using Pre-Assy. Insertion Double Joints. Refer to (P.637)



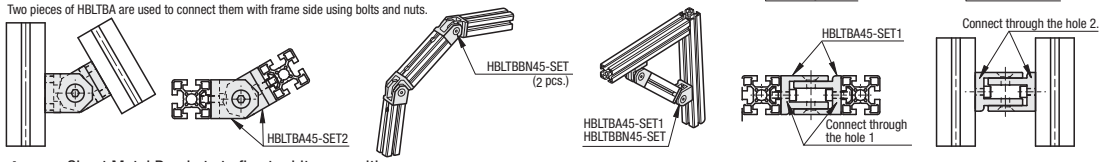
(2) Connection of Two Side Faces

One piece of HBLTBA and one piece of HBLTBBN are used to connect HBLTBA with the frame side face using a bolt and a nut, and to connect HBLTBBN with the frame end section using the pre-assembly double joint.



(3)Connection of Two Side Faces

Two pieces of HBLTBA are used to connect them with frame side using bolts and nuts.



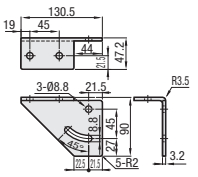
Features: Sheet Metal Brackets to fix at arbitrary positions.

Free Angle Sheet Metal Brackets RoHS

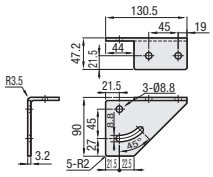


Type	M Material	S Surface Treatment
HBLBS8-6	1.1191/C45E	Trivalent Chromate

HBLPBL8-45



HBLPBR8-45



Part Number Type	No.	Applicable Extrusion	Applicable Screw · Nut Hexagon Socket Head Cap Screws with Coptured Washers	Qty.	Nuts	Qty.	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HBLPBL HBLPBR	8-45	45 Square (HFS8-45)	CBST8-15	4	HNTT8-8	4		

Order Example — Part Number: HBLPBL8-45

Days to Ship: 6 Days P.87 — 2 Days

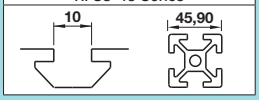
Alterations — Part Number: HBLPBL8-45 - SET (SET · SET1)



Alterations	Code	Spec.	Applicable Brackets	Price Adder
Set of Applicable Bolts and Nuts	SET	Supplies a set of applicable bolts and nuts for fixing the bracket to a extrusion.	HBLPBL8-45 HBLPBR8-45	3,80
Set with applicable bolts, nuts and clamp levers	SET1	Applicable Bolts 3 pcs. Clamp Lever (LNP) 1 Pc. Flat Washer (PWF) 1 Pc. Applicable Nuts 4 Pcs. Set with the above items.	HBLPBL8-45 HBLPBR8-45	8,20

Sheet Metal
-HFS8-45 Series-

HFS8-45 Series



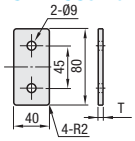
Features: Can be used for reinforcement of aluminum extrusions.

RoHS (P) Not RoHS compliant

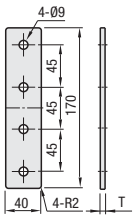


Type	M Material	S Surface Treatment
HPTSS	1.0320/St.22	Carbon Steel Bright Chromate Plating
HPTSSL		
HPTSD8-45		
HPTSD8-50		Trivalent Chromate
SHPTSS	1.4301/ X5CrNi18-10	-
SHPTSSL		
SHPTSD		

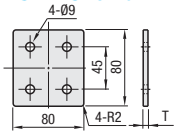
HPTSS8-45
SHPTSS8-45



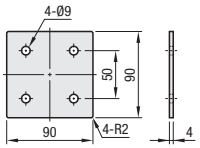
HPTSSL8-45
SHPTSSL8-45



HPTSD8-45
SHPTSD8-45



HPTSD8-50



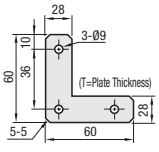
Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTSS8-45	80	3.2	M8-15	2	M8	2		
SHPTSS8-45		3						
HPTSSL8-45	160	3.2		4		4		
SHPTSSL8-45		3						
HPTSD8-45	150	3.2						
SHPTSD8-45		3						
HPTSD8-50	202	3.2						

RoHS (P) Not RoHS compliant

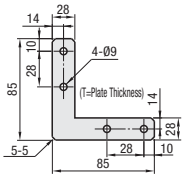


Type	M Material	S Surface Treatment
HPTLN	1.0320/St.22	Trivalent Chromate
HPTLS		Carbon Steel Bright Chromate Plating
HPTLD8-45		
HPTLD8-50		Trivalent Chromate
SHPTLN	1.4301/ X5CrNi18-10	-
SHPTLS		

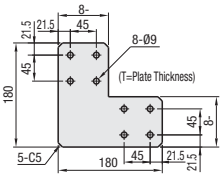
HPTLN8 (Trivalent Chromate)
SHPTLN8



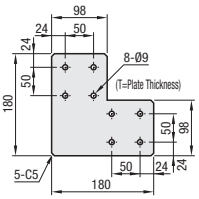
HPTLS8
SHPTLS8



HPTLD8-45



HPTLD8-50



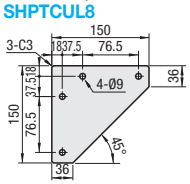
Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTLN8*	50	3.2	M8-15	3	M8	3		
SHPTLN8*		3						
HPTLS8*	89	3.2		4		4		
SHPTLS8*		3		4		4		
HPTLD8-45	535	3.2		8		8		
HPTLD8-50	569	3.2						

RoHS

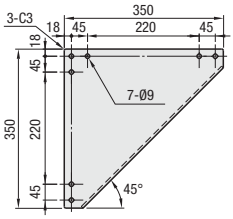


Type	M Material	S Surface Treatment
HPTCUL	1.0320/St.22	Trivalent Chromate
HPTUL		
HPTWUL		
SHPTCUL	1.4301	-

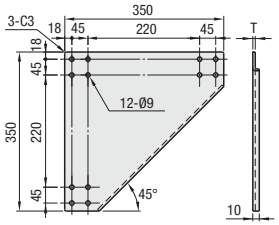
HPTCUL8 (Trivalent Chromate)
SHPTCUL8



HPTUL8-45 (Trivalent Chromate)



HPTWUL8-45 (Trivalent Chromate)



Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTCUL8*	360	3.2	M8-15	4	M8	4		
SHPTCUL8*		3		4		4		
HPTUL8-45	1760	3.2		7		7		
HPTWUL8-45	1758			12		12		

Alteration

Part Number - (SET)
HPTSS8-45 - SET

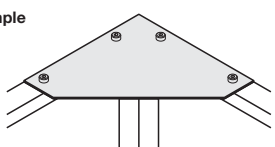
(P) When -SET is specified, it is not RoHS compliant.

Alteration	Code	Spec.		Part Number	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.		HPTSS8-45	1,20
				SHPTSS8-45	1,35
				HPTSSL8-45	2,40
				SHPTSSL8-45	2,70
				HPTSD8-45	2,40
				HPTSD8-50	2,40
				SHPTSD8-45	2,70
		Materials	Set	HPTLN8*	1,80
		1.0320/St.22	Screws: CBM	SHPTLN8*	2,00
			Nuts: HNTT	HPTLS8*	2,40
		1.4301/ X5CrNi18-10	Screws: SCB	SHPTLS8*	2,70
			Nuts: HNTTSN	HPTLD8-45	4,80
				HPTLD8-50	4,80
				HPTCUL8*	2,40
				SHPTCUL8*	2,70
				HPTUL8-45	4,20
				HPTWUL8-45	5,25

Order Example — Part Number: HPTSS8-45

Days to Ship — 6 Days P.87

Example



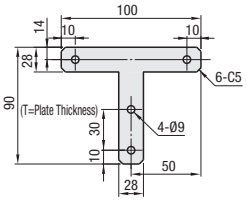
(P) 8* is in common with 8-45.

RoHS Not RoHS compliant

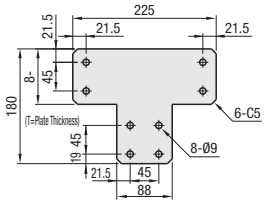


Type	Material	Surface Treatment
HPTTS HPTTD HPTPS	1.0320/St.22	Carbon Steel Bright Chromate Plating
SHPTTS	1.4301	-

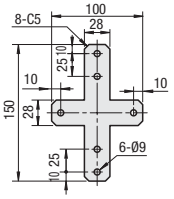
HPTTS8
SHPTTS8



HPTTD8-45

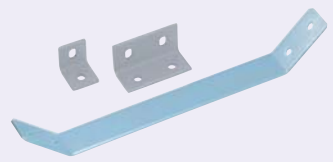


HPTPS8



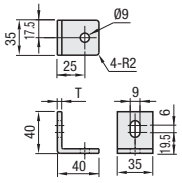
Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTTS8*	103	3.2	M8-15	4	M8	4		
SHPTTS8*		3		4		4		
HPTTD8-45	633	3.2		8		8		
HPTPS8*	135	3.2		6		6		

RoHS Not RoHS compliant

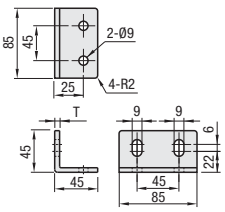


Type	Material	Surface Treatment
HPTBS HPTGS	1.0320/St.22	Carbon Steel Bright Chromate Plating
SHPTBS SHPTBD	1.4301/ X5CrNi18-10	-

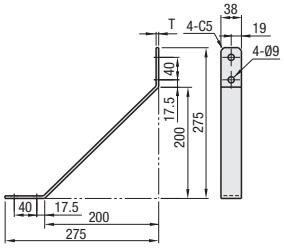
HPTBS8
SHPTBS8



SHPTBD8-45



HPTGS8



Part Number	Mass g	T	Applicable Screw · Nut				€ Unit Price	Volume Discount Rate
			Screw	Qty.	Nuts	Qty.	1~99 pcs.	100~
HPTBS8*	83	4.5	M8-15	2	M8	2		
SHPTBS8*		4						
SHPTBD8-45	234	4		4		4		
HPTGS8*	560	4.5		4		4		

Alteration

Part Number - (SET)
SHPTBD8-45 - SET

Alteration	Code	Spec.		Part Number	Price Adder
Applicable Screws and Nuts come as a set.	SET	Applicable screws and nuts for mounting each plate on extrusions come in a set.		HPTTS8*	2,40
				SHPTTS8*	2,70
		Materials	Set	HPTTD8-45	4,80
		1.0320/St.22	Screws: CBM	HPTPS8*	2,40
			Nuts: HNTT	HPTBS8*	1,10
		1.4301/ X5CrNi18-10	Screws: SCB	SHPTBS8*	1,35
			Nuts: HNTTSN	SHPTBD8-45	2,70
				HPTGS8*	2,40

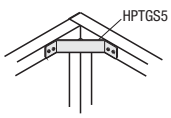
Order Example

Part Number
SHPTBD8-45

Days to Ship

6 Days P.87

Example

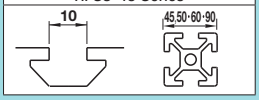


8* is in common with 8-45.

Pre-Assy. Insertion Nuts · Stoppers for Aluminum Frames - Standard

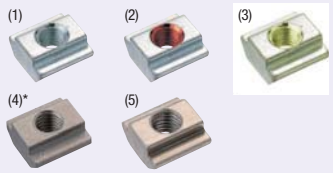
-For HFS8-45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-

HFS8-45 Series



CAD Data

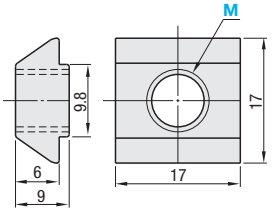
■Pre-Assembly Insertion Nuts RoHS



HNTT8 (1.0301/C10 Equivalent)
HNTTV8 (Thread Locking Adhesive · 1.0301/C10 Equivalent)
HNTTZ8 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
HNTTSN8 (1.4401/X5Cr5NiMo17-12-2 Equivalent, Sintering)
HNTTSS8 (1.4305/X10CrNiS18-9)

Type	M Material	S Surface Treatment
(1)HNTT8	1.0301/C10 Equivalent	Trivalent Chromate
(2)HNTTV8		
(3)HNTTZ8		
(4)HNTTSN8*	1.4401/X5Cr5NiMo17-12-2 Equivalent (Sintering)	-
(5)HNTTSS8	1.4305/X10CrNiS18-9	

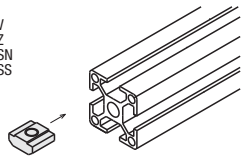
* Electrically conductive



Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent 1.4401/ X5Cr5NiMo17-12-2 Equivalent (Sintering) 1.4305/X10CrNiS18-9
8	23.5

EX

•Pre-Assembly Insertion Nuts
Aluminum Frames
Nuts are pre-inserted in the aluminum extrusion.
HNTU
HNTUV
HNTUZ
SHNTU
HNTT
HNTTV
HNTTZ
HNTTSN
HNTTSS
HNTM



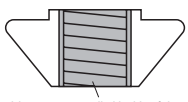
Part Number	M	Unit Price	Volume Discount Rate		
		1~499 pcs.	500~749	750~999	1000~
HNTT8 (1.0301/C10 Equivalent)	4 5 6 8				
HNTTV8 (Thread Locking · 1.0301/C10 Equivalent)	8				
HNTTZ8 (Thread Locking · 1.0301/C10 Equivalent)	8				
HNTTSN8 (1.4401/X5Cr5NiMo17-12-2 Equivalent · Sintering)	4 5 6 8				
HNTTSS8 (1.4305/X10CrNiS18-9)	8				

Order Example: Part Number - M → HNTT8 - 8

Days to Ship: 6 Days P.87

Bulk-packages are cost effective for in-house stock and large qty. uses. (**P.508**)

■Thread Locking Type



It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.
Thread Locking Adhesive is ---- A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.
Resin Coating ---------- Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

■Effect of Thread Locker (Reference)

Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

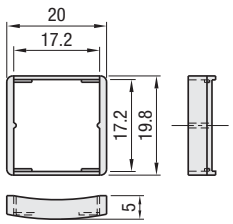
	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	17.9N • m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	25.6N • m	Test Conditions Measured value (HNTTV8-8) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 23.5N • m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	21.8N • m	Thread locking effect decreases after repeated use. 5th loosening torque: 20.3N • m Measurement at HNTTZ8-8

■Pre-Assembly Insertion Stoppers RoHS

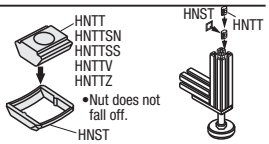
HNST8-45



M Material: Polyamide



EX



•Pre-assy. insertion nut is held temporarily in the extrusion.
•Nut does not fall off.

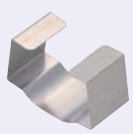
Part Number	Applicable Pre-Assembly Insertion Nuts	Color	€ Unit Price	Volume Discount Rate	
			1~499 pcs.	500~999	1000~
HNST8-45	HNTT8 HNTTV8 HNTTZ HNTTSN8 HNTTSS8	Gray			

Order Example: Part Number → HNST8-45

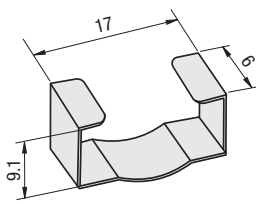
Days to Ship: 6 Days P.87

■Pre-Assembly Insertion Metal Stoppers RoHS

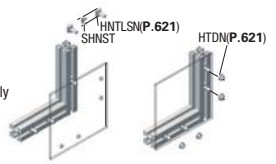
SHNST8



M Material: 1.4319/X3CrNiN17-8



EX



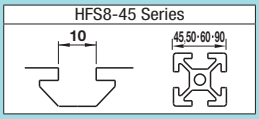
*Can also be used with Pre-Assembly Insertion Bolts.

Part Number	Applicable Pre-Assembly Insertion Nuts	€ Unit Price	Volume Discount Rate	
		1~499 pcs.	500~999	1000~
SHNST8	HNTT8 HNTTV8 HNTTZ HNTTSN8 HNTTSS8			

Order Example: Part Number → SHNST8

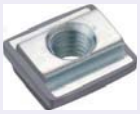
Days to Ship: 6 Days P.87

Pre-Assy. Insertion Nuts · Stoppers for Aluminum Frames
With Temporary Holding Function -Stopper Integrated Nuts · Spring Nuts-
-For HFS8-45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-



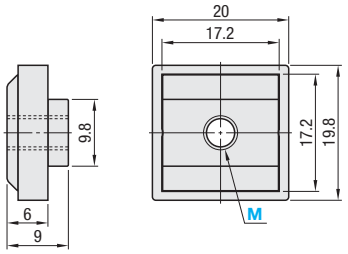
CAD Data

■Stopper Integrated Nuts RoHS



M Material: Body: 1.0301/C10 Equivalent
Stopper: Polyamide
S Surface Treatment: Trivalent Chromate

HNTE8-45



Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent
8	23.5

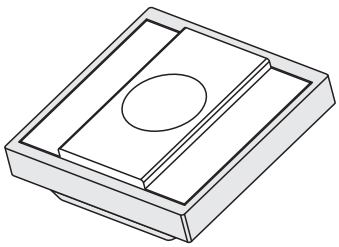
Part Number	M	€ Unit Price	Volume Discount Rate		
		1~499 pcs.	500~749	750~999	1000~
HNTE8-45	4 5 6 8				

Order Example

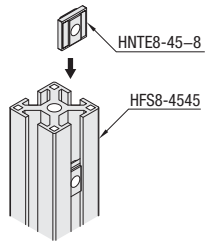
Part Number	-	M
HNTE8-45	-	8

Days to Ship: 6 Days P.87

Example

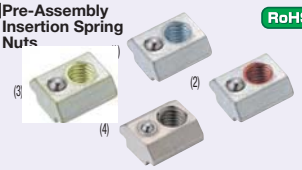


Integrated Pre-Assembly Insertion Nuts and Stoppers.



The nuts do not slip off even inserted into the vertically-placed extrusions.

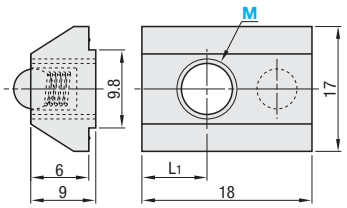
■Pre-Assembly Insertion Spring Nuts RoHS



HNTU8 (1.0301/C10)
HNTUV8 (Thread Locking Adhesive · 1.0301/C10 Equivalent)
HNTUZ8 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
SHNTU8 (1.4301/X5CrNi18-10)

Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent · 1.4301/X5CrNi18-10 Equivalent (Sintering)
8	23.5

Type	Materials			
	Body	Ball	Springs	S Surface Treatment
(1)HNTU8	1.0301/C10 Equivalent	1.4301/X5CrNi18-10	JIS SWP-A	Trivalent Chromate
(2)HNTUV8				
(3)HNTUZ8				
(4)SHNTU8	1.4301/X5CrNi18-10 Equivalent	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10-WP8	-



Part Number	M	L1	€ Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTU8 (1.0301/C10 Equivalent)	4 5 6 8	6				
HNTUV8 (Thread Locking · 1.0301/C10 Equivalent)	8					
HNTUZ8 (Thread Locking · 1.0301/C10 Equivalent)	8					
SHNTU8 (1.4301/X5CrNi18-10 Equivalent)	4 5 6 8	5.5				

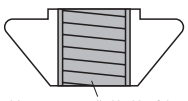
Order Example

Part Number	-	M
HNTU8	-	8

Days to Ship: 6 Days P.87

Bulk-packages are cost effective for in-house stock and large qty. uses. (P.508)

■Thread Locking Type



Anti-loose agent applied inside of the tap

It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.

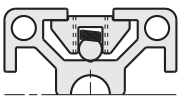
Thread Locking Adhesive is ----A microencapsulated anaerobic adhesive prevents thread loosening.
Note that it requires a hardening time (72 hours at room temperature 25°C).
The adhesive property is lost once loosened.

Resin Coating ----------Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

Example

• Does not fall even if a extrusion is placed vertically.

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.



■Effect of Thread Locker (Reference)

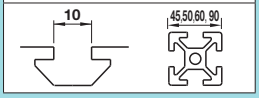
	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	17.9N • m	-
Thread Locking Adhesive Type	- Prevents loosening effectively. - Thread locking properties are lost once loosened. - Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	25.6N • m	Test Conditions Measured value (HNTTV8-8) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 23.5N • m.
Thread Locking Resin Coating Type	- Can be used repeatedly. (Thread locking effect decreases after repeated use.) - Thread locking effect is immediately seen right after tightening.	21.8N • m	Thread locking effect decreases after repeated use. 5th loosening torque: 20.3N • m Measurement at HNTTZ8-8

Add. Spec.

Pre-Assembly Insertion Nuts for Aluminum Frames · Stoppers Others

-For HFS8-45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-

HFS8-45 Series



CAD Data

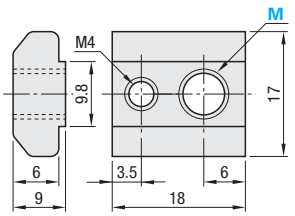
■Pre-Assembly Insertion Lock RoHS



M Material: 1.0301 Equivalent
S Surface Treatment: Trivalent Chromate

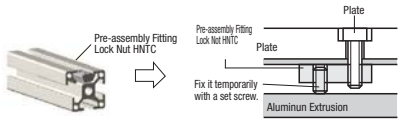
HNTC8

Reference Tightening Torque (N · m)	
M	1.0301 Equivalent
8	23.5



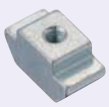
Example

•Pre-Assembly Insertion Lock Nuts
The position of post-assy. insertion lock nuts can be held temporarily with the set screw.



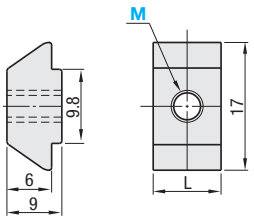
Part Number	M	Accessory	€Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTC8	8	M4 Set screw 1 pc.				

■Pre-Assembly Insertion Short Nuts RoHS



M Material: 1.0301 Equivalent
S Surface Treatment: Trivalent Chromate

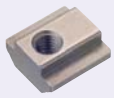
HNTJ8



•Overall length is shorter than Pre-Assy. Insertion Nuts HNTT. Suitable for installing sensors or other components closely in combination.
•Stopper is not included.

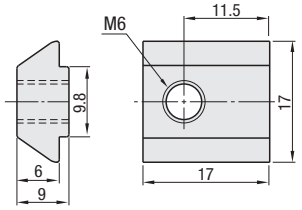
Part Number	M	L	€Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTJ8	3 4	8				
	8	12				

■Pre-Assy. Insertion Eccentric Nuts RoHS



* Electrically conductive
M Material: 1.4401 Equivalent (Sintering)

HNTHSN8



•The pre-assy. insertion offset nut, used in combination with a post-assy. insertion double joint, can be fixed in such a way that the nut, even if connected at the corner of the extrusion, does not protrude from the extrusion (frame).

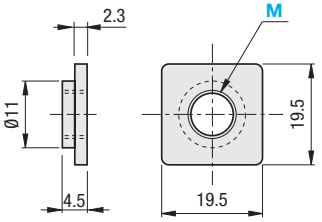
Part Number	€Unit Price	Volume Discount Rate
	1~99 pcs.	100~
HNTHSN8		

■Pre-Assembly Insertion Square Nuts RoHS

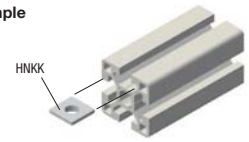


100 pcs. per package
Insert it into the extrusion upside down.
M Material: 1.0330
S Surface Treatment: Trivalent Chromate

HNKK8



Example



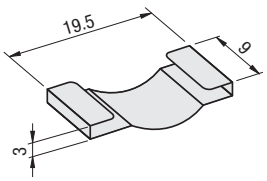
Part Number	M	€Unit Price	Volume Discount Rate	
		1~9 package	10~19	20~29
HNKK8	4 5 6 8			

■Metal Stoppers for Pre-Assembly Insertion Square Nuts RoHS



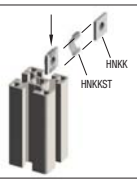
M Material: 1.4319

HNKKST8



100 pcs. per package

Example



Part Number	Applicable Pre-Assembly Insertion Nuts	€Unit Price	Volume Discount Rate	
		1~9 package	10~19	20~29
HNKKST8	HNKK8			

Order Example

Part Number	-	M
HNTC8	-	8
HNTJ8	-	8
HNTHSN8		
HNKK8	-	8
HNKKST8		

- Applicable Extrusions and Brackets
Applicable to extrusions and brackets with the same type number.

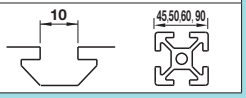
(Ex.)
Pre-Assy. Insertion Nut — HNTT6-_
Pre-Assembly Insertion Stoppers — HNST6
Extrusions — HFS6-_ _ _ _
Brackets — HBLFSN6

Days to Ship: 6 Days P87 2 Days

Post-Assembly Insertion Nuts for Aluminum Frames · Stoppers Standard

-For HFS8-45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-

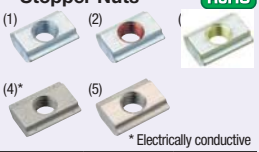
HFS8-45 Series



CAD Data

Post-Assembly Insertion Stopper Nuts

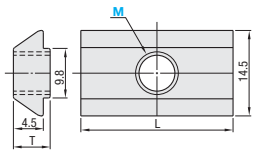
RoHS



* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTA8	1.0301 Equivalent	Trivalent Chromate
(2)HNTAV8		
(3)HNTAZ8		
(4)HNTFSN8*	1.4401 Equivalent (Sintering)	-
(5)HNTASS8	1.4305	-

HNTA8 (1.0301 Equivalent)
HNTAV8 (Thread Locking Adhesive · 1.0301 Equivalent)
HNTAZ8 (Thread Locking Resin Coating · 1.0301 Equivalent)
HNTASN8 (1.4401 Equivalent)
HNTASS8 (1.4305)



Reference Tightening Torque (N · m)	
M	1.0301 Equivalent · 1.4401 Equivalent (Sintering) · 1.4305
8	23.5

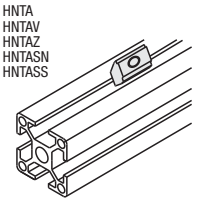
Details of Thread Locking Type P.619

Part Number Type	M	T	€Unit Price 1~499 pcs.	Volume Discount Rate 500~749	750~999	1000~
HNTA8 (1.0301 Equivalent)	4 5 6	6.5				
	8					
HNTAV8 (Thread Locking · 1.0301 Equivalent)	8					
HNTAZ8 (Thread Locking · 1.0301 Equivalent)	8					
HNTASN8 (1.4401 Equivalent, Sintering)	4 5 6 8	6.0				
HNTASS8 (1.4305)	8	6.5				

Bulk-packages are cost effective for in-house stock and large qty. uses. (P.508)

Example

•Post-Assembly Insertion Stopper Nuts

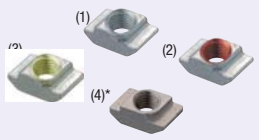


Order Example: Part Number - M → HNTA8 - 8

Days to Ship: 6 Days P.87 2 Days

Post-Assembly Insertion Nuts

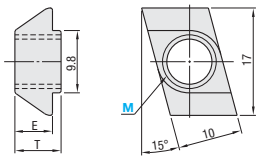
RoHS



* Electrically conductive

Type	M Material	S Surface Treatment
(1)HNTF8	1.0301 Equivalent	Trivalent Chromate
(2)HNTFV8		
(3)HNTFZ8		
(4)HNTFSN8*	1.4401 Equivalent (Sintering)	-

HNTF8 (1.0301 Equivalent)
HNTFV8 (Thread Locking Adhesive · 1.0301 Equivalent)
HNTFZ8 (Thread Locking Resin Coating · 1.0301 Equivalent)
HNTFSN8 (1.4401, Sintered)



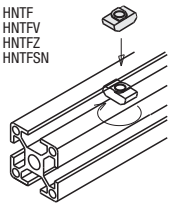
Reference Tightening Torque (N · m)	
M	1.0301 Equivalent / 1.4401 Equivalent (Sintering)
8	23.5

Details of Thread Locking Type P.619

Part Number Type	M	E	T	€Unit Price 1~499 pcs.	Volume Discount Rate 500~749	750~999	1000~
HNTF8 (1.0301 Equivalent)	4 5 6 8	6.0	9.0				
HNTFV8 (Thread Locking · 1.0301 Equivalent)	8						
HNTFZ8 (Thread Locking · 1.0301 Equivalent)	8						
HNTFSN8 (1.4401, Sintering)	4 5 6 8	6.4	8.9				

Example

•Post-Assembly Insertion Nuts



Order Example: Part Number - M → HNTF8 - 8

Days to Ship: 6 Days P.87 2 Days

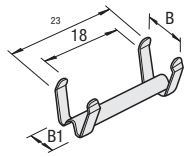
Post-Assembly Insertion Stoppers

RoHS



Type	M Material
(1)HNAST8	Polypropylene
(2)HNBST8	1.4319

HNAST8 (Polypropylene)
HNBST8 (1.4319)



Part Number Type	Applicable Stopper Nuts	Color	L	B	L1	B1	€Unit Price 1~499 pcs.	Volume Discount Rate 500~999	1000~
HNAST8	HNTA8 HNTAV8 HNTAZ8 HNTASN8 HNTASS8	White	21	11.1	26	9.8			
HNBST8		-	23	12.5	28	8			

Post-Assembly Insertion Nut · Stopper Set

RoHS



HNTAT8 (1.0301 Equivalent Set)
HNTATSN8 (1.4401 Equivalent Set)

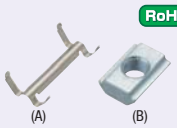
Type	(B) Stopper Nuts	(A) Stoppers
HNTAT8	HNTA8	HNAST8
HNTATSN8*	HNTASN8	

* Electrically conductive

Part Number Type	M	€Unit Price 1~499 pcs.	Volume Discount Rate 500~749	750~999	1000~
HNTAT8	4 5 6				
	8				
HNTATSN8	4 5 6 8				

Post-Assembly Insertion Nut · Metal Stopper Set

RoHS



HNTBT8 (1.0301 Equivalent Set)
HNTBTSN8 (1.4401 Equivalent Set)

Type	(B) Stopper Nuts	(A) Stoppers
HNTBT8	HNTA8	HNBST8
HNTBTSN8*	HNTASN8	

* Electrically conductive

Part Number Type	M	€Unit Price 1~499 pcs.	Volume Discount Rate 500~749	750~999	1000~
HNTBT8	4 5 6				
	8				
HNTBTSN8	4 5 6 8				

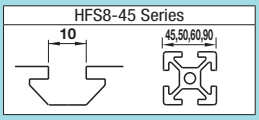
Order Example: Part Number - M → HNTA8 - 8, HNAST8

Days to Ship: 6 Days P.87 2 Days

NEW

Post-Assy. Insertion Nuts for Aluminum Frames With Temporary Holding Function

-For HFS8 · 45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-



CAD Data

■Post-Assembly Insertion Nuts with Leaf Springs

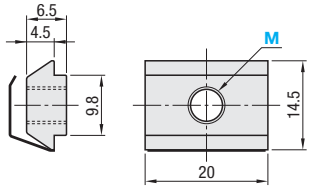
RoHS



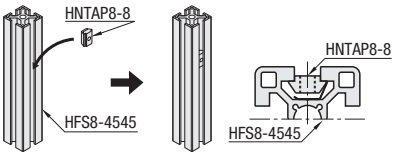
Part	M Material	S Surface Treatment
Body	1.0301/C10 Equivalent	Trivalent Chromate
Wing Part	1.4301/X5CrNi18-10	-

HNTAP8

Reference Tightening Torque (N · m)	
M	S10C Equivalent
8	23.5



Example



Welded Leaf Springs prevent the nuts from slipping off even inserted into the vertically-placed extrusions.

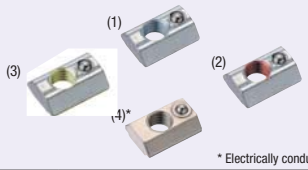
Part Number	M	€ Unit Price	Volume Discount Rate		
		1~499 pcs.	500~749	750~999	1000~
HNTAP8	4 5 6 8				

Order Example: Part Number HNTAP8 - M 8

Days to Ship: 6 Days P.87

■Post-Assembly Insertion Spring Nuts

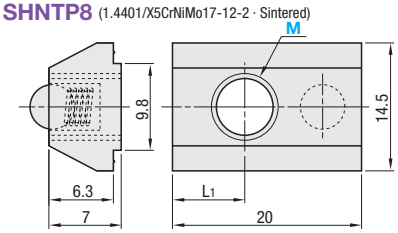
RoHS



* Electrically conductive

Type	M Material			S Surface Treatment
	Body	Ball	Springs	
(1)HNTP8 (2)HNTPV8 (3)HNTPZ8	1.0301/C10 Equivalent	1.4301	JIS SWP-A	Trivalent Chromate
(4)SHNTP8*	1.4401- Equivalent (Sintering)	1.4301	1.4301-WP8	-

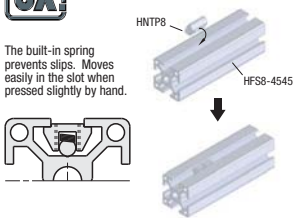
HNTP8 (1.0301/C10 Equivalent)
HNTPV8 (Thread Locking Adhesive · 1.0301/C10 Equivalent)
HNTPZ8 (Thread Locking Resin Coating · 1.0301/C10 Equivalent)
SHNTP8 (1.4401/X5CrNiMo17-12-2 · Sintered)



Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent / 1.4401- Equivalent (Sintering)
8	23.5

Example

The built-in spring prevents slips. Moves easily in the slot when pressed slightly by hand.



* Does not fall even if a extrusion is placed vertically.

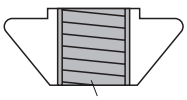
Part Number / Type	M	L1	€ Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTP8(1.0301 Equivalent)	4 5 6 8	8				
HNTPV8(Thread Locking · 1.0301 Equivalent)	8					
HNTPZ8(Thread Locking · 1.0301 Equivalent)	8					
SHNTP8(1.4401 Equivalent, Sintering)	4 5 6 8	8.5				

Bulk-packages are cost effective for in-house stock and large qty. uses. (**P.508**)

Order Example: Part Number HNTP8 - M 8

Days to Ship: 6 Days P.87 2 Days

■Thread Locking Type



It is a Nut with Thread locker applied on the inside of tap. Reduce loosening caused by vibration at transportation or operation of equipment.

Thread Locking Adhesive is ---A microencapsulated anaerobic adhesive prevents thread loosening. Note that it requires a hardening time (72 hours at room temperature 25°C). The adhesive property is lost once loosened.

Resin Coating ---Resin is coated along the threads. Although the thread locking effect may be less than adhesive type, it can be used repeatedly without hardening time required.

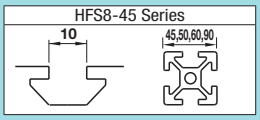
■Effect of Thread Locker (Reference)

Loosening torque values are for reference. Difference may occur depending on the clearances between bolts and nuts.

	Features	Loosening torque after tightening (1st time)	Remarks
Without Thread Locker	-	17.9N · m	-
Thread Locking Adhesive Type	· Prevents loosening effectively. · Thread locking properties are lost once loosened. · Requires a hardening time for adhesives (72 hours at room temperature 25°C) after tightening.	25.6N · m	Test Conditions: Measured value (HNTPV8-8) when a bolt is loosened after drying for 72 hours at room temperature (25 °C), after tightened at 23.5N · m.
Thread Locking Resin Coating Type	· Can be used repeatedly. (Thread locking effect decreases after repeated use.) · Thread locking effect is immediately seen right after tightening.	20.3N · m	Thread locking effect decreases after repeated use. 5th loosening torque: 19.1N · m Measurement with HNTAZ8-8

Post-Assy. Insertion Nuts, Others -Post-Assy. Insertion Lock Nuts · Short Nuts-

-For HFS8-45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-



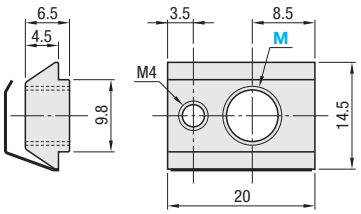
CAD Data

■Post-Assembly Insertion Lock Nuts with Leaf Springs RoHS



Part	M Material	S Surface Treatment
Body	1.0301/C10 Equivalent	Trivalent Chromate
Wing Part	1.4301/ X5CrNi18-10	-

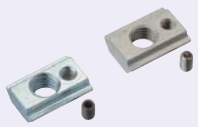
HNTRP8



Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent
8	23.5

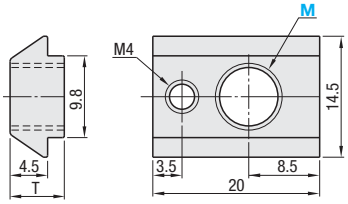
Part Number	M	Accessory	€ Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTRP8	8	M4 Set screw 1 pc. Set Screw				

■Post-Assembly Insertion Lock Nuts RoHS



Type	M Material	S Surface Treatment
HNTR8	1.0301/C10 Equivalent	Trivalent Chromate
HNTRSN8	1.4401 Equivalent (Sintering)	-

HNTR8 (1.0301/C10 Equivalent)
HNTRSN8 (1.4401/X5CrNiMo17-12-2 Equivalent · Sintering)



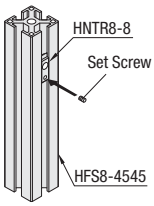
Reference Tightening Torque (N · m)	
M	1.0301/C10 Equivalent / 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)
8	23.5

Part Number / Type	M	T	Accessory	€ Unit Price	Volume Discount Rate		
				1~499 pcs.	500~749	750~999	1000~
HNTR8(1.0301/C10 Equivalent)	4 5 6 8	6.5	M4 Set screw 1 pc.				
HNTRSN8(1.4401 Equivalent · Sintering)		6.0					

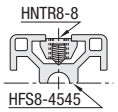
Order Example: Part Number - M → HNTR8 - 8

Days to Ship: 2 Days P.87

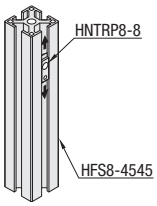
Example

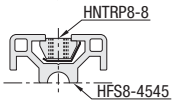


The nut can be fixed in place by itself by tightening the included set screw.

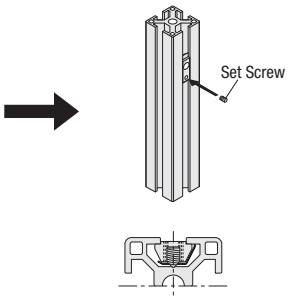


Suitable for use where high repeatability is required. Usable for use when mounting sensor or removing panels repeatedly.





Welded Leaf Springs prevents nuts from slipping off even inserted into the vertically-placed extrusions, leading to easy positioning.



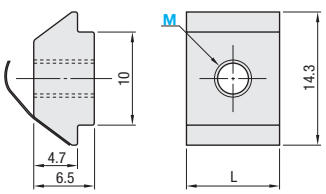
Also, the nut can be fixed in place by tightening the included set screw.

■Post-Assembly Insertion Short Nuts RoHS



Part	M Material	S Surface Treatment
Body	1.0301 Equivalent	Trivalent Chromate
Wing Part	1.4301	-

HNTAJ8



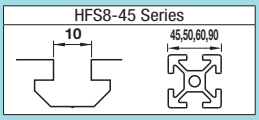
•Overall length is shorter than Pre-Assy. Insertion Nuts HNTT. Suitable for installing sensors or other components closely in together.

Part Number	M	L	€ Unit Price	Volume Discount Rate		
			1~499 pcs.	500~749	750~999	1000~
HNTAJ8	3 4	10				
	8	12				

Order Example: Part Number - M → HNTAJ8 - 8

Days to Ship: 6 Days P.87

Pre-Assy. Insertion Bolts / Post-Assy. Insertion Bolts / Conductive Washers / Toothed Washer / Flanged Nuts
-For HFS8-45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-



CAD Data

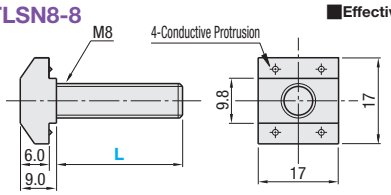
Tightening Torque P.676

Pre-Assembly Insertion Bolts RoHS



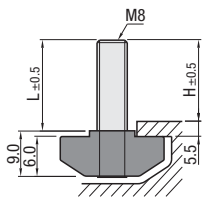
M Material: Nuts: 1.4401/X5CrNiMo17-12-2Equivalent (Sintering)
Bolts: 1.4301/X5CrNi18-10

HNTLSN8-8



* Electrically conductive

Effective Length of Pre-Assy. Insertion Bolts



Slot of Aluminum Extrusion

Part Number	L	H	Applicable Extrusion (Series)	Reference Tightening Torque (N · m)	€ Unit Price	Volume Discount Rate	
					1~299 pcs.	300~499	500~
HNTLSN8-8	20	17.5	HFS8	23.5			
	25	22.5					

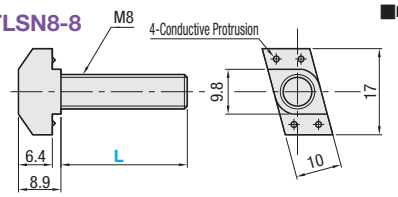
Order Example: Part Number HNTLSN8-8 - L 20
Days to Ship: 2 Days P.87

Post-Assembly Insertion Bolts RoHS



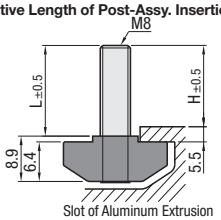
M Material: Nuts: 1.4401/X5CrNiMo17-12-2 Equivalent (Sintering)
Bolts: 1.4301/X5CrNi18-10

HATLSN8-8



* Electrically conductive

Effective Length of Post-Assy. Insertion Bolts

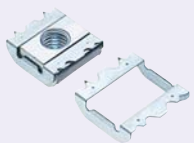


Slot of Aluminum Extrusion

Part Number	L	H	Applicable Extrusion (Series)	Reference Tightening Torque (N · m)	€ Unit Price	Volume Discount Rate	
					1~299 pcs.	300~499	500~
HATLSN8-8	20	17.0	HFS8	23.5			
	25	22.0					

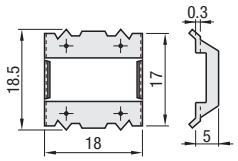
Order Example: Part Number HATLSN8-8 - L 20
Days to Ship: 2 Days P.87

Conductive Washers RoHS



M Material: 1.4301/X5CrNi18-10

HDW8



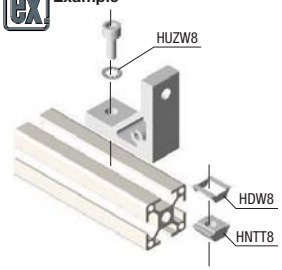
⚠ Be careful not to injure your hand when fitting onto nut.

Part Number Type	Applicable Pre-Assy. Insertion Nut	€ Unit Price	Volume Discount Rate
		1~99 pcs.	100~
HDW8	HNTT8		

Order Example: Part Number HDW8
Days to Ship: 2 Days P.87

Conductivity between extrusions is achieved by combining HDW and HUZW.

Example

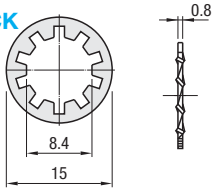


Toothed Washer for Aluminum Frames RoHS



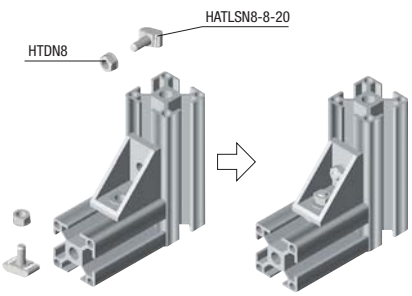
100 pcs. per package
M Material: 1.4301/X5CrNi18-10

HUZW8PACK



Part Number	€ Unit Price	Volume Discount Rate
	1~4 package	5~
HUZW8PACK		

Order Example: Part Number HUZW8PACK
Days to Ship: 6 Days P.87

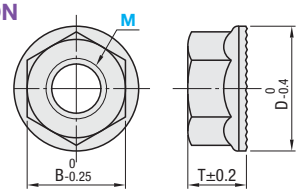


Flanged Nuts RoHS



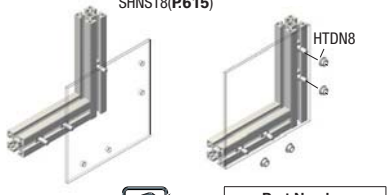
M Material: 1.4301/X5CrNi18-10

HTDN



Part Number Type	M	B	T	D	€ Unit Price 1~499 pcs.	Volume Discount Rate 500~999	1000~
HTDN (Stainless Steel)	4	7	4.2	10			
	5	8	5.5	12			
	6	10	6.0	13			
	8	12	7.5	17			

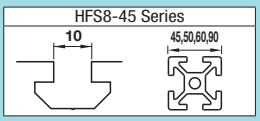
Example
HNTLSN8-8-20
SHNST8(P.615)



Order Example: Part Number HTDN6
Days to Ship: 2 Days P.87

Long Nuts

-For HFS8-45 Series Aluminum Frames 45 · 50 · 60 · 90 Square-

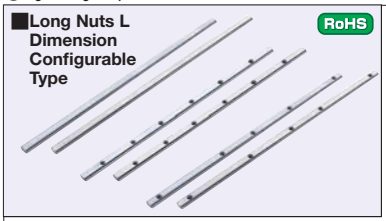


CAD Data

Tightening Torque P.676

Long Nuts L Dimension Configurable Type

RoHS

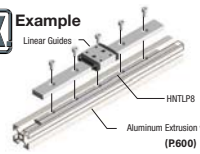


Type		Material	Surface Treatment	Reference Tightening Torque (N · m)
Pre-Assy. Insertion	Post-Assy. Insertion			
HNTLF8	HNTALF8	1.0301/C10 Equivalent	Trivalent Chromate	23.5
HNTLP8	HNTALP8			
HNTLS8	HNTALS8			
SHNTLF8	-	1.4305/X10CrNiS18-9	-	
SHNTLP8	SHNTALP8			
SHNTLS8	SHNTALS8			

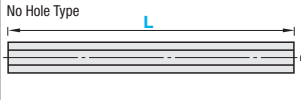
Cross Section Shape	A	B	E	T
Pre-Assy. Insertion	9.8	17	6	9
Post-Assy. Insertion	9.8	14.5	4.5	6.5

Reference Tightening Torque (N · m)	
M	1.0301 Equivalent / 1.4305
8	23.5

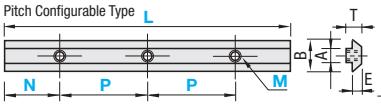
Example



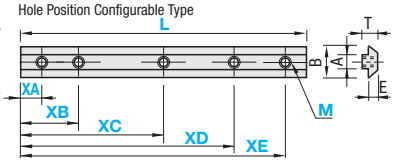
No Hole Type



Pitch Configurable Type



Hole Position Configurable Type



No Hole Type

Part Number		L 1mm Increment	HNTLF		SHNTLF		HNTALF	
			€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion)	(Post-Assembly Insertion)	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000						
HNTLF8 SHNTLF8	HNTALF8							

Pitch Configurable Type

Part Number		L 1mm Increment	M	N 1mm Increment	P 1mm Increment	Number of taps S	HNTLP		SHNTLP		HNTALP		SHNTALP	
							€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion)	(Post-Assembly Insertion)	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000	4 5 6 8	5≤N≤L-5	2M≤P≤L-2M	2≤S≤20								
HNTLP8 SHNTLP8	HNTALP8 SHNTALP8													

Hole Position Configurable Type

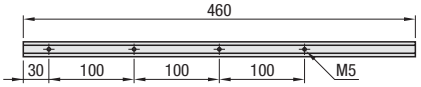
Part Number		L 1mm Increment	M	XA~XE 1mm Increment	HNTLS		SHNTLS		HNTALS		SHNTALS	
					€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
(Pre-Assembly Insertion)	(Post-Assembly Insertion)	(Pre-Assembly Insertion) 50~2000 (Post-Assembly Insertion) 50~1000	4 5 6 8	5~L-5								
HNTLS8 SHNTLS8	HNTALS8 SHNTALS8											

Number of tapped holes can be specified between 1 to 5.

Order Example

Part Number	L	M	N	P	S	XA	XB	XC	XD	XE
HNTLF8	1800									
HNTALF8	400									
HNTLP8	460	M5	N30	P100	4					
HNTALP8	210	M8	N8	P16	8					
HNTLS8	1050	M8				XA20	XB105			
SHNTLS8	1050	M8				XA20	XB105	XC250	XD500	XE755
HNTALS8	1000	M8				XA25	XB55	XC78	XD975	XE992

(Ex.) Pitch Configurable Type



Days to Ship: 8 Days

Express A: EUR 5,00/ piece

P.88

A flat charge of EUR 13,50 for 3 or more identical pieces.

Hole Machining Charge

Pitch Configurable Type	€ Unit Price / 1 Hole	Hole Position Configurable Type	€ Unit Price / 1 Hole
HNTLP · HNTALP		HNTLS · HNTALS	
SHNTLP · SHNTALP		SHNTLS · SHNTALS	

Price

The prices of Pitch Configurable Type and Hole Position Configurable Type are found by adding the unit prices in the table to the hole machining charges.

When

(Ex.) Part Number: HNTLS8 - L: 400 - M: M8 - XA: XA10 - XB: XB70

(€ Unit Price/m x Specified Full Length) + (Hole Machining Charge) = Price

7,70 x 0.4 + 3,20 x 2 =EUR 9,40

(Round down to ten cent.)

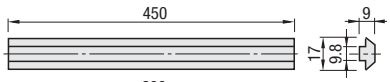
Long Nuts L Dimension Fixed Type

RoHS



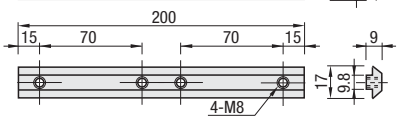
L Dimension Fixed without Holes

HNTK8



L Dimension Fixed with Holes

HNTLG8
SHNTLG8



Reference Tightening Torque (N·m)	
M	1.0301/C10 Equivalent / 1.4305/X10CrNiS18-9
8	23.5

Type	Materials	Surface Treatment
HNTK8	1.0301/C10 Equivalent	Trivalent Chromate
HNTLG8		
SHNTLG8	1.4305/X10CrNiS18-9	-

L Dimension Fixed without Holes

Part Number	€ Unit Price	Volume Discount Rate	
	1~499 pcs.	500~999	1000~
HNTK8			

Order Example: Part Number HNTLG8

Days to Ship: 6 Days

P.87

Alterations: Part Number HNTLG8 - (SET) SET

Alteration	Code	Spec.			Type	Price Adder
Hexagon Socket Set Screw Set	SET	Hexagon socket set screws come as a set.			HNTLG8	0,50
		Type	Set Screw	Qty.		
		HNTLG	MSSK	4	SHNTLG8	0,85
		SHNTLG	MSSU	4		

L Dimension Fixed with Holes

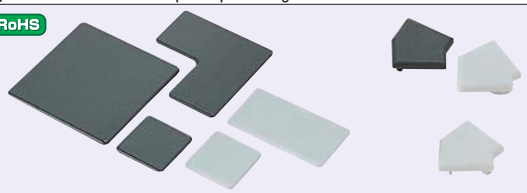
Part Number	€ Unit Price	Volume Discount Rate	
	1~499 pcs.	500~999	1000~
HNTLG8			
SHNTLG8 (Stainless Steel)			

Extrusion End Caps
-HFS8-45 Series-

HFS8-45 Series
10
45,90,50,60

Features: Standard caps for protecting frame end faces. Alterations are not required. When the cap is hard to insert, tap with a wooden or plastic hammer.

RoHS

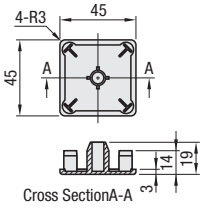


Type	Material
HFC	Polyamide
HFCL	Low Density Polyethylene

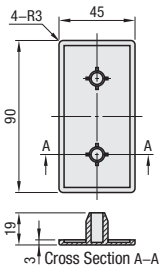
Some products are not required to specify colors, since there was no color configuration in the former catalogs. In that case, color is black.

The pin's shape and numbers of extrusion end caps may be changed to prevent caps from easily falling off.

HFC8-4545
HFCL8-4545

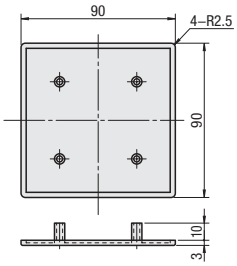


HFC8-4590
HFCL8-4590

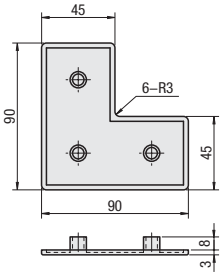


The shapes are changed to be less likely to fall off.
HFC: A tool is required to remove.
HFCL: Removable by hand.

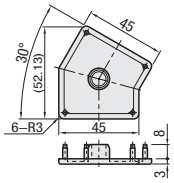
HFC8-9090



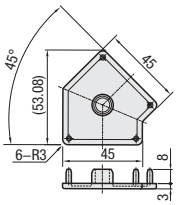
HFC8-909045



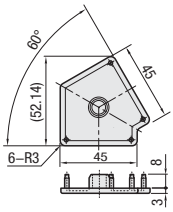
HFC30A8-45



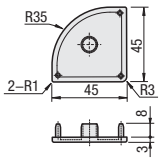
HFC45A8-45



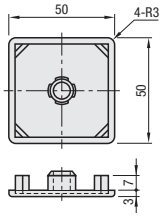
HFC60A8-45



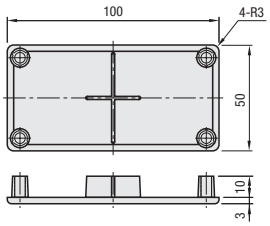
HFCR8-4545



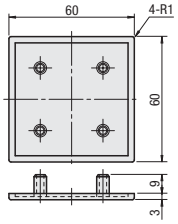
HFC8-5050



HFC8-50100



HFC6-8-6060



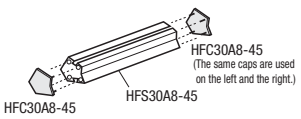
Part Number		Color	€ Unit Price	Volume Discount Rate		Applicable Extrusions *
Type	No.		1~14 pcs.	15~19	20~	
HFC8	4545	B (Black) S (Light Gray)				HFS8-4545
	4590					HFS8-4590
	9090					HFS8-9090
	909045					HFS8-909045
HFCL8	4545					HFS8-4545
	4590					HFS8-4590
HFC30A8-45						HFS30A8-45
HFC45A8-45						HFS45A8-45
HFC60A8-45						HFS60A8-45
HFCR8-4545						HFSR8-909045
HFC8	5050					HFS8-5050
	50100					HFS8-50100
HFC6-8	6060					HFS8-6060 (HFS6-6060)

HFC8-5050 cannot be used for HFS6-5050 extrusion.
HFC6-8-6060 can be used for both HFS6-6060 and HFS8-6060.
* For Aluminum Extrusion EFS Series, the same frame caps as of HFS Series can be used.

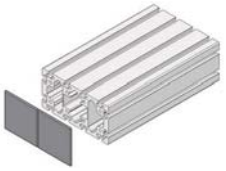
Order Example: Part Number - Color
HFC30A8-45 - B

Days to Ship: 6 Days P.87 2 Days

Example



When using Aluminum Extrusion HFS8-90180, please use 2 pieces of HFC8-9090.



CAD Data

Features: Frame End Caps Screw Mounting Type. Excels in safety preventing caps from falling off without alterations.

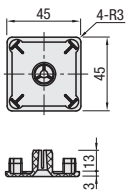
Screw Mounted

RoHS

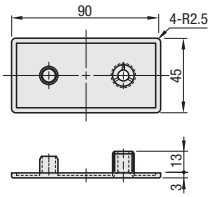


Material: Polyamide (Black · Light Gray)

HFCB8-4545
(Screw Fixing Type)



HFCB8-4590
(Screw Fixing Type)



The pin shape and numbers of extrusion caps may be changed to prevent caps from easily falling off.

Part Number		Color	€ Unit Price	Volume Discount Rate		Applicable Extrusions *
Type	No.		1~14 pcs.	15~19	20~	
HFCB8	4545	B(Black) S(Light Gray)				HFS8-4545
	4590					HFS8-4590

* For Aluminum Extrusion EFS Series, the same frame caps as of HFS Series can be used.
Flat Head Screws are included for Screw Mounted Type. (Black: HFBMB6-20, Light Gray: SHFBS6-20)

Order Example: Part Number **HFCB8-4545** - Color **B**

Days to Ship: **6 Days** P.87

Example

<Before Mounting>



<After Mounting>



Tapping on extrusion is not required.

Features: Frame caps only for High Rigidity Aluminum Frames. Alterations are required on the cross sections.

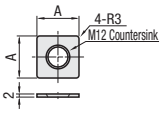
Plates for High Rigidity Type

RoHS

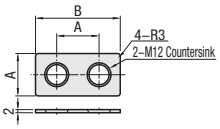


HFCD8

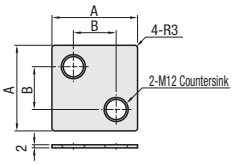
Shape AA



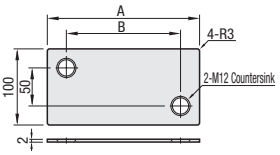
Shape BB



Shape AC



Shape AD



Material: 1.4301/X5CrNi18-10

Part Number		Shapes Pattern	A	B	Applicable Screw	Applicable Extrusion	€ Unit Price	Volume Discount Rate
Type	No.						1~9 pcs.	10~
HFCD8	4545	AA	45	-	SHFBS12-20 (Not included)	GFS8-4545		
	4590	AB		90		GFS8-4590		
	5050	AA	50	-		GFS8-5050		
	50100	AB		100		GFS8-50100		
	6060	AA	60	-		GFS8-6060		
	9090	AC	90	45		GFS8-9090		
	100100		100	50		GFS8-100100		
	100200	AD	200	150		GFS8-100200		

Order Example: Part Number **HFCD8-4545**

Days to Ship: **10 Days**

Special alteration is required on cross sections of extrusions to mount frame caps. (Refer to **P.658**)

Aluminum Frames with Built-in Joints

Features: Screw joint installable without alterations. (Wrench holes are necessary on the mating extrusion)

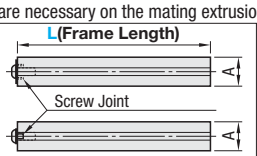
Screw Joint Type

RoHS

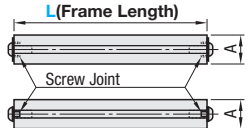


Name of Parts		M Material	S Surface Treatment
Aluminum Frames		EN AC-51 400-T5	Anodize
Screw Joints	Screw Bolt	1.7220/34CrMo4	Trivalent Chromate
	Joint Plate	1.0330/DC01	

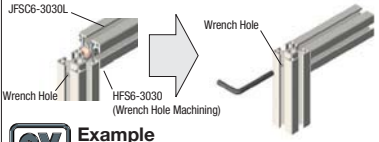
JFSC_-_ _ _ _L
(Left End Face Screw Joint Built-in Type)



JFSC_-_ _ _ _W
(Double End Face Screw Joint Built-in Type)



Wrench holes are necessary on the mating extrusion.



Example



(Ex.)
Blue = JFSS_-_ _ _ _W - Length
Green = JFSS_-_ _ _ _L - Length - RCH - RCV
Yellow = HFS_-_ _ _ _L - Length - LCP - RCP
(For Wrench Hole Alterations, refer to **P.649**)

Part Number		Joint Components	L 0.5mm Increment	Extrusions	Built-in Joint Component: Screw Joints	Built-in Joint Component: Qty.	A	Wrench required when tightening.	€ Extrusion Unit Price: Less than 300mm	€ Extrusion Unit Price: 300mm or more (€/m)	€ Joints, Other
JFSC	5-2020	L (Left End Face Only) / W (Double End Faces)	100~4000	HFS5-2020 (P.477)	HCJ5 (P.628)	1 / 2	20	For M5			
	6-3030	L (Left End Face Only) / W (Double End Faces)		HFS6-3030 (P.511)	HCJ6 (P.628)	1 / 2	30	For M8			
	8-4040	L (Left End Face Only) / W (Double End Faces)		HFS8-4040 (P.553)	HCJ8 (P.628)	1 / 2	40	For M12			
	8-4545	L (Left End Face Only) / W (Double End Faces)		HFS8-4545 (P.591)	HCJ8-45 (P.628)	1 / 2	45				
	8-6060	L (Left End Face Only) / W (Double End Faces)		HFS8-6060 (P.599)	HCJ8-60 (P.628)	1 / 2	60				

■When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: -3030L-2,00=EUR 6,90

■When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Configured L dimension + Joint or other € Unit Price = Price
ex: -3030L-18,00
8,30x1.8m+3,20=14,94+3,20 =EUR 18,14
(Round down to ten Cent.)

Order Example

Part Number	-	L
JFSC8-4040L		- 1200

Features: Center joint installable without alterations. (No holes are required on the mating extrusion)

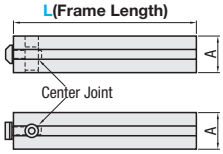
Center Joint Type

RoHS

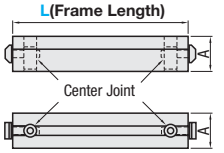


Name of Parts		M Material	S Surface Treatment
Aluminum Frames		EN AC-51 400/ AlMgSi0,7-T5	Anodize
Center Joints	Center Post	1.4308/G-X6CrNi18-9	-
	Joint Guide	1.4301/X5CrNi18-10	
	Set Screw	1.7220/34CrMo4	Blackening Film

(Left End Face Center Joint Built-in Type)

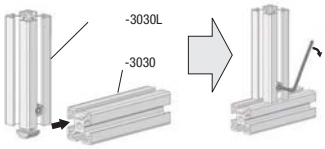


(Double End Face Center Joint Built-in Type)



Joint components will be shipped loosely tightened.

Example



Part Number		Joint Component	L 0.5mm Increment	Extrusions	Built-in Joint Component: Center Joint	Built-in Joint Component: Qty.	A	Wrench required when tightening.	€ Extrusion Unit Price: Less than 300mm	€ Extrusion Unit Price: 300mm or more (€/m)	€ Joints, Other
JFSM	5-2020	L (Left End Face Only) / W (Double End Faces)	100~4000	HFS5-2020 (P.477)	HMJ5 (P.629)	1 / 2	20	For M4			
	6-3030	L (Left End Face Only) / W (Double End Faces)		HFS6-3030 (P.511)	HMJ6 (P.629)	1 / 2	30	For M6			
	8-4040	L (Left End Face Only) / W (Double End Faces)		HFS8-4040 (P.553)	HMJ8 (P.629)	1 / 2	40				
	8-4545	L (Left End Face Only) / W (Double End Faces)		HFS8-4545 (P.591)	HMJ8-45 (P.629)	1 / 2	45				

■When L<300,
Unit prices are indicated in the table regardless of the length.
ex: -3030L-2,00=€ 8,80

■When L≥300,
Prices are calculated as follows:
€ Unit Price/m x Configured L dimension + Joint or other €Unit Price = Price
ex: -3030L-18,00
⇒8,30x1.8m+5,10=14,90+5,10=€20,00
(Round down to ten Cent.)

Order Example

Part Number	-	L
JFSM8-4040L		- 1200

Features: Simple joint installable without alterations. (No holes are required on the mating extrusion)

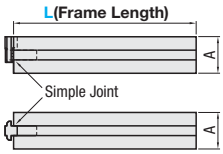
Simple Joint Type

RoHS

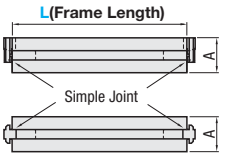


Name of Parts		M Material	S Surface Treatment
Aluminum Frames		EN AC-51 400/ AlMgSi0,7-T5	Anodize
Simple Joints	Body	1.1191/C45E	Trivalent Chromate
	Dedicated Screws	1.7220/34CrMo4	
	Set Screw		Blackening Film

JFSU6-3030L
(Left End Face Simple Joint Built-in Type)

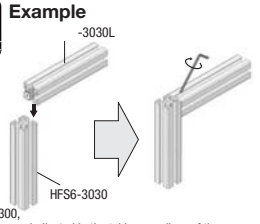


JFSU6-3030W
(Double End Face Simple Joint Built-in Type)



Joint components will be shipped loosely tightened.

Example



■When L<300,
Unit prices are indicated in the table regardless of the length.
ex: -3030L-2,50=€ 8,50

■When L≥300,
Prices are calculated as follows:
€ Unit Price/m x Configured L dimension + Joint or other € Unit Price = Price
ex: -3030L-14,00
8,30x1.4m+4,80=11,60+4,80 =€16,40 (Round down to ten Cent.)

Part Number		Joint Component	L 0.5mm Increment	Extrusions	Built-in Joint Component: Center Joint	Built-in Joint Component: Qty.	A	€ Extrusion Unit Price: Less than 300mm	€ Extrusion Unit Price: 300mm or more (€/m)	€ Joints, Other
JFSU	6-3030	L (Left End Face Only) / W (Double End Faces)	100~4000	HFS6-3030 (P.511)	HUJ6 (P.633)	1 / 2	30			

Order Example

Part Number	-	L
JFSU6-3030L		- 1200

Features: Single joint installable without alterations. (Wrench holes are necessary on the mating extrusion)

Single Joint Type

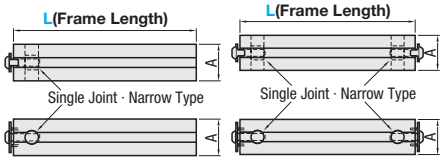
RoHS



Name of Parts		Material	Surface Treatment
Aluminum Frames		EN AC-51 400/ AlMgSi0,7-T5	Anodize
Single Joints Kit	Joint Plate	1.4301/ X5CrNi18-10	-
	Joint Nuts	1.4401/ X5CrNiMo17-12-2	
	Hexagon Socket Button Head Cap Screw	1.4567/ X3CrNiCu18-9-4	

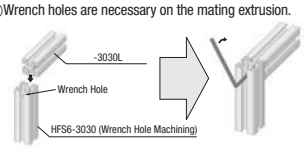
JFSS_-____L
(Left End Face Single Joint Built-in Type)

JFSS_-_ _ _W
(Double End Face Single Joint Built-in Type)



Joint components will be shipped loosely tightened.

Wrench holes are necessary on the mating extrusion.



Example



Blue = _-_ _ _ _W - Length
Green = _-_ _ _ _L - Length - RCH - RCV
Yellow = HFS_-_ _ _ _L - Length - LCP - RCP
(For Wrench Hole Alterations, refer to P.649)

Part Number		Joint Components	L 0.5mm Increment	Extrusions	Built-in Joint Component: Single Joint	Built-in Joint Component: Qty.	A	Wrench required when tightening.	€ Extrusion Unit Price: Less than 300mm	€ Extrusion Unit Price: 300mm or more (€/m)	€ Joints, Other
JFSS	6-3030	L (Left End Face Only)	100~4000	HFS6-3030 (P.511)	HSJNS6 (P.635)	1	30	For M6			
		W (Double End Faces)				2					
	8-4040	L (Left End Face Only)		HFS8-4040 (P.553)	HSJNS8 (P.635)	1	40	For M8			
		W (Double End Faces)				2					
	8-4545	L (Left End Face Only)		HFS8-4545 (P.591)	HSJNS8-45 (P.635)	1	45				
		W (Double End Faces)				2					

When L is less than 300
€ Unit prices are indicated in the table regardless of the length.
ex: -3030W-2,00=10,50

When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Configured L dimension + Joint or other €Unit Price
= Price
ex: -3030W-15,00
⇒8,30x1.5m+6,80=12,40+6,80=EUR 19,20
(Round down to ten Cent.)

Order Example

Part Number	-	L
JFSS8-4040L	-	1200

Features: Pre-Assy. Double Joint installable without specifying alterations. (No holes are required on the mating extrusion)

Pre-Assy. Insertion Double Joint Type

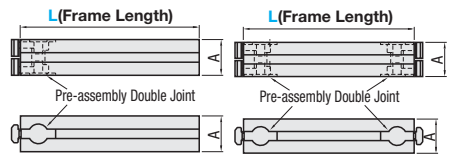
RoHS



Name of Parts		Materials	Surface Treatment
Aluminum Frames		EN AC-51 400/ AlMgSi0,7-T5	Anodize
Pre-Assy. Insertion Double Joint Kits	Pre-Assembly Insertion Double Joint	1.4401/ X5CrNiMo17-12-2 Equivalent	-
	Eccentric Nuts		
	Hex Socket Head Cap Screws	1.4301/ X5CrNi18-10	

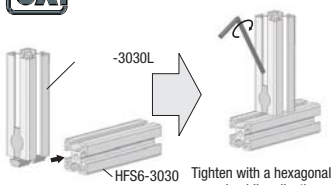
JFSD_-____L
(Left End Face Pre-Assy. Insertion Double Joint Built-in Type)

JFSD_-_ _ _W
(Double End Face Pre-Assy. Insertion Double Joint Built-in Type)



Joint components will be shipped loosely tightened.

Example



Tighten with a hexagonal wrench while adjusting the position.

Part Number		Joint Components	L 0.5mm Increment	Extrusions	Built-in Joint Component: Pre-Assembly Insertion Double Joint	Built-in Joint Component: Qty.	A	Wrench required when tightening.	€ Extrusion Unit Price: Less than 300mm	€ Extrusion Unit Price: 300mm or more (€/m)	€ Joints, Other
JFSD	6-3030	L (Left End Face Only)	100~4000	HFS6-3030 (P.511)	HDJHSN6 (P.637)	1	30	For M5			
		W (Double End Faces)				2					
	8-4040	L (Left End Face Only)		HFS8-4040 (P.553)	HDJHSN8 (P.637)	1	40	For M6			
		W (Double End Faces)				2					
	8-4545	L (Left End Face Only)		HFS8-4545 (P.591)	HDJHSN8-45 (P.637)	1	45				
		W (Double End Faces)				2					

When L is less than 300
€ Unit prices are indicated in the table regardless of the length.
ex: -4040L-2,50=€ 11,80.

When L is 300 or more
Prices are calculated as follows:
€Unit Price/m x Configured L dimension + Joint or other € Unit Price
= Price
ex: -4040L-12,00
⇒15,10x1.2m+7,30=18,10+7,30=EUR 25,40
(Round down to ten Cent.)

Alterations 7 Days

Order Example Part Number - L: JFSD8-4040L - 1200

Days to Ship 7 Days

Alterations	Code	Spec. Extrusions	Spec. Tap	Spec. Depth	€ Price Adder
Right End Face Tapping (is only applicable to Left End Face Joints Built-in Type.)	RTP (Right End Face Tapping)	5-2020	M5	15	
		6-3030	M8	24	
		8-4040	M12	36	
		8-4545	M12 (Heli-Coil Insert)	18	

Alterations	Code	Spec. Extrusions	Spec. H	Spec. Hole Dia.	€ Price Adder
Right End Face Wrench Hole (are only applicable.)	RCH / RCV	5-2020	10	7.35	
		6-3030	15	8	
		8-4040	20		
		8-4545	22.5		

Alterations only on this page are available.

Blind Joint Components
-Tapping Joints / TJ Plates / Torx Bits-

Alterations necessary to use this component

Wrench Hole →P.649

CAD Data

Features: Neccessary alterarion is only for wrench holes. Most economical Blind Joints. Dedicated Torx Bit is required for tightening.

Tapping Joints

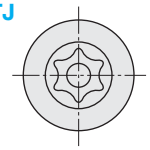


(Reference)Corner section when using this joint

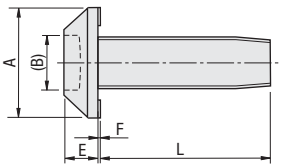


RoHS

HTJ



· Tapping is not required.



M Materials:
JIS SWCH18A~C18
(Carburized)
S Surface Treatment:
Trivalent Chromate
*JIS SWCH18A~C18
(Cold Forged JIS STKM Wire)

Part Number Type	No.	Torx Bit	Applicable Extrusion (Pilot Hole Dia.)	Proper Tightening Torque (Max.)	A	(B)	E	F	L	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HTJ	5	HTJXL25	Ø4.2	12N・m	11	3.84	2.25	0.25	20		
	6	HTJXL40	Ø6.8	24N・m	15	6.6	5	0.5	25		
	8		Ø10.5	74N・m	17		5.5		30		

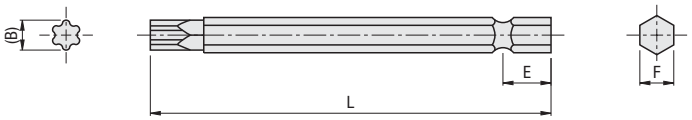
Tapping Joints	Applicable Extrusion No.				[Exception] Extrusion Not Available
HTJ5	5-2020* 5-4040	5-2040	5-2060	5-2080	* Curved HFSR5-2020 is not applicable since wrench holes cannot be added.
HTJ6	6-3030* 6-5050 6-6060	6-3060 6-50100 6-6090	6-3090 6-100100 6-60120	6-30120	* Curved HFSR6-3030 is not applicable since wrench holes cannot be added.
HTJ8	8-4040*	8-4080	8-40120	8-40160	* Curved HFSR8-4040 is not applicable since wrench holes cannot be added.

Torx Bit



RoHS

HTJXL



M Material: 1.6511/36CrNiMo4

Part Number Type	No.	Applicable Drive for Torx Bit	(B)	L	E	F	€ Unit Price 1~9 pcs.	Volume Discount Rate 10~
HTJXL	25	T25	3.84	75	9	6.35		
	40	T40	6.6					

Order Example

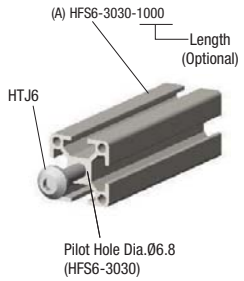
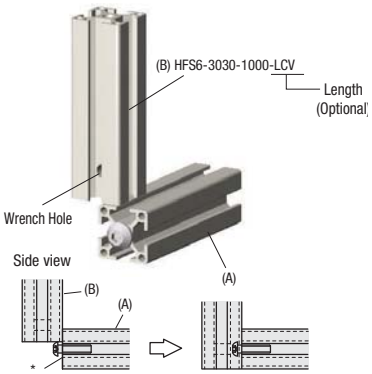
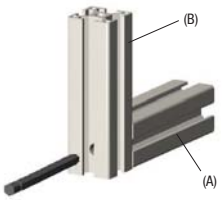
Part Number
HTJ6
HTJXL40

Days to Ship

6 Days P.87

Example

How to Connect Tapping Joints (Female Thread holes are not required for extrusion connection.)

Step	1	2	3
Explanation	Tighten temporarily the tapping joint on frame end face. (Refer to appropriate tightening torque above.)	Pass the head of tapping joint through the slot of Extrusion (B), and slide it down to the bottom of (A). TJ plate goes through the slot of frame (B) too.	Pass the Torx bit through wrench hole, and tighten it by motorized screw driver.
Tapping Joints	 * Female Thread holes are not required.	 * Part below neck of HTJ8 is thinned so as to be engaged with slot width of 10 mm (HFS8 Series).	

Blind Joint Components
-Screw Joints-

Alterations necessary to use this component

Tapping	Wrench Hole
→P.647	→P.649

CAD Data

Features: Including Rotation Stoppers, available from EUR 1,40. Cost saving Blind joints.

Screw Joints



(Reference)
Corner section when using this joint

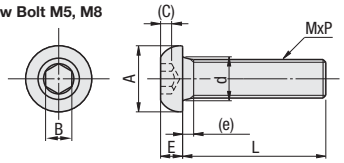


RoHS

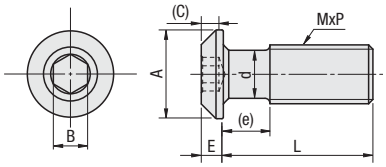
HCJ (Trivalent Chromate)
SHCJ (Stainless Steel)

(A) Screw Bolt

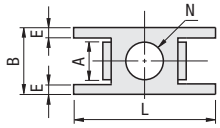
Screw Bolt M5, M8

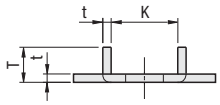


Screw Bolt M12

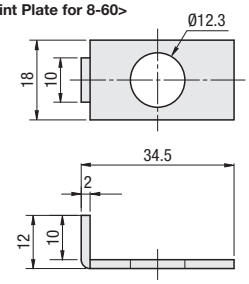


(B) Joint Plate





<Joint Plate for 8-60>



Type	Components	Material	Surface Treatment
HCJ	Screw Bolt	1.7220/ 34CrMo4	Trivalent Chromate
	Joint Plate	1.0330/DC01	
	Screw Bolt	1.4301- Equivalent	-
	Joint Plate	1.4301/ X5CrNi18-10	

Part Number		Components		HCJ			
Type	No.	(A) Screw Bolt	(B) Joint Plate	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HCJ (Trivalent Chromate)	5	M5	5				
	6	M8	6				
	8	M12	8				
SHCJ (Stainless Steel)	8-45		8-45				
	8-60		For 8-60				

Screw Joints	Applicable Extrusion No.				[Exception] Extrusion Not Available
HCJ5	5-2020*	5-2040	5-2060	5-2080	* Curved HFSR5-2020 is not applicable since wrench holes cannot be added.
	5-4040				
HCJ6 SHCJ6	6-3030*	6-3060	6-3090	6-30120	* Curved HFSR6-3030 is not applicable since wrench holes cannot be added.
	6-5050	6-50100	6-100100		
	6-6060	6-6090	6-60120		
HCJ8	8-4040*	8-4080	8-40120	8-40160	* Curved HFSR8-4040 is not applicable since wrench holes cannot be added.
HCJ8-45	8-4545*	8-4590*	8-45180		*Not applicable to HFSL (light type). *Curved HFSR8-4545 is not applicable since wrench holes cannot be added. For GFS8-100100 and GFS8-100200, bracket connection is recommended as they are heavy.
HCJ8-60	8-6060				-

For SHCJ, No.6 only.

(A) Screw Bolt	MxP	L	A	E	B	(c)	d	(e)
M5	5x0.8	15	9.5	2.75	3	1.56	-	1.6
M8	8x1.25	20	14	4.4	5	2.6	-	3.5
M12	12x1.75	29.4	18	4.5	6	3.6	9.8	8.4

(B) Joint Plate	N	A	B	E	L	T	t	K
5	5.5	4	10	2	14	5	0.8	8.2
6	8.3	5	15	3	24	7.5	1.5	12.2
8	12.3	6	18	3.5	24	12	2.0	15.2
8-45					39			19.2

For the detailed dimensions of joint plate for HCJ8-60, refer to the diagram.

Order Example

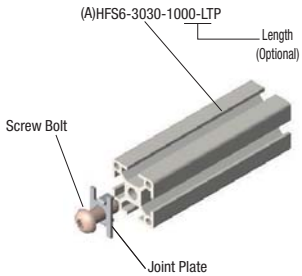
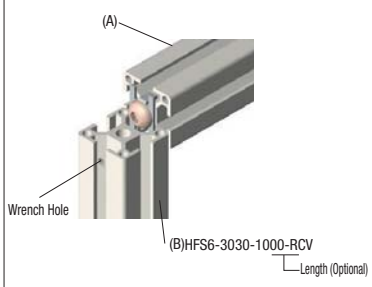
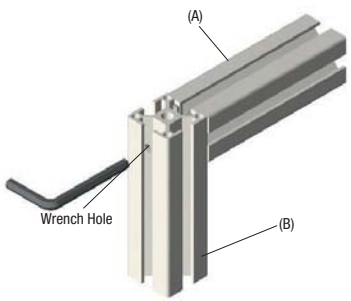
Part Number
HCJ8-45
SHCJ6

Days to Ship

6 Days P.87

Example

How to Connect Screw Joints (Female Thread holes or wrench holes are required on the extrusion.)

Step	1	2	3
Explanation	Mount a screw joint on the tapped hole on the extrusion end face.	Pass the head of screw joint through the slot of Extrusion (B), and slide it down to the bottom of (A).	Insert the hexagonal wrench into the wrench hole and tighten it.
Screw Joints			

Blind Joint Components
-Center Joint Kits-

Alterations necessary to use this component
M type hole alteration →P.656

CAD Data

Features: Only one screw for tightening. Work efficiency enhancing anti-rotation type has been added.

Center Joint Kits -Pre-Assembly Insertion Type- RoHS
(Standard Direction)(90-Degree Reversal)



Center Joint Kits -Post-Assembly Insertion Type-



Center JointKit -With Rotation Stopper-

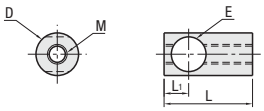




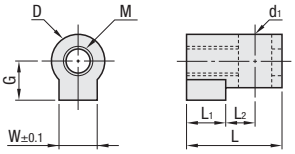
(Ref.) Corner section when using this joint

Type	Components (Each 1 pc.)					
	Joint Guide		Center Post		Set Screw	
	Type	Material	Type	Material	Size	Material
HMJ	Standard	1.4301/ X5CrNi18-10	Pre-Assy. Insertion Standard Direction	1.4308/ G-X6CrNi18-9	NO.5:M4x8 NO.6:M6x12 NO.8:M6x16 NO.8-45:M6x20	1.7220/34CrMo4 (Surface Treatment: Black Oxide)
HMJR			Pre-Assy. Insertion 90-Degree Rotated			
HAMJ			Post-Assy. Insertion Standard Direction			
HZJ	With Rotation Stpper	1.4301/ X5CrNi18-10	Pre-Assy. Insertion Standard Direction	1.4308/ G-X6CrNi18-9		
HAZJ			Post-Assy. Insertion Standard Direction			

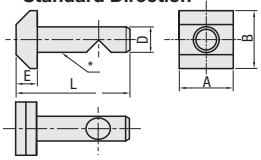
Joint-Guide (Standard)



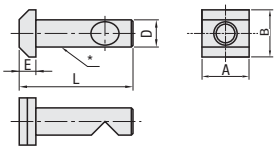
Joint-Guide (with Rotation Stopper)



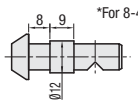
Pre-Assy. Insertion Center Post Standard Direction



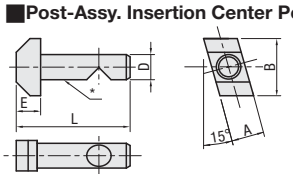
Pre-Assy. Insertion Center Post 90-Degree Reversal Type
(Tightening direction is reversed 90 degrees as shown in the lower right-hand figure on P.630.)



For center posts No.8-45, There will be a diameter (Ø12) Extrusion Mating Section as show below.



Post-Assy. Insertion Center Post



Part Number		Accessories						HMJ HMJR HAMJ		HZJ HAZJ	
								€ Unit Price	Volume Discount Rate	€ Unit Price	Volume Discount Rate
Type	No.	Center Post	Qty.	Joint Guide	Qty.	Set Screw	Qty.	1~99 pcs.	100~	1~99 pcs.	100~
HMJ HZJ Pre-Assy. Insertion Standard Direction Type	5	Pre-Assembly Insertion Center Post 5	1	Joint Guide 5	1	M4x8	1				
	6	Pre-Assembly Insertion Center Post 6		Joint Guide 6		M6x12					
	8	Pre-Assembly Insertion Center Post 8		Joint Guide 8		M6x16					
	8-45	Pre-Assembly Insertion Center Post 8-45		Joint Guide 8-45		M6x20					
HMJR Pre-Assy. Insertion 90-Degree Reversal Type	5	Pre-Assy. Insertion Center Post 5 Reversal		Joint Guide 5		M4x8					
	6	Pre-Assy. Insertion Center Post 6 Reversal		Joint Guide 6		M6x12					
	8	Pre-Assy. Insertion Center Post 8 Reversal		Joint Guide 8		M6x16					
	8-45	Pre-Assy. Insertion Center Post 8-45 Reversal		Joint Guide 8-45		M6x20					
HAMJ HAZJ Post-Assembly Insertion Type	5	Post-Assembly Insertion Center Post 5		Joint Guide 5		M4x8					
	6	Post-Assembly Insertion Center Post 6		Joint Guide 6		M6x12					
	8	Post-Assembly Insertion Center Post 8		Joint Guide 8		M6x16					
	8-45	Post-Assembly Insertion Center Post 8-45		Joint Guide 8-45		M6x20					

Pre-Assy. Insertion Center Post (Standard Direction / 90-Degree Reversal)

Name of Parts	D	L	E	A	B
Pre-Assembly Insertion Center Post 5 Pre-Assy. Insertion Center Post 5 Reversal	4	20.5	3.5	10	10
Pre-Assembly Insertion Center Post 6 Pre-Assy. Insertion Center Post 6 Reversal	6.6	29.5	5.5	14	15
Pre-Assembly Insertion Center Post 8 Pre-Assy. Insertion Center Post 8 Reversal	9.8	41	6	17	17
Pre-Assembly Insertion Center Post 8-45 Pre-Assy. Insertion Center Post 8-45 Reversal		42			

Post-Assy. Insertion Center Post

Name of Parts	D	L	E	A	B
Post-Assembly Insertion Center Post 5	4	20.5	3.5	6	10
Post-Assembly Insertion Center Post 6	6.6	30.4	6.4	8	15
Post-Assembly Insertion Center Post 8	9.8	41.4	6.4	10	17
Post-Assembly Insertion Center Post 8-45		42.4			

Center Joint No.	Applicable Extrusion No.				[Exception] Extrusion Not Available
5	5-2020*1	5-2040	5-2060	5-2080	*1 Curved HFSR5-2020 cannot be used, because Wrench Hole Machining is not allowed.
	5-4040	5-4060	5-4080		
6	6-3030*1	6-3060	6-3090*2	6-30120*2	*1 Curved HFSR6-3030 cannot be used, because Wrench Hole Machining is not allowed. *2 Cannot be used in the long side direction because standard hole machining is not allowed.
	6-5050	6-50100*2			
	6-6060	6-6090			
8	8-4040*1	8-4080	8-40120	8-40160*2	*1 Curved HFSR8-4040 cannot be used, because Wrench Hole Machining is not allowed. *2 Cannot be used in the long side direction because standard hole machining is not allowed.
8-45	8-4545*1	8-4590*1	8-45180*2		*1 HFSL8-4545, HFSLF8-4545 and HFSLT8-4545 cannot be used because the thickness of slot extrusion is different. Curved HFSR8-4545 cannot be used, because Wrench Hole Machining is not allowed. *2 Cannot be used in the long side direction because standard hole machining is not allowed.

Joint-Guide (Standard)

Name of Parts	D	L	L_1	E	M
Joint Guide 5	6.9	12	4	4.1	4
Joint Guide 6	10.9	19	6	6.8	6
Joint Guide 8	12.8	27	7.5	9.9	
Joint Guide 8-45		31			

Joint-Guide (with Rotation Stopper)

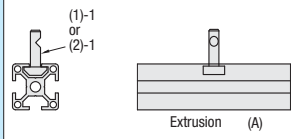
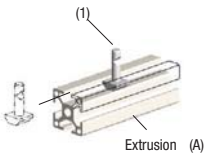
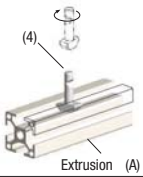
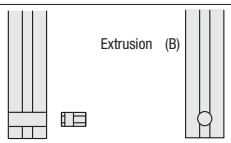
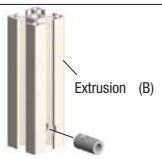
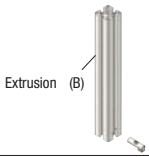
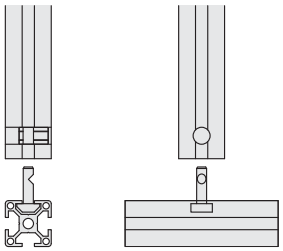
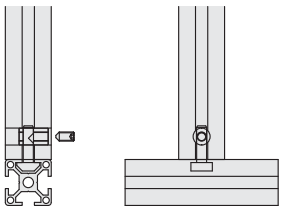
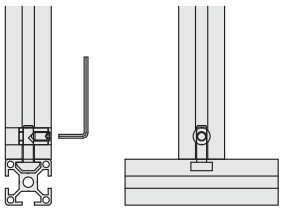
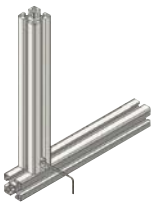
Name of Parts	D	G	W	L	L_1	L_2	d_1	M
Joint Guide 5	6.9	5.5	5.8	13.0	4	13	4.1	4
Joint Guide 6	10.9	8	7.8	19.5	6	19.5	6.8	6
Joint Guide 8	12.8	9	9.8	28.0	7.5	28	9.9	

Order Example Part Number HMJ8

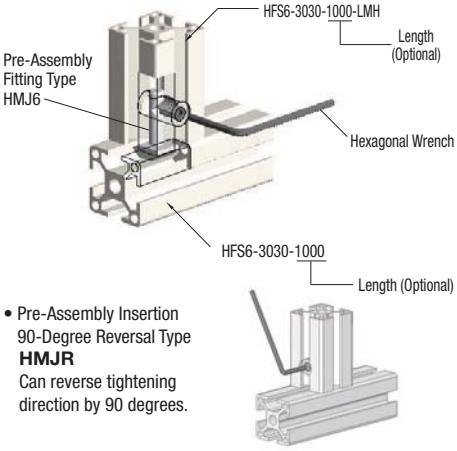
Days to Ship 6 Days P.87

Example

Center Joint Connection Method

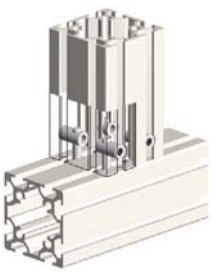
Step	Front View / Side View	Standard Type	With Rotation Stopper	Explanation
1				Mount center post to extrusion (A). (For Post-Assembly Insertion Type, it can be inserted by turning from upside of the slot.) Center Post is for Standard Type and With Rotation Stopper Type.
2				Insert joint guide in the extrusion (B) with M hole (**P.656**). For standard type, adjust the through hole to be upward.
3				Move the extrusion (A) close to the extrusion (B) while putting the center post through the through hole of joint guide.
4				Tighten the set screw to the side of joint guide.
5				When the set screw is tightened against a V groove on the center post, the (ok) (A) and (B) are puled and bound together.

- Product Number for the parts shown on the above example (standard type).



- Pre-Assembly Insertion 90-Degree Reversal Type **HMJR**
  Can reverse tightening direction by 90 degrees.

- Connecting extrusions with 2 or more slots on one side.
  Insert joint guide from the both sides of M type hole, and connect and tighten it with two or more center joints.
- For extrusions with three slots, holes cannot be addeed on the center row.
  (For extrusions with four rows of slots, all slots are drilled.)



2-slotted extrusions can be connected by using two Center Joint kits.

3-slotted extrusions are connected using two outside slots only.

Blind Joint Components
-Post Assembly Insertion Double Joint Kits-

Part Number & Spec.Change Printed in Purple

Alterations necessary to use this component

M type hole alteration →P.656

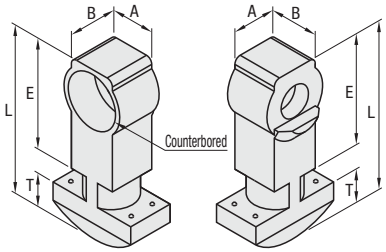
CAD Data

RoHS

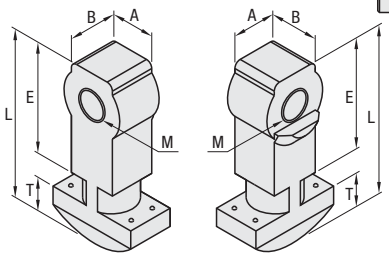
HPJN (Post-assembly Insertion Double Joint)

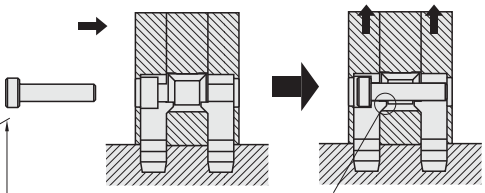


(1)Post-Assembly Insertion Double Joint A



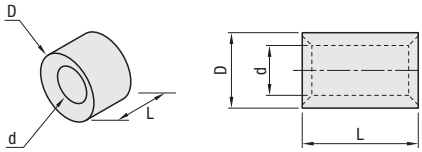
(2)Post-Assembly Insertion Double Joint B





The tapered part of a Joint Pipe and the tab of a post-assembly joint create upward lifting force, and this force joints the extrusions together.

(3)Joint Pipe



Name of Parts		M Material
Post-Assembly Insertion Double Joints (A · B)		1.4308
Joint Pipe	No. 5-20, 6-30, 8-40, 8-45	1.4301 (Sintering)
	No. 5-40, 6-60, 8-80, 8-90	1.4301
Hex Socket Head Cap Screws		1.4301

HPJ is modified the part number and specification to HPJN.

Part Number		Accessory								€ Unit Price	Volume Discount Rate
Type	No.	(1) Post-Assembly Insertion Double Joint A	Qty.	(2) Post-Assembly Insertion Double Joint B	Qty.	(3) Joint Pipe	Qty.	(4) Hexagon Socket Head Cap Screw	Qty.	1~9 pcs.	20~
HPJN	5-20	Post-assembly insertion double joints A5	1	Post-assembly insertion double joints B5	1	Joint Pipe 5-20	1	M3x15	1		
	5-40					Joint Pipe 5-40		M3x35			
	6-30	Post-assembly insertion double joints A6		Post-assembly insertion double joints B6		Joint Pipe 6-30		M5x22			
	6-60					Joint Pipe 6-60		M5x50			
	8-40	Post-assembly insertion double joints A8		Post-assembly insertion double joints B8		Joint Pipe 8-40		M6x30			
	8-80					Joint Pipe 8-80		M6x70			
	8-45	Post-assembly insertion double joints A8-45		Post-assembly insertion double joints B8-45		Joint Pipe 8-45		M6x35			
	8-90					Joint Pipe 8-90		M6x80			

(1) Post-Assembly Insertion Double Joint A

Name of Parts	A	B	L	T	E	Counterbored
Post-assembly insertion double joints A5	5.8	5.2	19.5	3.3	12.7	For M3
Post-assembly insertion double joints A6	7.8	7.5	28.6	6	18.6	For M5
Post-assembly insertion double joints A8	9.8	10	39	6.5	24.5	For M6
Post-assembly insertion double joints A8-45			39.5		25	

(2) Post-Assembly Insertion Double Joint B

Name of Parts	A	B	L	T	E	M
Post-assembly insertion double joints B5	5.8	5.2	19.5	3.3	12.7	3
Post-assembly insertion double joints B6	7.8	7.5	28.6	6	18.6	5
Post-assembly insertion double joints B8	9.8	10	39	6.5	24.5	6
Post-assembly insertion double joints B8-45			39.5		25	

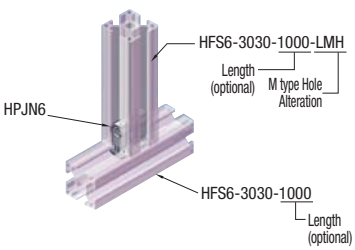
(3) Joint Pipe

Name of Parts	L	D	d
Joint Pipe 5-20	8	7	4.7
Joint Pipe 5-40	28		
Joint Pipe 6-30	12	11	7
Joint Pipe 6-60	42		
Joint Pipe 8-40	15	13	8
Joint Pipe 8-80	55		
Joint Pipe 8-45	19		
Joint Pipe 8-90	64		

Post Assembly Insertion Double Joint Kits	Applicable Extrusion No.	[Exception] Extrusion Not Available	
HPJN5-20	5-2020	-	Cannot be used on surfaces without slots.
HPJN5-40	5-2040 5-4040	-	
HPJN6-30	6-3030	-	
HPJN6-60	6-3060 6-6060	-	
HPJN8-40	8-4040	-	
HPJN8-80	8-4080 8-8080	-	
HPJN8-45	8-4545*	*HFSL8-4545, HFSLF8-4545 and HFSLT8-4545 cannot be used because the thickness of slot extrusion is different.	
HPJN8-90	8-4590* 8-9090	*HFSLT8-4590 cannot be used because the thickness of slot extrusion is different	

Example

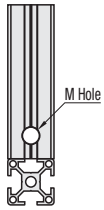
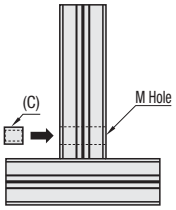
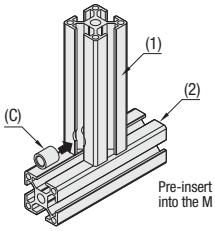
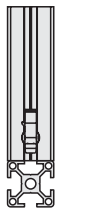
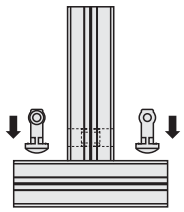
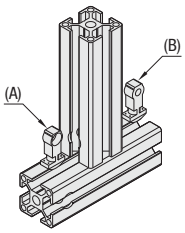
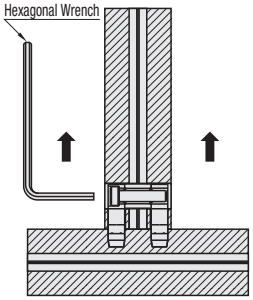
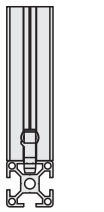
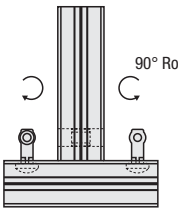
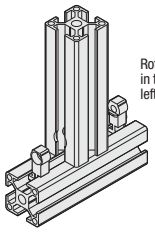
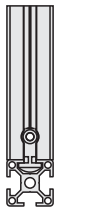
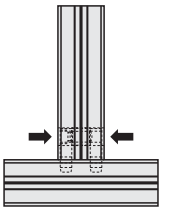
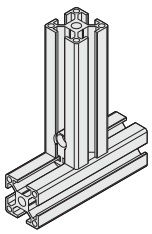
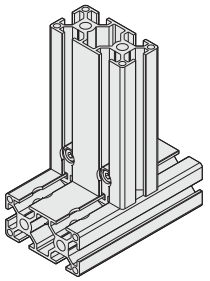
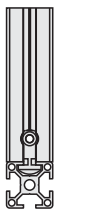
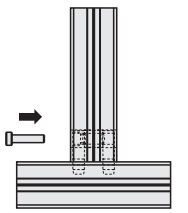
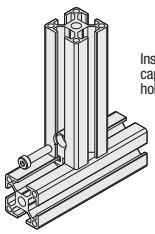
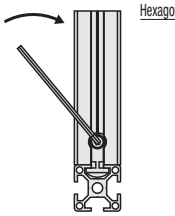
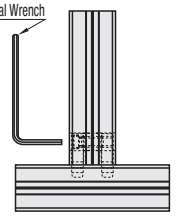
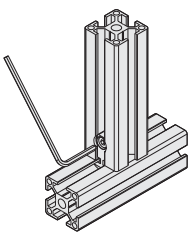
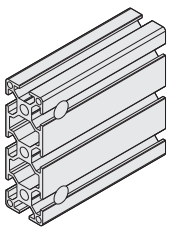
- Installation Example



Order Example Part Number HPJN6-30 Days to Ship 6 Days P.87

Example

■Post-Assembly Insertion Double Joint Connection (Connect the extrusion at the corners or the center.)

Step	Front View	Side view	Post-Assembly Insertion Double Joints	Specification Method by Part Number (30 Square as an Example)
1			 Pre-insert the joint pipe (C) into the M hole of extrusion (1).	(1) HFS6-3030-1000-LMH (2) HFS6-3030-1000 (A) Post-Assembly Insertion Double Joint A (B) Post-Assembly Insertion Double Joint B (C) Joint Pipe
2		 Insert the Post-Assembly Double Joints (A) and (B) sideways into the slot of extrusion (2).		 - When tightening the Hexagon Socket Head Cap Screw, pulling force works as illustrated above, and connects two extrusions.
3			 Rotate the joints (A) and (B) 90° in the direction as shown in the left figure.	
4		 Fit the joints (A) and (B) in the slot of the extrusion.		■ Example of Rectangle Shape Extrusion 
5			 Insert the hexagon socket head cap screw into a counterbore hole of the joint (A).	For extrusions with three rows of slots, M holes cannot be drilled on the center one. (For explanation of M hole, refer to **P.656**)
6		 Tighten the hexagon socket head cap screw with a hexagonal wrench; the extrusion (1) and (2) are lifted upward, then 2 extrusions joint together.		 ex.)HFS6-3090-1000-LMH

Blind Joint Components
-Simple Joint Kits-

Alterations necessary to use this component

Tapping →P.647

CAD Data

Features: Only end tapping is required on extrusions. Simple joints with good workability.

RoHS



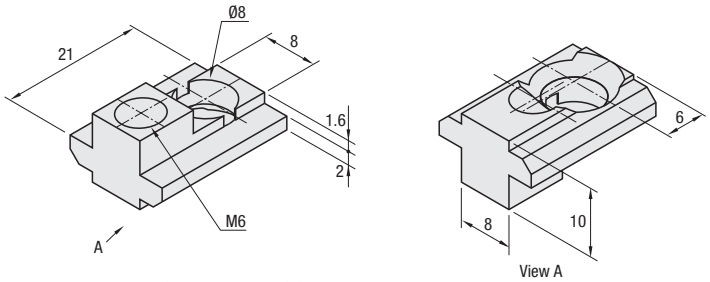
(Reference) Corner section when using this joint



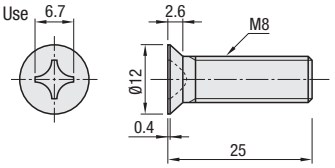
Name of Parts	Material	Surface Treatment
Body	1.1191/C45E	Trivalent Chromate
Dedicated Screws	1.7220/34CrMo4	Trivalent Chromate
Set Screw		Black Oxide

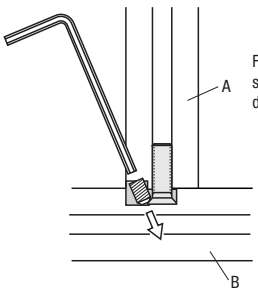
HUJ (Simple Joint Kit)

(1) Simple Joint Body (Set Screw Included)



(2) Bolts for Exclusive Use





Frame A and B are fastened as the set screw pushes the head of the dedicated bolt.

Part Number		Components		HUJ	
Type	No.			€ Unit Price	Volume Discount Rate
				1~99 pcs.	100~
HUJ	6	(1) Simple Joint Body (Set Screw Included)	(2) Bolts for Exclusive Use	300	285

Order Example

Part Number
HUJ6

Days to Ship: 6 Days P.87

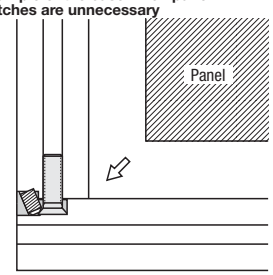
Simple Joint	Applicable Extrusion No.			
HUJ6	6-3030	6-3060	6-3090*	6-30120*
	6-5050			
	6-6060			

*Rectangle frame might have less fastening points depending on the direction of fastening. (Refer to the example of using HFS6-3090 on the next page.)

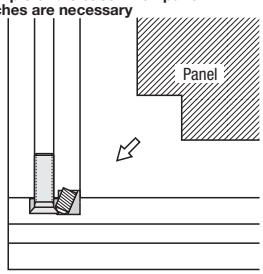
Example

To insert a panel into extrusion slots, notching may be required depending on the direction Simple Joint is mounted.

Example of the case when panel notches are unnecessary



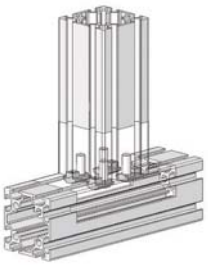
Example of the case when panel notches are necessary



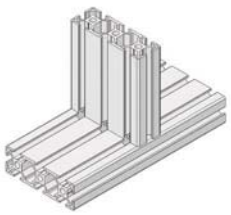
■Simple Joint Connection (Connected on the extrusion corner or in the middle)

Step	Side view	Sketch Drawing
1	**HUJ6** (1) Simple Joint Body (2) Bolts for Exclusive UseTapping	Tapping (2) (A) **HFS6-3030-1000-LTP** (1)
	Insert the exclusive bolt (2) into the simple joint main body (1) and install in the tap hole of the extrusion A.	
2	Do not tighten bolts too much, or they will not fit into the slot of Extrusion (B).	Enlarged View X Loosen the bolt head for a half revolution from the condition of the bolt fully inserted to keep some allowance at X part.
3	Insert into the slot of Extrusion (B).	(B) **HFS6-3030-1000**
4	Hexagonal Wrench Tighten the set screw of Simple Joint Body with a hexagonal wrench and the steps are finished.	

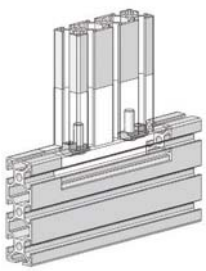
<Example of HFS6-6060>
- Using 4 simple joints



<Example of HFS6-3090(1)>
- Using 3 simple joints



<Example of HFS6-3090(2)>
- 2 easy joints are used in this example.



Blind Joint Components
-Single Joint Kits-

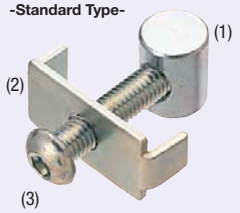
Alterations necessary to use this component

Wrench Hole	D type hole alteration
→P.649	→P.654

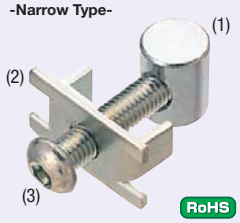
CAD Data How to use P.636

Features: D holes added on extrusions do not penetrate to the flat face. Blind Joints with very good appearance.

Single Joint Kits -Standard Type-

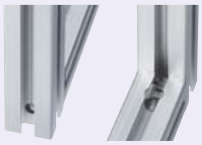


Single Joint Kits -Narrow Type-



RoHS

(Ref.) Corner section when using this joint



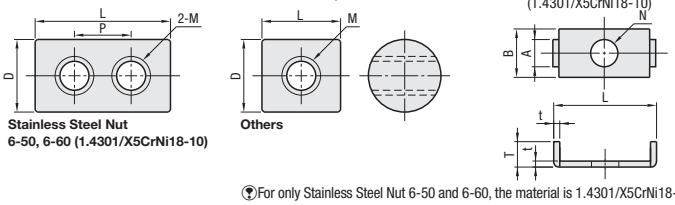
Type	Material	Surface Treatment
Nuts	1.0038/S235JR	Trivalent Chromate
Stainless Steel Nut	1.4401- equivalent, 1.4301/X5CrNi18-10	-
Plate	1.0330/DC01	Trivalent Chromate
Stainless Steel Plate	1.4301/X5CrNi18-10	-
Narrow Plate		
Button Head Cap Screw	1.7220/34CrMo4	Trivalent Chromate
Button Head Cap Screw Stainless Steel	1.4301/X5CrNi18-10	-

•Single Joint Kits -Standard Type-
Use it when edges of two extrusions are connected perpendicularly, after a hole is drilled in each extrusion.Refer to P.636

HSJ (Steel Type)
HSJS (Stainless Steel)

(1)Joint Nut
Nut (1.0038/S235JR)
Stainless Steel Nut (1.4301/X5CrNi18-10 / 1.4401- Equivalent, Sintering)

(2)Joint Plate
Plate (1.0330/DC01)
Stainless Steel Plate (1.4301/X5CrNi18-10)



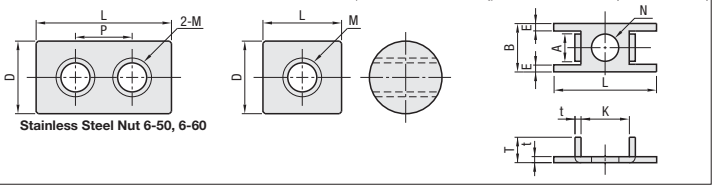
For only Stainless Steel Nut 6-50 and 6-60, the material is 1.4301/X5CrNi18-10.

•Single Joint Kits -Narrow Type-
Shape of Narrow Type has altered so that its joint section does not collide with the panel when the panel is inserted into the frame slot. Refer to P.680

HSJNS(Stainless Steel)

(1)Joint Nut
Stainless Steel Nut (1.4401/X5CrNiMo17-12-2, Sintering)

(2)Narrow Type Joint Plate
Narrow Plate (1.4301/X5CrNi18-10)



Single Joint Kits -Standard Type / Narrow Type-

Refer to the next page for the application to each extrusion.

Type	Part Number: Type	Part Number: No.	Applicable Extrusions (Type)	(1) Joint Nut (1 pc.): 1.0038/S235JR	(1) Joint Nut (1 pc.): 1.4301/X5CrNi18-10 / 1.4401- equivalent	(2) Joint Plates: 1.0330/DC01	Qty.	(2) Joint Plates: 1.4301/X5CrNi18-10	Qty.	(3) Hexagon Socket Button Head Cap Screw: 1.7220/34CrMo4	Qty.	(3) Hexagon Socket Button Head Cap Screw: 1.4301/X5CrNi18-10	Qty.	Steel Type: € Unit Price 1~99 pcs.	Steel Type: Volume Discount Rate 100~	Stainless Steel Type: € Unit Price 1~99 pcs.	Stainless Steel Type: Volume Discount Rate 100~
Standard	HSJ HSJS (Stainless Steel)	6	Refer to Right Page	Nut 6	Stainless Steel Nut 6	Plate 6	1	Stainless Steel Plate 6	1	Button Head Cap Screw M6-25	1	Button Head Cap Screw Stainless Steel M6-25	1				
		6-50		-	Stainless Steel Nut 6-50	-	-	Stainless Steel Plate 6-50	2	-	-		2				
		6-60			Stainless Steel Nut 6-60			Stainless Steel Plate 6									
		8		Nut 8	Stainless Steel Nut 8	Plate 8	1	Stainless Steel Plate 8	1	Button Head Cap Screw M8-35	1	Button Head Cap Screw Stainless Steel M8-35	1				
		8-45		Nut 8-45	Stainless Steel Nut 8-45	Plate 8-45		Stainless Steel Plate 8-45									
Narrow	HSJNS (Stainless Steel)	6		-	Stainless Steel Nut 6	-	-	Narrow Plate 6	1	-	-	Button Head Cap Screw Stainless Steel M6-25	1				
		6-50			Stainless Steel Nut 6-50			Narrow Plate 6-50	2				2				
		6-60			Stainless Steel Nut 6-60			Narrow Plate 6									
		8			Stainless Steel Nut 8			Narrow Plate 8	1			Button Head Cap Screw Stainless Steel M8-35	1				
		8-45*			Stainless Steel Nut 8-45			Narrow Plate 8-45									

* Not applicable to 45 Square Light Type Series (HFSL8-45).

(1) Dimension of Joint Nut

Type	Size	M	D	P	L
Nuts	6	6	11	-	12
	6-50			20	32
	6-60			30	42
	8	8	13	-	15
	8-45		15		19

(2) Dimension of Joint Plate

Type	Size	N	A	1.0330/DC01 B	1.0330/DC01 L	1.0330/DC01 T	1.0330/DC01 t	1.4301/X5CrNi18-10 / 1.4401- equivalent B	1.4301/X5CrNi18-10 / 1.4401- equivalent E	1.4301/X5CrNi18-10 / 1.4401- equivalent L	1.4301/X5CrNi18-10 / 1.4401- equivalent T	1.4301/X5CrNi18-10 / 1.4401- equivalent t	1.4301/X5CrNi18-10 / 1.4401- equivalent K
Plate	6	6.5	8	14	29	7.6	1.6	14	-	29	7.5	1.5	-
	6-50				19					19			
	8	8.5	10	18	38	12	2.0	18		38	12	2.0	
	8-45									43			
Narrow Plate	6	6.5	5	-				15	3	25	7.5	1.5	12.2
	6-50									19			
	8	8.5	6					18	3.5	34	12	2.0	15.2
	8-45									39			19.2

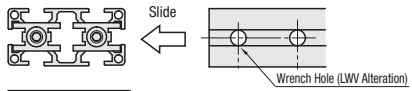
Order Example Part Number: HSJ8

Days to Ship 6 Days P.87

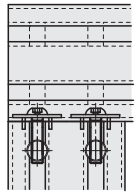
Example

•When mounting rectangular extrusions such as HFS6-3060, 8-4080 or 8-4590, refer to the below example.

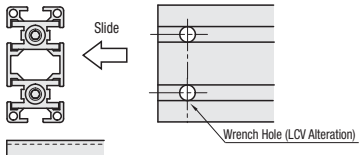
Ex. (1)



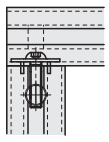
<Completed>



Ex. (2)

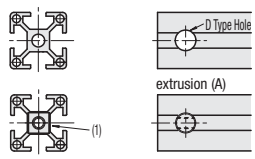
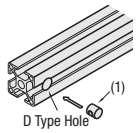
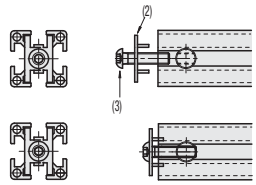
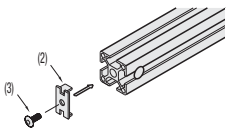
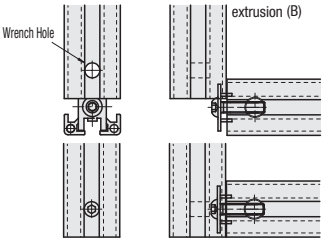
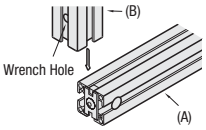
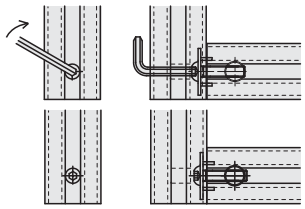
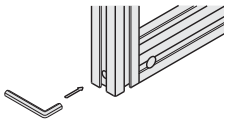


<Completed>



Example

Single Joint Connection Method (Connect the extrusions at the corners.)

Step	Front View Side View	Sketch Drawing
1		Drills D type hole in the frame.  Insert joint nut (1) in the extrusion where hole D is drilled.
2		 Put the button bolt (3) through the joint plate (2), lightly tighten it temporarily.
3		 Pass joint plate (2) through slot in the extrusion (B) where the wrench hole was drilled and slide it to bottom of (A)
4		 Tighten the button bolt (3) with a hexagonal wrench through the wrench hole.

Connection Method by Part Number(30 Square as an Example)

(A) **HFS6-3030-1000-LDH**

- Length (optional)
- Adds a D hole horizontally on the left side of the extrusion.

HSJNS6(Single Joint / Narrow Type)

- (1)**Stainless Steel Nut 6**
- (2)**Narrow Plate 6**
- (3)**Button Head Cap Screw Stainless Steel M6-25**

(B) **HFS6-3030-800-LCV**

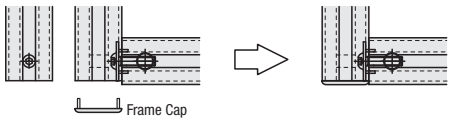
- Length (optional)
- Adds a wrench hole vertically on the left side of the extrusion.

Method of Shortening the Extrusion to Compensate for the Thickness of Extrusion End Cap

(Single Joint / Narrow Type)

For normal specification, the extrusion end cap adds its thickness to the length of a frame when it is mounted. With optional specification of the extrusion and change of the single joint, extrusion end cap and extrusion can be flat. Beforehand, please specify the extrusion length 3mm shorter (one side) to compensate for the thickness of the extrusion end cap. (The length is shortened by 6mm when wrench holes are located at both ends.)

•To specify options for extrusions, see **P.651**



In this case, use HSJNS instead of HSJ or HSJS.
(As the L dimension of HSJ is long, it fits the extrusion end cap.)

Extrusions Applicable to Single Joint (Not applicable to extrusions not listed in the table.)

Features	Extrusions: HFS6 Series 30, 50, 60, 100mm square Slot width 8mm		
	Type	No.	Applicable single joint
Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	HSJ6 / HSJS6 / HSJNS6
		3060	HSJ6 / HSJS6 / HSJNS6
		3090	HSJ6 / HSJS6 / HSJNS6
		30120	HSJ6 / HSJS6 / HSJNS6
		5050	HSJS6-50 / HSJNS6-50
		6060	HSJS6-60 / HSJNS6-60
		6090	HSJS6-60 / HSJNS6-60
		60120	HSJS6-60 / HSJNS6-60
Three-Side Slots One Flat	HFSF6 EFSF6	3030	HSJ6 / HSJS6 / HSJNS6
		3060	HSJ6 / HSJS6 / HSJNS6
		6060	HSJS6-60 / HSJNS6-60
Two-Side Slots Two Flats	HFST6 EFST6	3030	-
		6060	-
Two Slots on Opposite Sides	HFSH6 EFSH6	3030	HSJ6 / HSJS6 / HSJNS6
One-Side Slot Three Flats	HFSC6 EFSC6	3030	HSJ6 / HSJS6 / HSJNS6
Light Type	HFSL6	3030	HSJ6 / HSJS6 / HSJNS6
		3060	HSJ6 / HSJS6 / HSJNS6
Black Anodize	HFSB6 EFSB6	3030	HSJ6 / HSJS6 / HSJNS6
		3060	HSJ6 / HSJS6 / HSJNS6
		5050	HSJS6-50 / HSJNS6-50
		6060	HSJS6-60 / HSJNS6-60
	HFSFB6	3030	HSJ6 / HSJS6 / HSJNS6
	HFSTB6	3030	-
	HFSLB6	3030	HSJ6 / HSJS6 / HSJNS6
		3060	HSJ6 / HSJS6 / HSJNS6

Features	Extrusions: HFS8 Series 40, 80mm square Slot width 10mm		
	Type	No.	Applicable single joint
Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	HSJ8 / HSJS8 / HSJNS8
		4080	HSJ8 / HSJS8 / HSJNS8
		40120	HSJ8 / HSJS8 / HSJNS8
		40160	HSJ8 / HSJS8 / HSJNS8
Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4040	HSJ8 / HSJS8 / HSJNS8
Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	-
Two Slots on Opposite Sides	HFSH8 EFSH8	4040	HSJ8 / HSJS8 / HSJNS8
One-Side Slot Three Flats	HFSC8 EFSC8	4040	HSJ8 / HSJS8 / HSJNS8
Light Type	HFSL8	4040	HSJ8 / HSJS8 / HSJNS8
		4080	HSJ8 / HSJS8 / HSJNS8
Black Anodize	HFSB8 EFSB8	4040	HSJ8 / HSJS8 / HSJNS8
		4080	HSJ8 / HSJS8 / HSJNS8
	HFSFB8	4040	HSJ8 / HSJS8 / HSJNS8
	HFSTB8	4040	-
	HFSLB8	4040	HSJ8 / HSJS8 / HSJNS8
		4080	HSJ8 / HSJS8 / HSJNS8

Features	Extrusions: HFS8-45 Series HFS8-50 Series HFS8-60 Series 45, 50, 60, 90, 100mm square Slot width 10mm		
	Type	No.	Applicable single joint
Four-Side Slots	HFS8 GFS8 EFS8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
		4590	HSJ8-45 / HSJS8-45 / HSJNS8-45
		45180	HSJ8-45 / HSJS8-45 / HSJNS8-45
Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4545	-
Two Slots on Opposite Sides	HFSH8 EFSH8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
One-Side Slot Three Flats	HFSC8 EFSC8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
Light Type	HFSL8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
	HFSLF8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
	HFSLT8	4545	-
Black Anodize	HFSB8 EFSB8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
		4590	HSJ8-45 / HSJS8-45 / HSJNS8-45
	HFSFB8	4545	HSJ8-45 / HSJS8-45 / HSJNS8-45
	HFSTB8	4545	-

Blind Joint Components
-Pre-Assembly Insertion Double Joint Kits-

Alterations necessary to use this component

S type hole alteration →P.655

CAD Data

Features: Two screws are used for connecting. Can be used to entend extrusions as well as mounting to plates. A joint type superior in mounting flexibility.

Pre-Assy. Insertion Double Joint Kits -Standard Type-



Products shown in the picture come by ordering quantity 1.

Pre-Assy. Insertion Double Joint Kits -Eccentric Nut Type-



RoHS

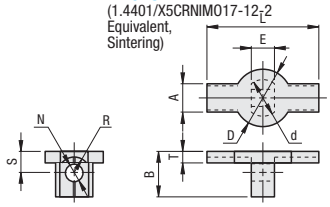
Products shown in the picture come by ordering quantity 1.

(Ref.) Corner section when using this joint

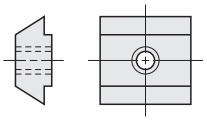


HDJSN

(1) Pre-Assembly Insertion Double Joint
HDJFSN
(1.4401/X5CRNIMO17-12-2 Equivalent, Sintering)



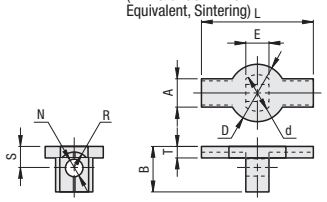
(2) Pre-Assembly Insertion Nut HNTTSN
(1.4401/X5CRNIMO17-12-2 Equivalent, Sintering) Electrically conductive



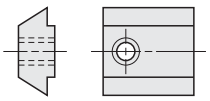
HDJHSN

(Eccentric Nut Type)

(1) Pre-Assembly Insertion Double Joint
HDJFSN
(1.4401/X5CRNIMO17-12-2 Equivalent, Sintering)



(2) Pre-Assembly Insertion Eccentric Nut HNTHSN
(1.4401/X5CRNIMO17-12-2 Equivalent, Sintering) Electrically conductive



Pre-Assy. Insertion Double Joint Kits

Type	Part Number		(1) Pre-Assembly Insertion Double Joint (2 pcs.)	(2) Pre-Assembly Insertion Nut (2 pcs.)	(3) Hexagon Socket Head Cap Screw (2 pcs.)	€ Unit Price	Volume Discount Rate
	Type	No.	1.4401/X5CRNIMO17-12-2	1.4401	1.4301/X5CRNI18-10	1~99 pcs.	100~
Standard	HDJSN (1.4401/X5CRNIMO17-12-2 Equivalent, Sintering)	6	HDJFSN6	HNTTSN6-5	SCB5-25		
		8	HDJFSN8	HNTTSN8-6	SCB6-35		
		8-45	HDJFSN8-45				
Eccentricity Nuts	HDJHSN (1.4401/X5CRNIMO17-12-2 Equivalent, Sintering)	6	HDJFSN6	HNTHSN6	SCB5-25		
		8	HDJFSN8	HNTHSN8	SCB6-35		
		8-45	HDJFSN8-45				

(1) Pre-Assembly Insertion Double Joint Single Item ▼One set is required to connect one place. ▼One set contains 2 pcs.

Part Number Type	No.	L	A	B	E	T	S	N	R	d	D	€ Unit Price 1~99 Sets	Volume Discount Rate 100~
HDJFSN (One set contains 2 pcs.)	6	29	7.9	12	7.3	1.9	4.7	5	4.25	10.9	16.5		
	8	39	9.9	16	8	4	7.5	6	5.5	12.9	20		
	8-45	44			11.2	4.5	8			14.9			

Pre Assy. Insertion Double Joints	Part Number		Usable in any direction.	Usable in the short length direction	Usable in the long length direction.	Usable in the direction where there is no flat surface at the connecting part.
HDJSN6 HDJHSN6 HDJFSN6	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	0			
		3060	0			
		3090	0			
		30120		0		
		5050	0			
		50100	0			
		100100	0			
		6060	0			
		6090	0			
		60120		0		
	HFSF6 EFSF6	3030				0
		3060			0	0
		5050				0
		6060				0
	HFSH6 EFSH6	3030				0
		3060			0	0
	HFSL6	3030	0			
		3060	0			
	HFSG6	6060	0			
	HFSB6 EFSB6	3030	0			
		3060	0			
		3090	0			
		30120	0			
		5050	0			
		6060	0			
	HFSFB6 EFSFB6	3030				0
	HFSLB6	3030	0			
		3060	0			
HDJSN8 HDJHSN8 HDJFSN8	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	0			
		4080	0			
		40120		0		
		40160		0		
		8080	0			
		80160		0		
	HFSH8	8080	0			
	HFSF8 GFSF8 EFSF8	4040				0
		4080			0	0
		8080				0
	HFSH8 EFSH8	4040				0
		4080			0	0
	HFSL8	4040	0			
		4080	0			
		4040	0			
		4080	0			
	HFSB8 EFSB8	40120		0		
		40160		0		
		8080	0			
		80160		0		
	HFSFB8	4040				0
	HFSLB8	4040	0			
		4080	0			
HDJSN8-45 HDJHSN8-45 HDJFSN8-45	HFS8 GFS8 EFS8	4545	0			
		4590	0			
		45180		0		
		5050	0			
		50100	0			
		6060	0			
		9090	0			
		90180		0		
	HFSF8 GFSF8 EFSF8	4545				0
		4590			0	0
		5050				0
		6060				0
	HFSH8 EFSH8	4545				0
	HFSL8	4545	0			
		4590	0			
	HFSLF8	4545				0
	HFSB8 EFSB8	4545	0			
		4590	0			
		5050	0			
		50100	0			
		9090	0			
		90180		0		
	HFSFB8	4545				0

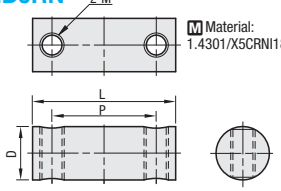
Not applicable to extrusions not listed above.

Pre Assy. Insertion Double Nuts for Joints



RoHS

HDJRN



M Material: 1.4301/X5CRNI18-10

Part Number Type	No.	D	L	P	M	Mass (g)	€ Unit Price 1~99 pcs.	Volume Discount Rate 100~
HDJRN	6	11	29.8	20.6	6	43		
	8	13	39.8	25		52		
	8-45	15	44.8	29		56		

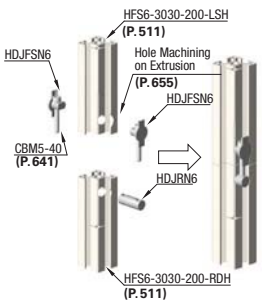
Part Number Type	No.	Applicable: Applicable Extrusion	Pre-Assembly Insertion Double Joint	Screw Fastening
HDJRN	6	HFS6-3030	HDJFSN6	CBM5-40
	8	HFS8-4040	HDJFSN8	CBM6-50
	8-45	HFS8-4545	HDJFSN8-45	CBM6-50

Order Example

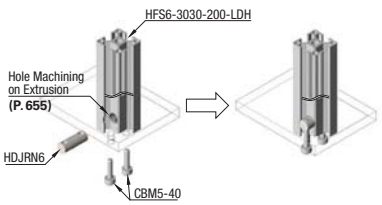
Part Number
HDJSN8-45
HDJRN6

Days to Ship: 6 Days P.87

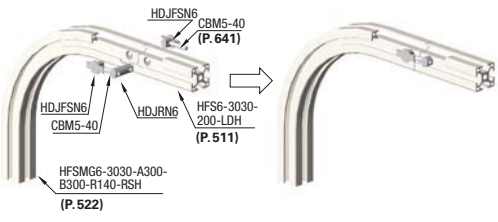
Example of Extrusion Connection



Example of Mounting to an Extrusion from the Bottom

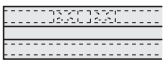
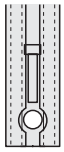
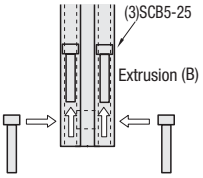
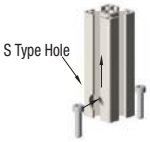
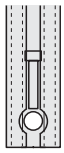
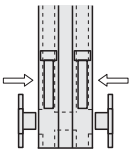
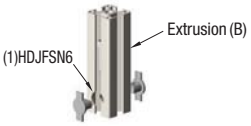
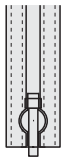
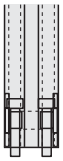
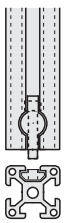
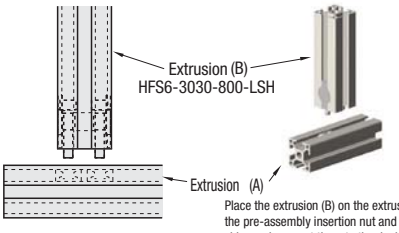
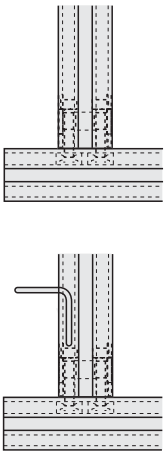


Example of Connection with Curved Extrusions



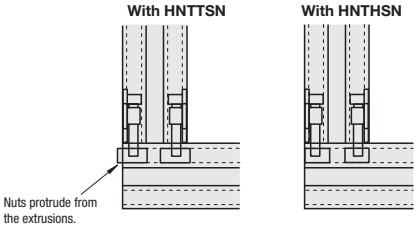
Example

■Pre-Assembly Insertion Double Joint Connection (Connect the extrusion at the center.)

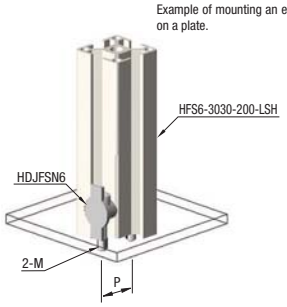
Step	Front View	Side View	Sketch Drawing
1			 (2) Pre-insert the pre-assembly insertion nuts into the extrusion (A).
2			 Insert screw (3) in the extrusion (B) with S hole. Put the screw head through the S hole, then move the screw along the slot until the screw tip aligns with S hole.
3			 Insert Pre-Assembly Double Joint (1) into the extrusion (B) where the screws were inserted.
4			 Put the screw through the hole of the Pre-Assembly Double Joint in the slot of the extrusion (B).
5			Place the extrusion (B) on the extrusion (A), then slide the pre-assembly insertion nut and screw from both sides and connect them to the double joint (1).
6			 Tighten with a hexagonal wrench while adjusting the position.

- **How to Use Pre-Assembly Insertion Double Joint Connection at the Corner**

  If HNTHSN6 is used instead of (2) HNTTSN6-5, Pre-Assembly Insertion Double Joint can be used at the corner of the extrusion.



- Pre-Assembly Insertion Double Joint Kits · Eccentric Nut Type
  It is used when installing brackets with angle, truss brackets and angled extrusions.
- The allowable load is the same level as when the bracket is used.



Part Number Type	Part Number No.	Extrusion Used	M	P
HDJFSN	6	HFS6-3030	5	20.6
		HFS6-5050		40.6
		HFS6-6060		50.6
	8	HFS8-4040	6	25
		HFS8-8080		65
	8-45	HFS8-4545		29
		HFS8-5050		34
		HFS8-6060		44
		HFS8-9090		74

Same shape of different surface treatment or material can be also used.

Blind Joint Components
-Parallel Joint Kits-

Alterations necessary to use this component
L type hole alteration →P.657

Features: Extrusions can be connected in parallel. Post assembly additions enabling type is also provided.

Parallel Joint -Pre-Assembly Insertion Type-

RoHS



Parallel Joint -Post-Assembly Insertion Type-



(Ref.) Corner section when using this joint

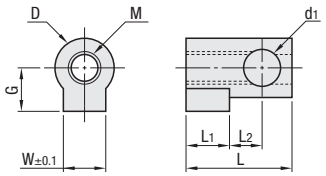


Name of Parts	Material	Surface Treatment
Pre-Assy. Insertion Parallel Post	1.4308/G-X6CrNi18-9	-
Post-Assy. Insertion Parallel Post		
Joint Guide	1.4301/X5CrNi18-10	
Set Screw	1.7220/34CrMo4	Black Oxide

HLJ
(Parallel Joint Kits Pre-Assy. Insertion Type)

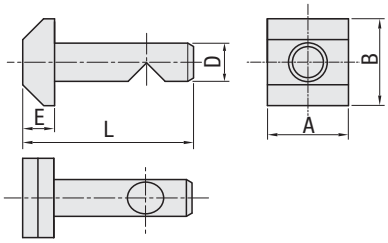
HALJ
(Parallel Joint Kits Post-Assy. Insertion Type)

Joint Guide (Component (1))

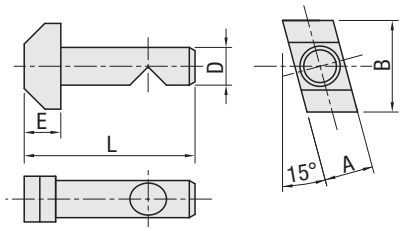


Parallel Joint(Component (2))

(2)-1 Pre-Assy. Insertion Parallel Post



(2)-2 Post-Assy. Insertion Parallel Post



Part Number		Accessory						€ Unit Price	Volume Discount Rate
Type	No.	(1) (2) Parallel Post	Qty.	(3) Joint Guide	Qty.	(4) Set Screw	Qty.	1~99 pcs.	100~
HLJ Pre-Assembly Insertion Type	5	Pre-Assy. Insertion Parallel Post 5	1	5	1	M4X8	1		
	6	Pre-Assy. Insertion Parallel Post 6		6		M6X12			
	8	Pre-Assy. Insertion Parallel Post 8		8		M6X16			
HALJ Post-Assembly Insertion Type	5	Post-Assy. Insertion Parallel Post 5		5		M4X8			
	6	Post-Assy. Insertion Parallel Post 6		6		M6X12			
	8	Post-Assy. Insertion Parallel Post 8		8		M6X16			

Detailed Dementions of Components
Joint Guide (Component (1))

Name of Parts	D	G	W	L	L1	L2	d1	M
Joint Guide 5	6.9	5.5	5.8	13.0	5	4	4.1	4
Joint Guide 6	10.9	8	7.8	19.5	8	6	6.8	6
Joint Guide 8	12.8	9	9.8	28.0	11	7.5	9.9	

Pre-Assy. Insertion Parallel Post (Component (2)-1)

Name of Parts	D	L	E	A	B
Pre-Assy. Insertion Parallel Post 5	4	20.5	3.5	10	10
Pre-Assy. Insertion Parallel Post 6	6.6	29.5	5.5	14	15
Pre-Assy. Insertion Parallel Post 8	9.8	41	6	17	17

Post-Assy. Insertion Parallel Post (Component (2)-2)

Name of Parts	D	L	E	A	B
Post-Assy. Insertion Parallel Post 5	4	20.5	3.5	6	10
Post-Assy. Insertion Parallel Post 6	6.6	30.4	6.4	8	15
Post-Assy. Insertion Parallel Post 8	9.8	41.4	6.4	10	17

Extrusions Applicable to This Joint

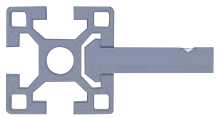
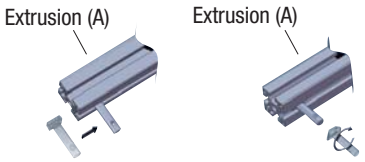
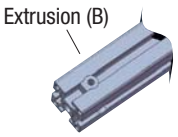
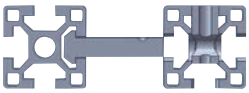
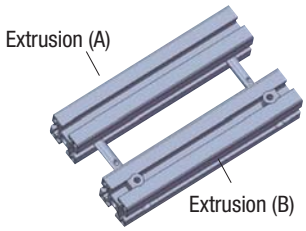
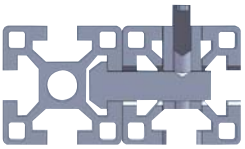
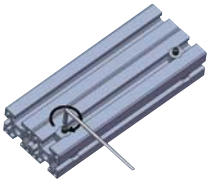
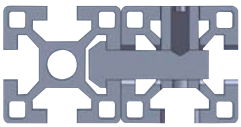
Parallel Joint No.	Applicable Extrusion No.	[Exception] Extrusion Not Available
5	5-2020*1 5-2040 5-2060 5-2080 5-4040 5-4060 5-4080	* 1HFSH and HFSC are not applicable since L holes cannot be added.
6	6-3030*1 6-3060*1 6-3090 6-30120 6-5050 6-50100 6-6060 6-6090	* 1HFSH and HFSC are not applicable since L holes cannot be added.
8	8-4040*1 8-4080*1 8-40120 8-40160	* 1HFSH and HFSC are not applicable since L holes cannot be added.

Order Example — Part Number: HLJ8

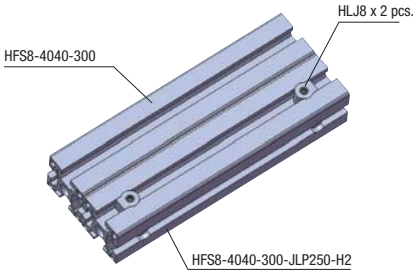
Days to Ship: 6 Days P.87

Example

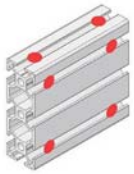
Parallel Joint Connection Method

Step	Front View / Side View	Parallel Joint	Explanation
1			Mount parallel post to extrusion (A). (Post-Assembly Insertion Type can be inserted by turning from upside of slot.) Parallel Post is for Standard Type and With Rotation Stopper Type.
2			Insert a Jont Guide into the extrusion (B) with L Holes (**P.657**). Aligning of the holes is not reqired.
3			Move the plate (A) close to the plate (B) while putting the parallel post through the through hole of joint guide.
4			Tighten the set screw to the side of joint guide.
5			When the set screw is tightened against the V groove on the post, the extrusions (A) and (B) will pull together and be bound.

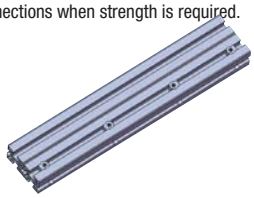
- Part Numbers for the parts shown on the above example.



- Connecting extrusions with 2 or more slots on one side.
  Insert joint guide from the both ends of L hole, then connect with 2 or more parallel joints.
- Connecting extrusions with 3 or more slots. L holes are added on the outside rows only.
  Not applicable on rows in the middle.



- As long as interference between each joint does not occur, multiple extrusions can be connected. Use multiple connections when strength is required.



NEW Hexagon Socket Head Cap Screws for Aluminum Frames -Single Item · Bulk-packages-

Features: Standard screws to connect various brackets for wide range of applications.

Hex Socket Head Cap Screws

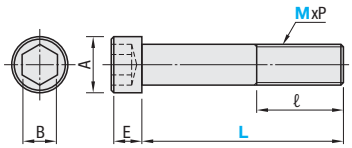


RoHS

Type	Material	Surface Treatment
CBM	1.7220	Carbon Steel Bright Chromate Plating
SCB	1.4567	-
HCBMTB	1.7220	Trivalent Chromate (Black)

CBM (Carbon Steel Bright Chromate)
SCB (Stainless Steel)
HCBMTB (Trivalent Chromate, Black)

Not RoHS compliant



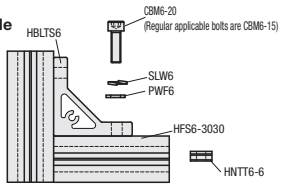
ℓ	Part Number Type M - L	MxP	A	E	B	CBM €Unit Price 1~99 pcs.	CBM Volume Discount Rate 100~	SCB €Unit Price 1~9 pcs.	SCB Volume Discount Rate 10~29	SCB Volume Discount Rate 30~99	SCB Volume Discount Rate 100~	HCBMTB €Unit Price 1 ~ 99 pcs.	HCBMTB Volume Discount Rate 100~
Full Thread	CBM SCB HCBMTB 3 - 18	3x0.5	5.5	3	2.5								
18	CBM SCB HCBMTB 3 - 35												
Full Thread	CBM SCB HCBMTB 4 - 18	4x0.7	7	4	3								
20	CBM SCB HCBMTB 4 - 22												
20	CBM SCB HCBMTB 4 - 45												
Full Thread	CBM SCB HCBMTB 5 - 6	5x0.8	8.5	5	4								
	CBM SCB HCBMTB 5 - 8												
	CBM SCB HCBMTB 5 - 10												
	CBM SCB HCBMTB 5 - 14												
	CBM SCB HCBMTB 5 - 18												
	CBM SCB HCBMTB 5 - 22												
Full Thread	CBM SCB HCBMTB 6 - 8	6x1.0	10	6	5								
	CBM SCB HCBMTB 6 - 12												
	CBM SCB HCBMTB 6 - 14												
	CBM SCB HCBMTB 6 - 15												
	CBM SCB HCBMTB 6 - 16												
	CBM SCB HCBMTB 6 - 18												
	CBM SCB HCBMTB 6 - 20												
	CBM SCB HCBMTB 6 - 22												
	CBM SCB HCBMTB 6 - 30												
24	CBM SCB HCBMTB 6 - 60												
Full Thread	CBM SCB HCBMTB 8 - 12	8x1.25	13	8	6								
	CBM SCB HCBMTB 8 - 15												
	CBM SCB HCBMTB 8 - 18												
	CBM SCB HCBMTB 8 - 20												
	CBM SCB HCBMTB 8 - 22												
	CBM SCB HCBMTB 8 - 25												
28	CBM SCB HCBMTB 8 - 80												

For other spec., refer to **P.174** and **176**

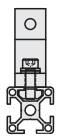
Days to Ship: 6 Days P.87

Order Example: Part Number CBM6-8

Example



<View from Extrusion Side>



<View from Cross Section of Extrusion>

Please use bolts of different length from regular applicable ones depending on conditions, such as washers for bracket loosening prevention.

Features: Screws with washers have optimum shank lengths for extrusion connections using brackets.

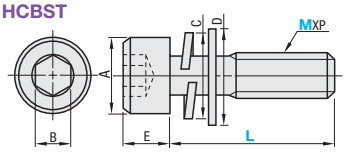
Spring Washer Assembled Screws

RoHS



Screw	Material: Structural Alloy Steel Hardness: 32~44HRC * Strength Class 10.9 JIS 0209 (6g)
Washer	Spring Washer JIS B1251 Flat Washer JIS B1256
Surface Treatment	Trivalent Chromate

HCBST



Part Number Type	M - L	MxP	A	E	B	C	D	HCBST €Unit Price 1 ~ 99 pcs.	HCBST Volume Discount Rate 100~
HCBST	5 - 12	5x0.8	8.5	5	4	8.5	10		
	5 - 16								
	6 - 15	6x1.0	10	6	5	11.5	12.5		
	6 - 20								
	6 - 25								
	8 - 20	8x1.25	13	8	6	14.5	17		
	8 - 24								
	8 - 29								

Days to Ship: 6 Days 2 Days P.87

Order Example: Part Number HCBST6-15

Surface Treatment: Black Oxide, Materials: For Spring Washer Assembled Hexagon Socket Head Cap Screws of stainless steel, refer to **P.178**

CAD Data

Features: Bulk-packages of Spring Washer Assembled Screw HCBST. Bulk-packages are cost-saving for in-house stock or large quantities.

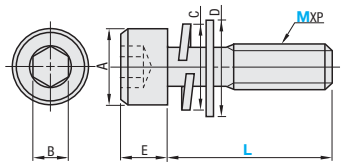
Spring Washer Assembled Screws Bulk-packages (500pcs. per package)



RoHS

Screw Fastening	M Material: Structural Alloy Steel H Hardness: 32~44HRC * Strength Class 10.9 JIS 0209 (6g)
Washer	Spring Washer JIS B1251 Flat Washer JIS B1256
S Surface Treatment	Trivalent Chromate

HCBST_-__-SET1



Part Number Type	M M - L - SET1 (500pcs. per pkg.)		MxP	A	E	B	C	D	€Package Price	Price per pc.
HCBST	5 - 12	SET1	5x0.8	8.5	5	4	8.5	10		
	16									
	6 - 15		6x1.0	10	6	5	11.5	12.5		
	20									
	25									
	8 - 20		8x1.25	13	8	6	14.5	17		
	24									
	29									

Days to Ship: 6 Days P.87

Order Example: Part Number HCBST6-15-SET1

List of Hexagon Socket Head Cap Screws with Captured Washers for each Bracket

Extrusions	Bracket	Hexagon Socket Head Cap Screws with Captured Washers	Bracket (With Female Thread Hole)	Hexagon Socket Head Cap Screws with Captured Washers
HFS5 Series	HBLFSL5	Not applicable	HBLFSL5-C	Not applicable
	HBLFSN5	HCBST5-12	HBLFSN5-C	HCBST5-12
	HBLFSSW5	Not applicable	HBLFSSW5-C	Not applicable
	HBLFSD5	HCBST5-12	HBLFSD5-C	HCBST5-12
	HBLFUD5	HCBST5-16	HBLFUD5-C	HCBST5-16
	HBLT_5	HCBST5-12	HBLT_5-C	HCBST5-12
	HBLU_5	HCBST5-16	HBLU_5-C	HCBST5-16
	HBLS_5	Not applicable	-	-
	HBLFSNT5 (With Cover)	Not applicable	HBLFSNT5-C (With Cover)	Not applicable
HFS6 Series	HBLFSL6	Not applicable	HBLFSL6-C	Not applicable
	HBLFSN6	Not applicable	HBLFSN6-C	Not applicable
	HBLFS6	HCBST6-15	HBLFS6-C	HCBST6-15
	HBLFSSW6 (-50)	HCBST6-15	HBLFSSW6 (-50)-C	HCBST6-15
	HBLFSD6	Not applicable	HBLFSD6-C	Not applicable
	HBLFSDD6	Not applicable	HBLFSDD6-C	Not applicable
	HBLSDW6 (-50)	HCBST6-15	HBLFSDW6 (-50)-C	HCBST6-15
	HBLFTD6 (-50)	HCBST6-20	HBLFTD6 (-50)-C	HCBST6-20
	HBLFUD6 (-50)	HCBST6-25	HBLFUD6 (-50)-C	HCBST6-25
	HBLT_6(-50)	HCBST6-20	HBLT_6-C(-50)	HCBST6-20
	HBLU_6(-50)	HCBST6-25	HBLU_6-C(-50)	HCBST6-25
	HBLS_6(-50)	Not applicable	-	-
	HBLD_6 (Triangle)	Not applicable	-	-
	HBLFSNT6 (With Cover)	Not applicable	HBLFSNT6-C (With Cover)	Not applicable
HFS8 Series	HBLFSN8 (-45)	HCBST8-24	HBLFSN8 (-45)-C	HCBST8-24
	HBLFS8	HCBST8-24	HBLFS8-C	HCBST8-24
	HBLFSSW8 (-45)	HCBST8-24	HBLFSSW8 (-45)-C	HCBST8-24
	HBLFSD8	HCBST8-24	HBLFSD8-C	HCBST8-24
	HBLFTD8	HCBST8-24	HBLFTD8-C	HCBST8-24
	HBLFUD8	HCBST8-29	HBLFUD8-C	HCBST8-29
	HBLT_8(-45)	HCBST8-24	HBLT_8(-45)-C	HCBST8-24
	HBLU_8(-45)	HCBST8-29	HBLU_8(-45)-C	HCBST8-29
	HBLS_8(-45)	HCBST8-20	-	-
	HBLDSWT8 (-45) (Triangle)	Not applicable	-	-
	HBLFSNT8 (With Cover)	Not applicable	HBLFSNT8-C (With Cover)	Not applicable

If not applicable, failures may occur such as bolt heads interfering with each other.

Screws for Aluminum Frames -Single Item · Bulk-packages-

Features: Flathead screws for countersunk holes such as on hinges and etc.

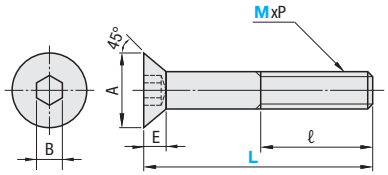
Hexagon Socket Flat Head Screws

RoHS



Type	Materials	Surface Treatment
HFBCM	1.7220/34CrMo4	Trivalent Chromate
SHFBS	1.4301/X5CrNi18-10 Equivalent	-
HFBMB	1.7220/34CrMo4	Trivalent Chromate (Black)

HFBCM (Trivalent Chromate)
SHFBS (Stainless Steel)
HFBMB (Trivalent Chromate (Black))



ℓ	Part Number Type	M - L	MxP	A	E	B	HFBCM € Unit Price 1~99 pcs.	HFBCM Volume Discount Rate 100~	SHFBS € Unit Price 1~99 pcs.	SHFBS Volume Discount Rate 100~	HFBMB € Unit Price 1~99 pcs.	HFBMB Volume Discount Rate 100~
Full Thread	HFBCM / SHFBS / HFBMB	3 - 6 8 10 12	3x0.5	6	1.7	2						
Full Thread	HFBCM / SHFBS / HFBMB	4 - 6 8 10 12	4x0.7	8	2.3	2.5						
Full Thread	HFBCM / SHFBS / HFBMB	5 - 6 8 10 12 15 20 35 40 45	5x0.8	10	2.8	3						
16												
Full Thread	HFBCM / SHFBS / HFBMB	6 - 8 10 12 15 20	6x1.0	12	3.3	4						
Full Thread	HFBCM / SHFBS / HFBMB	8 - 12 15 16 20	8x1.25	16	4.4	5						
Full Thread	HFBCM / SHFBS / HFBMB	10 - 16 18	10x1.5	20	5.5	6						
Full Thread	SHFBS	12 - 20	12x1.75	24	6.5	8						

Features: Convenient screws for visible locations such as panel mounting.

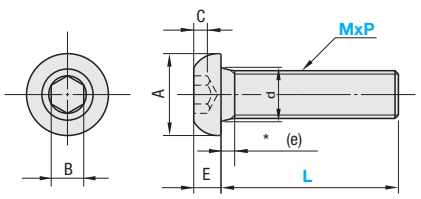
Hexagon Socket Button Head Cap Screw

RoHS



Type	Material	Hardness	Surface Treatment
HBCBM	1.7220/34CrMo4	31HRC	Trivalent Chromate
SBCB	1.4567/X3CrNiCu18-9-4	-	-

HBCBM (Trivalent Chromate)
SBCB (Stainless Steel)



JIS B 1174

Part Number Type	M - L	A	E	B	C (Min.)	d	(e) (Max.)	€ Unit Price 1 ~ 199 pcs.	Volume Discount Rate 200~299	300~499	500~
HBCBM	5 - 10 5 - 15	9.5	2.75	3	1.56	5.7	1.6				
HBCBM	6 - 20 6 - 25	10.5	3.3	4	2.08	6.8	2				
HBCBM	8 - 20 8 - 25 8 - 35	14	4.4	5	2.6	9.2	2.5				
SBCB	4 - 12	7.5	2.2	2.5	1.3	4.7	2.1				
SBCB	6 - 25	10.5	3.3	4	2.08	6.8	3				
SBCB	8 - 25 8 - 35	14	4.4	5	2.6	9.2	3.5				
SBCB	10 - 30	17.5	5.5	6	3.12	11.2	4.5				
SBCB	12 - 35	21	6.6	8	4.16	14.2	5.25				

Days to Ship: 6 Days (P.87), 2 Days

Order Example — Part Number: HFBCM4-6, HBCBM6-20

For other spec.,refer to P.183

Price Reduction
4% on average

CAD Data

Features: Flathead screws for countersunk holes such as on hinges and etc.

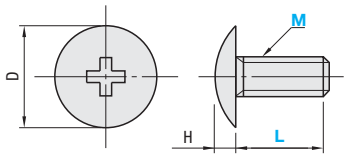
Cross Recessed Truss Machine Screws

RoHS



Type	M Material	S Surface Treatment
HCBM	JIS STKM for Mechanical Structure	Carbon Steel Bright Chromate Plating
SHCBM	1.4301/X5CrNi18-10 Equivalent	-
HCBMB	JIS STKM for Mechanical Structure	Trivalent Chromate (Black)

HCBM HCBMB (Trivalent Chromate (Black))
SHCBM (Stainless Steel)



Not RoHS compliant

Part Number Type	M - L	D	H	HCBM € Unit Price 1 ~ 99 pcs.	HCBM Volume Discount Rate 100~	SHCBM € Unit Price 1 ~ 99 pcs.	SHCBM Volume Discount Rate 100~	HCBMB € Unit Price 1 ~ 99 pcs.	HCBMB Volume Discount Rate 100~
HCBM SHCBM	3 - 6	6.9	1.9						
HCBM SHCBM HCBMB	4 - 5 8 10 12	9.4	2.5						
HCBM SHCBM HCBMB	5 - 8 10 12 15 30 35	12	3.1						
HCBM SHCBM HCBMB	6 - 10 12 15	14	3.7						

Days to Ship: 6 Days / 2 Days P.87

Order Example: Part Number HCBM5-12

Features: Bulk-packages of Hexagon Socket Flat Head Cap Screws · Cross Recessed Truss Machine Small Screws. Bulk-packages are cost effective for in-house stock or large quantitiy uses.

Hexagon Socket Flat Head Cap Screws/ Cross Recessed Truss Machine Screws Small Screw Bulk-packages (500pcs. per package)

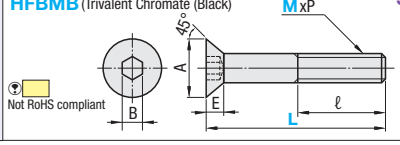
RoHS



Type		M Material	S Surface Treatment
Hexagon Socket Flat Head Cap Screws	HFBCM	1.7220/34CrMo4	Trivalent Chromate
	SHFBS	1.4301/X5CrNi18-10 Equivalent	-
	HFBMB	1.7220/34CrMo4	Trivalent Chromate (Black)
Cross Recessed Truss Machine Small Screws	HCBM	JIS STKM for Mechanical Structure	Carbon Steel Bright Chromate Plating
	SHCBM	1.4301/X5CrNi18-10 Equivalent	-
	HCBMB	JIS STKM for Mechanical Structure	Trivalent Chromate (Black)

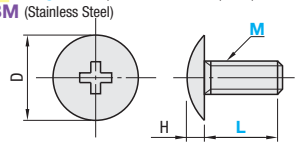
■Hexagon Socket Flat Head Cap Screws Bulk-packages ■Cross Recessed Truss Machine Small Screws Bulk-packages

HFBCM (Trivalent Chromate)
SHFBS (Stainless Steel)
HFBMB (Trivalent Chromate (Black))



Not RoHS compliant

HCBM HCBMB (Trivalent Chromate (Black))
SHCBM (Stainless Steel)



Hexagon Socket Flat Head Cap Screws

Part Number Type	M	L	SET / (500pcs. per pkg.)	MXP	ℓ	A	E	B
HFBCM SHFBS HFBMB	3	6 8 10 12	SET1	3x0.5	Full Thread	6	1.7	2
	4	6 8 10 12		4x0.7	Full Thread	8	2.3	2.5
	5	6 8 10 12 15 20 35 40 45		5x0.8	Full Thread 16	10	2.8	3
	6	8 10 12 15 20		6x1.0	Full Thread	12	3.3	4
	8	12 15 16 20		8x1.25	Full Thread	16	4.4	5
	10	16 18		10x1.5	Full Thread	20	5.5	6

Cross Recessed Truss Machine Screws

Part Number Type	M	L	SET / (500pcs. per pkg.)	D	H
HCBM SHCBM HCBMB	3	6	SET1	6.9	1.9
	4	5		9.4	2.5
	5	8		12	3.1
	6	10		14	3.7

Price (euros)

Days to Ship: 6 Days / 2 Days P.87

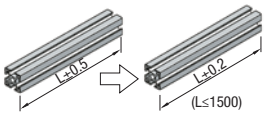
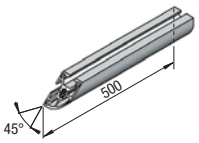
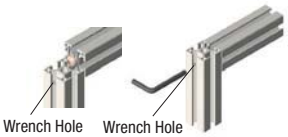
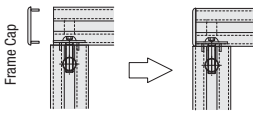
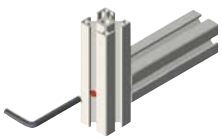
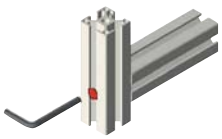
Order Example: Part Number HFBCM5-10-SET1

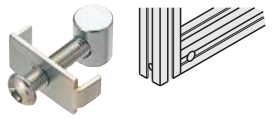
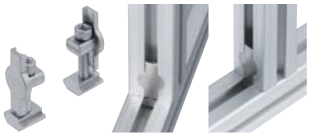
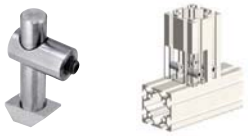
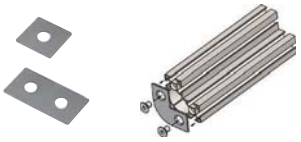
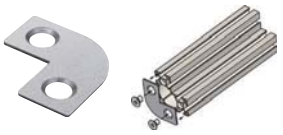
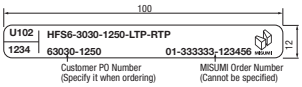
M-L	HFBCM € Unit Price of Set of 500 pcs. (SET1)	SHFBS € Unit Price of Set of 500 pcs. (SET1)	HFBMB € Unit Price of Set of 500 pcs. (SET1)
3-6			
8			
10			
12			
4-6			
8			
10			
12			
5-6			
8			
10			
12			
15			
20			
35			
40			
45			
6-8			
10			
12			
15			
20			
8-12			
15			
16			
20			
10-16			
18			

M-L	HCBM Set of 500 pcs. (SET1)	SHCBM Set of 500 pcs. (SET1)	HCBMB Set of 500 pcs. (SET1)
3-6			
4-5			
8			
10			
12			
5-8			
10			
12			
15			
30			
35			
6-10			
12			
15			

Alterations for Aluminum Frames Outline

MISUMI Aluminum Extrusion products can be utilized for structure building with highly enhanced design flexibility when available alteration options are applied. Some alterations are not applicable depending on extrusion types and sizes.
Check for the available alterations on each product page price lists.
The hyphens (-) in the price lists denote the unavailable items.

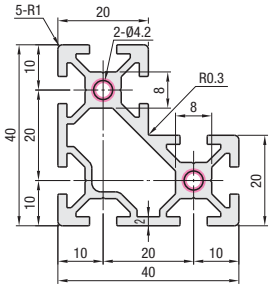
Type	Alterations	Page	Alteration Codes	Example	Contents
End Tapping	End Tapping	P.647	LTP/RTP/TPW		Adds tapped holes on extrusion ends. Blind Joints which require this alteration - Screw Joints **P.628** - Simple Joint **P.633**
Cutting Methods Change	High Precision Cut	P.648	SC		Applies High Precision Cut with an overall length tolerance of L±0.2 (Standard=L±0.5). Ⓟ Only applicable to L≤1500
	45 Degree Cut	P.648	LAT45/RAT45		Cuts with 45-degree angle.
Drill Wrench Hole	Wrench Hole in Fixed Position	P.649	LWH/RWP		Wrench access hole(s) for Blind Joints are drilled. The hole location will be aligned with the mating extrusion's tapped hole location. Blind Joints which require this alteration - Screw Joints **P.628** - Single Joints **P.635** - Tapping Joints **P.627**
	Extrusion End Caps Thickness Offset	P.650	FL/FR		Offsets the wrench access hole for the thickness of Frame Cap (3mm). The cap will be flush with the adjacent extrusion surface.
	Wrench Hole in Specified Position	P.651	AH/BH/AV/BV		Adds a wrench hole in a desired position from the left end. Use for Blind Jointing in beam sections.
Counterboring	Counterbores in Specified Position	P.653	Z6/XA100		Adds a counterbored hole in a desired position from the left end. Can be used for connecting extrusions or installing tables etc.

Type	Alterations	Page	Alteration Codes	Example	Contents
Blind Joints Dedicated Holes	D type Hole	P.654	LDH/RDV		Adds required holes for Single Joint connections. (Single Joints: Refer to **P. 635**)
	S type Hole	P.655	LSH		Adds required holes for Pre-Assy. Insertion Double Joint connections. (Pre-Assy. Insertion Double Joint: Refer to **P. 637**)
	M type Hole	P.656	LMH		Adds required holes for Post-Assy. Insertion Double Joints, Center Joint connections. (Post-Assy. Insertion Double Joints: Refer to **P. 631**)
	L type Hole	P.657	JLP		Adds required holes for Parallel Joint connections. (Parallel Joints: Refer to **P. 639**)
Special Extrusions End Plates Alterations for mounting	GFS Series End Tapping	P.658	LTS/RTS/TSW		Necessary alteration to use Ends Protection Plates for High Rigidity Aluminum Frames GFS series. (Refer to **P.552 · 590 · 624**)
	HFSR End Tapping	P.658	LTS/RTS/TSW		Necessary alteration to use Ends Protection Plates for HFSR series. (Refer to **P. 510 · 552 · 590**)
Labeling	Labeling	P.658	ZZZ		Adds a sticker with catalog No. etc. on the aluminum extrusions. Although number of characters are limited, customer's own serial number or unit number can be labeled.

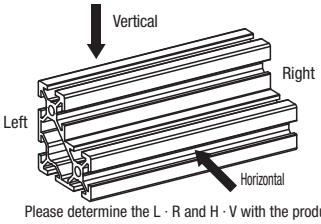
■Standard of Extrusion Position and Indications

For some hole alterations, specifying of "Which end (L or R) to apply the alterations" and "Which direction (horizontal or vertical) to apply the alterations" will be required. Using our standard specifying method for orientation (as the product drawings facing you on product pages), then L · R and H · V are determined as shown below.

Ex.: HFS5-404020



(Cross-Section View on product page)

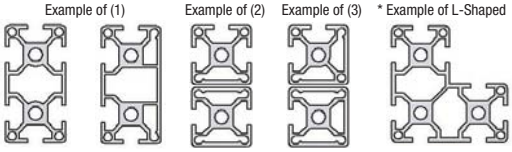


Please determine the L · R and H · V with the product drawings facing you, on each product page.

■Standard of Extrusion Position

Placement to determine right or left of extrusions is shown as follows.
(1) On the vertical length
(2) Flat side down
(2) One flat side down and another flat side right

Example of (1) Example of (2) Example of (3) * Example of L-Shaped



When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

LR (Left and right of extrusions):

Place extrusions properly, then determine the right and left.
Since most extrusion cross sections are symmetrical and can be used in any orientation. However, please specify the L · R parameters in your orders for administrative purposes.
Extrusions (1) with different alterations applied on left and right ends, and (2) with non-symmetrical cross sections are not reversible therefore the L · R specifications will become critically important.

HVP (Horizontal / Vertical / Cross):

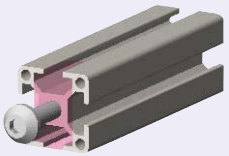
Specify the hole alterations with the extrusion properly oriented, and according to the connection method with the mating extrusion.

Tapping

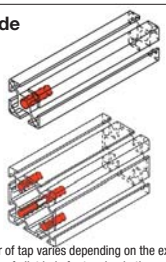
Blind Joints which require this alteration

Screw Joints →P.628 | Simple Joint →P.633

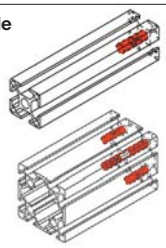
Adds tapped holes on extrusion ends.



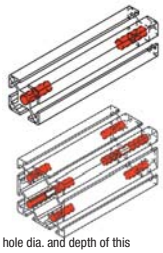
Left Side LTP



Right Side RTP



Both Sides TPW



The number of tap varies depending on the extrusion type (the number of pilot hole for tapping in the end). See each product page for the tapping positions.

For specifying tapping hole dia. and depth of this alteration, check for the list of alteration fees.

⊗Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations					Tapping			
Code					End Tapping			
Extrusions	Features	Type	No.	Page	Tap Shapes	No. of Female Thread Holes (Per End)	Left LTP	Right RTP	Both TPW
HFS5 Series 20, 25, 40mm Square Slot Width 6mm	Four-Side Slots	HFS5 CAF5 HFSY5	2020	P.477	M5 Depth 15	1			
			2040	P.478		2			
			2060	P.479		3			
			2080	P.479		4			
			2525	P.479	M8 Depth 24	1			
			2550	P.479		2			
			4040	P.478		4			
			4060	P.479					
			4080	P.479					
			404020	P.480		2			
	Three-Side Slots One Flat	HFSF5	2020	P.477		1			
			2040	P.478		2			
			4040	P.478		4			
	Two-Side Slots Two Flats	HFST5	2020	P.477		1			
			4040	P.478		4			
	Two Slots on Opposite Sides	HFSH5	2020	P.477		1			
	One-Side Slot Three Flats	HFSC5	2020	P.477					
	Angled	HFS30A5	20	P.480		1			
		HFS45A5		P.480					
		HFS60A5		P.480					
	Black Anodize	HFSB5	2020	P.477		2			
			2040	P.478					
			2525	P.479	M8 Depth 24	1			
			2550	P.479		2			
			4040	P.478		4			
		HFSFB5	2020	P.477	M5 Depth 15	1			
		HFSTB5	2020	P.477					
	Curved	HFSR5	2020	P.480	M4 Depth 12				
			404020	P.480	M5 Depth 15	2			
HFS6 Series 30,50,60, 100mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	M8 Depth 24	1			
			3060	P.513		2			
			3090	P.516		3			
			30120	P.516		4			
			5050	P.519					
			50100	P.519					
			100100	P.519					
			6060	P.515					
			6090	P.517					
			60120	P.517					
			606030	P.518		3			
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512		1			
			3060	P.514		2			
			5050	P.519		4			
			6060	P.515					
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512		1			
			3060	P.514		2			
			5050	P.519		4			
			6060	P.515					
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512		1			
			3060	P.514		2			
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512		1			
	Light Type	HFSL6	3030	P.511		1			
			3060	P.513		2			
			5050	P.519		4			
	Heavy Type	HFSG6	6060	P.515		4			
	Angled	HFS30A6	30	P.518		1			
		HFS45A6		P.518					
		HFS60A6		P.518					
	Black Anodize	HFSB6 EFSB6	3030	P.511		1			
			3060	P.513		2			
			3090	P.516		3			
			30120	P.516		4			
			5050	P.519					
			6060	P.515					
		HFSFB6 EFSFB6	3030	P.512		1			
		HFSTB6 EFSTB6	3030	P.512					
		HFSLB6	3030	P.511					
	Curved	HFSR6	3060	P.513		2			
			3030	P.518		1			
			606030	P.518		2			

Alterations					Tapping			
Code					End Tapping			
Extrusions	Features	Type	No.	Page	Tap Shapes	No. of Female Thread Holes (Per End)	Left LTP	Right RTP	Both TPW
HFS8 Series 40, 80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	M12 Depth 36	1			
			4080	P.555		2			
			40120	P.558		3			
			40160	P.558		4			
			8080	P.557	M8 Depth 24				
			80160	P.558					
			808040	P.560	M12 Depth 36	3			
	Three-Side Slots One Flat	HFSH8	8080	P.557	M8 Depth 24	4			
		HFSF8	4040	P.554	M12 Depth 36	1			
		GFSF8	4080	P.556		2			
		EFSF8	8080	P.557	M8 Depth 24	4			
	Two-Side Slots Two Flats	HFST8	4040	P.554	M12 Depth 36	1			
		GFST8	4080	P.556		2			
		EFST8	8080	P.557	M8 Depth 24	4			
	Two Slots on Opposite Sides	HFSH8	4040	P.554	M12 Depth 36	1			
		EFSH8	4080	P.556		2			
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554		1			
	Light Type	HFSL8	4040	P.553					
			4080	P.555		2			
	Angled	HFS30A8	40	P.559		1			
		HFS45A8		P.559					
		HFS60A8		P.559					
	Black Anodize	HFSB8 EFSB8	4040	P.553		1			
			4080	P.555		2			
			40120	P.558		3			
			40160	P.558		4			
			8080	P.557	M8 Depth 24				
			80160	P.558					
		HFSFB8 EFSFB8	4040	P.553	M12 Depth 36	1			
		HFSTB8 EFSTB8	4040	P.554					
		HFSLB8	4040	P.553					
			4080	P.555		2			
	Curved	HFSR8	4040	P.560	M 10 Depth 30	1			
			808040	P.560	M12 Depth 36	2			
HFS8-45 Series HFS8-50 Series HFS8-60 Series 45,50,60, 90, 100mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8*EFS8 CAF8	4545	P.591	M12 Depth 18 (Heli-coil is inserted to Ø12.5)	1			
			4590	P.594		2			
			45180	P.595		4			
			5050	P.597		1			
			50100	P.598		2			
			6060	P.599	M8 Depth 24	1			
			9090*	P.595		4			
			90180	P.595					
			909045	P.596	M12 Depth 18 (Heli-coil is inserted to Ø12.5)	3			
			100100*	P.598		4			
			102200*	P.598		4			
	Three-Side Slots One Flat	HFSF8 GFSF8* EFSF8	4545*	P.592		1			
			4590	P.594		2			
			5050	P.597					
			6060	P.599					
	Two-Side Slots Two Flats	HFST8 EFST8	4545	P.593		1			
			5050	P.597					
		GFST8	6060	P.599					
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593					
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593					
	Light Type	HFSL8	4545	P.591					
	Four-Side Slots Three-Side Slots Two-Side Slots	HFSLF8	4545	P.592		2			
		HFSLT8	4545	P.593					
	Angled	HFS30A8	45	P.596		1			
		HFS45A8		P.596					
		HFS60A8		P.596					
	Black Anodize	HFSB8 EFSB8	4545	P.591					
			4590	P.594		2			
			45180	P.595		4			
			5050	P.597		1			
			50100	P.598		2			
			9090	P.595	M8 Depth 24	4			
			90180	P.595					
		HFSFB8	4545	P.592	M12 Depth 18 (Heli-coil is inserted to Ø12.5)	1			
		HFSTB8	4545	P.593					
	Curved	HFSR8	4545	P.596	M12 Depth 36	2			
			909045	P.596					

For * marked GFS series, tapping diameter is M12 Depth 36.

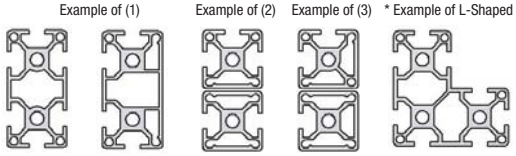
Order Example Part Number: HFS6 / HFS8 - 3030 / 4080 - 500 / 1200 - LTP / TPW

Days to Ship 7 Days

Standard of Extrusion Position

Placement to determine right or left of extrusions is shown as follows.
(1) On the vertical length
(2) Flat side down
(2) One flat side down and another flat side right

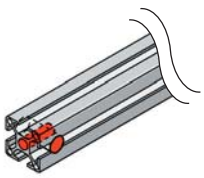
Example of (1) Example of (2) Example of (3) * Example of L-Shaped



ⓟWhen the extrusion is on the vertical length and also has a flat side, (1) has the priority.

D hole · S hole · M hole - Notes for Combination Use of Tapping Hole.

•When D, S, M holes are specified in the same direction as the tapped holes, the tap depths will be changed to avoid interferences with D, S, and M holes.



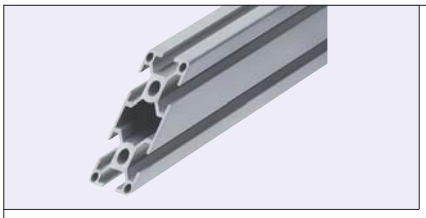
(Ex.) HFS6-3030-500-LDH-LTP

• EFS and CAF is the same as HFS series.

Extrusions (Series)	Standard Tap Depth	Tap depth when D type hole and S type hole are specified	Tap depth when M type hole is specified
HFS5 20, 40mm Square	15mm	-	6mm
HFS5 25mm Square	24mm		-
HFS6 30, 50, 60, 100mm square		9mm	9mm
HFS8 40mm Square	36mm	13mm	13mm
HFS8 80mm Square	24mm		
HFS8-45 45mm Square	18mm	14mm	
HFS8-45 90mm Square	24mm		
GFS8 40, 80mm square	36mm	13mm	13mm
GFS8 45, 50, 60, 90, 100mm square	36mm	14mm	13mm

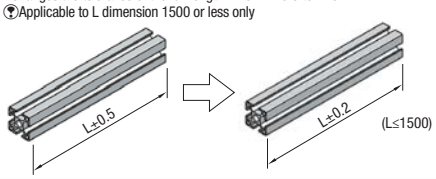
Extrusion Cut

-45 Degree Cuts - High Precision Cuts-



• High Precision Cut SC

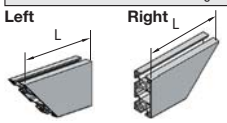
-Changes the tolerance of the full length L from L±0.5 to L±0.2.
※Applicable to L dimension 1500 or less only



• 45 Degree Cut

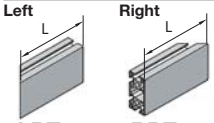
L_T45: Adds a 45 degree cut on the left end in the specified direction.
R_T45: Adds a 45 degree cut on the right end in the specified direction.

Cut with cross the section facing down



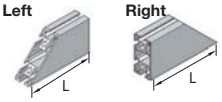
LAT45 **RAT45**

Cut with cross the section facing back



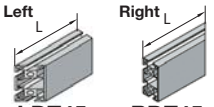
LBT45 **RBT45**

Cut with cross the section facing up



LCT45 **RCT45**

Cut with cross the section facing front



LDT45 **RDT45**

※The cut direction can be specified as four directions against the cross section.
⊗In case of angled cut, it is impossible to specify other alteration in the same direction.

⊗Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations					Extrusion Cut		
					High Precision Cut	45 Degree Cut	
						Left	Right
Code					SC	LAT45 LBT45 LCT45 LDT45	RAT45 RBT45 RCT45 RDT45
Extrusions	Features	Type	No.	Page			
HFS5 Series 20, 25, 40mm Square Slot Width 6mm	Four-Side Slots	HFS5 CAF5 HFSY5	2020	P.477			
			2040	P.478			
			2060	P.479			
			2080	P.479		⊗	⊗
			2525	P.479			
			2550	P.479			
			4040	P.478			
			4060	P.479			
			4080	P.479		⊗	⊗
			404020	P.480			
	Three-Side Slots One Flat	HFSF5	2020	P.477			
			2040	P.478			
			4040	P.478			
	Two-Side Slots Two Flats	HFST5	2020	P.477			
			4040	P.478			
	Two Slots on Opposite Sides	HFSH5	2020	P.477			
	One-Side Slot Three Flats	HFSC5	2020	P.477			
	Angled	HFS30A5	20	P.480			
		HFS45A5		P.480		⊗	⊗
		HFS60A5		P.480			
	Black Anodize	HFSB5	2020	P.477			
			2040	P.478			
			2525	P.479			
			2550	P.479			
			4040	P.478			
		HFSFB5	2020	P.477			
		HFSTB5	2020	P.477			
	Curved	HFSR5	2020	P.480			
			404020	P.480		⊗	⊗
HFS6 Series 30,50,60, 100mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511			
			3060	P.513			
			3090	P.516		⊗	⊗
			30120	P.516			
			5050	P.519			
			50100	P.519		⊗	⊗
			100100	P.519			
			6060	P.515			
			6090	P.517		⊗	⊗
			60120	P.517			
			606030	P.518			
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512			
			3060	P.514			
			5050	P.519			
			6060	P.515			
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512			
			3060	P.514			
			5050	P.519			
			6060	P.515			
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512			
			3060	P.514			
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512			
	Light Type	HFSL6	3030	P.511			
			3060	P.513			
			5050	P.519			
	Heavy Type	HFSG6	6060	P.515			
	Angled	HFS30A6	30	P.518			
		HFS45A6		P.518		⊗	⊗
		HFS60A6		P.518			
	Black Anodize	HFSB6 EFSB6	3030	P.511			
			3060	P.513			
			5050	P.519			
			6060	P.515			
		HFSFB6 EFSFB6	3030	P.512			
		HFSTB6 EFSTB6	3030	P.512			
		HFSLB6	3030	P.511			
			3060	P.513			
	Curved	HFSR6	3030	P.518			
			606030	P.518		⊗	⊗

Alterations					Extrusion Cut		
					High Precision Cut	45 Degree Cut	
						Left	Right
Code					SC	LAT45 LBT45 LCT45 LDT45	RAT45 RBT45 RCT45 RDT45
Extrusions	Features	Type	No.	Page			
HFS8 Series 40, 80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 CAF8 HFSY8	4040	P.553			
			4080	P.555			
			40120	P.558			
			40160	P.558			
			8080	P.557			
			80160	P.558			
			808040	P.560			
		HFSH8	8080	P.557			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4040	P.554			
			4080	P.556			
			8080	P.557			
	Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	P.554			
			4080	P.556			
			8080	P.557			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4040	P.554			
			4080	P.556			
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554			
	Light Type	HFSL8	4040	P.553			
			4080	P.555			
	Angled	HFS30A8	40	P.559			
		HFS45A8		P.559			
		HFS60A8		P.559			
	Black Anodize	HFSB8 EFSB8	4040	P.553			
			4080	P.555			
			8080	P.557			
			80160	P.558			
		HFSFB8 EFSFB8	4040	P.553			
		HFSTB8 EFSTB8	4040	P.554			
		HFSLB8	4040	P.553			
			4080	P.555			
	Curved	HFSR8	4040	P.560			
			808040	P.560			
HFS8-45 Series HFS8-50 Series HFS8-60 Series 45,50,60, 90, 100mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591			
			4590	P.594			
			45180	P.595			
			5050	P.597			
			50100	P.598			
			6060	P.599			
			9090	P.595			
			90180	P.595			
			900045	P.596			
			100100	P.598			
			100200	P.598			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592			
			4590	P.594			
			5050	P.597			
			6060	P.599			
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593			
			5050	P.597			
			6060	P.599			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593			
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593			
	Light Type Four-Side Slots Three-Side Slots Two-Side Slots	HFSL8	4545	P.591			
			4590	P.594			
		HFSLF8	4545	P.592			
		HFSLT8	4545	P.593			
	Angled	HFS30A8	45	P.596			
		HFS45A8		P.596			
		HFS60A8		P.596			
	Black Anodize	HFSB8 EFSB8	4545	P.591			
			4590	P.594			
			45180	P.595			
			5050	P.597			
			50100	P.598			
			9090	P.595			
			90180	P.595			
		HFSFB8	4545	P.592			
		HFSTB8	4545	P.593			
	Curved	HFSR8	4545	P.596			
			900045	P.596			

Order Example

Part Number

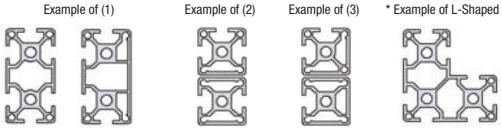
HFS8 - 4040 - 600 - SC
HFS5 - 2020 - 1000 - LAT45 - RBT45

Days to Ship: 7 Days

■Standard of Extrusion Position

Placing method of the extrusion, which is a basis to determine right and left is shown as follows.
(1) On the vertical length
(2) Flat side down
(2) One flat side down and another flat side right

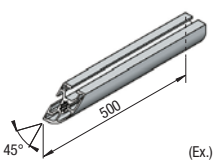
Example of (1) Example of (2) Example of (3) * Example of L-Shaped



※When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

■Notes for 45 Degree Cut of HFSR Series.

- As standard, the frame is placed like the following figure for R sector like HFSR6-3030.



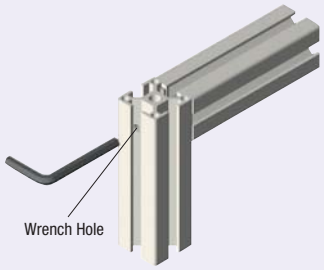
(Ex.) HFSR6-3030-500-LCT45

Fastening Location Wrench Access Hole Alterations

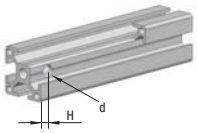
Blind Joints which require this alteration

Screw Joints	Single Joint	Tapping Joints
→P.628	→P.633	→P.627

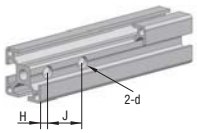
Wrench access holes used for Blind Joint connections, etc. are drilled.



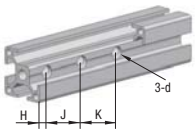
1 Row (C)



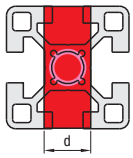
2 Rows (W)



3 Rows (E)



Cross Section View



■Position and Size of Hole

Extrusion Series	H (mm)	J (mm)	K (mm)	Wrench Hole d (mm)
HFS5	10	20	20	7.35
HFS5 (25 SQ.)	12.5	25	25	
HFS6	15	30	30	8
HFS6 (50 SQ.)	15	20	20	
HFS8	20	40	40	
HFS8-45	22.5	45	45	

■Alteration Code Specifying Method

Drilling option is specifiable by combining symbols in the first, second and third column in the table.

-LWH Drills two rows of wrench holes horizontally on the left side of the extrusion.
-LWP Drills two rows of wrench holes crisscross on the left side of the extrusion.

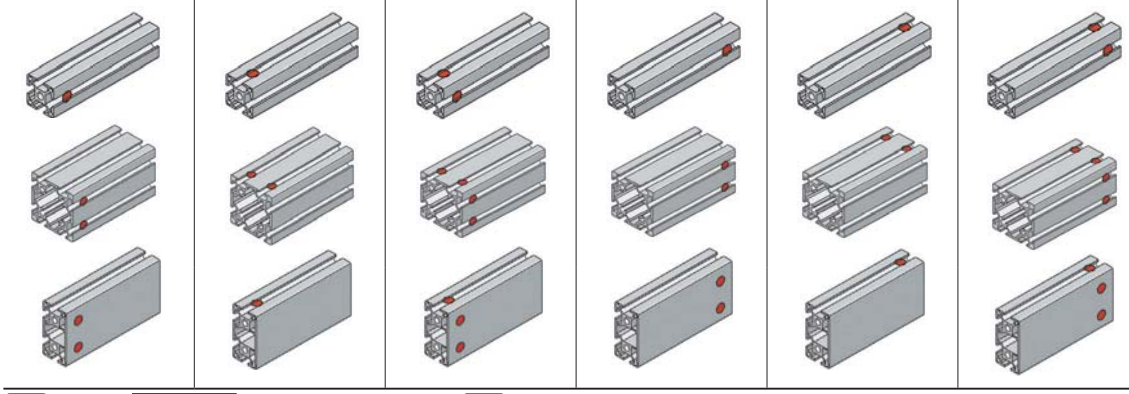
Meaning of Option Symbols		
First	Second	Third
L (Left) **R** (Right)	**C** (Wrench Holes in Single Line) **W** (Wrench Holes in Two Lines) **E** (Wrench Holes in Three Lines)	**H** (Horizontal) **V** (Vertical) **P** (Crisscross)

* For additional explanations on various options, see Alterations Overview. (**P.645**)

■Alteration Code Example

Wrench Hole

Left Side			Right Side		
Horizontally One Row (Two Rows, Three Rows)	Vertically One Row (Two Rows, Three Rows)	Crisscross One Row (Two Rows, Three Rows)	Horizontally One Row (Two Rows, Three Rows)	Vertically One Row (Two Rows, Three Rows)	Crisscross One Row (Two Rows, Three Rows)
LCH (LWH, LEH)	**LCV (LWV, LEV)**	**LCP (LWP, LEP)**	**RCH (RWH, REH)**	**RCV (RWV, REV)**	**RCP (RWP, REP)**



Order Example

Part Number						
HFS6 HFS8	-	3030 4080	-	500 1200	-	LCH RCP

Days to Ship: **7 Days**

⊗Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations					Wrench Hole Dia.	Wrench Hole																	
						Horizontal drilling on the left			Vertical drilling on the left			Crisscross drilling on the left			Horizontal drilling on the right			Vertical drilling on the right			Crisscross drilling on the right		
						1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines
Code						LCH	LWH	LEH	LCV	LWV	LEV	LCP	LWP	LEP	RCH	RWH	REH	RCV	RWV	REV	RCP	RWP	REP
Extrusions	Features	Type	No.	Page																			
HFS5 Series 20, 25, 40mm Square Slot Width 6mm	Four-Side Slots	HFS5 CAF5 HFSY5	2020	P.477	Ø7.35																		
			2040	P.478																			
			2060	P.479																			
			2080	P.479																			
			2525	P.479																			
			2550	P.479																			
			4040	P.478																			
			4060	P.479																			
			4080	P.479																			
			404020	P.480																			
	Three-Side Slots One Flat	HFSF5	2020	P.477																			
			2040	P.478																			
			4040	P.478																			
	Two-Side Slots Two Flats	HFST5	2020	P.477																			
			4040	P.478																			
	Two Slots on Opposite Sides	HFSH5	2020	P.477																			
	One-Side Slot Three Flats	HFSC5	2020	P.477																			
	Angled	HFS30A5	20	P.480																			
		HFS45A5		P.480																			
		HFS60A5		P.480																			
	Black Anodize	HFSB5	2020	P.477																			
			2040	P.478																			
			2525	P.479																			
			2550	P.479																			
			4040	P.478																			
		HFSFB5	2020	P.477																			
		HFSTB5	2020	P.477																			
	Curved	HFSR5	2020	P.480																			
			404020	P.480																			

⊗Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations					Wrench Hole Dia.	Wrench Hole																	
						Horizontal drilling on the left			Vertical drilling on the left			Crisscross drilling on the left			Horizontal drilling on the right			Vertical drilling on the right			Crisscross drilling on the right		
Code						1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines	1 Line	2 Lines	3 Lines
Extrusions	Features	Type	No.	Page		LCH	LWH	LEH	LCV	LWV	LEV	LCP	LWP	LEP	RCH	RWH	REH	RCV	RWV	REV	RCP	RWP	REP
HFS6 Series 30,50,60, 100mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	Ø8																		
			3060	P.513																			
			3090	P.516																			
			30120	P.516																			
			5050	P.519																			
			50100	P.519																			
			100100	P.519																			
			6060	P.515																			
			6090	P.517																			
			60120	P.517																			
			606030	P.518																			
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512																			
			3060	P.514																			
			5050	P.519																			
			6060	P.515																			
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512																			
			3060	P.514																			
			5050	P.519																			
			6060	P.515																			
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512																			
			3060	P.514																			
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512																			
	Light Type	HFSL6	3030	P.511																			
			3060	P.513																			
			5050	P.519																			
	Heavy Type	HFSG6	6060	P.515																			
	Angled	HFS30A6	30	P.518																			
		HFS45A6		P.518																			
		HFS60A6		P.518																			
	Black Anodize	HFSB6 EFSB6	3030	P.511																			
			3060	P.513																			
			5050	P.519																			
			6060	P.515																			
		HFSFB6 EFSFB6	3030	P.512																			
		HFSTB6 EFSTB6	3030	P.512																			
		HFSLB6	3030	P.511																			
			3060	P.513																			
	Curved	HFSR6	3030	P.518																			
			606030	P.518																			
HFS8 Series 40, 80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	Ø8																		
			4080	P.555																			
			40120	P.556																			
			40160	P.558																			
			8080	P.557																			
			80160	P.558																			
			808040	P.560																			
		HFSH8	8080	P.557																			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4040	P.554																			
			4080	P.556																			
			8080	P.557																			
	Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	P.554																			
			4080	P.556																			
			8080	P.557																			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4040	P.554																			
			4080	P.556																			
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554																			
	Light Type	HFSL8	4040	P.553																			
			4080	P.555																			
	Angled	HFS30A8	40	P.559																			
		HFS45A8		P.559																			
		HFS60A8		P.559																			
	Black Anodize	HFSB8 EFSB8	4040	P.553																			
			4080	P.555																			
			8080	P.557																			
			80160	P.558																			
		HFSFB8 EFSFB8	4040	P.553																			
		HFSTB8 EFSTB8	4040	P.554																			
		HFSLB8	4040	P.553																			
			4080	P.555																			
			4040	P.560																			
	Curved	HFSR8	808040	P.560																			
HFS8-45 Series HFS8-50 Series HFS8-60 Series 45,50,60, 90, 100mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591	Ø8																		
			4590	P.594																			
			45180	P.595																			
			5050	P.597																			
			50100	P.598																			
			6060	P.599																			
			9090	P.595																			
			90180	P.595																			
			909045	P.596																			
			100100	P.598																			
			100200	P.598																			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592																			
			4590	P.594																			
			5050	P.597																			
			6060	P.599																			
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593																			
			5050	P.597																			
			6060	P.599																			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593																			
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593																			
	Light Type Four-Side Slots Three-Side Slots Two-Side Slots	HFSL8	4545	P.591																			
			4590	P.594																			
		HFSLF8	4545	P.592																			
		HFSLT8	4545	P.593																			
	Angled	HFS30A8	45	P.596																			
		HFS45A8		P.596																			
		HFS60A8		P.596																			
	Black Anodize	HFSB8 EFSB8	4545	P.591																			
			4590	P.594																			
			45180	P.595																			
			5050	P.597																			
			50100	P.598																			
			9090	P.595																			
			90180	P.595																			
		HFSFB8	4545	P.592																			
		HFSTB8	4545	P.593																			
	Curved	HFSR8	4545	P.596																			
			909045	P.596																			

■Standard of Extrusion Position

Placing method of the extrusion, which is a basis to determine right and left is shown as follows.

(1) On the vertical length
(2) Flat side down
(2) One flat side down and another flat side right

Example of (1) Example of (2) Example of (3) * Example of L-Shaped

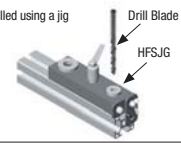


⚲When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

■Hole(s) on Smooth Surfaces

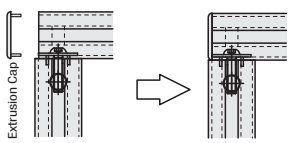
When the Wrench Access Hole alteration is not desirable on flat (no slot) surfaces to preserve the smooth surface esthetics, we recommend using the Blind Joint Kits (**P.633**) that require no access holes.

- Wrench access hole can be drilled using a jig on **P.748** by the customers.



■Available Alteration Combinations

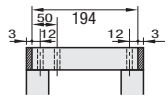
Wrench access hole is moved-in by 3mm to account for the thickness of extrusion end caps. By moving-in the tightening position by 3mm, the end caps will be flush with an adjoining extrusion. (Free)



In order to make the extrusion and the extrusion end cap flat,

-FL: Shifts the wrench hole on the left side 3mm toward the left end.
-FR: Shifts the wrench hole on the right side 3mm toward the right end.

ex **Example**



For HFS6-3030-194-LCV-FL-RCV-FR ---
The wrench access holes originally to be drilled at 15mm will be moved to 12mm to take the end cap thickness in account.

⚲This must be specified as an additional modifier of the Wrench Access Hole Alteration. Adding this modifier alone to other alterations will be invalid.

Order Example

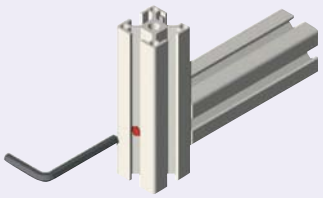
Part Number							
HFS6	- 3030 -	2160 -	LCV -	FL -	RCV -	FR

Location Specified Wrench Access Hole Alterations

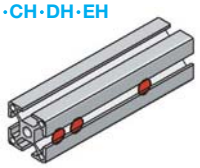
Blind Joints which require this alteration

Screw Joints	Single Joint	Tapping Joints
→P. 628	→P. 635	→P. 627

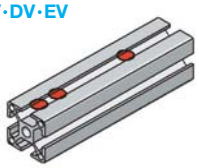
Adds drilled holes for Blind Joint (mainly for beams) connections at specified locations.



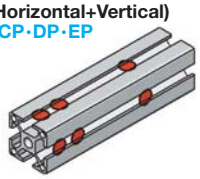
Horizontal
AH·BH·CH·DH·EH



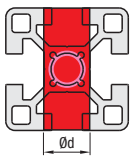
Vertical
AV·BV·CV·DV·EV



Cross (Horizontal+Vertical)
AP·BP·CP·DP·EP



Cross Section View

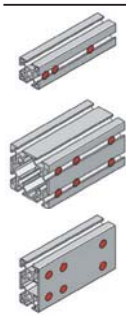
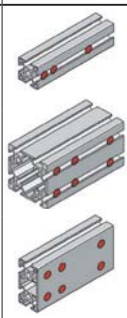
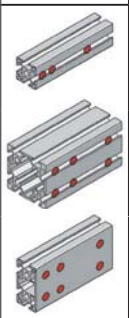
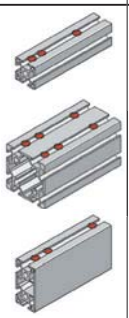
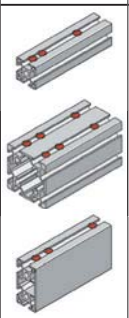
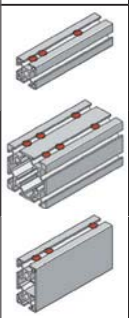
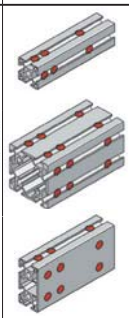
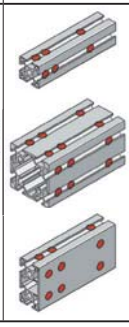
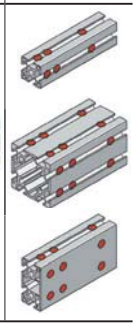


■Alteration Code Specifying Method

Alteration Code: Specify in 0.5mm increments (from Left End)	Extrusion Series	Ød
AH·BH·CH·DH·EH (Horizontal) **AV·BV·CV·DV·EV** (Vertical) **AP·BP·CP·DP·EP** (Crisscross)	5 Series	Ø7.35
	6 Series	Ø8
	7 Series	
	8-45 Series	

For additional explanations on various options, see Alterations Overview (**P.645**).
Up to 5 locations in Vertical, Horizontal, and Cross directions can be specified.

■Alteration Code Example

Horizontal			Vertical			Cross		
AH (1 Location Horizontal)	AH BH (2 Locations Horizontal)	AH BH CH (3 Locations Horizontal)	AV (1 Location Horizontal)	AV BV (2 Locations Horizontal)	AV BV CV (3 Locations Horizontal)	AP (1 Location Horizontal)	AP BP (2 Locations Horizontal)	AP BP CP (3 Locations Horizontal)
								

Order Example

Part Number
HFS6-3030-300-AH30-BH280-AV100-BV280

Days to Ship **8 Days**

Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

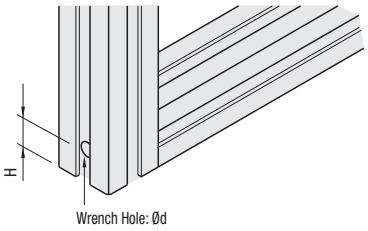
Alterations Code: Extrusions	Features	Type	No.	Page	Wrench Hole Dia.	Wrench Hole in Specified Position: Horizontally AH~EH	Vertically AV~EV	Crisscross AP~EP
HFS5 Series 20,25,40 mm Square Slot Width 6mm	Four-Side Slots	HFS5 CAF5 HFSY5	2020	P.477	Ø7.35			
			2040	P.478				
			2060	P.479				
			2080	P.479				
			2525	P.479				
			2550	P.479				
			4040	P.478				
			4060	P.479				
			4080	P.479				
			404020	P.480				
	Three-Side Slots One Flat	HFSF5	2020	P.477				
			2040	P.478				
			4040	P.478				
	Two-Side Slots Two Flats	HFST5	2020	P.477				
			4040	P.478				
	Two Slots on Opposite Sides	HFSH5	2020	P.477				
	One-Side Slot Three Flats	HFSC5	2020	P.477				
	Angled	HFS30A5	20	P.480				
		HFS45A5		P.480				
		HFS60A5		P.480				
	Black Anodize	HFSB5	2020	P.477				
			2040	P.478				
			2525	P.479				
			2550	P.479				
			4040	P.478				
		HFSFB5	2020	P.477				
		HFSTB5	2020	P.477				
	Curved	HFSR5	2020	P.480				
			404020	P.480				

⊗Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations					Wrench Hole in Specified Position			
Code					Wrench Hole Dia.	Horizontally	Vertically	Crisscross
Extrusions	Features	Type	No.	Page		AH~EH	AV~EV	AP~EP
HFS6 Series 30,50,60,100mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	Ø8			
			3060	P.513				
			3090	P.516				
			30120	P.516				
			5050	P.519				
			50100	P.519				
			100100	P.519				
			6060	P.515				
			6090	P.517				
			60120	P.517				
			606030	P.518				
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512				
			3060	P.514				
			5050	P.519				
			6060	P.515				
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512				
			3060	P.514				
			5050	P.519				
			6060	P.515				
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512				
			3060	P.514				
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512				
	Light Type	HFSL6	3030	P.511				
			3060	P.513				
			5050	P.519				
	Heavy Type	HFSG6	6060	P.515				
	Angled	HFS30A6	30	P.518				
		HFS45A6		P.518				
		HFS60A6		P.518				
	Black Anodize	HFSB6 EFSB6	3030	P.511				
			3060	P.513				
			5050	P.519				
			6060	P.515				
		HFSFB6 EFSFB6	3030	P.512				
		HFSTB6 EFSTB6	3030	P.512				
		HFSLB6	3030	P.511				
			3060	P.513				
	Curved	HFSR6	3030	P.518				
			606030	P.518				
HFS8 Series 40, 80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	Ø8			
			4080	P.555				
			40120	P.558				
			40160	P.558				
			8080	P.557				
			80160	P.558				
			808040	P.560				
		HFSH8	8080	P.557				
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4040	P.554				
			4080	P.556				
			8080	P.557				
	Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	P.554				
			4080	P.556				
			8080	P.557				
	Two Slots on Opposite Sides	HFSH8 EFSH8	4040	P.554				
			4080	P.556				
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554				
	Light Type	HFSL8	4040	P.553				
			4080	P.555				
	Angled	HFS30A8	40	P.559				
		HFS45A8		P.559				
		HFS60A8		P.559				
	Black Anodize	HFSB8 EFSB8	4040	P.553				
			4080	P.555				
			8080	P.557				
			80160	P.558				
		HFSFB8 EFSFB8	4040	P.553				
		HFSTB8 EFSTB8	4040	P.554				
		HFSLB8	4040	P.553				
			4080	P.555				
	Curved	HFSR8	4040	P.560				
			808040	P.560				
HFS8-45 Series HFS8-50 Series HFS8-60 Series 45,50,60,90,100mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591	Ø8			
			4590	P.594				
			45180	P.595				
			5050	P.597				
			50100	P.598				
			6060	P.599				
			9090	P.595				
			90180	P.595				
			909045	P.596				
			100100	P.598				
			100200	P.598				
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592				
			4590	P.594				
			5050	P.597				
			6060	P.599				
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593				
			5050	P.597				
			6060	P.599				
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593				
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593				
	Light Type Four-Side Slots Three-Side Slots Two-Side Slots	HFSL8	4545	P.591				
			4590	P.594				
		HFSLF8	4545	P.592				
		HFSLT8	4545	P.593				
	Angled	HFS30A8	45	P.596				
		HFS45A8		P.596				
		HFS60A8		P.596				
	Black Anodize	HFSB8 EFSB8	4545	P.591				
			4590	P.594				
			45180	P.595				
			5050	P.597				
			50100	P.598				
			9090	P.595				
			90180	P.595				
		HFSFB8	4545	P.592				
		HFSTB8	4545	P.593				
	Curved	HFSR8	4545	P.596				
			909045	P.596				

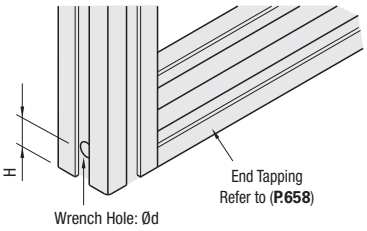
■Alterations Needed for Various Joints

Tapping Joint Drilling



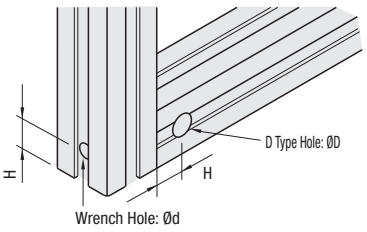
P. 627 A wrench access hole is needed for a Tapping Joint.

Screw Joint Drilling



P. 628 For a Screw Joint, a wrench access hole on one extrusion, and a hole tapping (**P. 658**) on the other extrusion are needed.

Single Joint Drilling

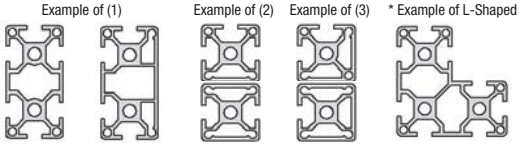


P. 635 For a Single Joint, a wrench access hole on one extrusion, and a D Hole (**P. 654**) on the other extrusion are needed.

■Standard of Extrusion Position

Placing method of the extrusion, which is a basis to determine right and left is shown as follows.
(1) On the vertical length
(2) Flat side downa
(2) One flat side down and another flat side right

Example of (1) Example of (2) Example of (3) * Example of L-Shaped

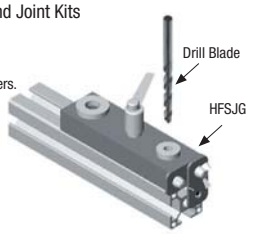


When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

■Hole(s) on Smooth Surfaces

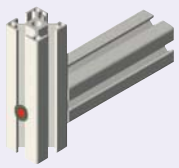
When the Wrench Access Hole alteration is not desirable on flat (no slot) surfaces to preserve the smooth surface esthetics, we recommend using the Blind Joint Kits (**P.633**) that require no access holes.

- Wrench access hole can be drilled using a jig on **P. 748** by the customers.

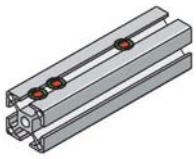


Counterbore Hole in Specified Position

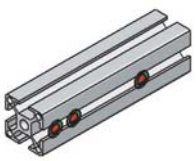
Countrbores useable for various purposes are added at customer specified locations.



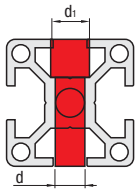
Top to Bottom (Vertical)
XA XB XC XD XE



Right to Left (Horizontal)
YA YB YC YD YE



Cross Section View



Counterbore is added on every slot for multiple slotted extrusions.

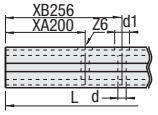
Alteration Code Specifying Method

- As for the Counterbore, it is possible to select one type of hole diameter in Z selection and specify up to five holes in one direction.
- Specify the desired hole position from the left end.

Alterations	Conterboring				
Code	Z Selection				XA XB XC XD XE YA YB YC YD YE
Spec.	Extrusion Series	Z	d	d1	Distance from the Left End (0.5mm Increment)
Counterbores and Locations Specifying	HFS5	5	5.5	9.5	7~L-7
	HFS6 GFS6	6	6.5	11	
		8	9	14	
	HFS8 (-45) GFS8	6	6.5	11	
		8	9	14	
		12	13	19	10~L-10

Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Order Example — Part Number: HFS6-3030-500-Z6-XA200-XB256



Days to Ship 8 Days

Alterations					Counterbores in Specified Position		
Code					Counterbored	From top to bottom	From right to left
Extrusions	Features	Type	No.	Page		XA~XE	YA~YE
HFS5 Series 20,25,40 mm Square Slot Width 6mm	Four-Side Slots	HFS5 CAF5 HFSY5	20,20	P.477	Z5 d5.5 d1 9.5		
			2040	P.478			
			2060	P.479			
			2080	P.479			
			2525	P.479			
			25,50	P.479			
			4040	P.478			
			4060	P.479			
			4080	P.479			
			404020	P.480			
	Three-Side Slots One Flat	HFSF5	2020	P.477			
			2040	P.478			
			4040	P.478			
	Two-Side Slots Two Flats	HFST5	2020	P.477			
			4040	P.478			
	Two Slots on Opposite Sides	HFSH5	2020	P.477			
	One-Side Slot Three Flats	HFSC5	2020	P.477	Z6 d6.5 d1 11		
	Angled	HFS30A5	20	P.480			
		HFS45A5		P.480			
		HFS60A5		P.480			
	Black Anodize	HFSB5	2020	P.477			
			2040	P.478			
			2525	P.479			
			25,50	P.479			
			4040	P.478			
		HFSFB5	2020	P.477			
		HFSTB5	2020	P.477			
	Curved	HFSR5	2020	P.480			
			,40,40,20	P.4,80			
HFS6 Series 30,,50,,60, 1,00mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	Z6 d6.5 d1 11		
			30,60	P.513			
			3090	P.516			
			301,20	P.516			
			5050	P.519			
			50100	P.519			
			100100	P.519			
			,60,60	P.515			
			,6090	P.517			
			,601,20	P.517			
			,60,6030	P.518			
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512			
			30,60	P.514			
			5050	P.519			
			,60,60	P.515			
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512			
			30,60	P.514			
			5050	P.519			
			,60,60	P.515			
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512			
			30,60	P.514			
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512			
	Light Type	HFSL6	3030	P.511	Z8 d9 d1 14		
			30,60	P.513			
			5050	P.519			
	Heavy Type	HFSG6	,60,60	P.515			
	Angled	HFS30A6	30	P.518			
		HFS45A6		P.518			
		HFS,60A6		P.518			
	Black Anodize	HFSB6 EFSB6	3030	P.511			
			30,60	P.513			
			5050	P.519			
			,60,60	P.515			
		HFSFB6 EFSFB6	3030	P.512			
		HFSTB6 EFSTB6	3030	P.512			
		HFSLB6	3030	P.511			
			30,60	P.513			
	Curved	HFSR6	3030	P.518			
			,60,6030	P.518			

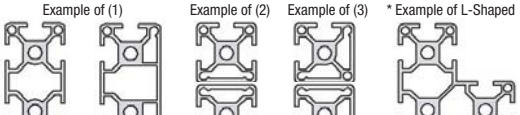
Alterations					Counterbores in Specified Position		
Code					Counterbored	From top to bottom	From right to left
Extrusions	Features	Type	No.	Page		XA~XE	YA~YE
HFS8 Series 40, 80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	Z6 d6.5 d1 11 Z8 d9 d1 14 Z12 d13 d1 19		
			4080	P.555			
			40120	P.558			
			40160	P.558			
			8080	P.557			
			80160	P.558			
			808040	P.560			
		HFSH8	8080	P.557			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4040	P.554			
			4080	P.556			
			8080	P.557			
	Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	P.554			
			4080	P.556			
			8080	P.557			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4040	P.554			
			4080	P.556			
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554			
	Light Type	HFSL8	4040	P.553			
			4080	P.555			
	Angled	HFS30A8	40	P.559			
		HFS45A8		P.559			
		HFS60A8		P.559			
	Black Anodize	HFSB8 EFSB8	4040	P.553			
			4080	P.555			
			8080	P.557			
			80160	P.558			
		HFSFB8 EFSFB8	4040	P.553			
		HFSTB8 EFSTB8	4040	P.554			
		HFSLB8	4040	P.553			
			4080	P.555			
	Curved	HFSR8	4040	P.560			
			808040	P.560			
HFS8-45 Series HFS8-,50 Series HFS8-60 Series 40,,50,60,90, 1,00mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591	Z6 d6.5 d1 11 Z8 d9 d1 14 Z12 d13 d1 19		
			4590	P.594			
			45180	P.595			
			5050	P.597			
			50100	P.598			
			6060	P.599			
			9090	P.595			
			90180	P.595			
			909045	P.596			
			100100	P.598			
			100200	P.598			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592			
			4590	P.594			
			5050	P.597			
			6060	P.599			
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593			
			5050	P.597			
			6060	P.599			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593			
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593			
	Light Type Four-Side Slots Three-Side Slots Two-Side Slots	HFSL8	4545	P.591			
			4590	P.594			
		HFSLF8	4545	P.592			
		HFSLT8	4545	P.593			
	Angled	HFS30A8	45	P.596			
		HFS45A8		P.596			
		HFS60A8		P.596			
	Black Anodize	HFSB8 EFSB8	4545	P.591			
			4590	P.594			
			45180	P.595			
			5050	P.597			
			50100	P.598			
			9090	P.595			
			90180	P.595			
		HFSFB8	4545	P.592			
		HFSTB8	4545	P.593			
	Curved	HFSR8	4545	P.596			
			909045	P.596			

Standard of Extrusion Position

Placing method of the extrusion, which is a basis to determine right and left is shown as follows.

(1) On the vertical length
(2) Flat side down
(2) One flat side down and another flat side right

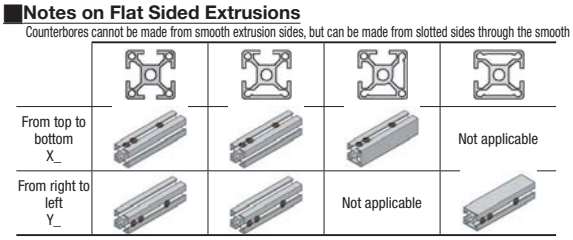
Example of (1) Example of (2) Example of (3) * Example of L-Shaped



When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

Notes on Flat Sided Extrusions

Counterbores cannot be made from smooth extrusion sides, but can be made from slotted sides through the smooth sides.

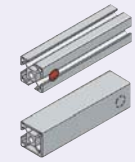


D Type Hole Alteration

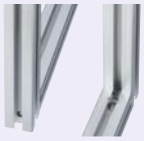
Blind Joints which require this alteration

Single Joint →P. 635

Adds D Holes for Single Joint connections.

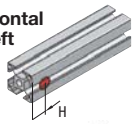


(Ref.) View of Single Jointed Corners

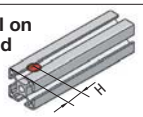


D Holes do not penetrate through the smooth sides, enabling esthetically pleasing connections.

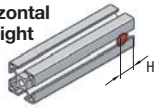
Horizontal on Left End LDH



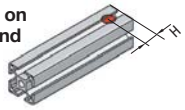
Vertical on Left End LDV



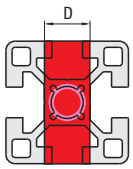
Horizontal on Right End RDH



Vertical on Right End RDV



Cross Section View



D Hole is added on every slot for multiple slotted extrusions.

Position and Size of Hole

Extrusion Series	H (mm)	D type Hole ØD (mm)
HFS6	15	11.1
HFS8	20	13.1
HFS8-45	22.5	15.1

Order Example — Part Number: HFS6-3030-2000-LDH-RDH

Days to Ship: 7 Days

⊗Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Extrusions	Features	Type	No.	Page	D Hole Dia.	D type Hole: Left Side Horizontally LDH	Left Side Vertically LDV	Right Side Horizontally RDH	Right Side Vertically RDV
HFS6 Series 30 50 60 100mm square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	D11.1				
			3060	P.513					
			3090	P.516					
			30120	P.516			⊗		⊗
			5050	P.519					
			50100	P.519			⊗		⊗
			100100	P.519		⊗	⊗	⊗	⊗
			6060	P.515					
			6090	P.517					
			60120	P.517			⊗		⊗
			606030	P.518		⊗	⊗	⊗	⊗
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512					
			3060	P.514					
			5050	P.519					
			6060	P.515					
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512					
			3060	P.514					
			5050	P.519					
			6060	P.515					
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512					
			3060	P.514					
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512					
	Light Type	HFSL6	3030	P.511					
			3060	P.513					
			5050	P.519					
	Heavy Type	HFSG6	6060	P.515					
	Angled	HFS30A6	30	P.518		⊗	⊗	⊗	⊗
		HFS45A6		P.518					
		HFS60A6		P.518					
	Black Anodize	HFSB6 EFSB6	3030	P.511					
			3060	P.513					
			5050	P.519					
			6060	P.515					
		HFSFB6 EFSFB6	3030	P.512					
		HFSTB6 EFSTB6	3030	P.512					
		HFSLB6	3030	P.511					
			3060	P.513					
	Curved	HFSR6	3030	P.518		⊗	⊗	⊗	⊗
			606030	P.518					
HFS8 Series ,40, ,80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	D13.1				
			4080	P.555					
			40120	P.558			⊗		⊗
			40160	P.558					
			8080	P.557					
			80160	P.558		⊗	⊗	⊗	⊗
			808040	P.5,60					
		HFSH8	8080	P.557					
	Three-Side Slots One Flat	HFSF8	4040	P.554					
		GFSF8	4080	P.556					
		EFSF8	8080	P.557					
	Two-Side Slots Two Flats	HFST8	4040	P.554					
		GFST8	4080	P.556					
		EFST8	8080	P.557					
	Two Slots on Opposite Sides	HFSH8	4040	P.554					
		EFSH8	4080	P.556					
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554					
	Light Type	HFSL8	4040	P.553					
			4080	P.555					
	Angled	HFS30A8	40	P.559		⊗	⊗	⊗	⊗
		HFS45A8		P.559					
		HFS,60A8		P.559					
	Black Anodize	HFSB8 EFSB8	4040	P.553					
			4080	P.555					
			8080	P.557					
			80160	P.558			⊗		⊗
		HFSFB8 EFSFB8	4040	P.553					
		HFSTB8 EFSTB8	4040	P.554					
		HFSLB8	4040	P.553					
			4080	P.555					
	Curved	HFSR8	4040	P.5,60		⊗	⊗	⊗	⊗
			808040	P.560					

Extrusions	Features	Type	No.	Page	D Hole Dia.	D type Hole: Left Side Horizontally LDH	Left Side Vertically LDV	Right Side Horizontally RDH	Right Side Vertically RDV
HFS8-45 Series HFS8-50 Series HFS8-60 Series 45,50,60,90,100 mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591	D15.1				
			4590	P.594					
			45180	P.595			⊗		⊗
			5050	P.597					
			50100	P.598			⊗		⊗
			6060	P.599					
			9090	P.595					
			90180	P.595			⊗		⊗
			909045	P.596		⊗	⊗	⊗	⊗
			100100	P.598					
			100200	P.598			⊗		⊗
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592					
			4590	P.594					
			5050	P.597					
			6060	P.599					
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593					
			5050	P.597					
			6060	P.599					
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593					
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593					
	Light Type Four-Side Slots	HFSL8	4545	P.591					
			4590	P.594					
	Three-Side Slots	HFSLF8	4545	P.592					
	Two-Side Slots	HFSLT8	4545	P.593					
	Angled	HFS30A8	45	P.596		⊗	⊗	⊗	⊗
		HFS45A8		P.596					
		HFS60A8		P.596					
	Black Anodize	HFSB8 EFSB8	4545	P.591					
			4590	P.594					
			45180	P.595			⊗		⊗
			5050	P.597					
			50100	P.598			⊗		⊗
			9090	P.595					
			90180	P.595			⊗		⊗
		HFSFB8	4545	P.592					
		HFSTB8	4545	P.593					
	Curved	HFSR8	4545	P.596		⊗	⊗	⊗	⊗
			909045	P.596					

Standard of Extrusion Position

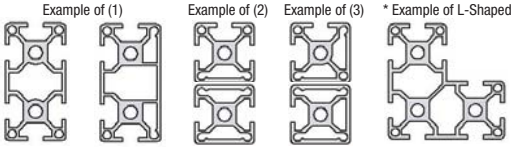
Placing method of the extrusion, which is a basis to determine right and left is shown as follows.

(1) On the vertical length

(2) Flat side down

(2) One flat side down and another flat side right

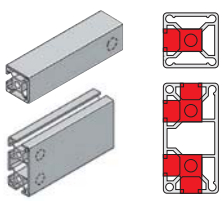
Example of (1) | Example of (2) | Example of (3) | * Example of L-Shaped



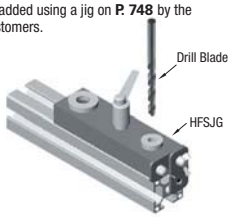
When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

Additional Info. on Smooth Sided Extrusions

D Holes in smooth direction are blind holes, and do not penetrate through the smooth side.



•D holes and wrench access holes can be added using a jig on P. 748 by the customers.



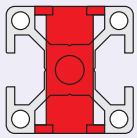
S Type Hole Alteration

Blind Joints which require this alteration

Pre-Assembly Insertion Double Joint
→P.637

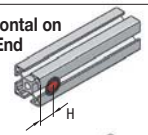
Drilling of S Holes for Pre Assy. Insertion Double Joint connections.

(Reference)Corners when using Pre Assy. Insertion Double Joints

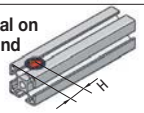




Horizontal on Left End LSH



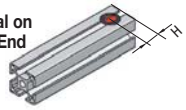
Vertical on Left End LSV



Horizontal on Right End RSH

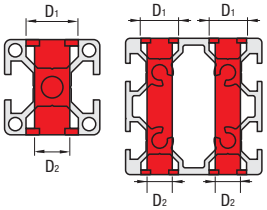


Vertical on Right End RSV



⊛S Hole is added on every slot for multiple slotted extrusions.

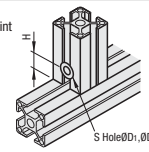
Cross Section View



■Position and Size of Hole

Extrusion Series	H (mm)	S type Hole ØD1 (mm)	S type Hole ØD2 (mm)
HFS6	15	16.5	11.1
HFS8	20	20	13.1
HFS8-45	22.5	20	15.1

■Pre-Assembly Insertion Double Joint Drilling



Order Example Part Number HFS6-3030-2000-LSH-RSV

Days to Ship 7 Days

⊛Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations Code: Extrusions	Features	Type	No.	Page	S Hole Dia.	S type Hole: Left Side Horizontally LSH	Left Side Vertically LSV	Right Side Horizontally RSH	Right Side Vertically RSV
HFS6 Series 3050,60 100mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	D1Ø16.5 D2Ø11.1				
			3060	P.513					
			3090	P.516					
			30120	P.516			⊛		⊛
			5050	P.519					
			50100	P.519					
			100100	P.519					
			6060	P.515					
			6090	P.517					
			60120	P.517			⊛		⊛
			606030	P.518		⊛	⊛	⊛	⊛
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512					
			3060	P.514		⊛	⊛	⊛	⊛
			5050	P.519			⊛		⊛
			6060	P.515			⊛		⊛
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512		⊛	⊛	⊛	⊛
			3060	P.514		⊛	⊛	⊛	⊛
			5050	P.519		⊛	⊛	⊛	⊛
			6060	P.515		⊛	⊛	⊛	⊛
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512					
			3060	P.514		⊛	⊛	⊛	⊛
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512		⊛	⊛	⊛	⊛
	Light Type	HFSL6	3030	P.511					
			3060	P.513					
			5050	P.519					
	Heavy Type	HFSG6	6060	P.515					
	Angled	HFS30A6	30	P.518		⊛	⊛	⊛	⊛
		HFS45A6		P.518		⊛	⊛	⊛	⊛
		HFS60A6		P.518		⊛	⊛	⊛	⊛
	Black Anodize	HFSB6 EFSB6	3030	P.511					
			3060	P.513					
			5050	P.519					
			6060	P.515					
		HFSFB6 EFSFB6	3030	P.512		⊛	⊛	⊛	⊛
		HFSTB6 EFSTB6	3030	P.512		⊛	⊛	⊛	⊛
		HFSLB6	3030	P.511					
			3060	P.513					
	Curved	HFSR6	3030	P.518		⊛	⊛	⊛	⊛
			606030	P.518		⊛	⊛	⊛	⊛
HFS8 Series 40 ,80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	D1Ø20 D2Ø13.1				
			4080	P.555					
			40120	P.558					
			40160	P.558			⊛		⊛
			8080	P.557					
			80160	P.558			⊛		⊛
			808040	P.560		⊛	⊛	⊛	⊛
		HFSH8	8080	P.557					
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4040	P.554			⊛		⊛
			40,80	P.556					
			8080	P.557					
	Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	P.554		⊛	⊛	⊛	⊛
			4080	P.556		⊛	⊛	⊛	⊛
			8080	P.557		⊛	⊛	⊛	⊛
	Two Slots on Opposite Sides	HFSH8 EFSH8	4040	P.554		⊛	⊛	⊛	⊛
			4080	P.556		⊛	⊛	⊛	⊛
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554		⊛	⊛	⊛	⊛
	Light Type	HFSL8	4040	P.553					
			4080	P.555					
	Angled	HFS30A8	40	P.559		⊛	⊛	⊛	⊛
		HFS45A8		P.559		⊛	⊛	⊛	⊛
		HFS60A8		P.559		⊛	⊛	⊛	⊛
	Black Anodize	HFSB8 EFSB8	4040	P.553					
			4080	P.555					
			8080	P.557					
			80160	P.558			⊛		⊛
		HFSFB8 EFSFB8	4040	P.553		⊛	⊛	⊛	⊛
		HFSTB8 EFSTB8	4040	P.554		⊛	⊛	⊛	⊛
		HFSLB8	4040	P.553					
			4080	P.555					
	Curved	HFSR8	4040	P.5,60		⊛	⊛	⊛	⊛
			808040	P.5,60		⊛	⊛	⊛	⊛

Alterations Code: Extrusions	Features	Type	No.	Page	S Hole Dia.	S type Hole: Left Side Horizontally LSH	Left Side Vertically LSV	Right Side Horizontally RSH	Right Side Vertically RSV
HFS8-45 Series HFS8-50 Series HFS8-,60 Series 4550,60,90 100mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591	D1Ø20 D2Ø15.1				
			4590	P.594					
			45180	P.595			⊛		⊛
			5050	P.597					
			50100	P.598					
			6060	P.599					
			9090	P.595					
			90180	P.595			⊛		⊛
			909045	P.596		⊛	⊛	⊛	⊛
			100100	P.598					
			100200	P.598			⊛		⊛
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592					
			4590	P.594		⊛	⊛	⊛	⊛
			5050	P.597			⊛		⊛
			6060	P.599			⊛		⊛
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593		⊛	⊛	⊛	⊛
			5050	P.597		⊛	⊛	⊛	⊛
			6060	P.599		⊛	⊛	⊛	⊛
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593		⊛	⊛	⊛	⊛
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593		⊛	⊛	⊛	⊛
	Light Type Four-Side Slots	HFSL8	4545	P.591					
			4590	P.594					
	Three-Side Slots	HFSLF8	4545	P.592					
	Two-Side Slots	HFSLT8	4545	P.593		⊛	⊛	⊛	⊛
	Angled	HFS30A8	45	P.596		⊛	⊛	⊛	⊛
		HFS45A8		P.596		⊛	⊛	⊛	⊛
		HFS,60A8		P.596		⊛	⊛	⊛	⊛
	Black Anodize	HFSB8 EFSB8	4545	P.591					
			4590	P.594					
			45180	P.595			⊛		⊛
			5050	P.597					
			50100	P.598					
			9090	P.595					
			90180	P.595			⊛		⊛
		HFSFB8	4545	P.592		⊛	⊛	⊛	⊛
		HFSTB8	4545	P.593		⊛	⊛	⊛	⊛
	Curved	HFSR8	4545	P.596		⊛	⊛	⊛	⊛
			909045	P.596		⊛	⊛	⊛	⊛

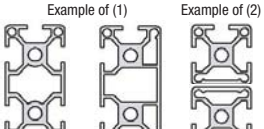
■Standard of Extrusion Position

Placing method of the extrusion, which is a basis to determine right and left is shown as follows.

(1) On the vertical length

(2) Flat side down

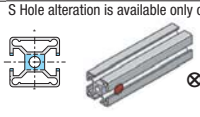
Example of (1) Example of (2)



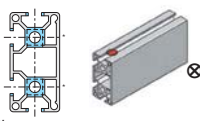
⊛When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

■Notes on Extrusions with Flat (Smooth) Sides

S Hole alteration is available only on sides that are not smooth.



⊛Not applicable in vertical direction towards smooth surfaces.



⊛Not applicable in horizontal direction towards smooth surfaces.

■Notes on Large Extrusions and L-sectioned Extrusions

Maximum length available for S Holes is 100mm. S Hole alteration over 100mm on the sides of larger extrusions such as 30120 is not possible.

S Hole alteration on L-sectioned extrusions is not possible, irrespective of directions.

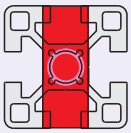
M Type Hole Alteration

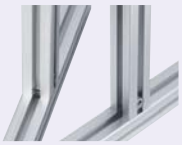
Blind Joints which require this alteration

Post-Assembly Insertion Double Joints	Center Joint
→P.631	→P.629

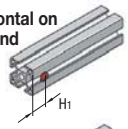
Drilling of M Holes for Center Joint and Post Assy. Insertion Double Joint connections.

(Reference)Corners when using Center Jointing

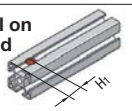




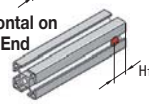
Horizontal on Left End LMH



Vertical on Left End LMV



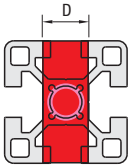
Horizontal on Right End RMH



Vertical on Right End RMV



Cross Section View



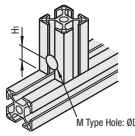
M Hole is added on every slot for multiple slotted extrusions, except for the middle slot of 3-slotted extrusion.

Position and Size of Hole

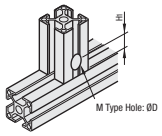
Extrusion Series	H1 (mm)	M type Hole ØD (mm)
HFS5	10	7.1
HFS5 (25 Square)	-	-
HFS6	15	11.1
HFS8	20	13.1
HFS8-45	*(20.5)	

Only for 45 Square Light Type (HFSL8-45) Series, H1 dimension is 20.5.

Post-Assembly Insertion Double Joint Drilling



Center Joint Drilling



Order Example

Part Number: HFS6-3030-2000-LMH-RMH

Days to Ship

7 Days

Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations					M Hole Dia.	M type Hole			
						Left Side		Right Side	
Code						Horizontally	Vertically	Horizontally	Vertically
Extrusions	Features	Type	No.	Page		LMH	LMV	RMH	RMV
HFS5 Series 20, 25, 40mm Square Slot Width 6mm	Four-Side Slots	HFS5 CAF5 HFSY5	2020	P.477	Ø7.1				
			2040	P.478					
			2060	P.479					
			2080	P.479					
			2525	P.479					
			2550	P.479					
			4040	P.478					
			4060	P.479					
			4080	P.479					
			404020	P.480					
	Three-Side Slots One Flat	HFSF5	2020	P.477					
			2040	P.478					
			4040	P.478					
	Two-Side Slots Two Flats	HFST5	2020	P.477					
			4040	P.478					
	Two Slots on Opposite Sides	HFSH5	2020	P.477					
	One-Side Slot Three Flats	HFSC5	2020	P.477					
	Angled	HFS30A5	20	P.480					
		HFS45A5		P.480					
		HFS60A5		P.480					
	Black Anodize	HFSB5	2020	P.477					
			2040	P.478					
			2525	P.479					
			2550	P.479					
			4040	P.478					
		HFSFB5	2020	P.477					
		HFSTB5	2020	P.477					
	Curved	HFSR5	2020	P.480					
			404020	P.480					
HFS6 Series 30,50,60,100 mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	Ø11.1				
			3060	P.513					
			3090	P.516					
			30120	P.516					
			5050	P.519					
			50100	P.519					
			100100	P.519					
			6060	P.515					
			6090	P.517					
			60120	P.517					
			606030	P.518					
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512					
			3060	P.514					
			5050	P.519					
			6060	P.515					
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512					
			3060	P.514					
			5050	P.519					
			6060	P.515					
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512					
			3060	P.514					
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512					
	Light Type	HFSL6	3030	P.511					
			3060	P.513					
			5050	P.519					
	Heavy Type	HFSG6	6060	P.515					
	Angled	HFS30A6	30	P.518					
		HFS45A6		P.518					
		HFS60A6		P.518					
	Black Anodize	HFSB6 EFSB6	3030	P.511					
			3060	P.513					
			5050	P.519					
			6060	P.515					
		HFSFB6 EFSFB6	3030	P.512					
		HFSTB6 EFSTB6	3030	P.512					
		HFSLB6	3030	P.511					
			3060	P.513					
	Curved	HFSR6	3030	P.518					
			606030	P.518					

Alterations					M Hole Dia.	M type Hole			
						Left Side		Right Side	
Code						Horizontally	Vertically	Horizontally	Vertically
Extrusions	Features	Type	No.	Page		LMH	LMV	RMH	RMV
HFS8 Series 40, 80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	Ø13.1				
			4080	P.555					
			40120	P.558					
			40160	P.558					
			8080	P.557					
			80160	P.558					
			808040	P.560					
	Three-Side Slots One Flat	HFSH8	8080	P.557					
		HFSF8 GFSF8 EFSF8	4040	P.554					
			4080	P.556					
			8080	P.557					
	Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	P.554					
			4080	P.556					
			8080	P.557					
	Two Slots on Opposite Sides	HFSH8 EFSH8	4040	P.554					
			4080	P.556					
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554					
	Light Type	HFSL8	4040	P.553					
			4080	P.555					
	Angled	HFS30A8	40	P.559					
		HFS45A8		P.559					
		HFS60A8		P.559					
	Black Anodize	HFSB8 EFSB8	4040	P.553					
			4080	P.555					
			8080	P.557					
			80160	P.558					
		HFSFB8 EFSFB8	4040	P.553					
		HFSTB8 EFSTB8	4040	P.554					
		HFSLB8	4040	P.553					
			4080	P.555					
	Curved	HFSR8	4040	P.560					
			808040	P.560					
HFS8-45 Series HFS8-50 Series HFS8-60 Series 45,50,60,90,100 mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591	Ø13.1				
			4590	P.594					
			45180	P.595					
			5050	P.597					
			50100	P.598					
			6060	P.599					
			9090	P.595					
			90180	P.595					
			909045	P.596					
			100100	P.598					
			100200	P.598					
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592					
			4590	P.594					
			5050	P.597					
			6060	P.599					
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593					
			5050	P.597					
			6060	P.599					
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593					
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593					
	Light Type Four-Side Slots Three-Side Slots Two-Side Slots	HFSL8	4545	P.591					
			4590	P.594					
		HFSLF8	4545	P.592					
		HFSLT8	4545	P.593					
	Angled	HFS30A8	45	P.596					
		HFS45A8		P.596					
		HFS60A8		P.596					
	Black Anodize	HFSB8 EFSB8	4545	P.591					
			4590	P.594					
			45180	P.595					
			5050	P.597					
			50100	P.598					
			9090	P.595					
			90180	P.595					
		HFSFB8	4545	P.592					
		HFSTB8	4545	P.593					
	Curved	HFSR8	4545	P.596					
			909045	P.596					

Standard of Extrusion Position

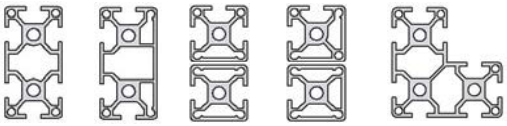
Placing method of the extrusion, which is a basis to determine right and left is shown as follows.

(1) On the vertical length

(2) Flat side down

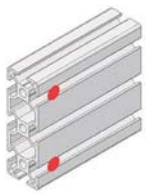
(2) One flat side down and another flat side right

Example of (1) Example of (2) Example of (3) * Example of L-Shaped



When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

M Hole will be applied on the middle slot of a 3-slotted surface.



ex.)HFS6-3090-1000-LMH

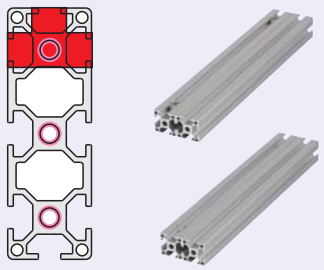
L Type Hole Alteration

Blind Joints which require this alteration

Parallel Joint → P.639

Drilling of L Holes for Parallel Joint connections.

(Reference)Parallel Joint Jointed Corners

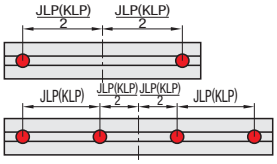


L Holes on Bottom in Cross

JLP



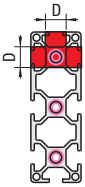
When 2 and 4 holes are specified, they will be symmetrically placed about a center point.



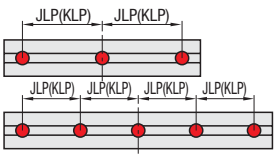
L Holes on Top in Cross

KLP





When 3 and 5 holes are specified, there will be one hole at the center and the rest will be placed symmetrically placed about the center hole.



For extrusions with multiple slots on one surface, only a slot on each end will be hole machined.

Alteration	Hole Pitch (1mm Increments)	H (Hole Qty.)	No.	D
JLP KLP	D+4.9~ $\frac{\text{L-D-10}}{\text{H-1}}$	2 3 4 5	5	7.1
			6	11.1
			8	13.1

Order Example (Part Number)

HFS6 - 3090 - 1200 - JLP1100 - H2
HFS8 - 4080 - 1800 - KLP870 - H3
HFS8 - 4080 - 1800 - JLP870 - KLP870-H3

Days to Ship: **7 Days**

Hole pitch on Top/Bottom can be separately specified, but the No. of holes will be equal on Top and Bottom.

Check for the applicable extrusions and the alteration fees in the below table. Indicated with "-" in the table are not applicable.

Alterations Code: Extrusions	Features	Type	No.	Page	L Hole (Charge per 1 hole location) L Hole Dia.	Top Section in Cross JLP	Bottom Section in Cross KLP
HFS5 Series 20, 25, 40mm Square Slot Width 6mm	Four-Side Slots	HFS5 CAF5 HFSY5	2020	P.477	Ø7.1		
			2040	P.477			
				P.478			
			2060	P.479			
			2080	P.479			
			2525	P.479			
			2550	P.479			
			4040	P.478			
			4060	P.479			
			4080	P.479			
			404020	P.480			
	Three-Side Slots One Flat	HFSF5	2020	P.477			
			2040	P.478			
			4040	P.478			
	Two-Side Slots Two Flats	HFST5	2020	P.477			
			4040	P.478			
	Two Slots on Opposite Sides	HFSH5	2020	P.477			
	One-Side Slot Three Flats	HFSC5	2020	P.477			
	Angled	HFS30A5	20	P.480			
		HFS45A5		P.480			
		HFS60A5		P.480			
	Black Anodize	HFSB5	2020	P.477			
			2040	P.478			
			2525	P.479			
			2550	P.479			
			4040	P.478			
		HFSFB5	2020	P.477			
		HFSTB5	2020	P.477			
	Curved	HFSR5	2020	P.480			
			404020	P.480			
HFS6 Series 30,50,60, 100mm Square Slot width 8mm	Four-Side Slots	HFS6 GFS6 EFS6 CAF6 HFSY6	3030	P.511	Ø11.1		
			3060	P.513			
			3090	P.516			
			30120	P.516			
			5050	P.519			
			50100	P.519			
			100100	P.519			
			6060	P.515			
			6090	P.517			
			60120	P.517			
			606030	P.518			
	Three-Side Slots One Flat	HFSF6 EFSF6	3030	P.512			
			3060	P.514			
			5050	P.519			
			6060	P.515			
	Two-Side Slots Two Flats	HFST6 EFST6	3030	P.512			
			3060	P.514			
			5050	P.519			
			6060	P.515			
	Two Slots on Opposite Sides	HFSH6 EFSH6	3030	P.512			
			3060	P.514			
	One-Side Slot Three Flats	HFSC6 EFSC6	3030	P.512			
	Light Type	HFSL6	3030	P.511			
			3060	P.513			
			5050	P.519			
	Heavy Type	HFSG6	6060	P.515			
	Angled	HFS30A6	30	P.518			
		HFS45A6		P.518			
		HFS60A6		P.518			
	Black Anodize	HFSB6 EFSB6	3030	P.511			
			3060	P.513			
			3090	P.516			
			30120	P.516			
			5050	P.519			
			6060	P.515			
		HFSFB6 EFSFB6	3030	P.512			
		HFSTB6 EFSTB6	3030	P.512			
		HFSLB6	3030	P.511			
			3060	P.513			
			3030	P.518			
	Curved	HFSR6	606030	P.518			

Alterations Code: Extrusions	Features	Type	No.	Page	L Hole (Charge per 1 hole location) L Hole Dia.	Top Section in Cross JLP	Bottom Section in Cross KLP
HFS8 Series 40, 80mm square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8 HFSY8	4040	P.553	Ø13.1		
			4080	P.555			
			40120	P.558			
			40160	P.558			
			8080	P.557			
			80160	P.558			
			808040	P.560			
		HFSH8	8080	P.557			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4040	P.554			
			4080	P.556			
			8080	P.557			
	Two-Side Slots Two Flats	HFST8 GFST8 EFST8	4040	P.554			
			4080	P.556			
			8080	P.557			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4040	P.554			
			4080	P.556			
	One-Side Slot Three Flats	HFSC8 EFSC8	4040	P.554			
	Light Type	HFSL8	4040	P.553			
			4080	P.555			
	Angled	HFS30A8	40	P.559			
		HFS45A8		P.559			
		HFS60A8		P.559			
	Black Anodize	HFSB8 EFSB8	4040	P.553			
			4080	P.555			
			40120	P.558			
			40160	P.558			
			8080	P.557			
			80160	P.558			
		HFSFB8 EFSFB8	4040	P.553			
		HFSTB8 EFSTB8	4040	P.554			
		HFSLB8	4040	P.553			
			4080	P.555			
	Curved	HFSR8	4040	P.560			
			808040	P.560			
HFS8-45 Series HFS8-50 Series HFS8-60 Series 45,50,60, 90, 100mm Square Slot width 10mm	Four-Side Slots	HFS8 GFS8 EFS8 CAF8	4545	P.591	-		
			4590	P.594			
			45180	P.595			
			5050	P.597			
			50100	P.598			
			6060	P.599			
			9090	P.595			
			90180	P.595			
			909045	P.596			
			100100	P.598			
			100200	P.598			
	Three-Side Slots One Flat	HFSF8 GFSF8 EFSF8	4545	P.592			
			4590	P.594			
			5050	P.597			
			6060	P.599			
	Two-Side Slots Two Flats	HFST8 EFST8 GFST8	4545	P.593			
			5050	P.597			
			6060	P.599			
	Two Slots on Opposite Sides	HFSH8 EFSH8	4545	P.593			
	One-Side Slot Three Flats	HFSC8 EFSC8	4545	P.593			
	Light Type Four-Side Slots Three-Side Slots Two-Side Slots	HFSL8	4545	P.591			
			4590	P.594			
		HFSLF8	4545	P.592			
		HFSLT8	4545	P.593			
	Angled	HFS30A8	45	P.596			
		HFS45A8		P.596			
		HFS60A8		P.596			
	Black Anodize	HFSB8 EFSB8	4545	P.591			
			4590	P.594			
			45180	P.595			
			5050	P.597			
			50100	P.598			
			9090	P.595			
			90180	P.595			
		HFSFB8	4545	P.592			
		HFSTB8	4545	P.593			
			4545	P.596			
	Curved	HFSR8	909045	P.596			

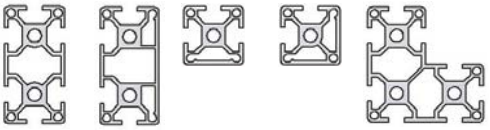
* Number of holes determines the alteration fee. (Table listed pricexHole qty.)
ex: For HFS6-3030-1200-JLP1100-H2, JPY260x2=JPY520 will be the alteration charge.

Standard of Extrusion Position

Placing method of the extrusion, which is a basis to determine right and left is shown as follows.

(1) On the vertical length
(2) Flat side down
(2) One flat side down and another flat side right

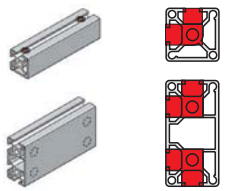
Example of (1) Example of (2) Example of (3) * Example of L-Shaped



When the extrusion is on the vertical length and also has a flat side, (1) has the priority.

Additional Info. on Smooth Sided Extrusions

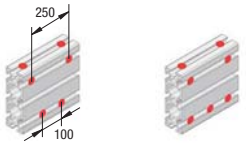
D Holes in smooth side direction are blind holes, and do not penetrate through the smooth side.



Notes on JLP/KLP Combination Use

Hole pitch on Top/Bottom can be separately specified, but the No. of holes will be equal on Top and Bottom.

- Hole pitch on Top/Bottom can be separately specified
- Uneven No. of holes cannot be specified

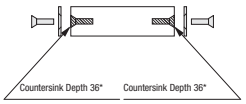


Other Special Alterations

■End Plates Mounting for GFS Series

Machines countersunk and tapped hole in order to mount the end plate for high rigidity aluminum extrusions.

Days to Ship 7 Days

Alterations		Hole Machining for End Plate Mounting		
Code		LTS	RTS	TSW
Spec.		Machined on the Left End 	Machined on the Right End 	Machined on Both Ends  *Depth 24 for GFS6 Series
Applicable Extrusions	Applicable Screw			
GFS6-3030	SHFBS8-15 x 1 pc.	4,00	4,00	8,00
GFS6-3060	SHFBS8-15 x 2 pcs.	8,00	8,00	16,00
GFS8-4040	SHFBS12-20 x 1 pc.	5,00	5,00	10,00
GFS8-4545		7,00	7,00	14,00
GFS8-5050				
GFS8-6060				
GFS8-4080	SHFBS12-20 x 2 pcs.	10,00	10,00	20,00
GFS8-4590		14,00	14,00	28,00
GFS8-50100				
GFS8-9090				
GFS8-100100				
GFS8-100200				

Screws are not included.

■End Plates Mounting for HFSR5-404020 and HFSR6-606030

P.497, **541**, **579**, **613** listed plates require the countersunk and tapped holes below.

Days to Ship 7 Days

Alterations		Hole Machining for End Plate Mounting		
Code		LTS	RTS	TSW
Spec.		The illustration below shows the basic frame position. LTS: Machined on the left end RTS: Machined on the right end TSW: Machined on both ends  Ex. LTS		
Applicable Extrusions	Applicable Screw			
HFSR5-404020	SHFBS5-6	6,60	6,60	13,20
HFSR6-606030	SHFBS8-12	7,60	7,60	15,20

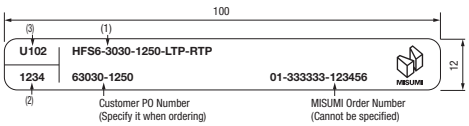
Bolts are not included.

■Labeling on Aluminum Frames

Adds a sticker with catalog No. etc. on the aluminum extrusion. (Free of Charge)
When placing an order, please add
(1)serial number within four digits starting by -ZZZ
(2)Unit No. in 3-digits or less beginning with - U.
after normal Part Number.
(Ex.)**HFS6-3030-1250-LTP-RTP-ZZZ1234-U102**

(1) Part Number (2) Serial Number (3) Unit Number





Detailed Spec.

Please specify the serial number by 1 digit at least.
Make (2) blank if the unit number is not specified.
If Part Number exceeds 41 digits, "..." follows from the 42nd digit.
If Customer PO Number exceeds 21 digits, "..." follows from the 22nd digit.

Aluminum Frames 15mm Square

-Brackets for Aluminum Frame 15mm Square/ Square Nuts for Aluminum Frame 15mm Square-

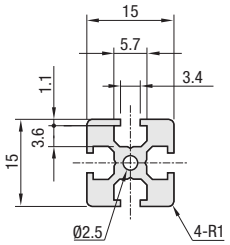
CAD Data

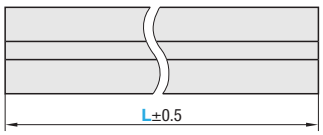
■Aluminum Frames 15mm Square



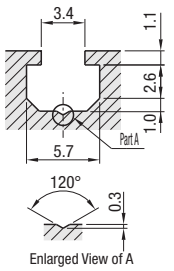
RoHS

HFS3-1515 (Configurable Length Extrusion)
KHFS3-1515 (Fixed Length Extrusion)





Details of slot



Cut surfaces are not anodized.

M Material: AW-6061/EN AW-AlMg1SiCu S Surface Treatment: Anodize

Part Number		L	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more	€ Unit Price	Volume Discount Rate
					ℓx	ℓy			1~9 pcs.	10~
HFS3	1515	50~2000 0.5mm Increment	0.34	126	0.280x10⁴	0.280x10⁴				
KHFS3		2000								

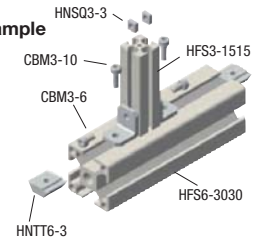
Order Example

Part Number	-	L
HFS3-1515	-	800

Price

When L is less than 300
€ Unit prices are indicated in the table regardless of the length.
ex: HFS3-1515-185=EUR 2,40
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFS3-1515-500
4,30x0.5m=EUR 2,10
(Round down to ten Cent.)

Example



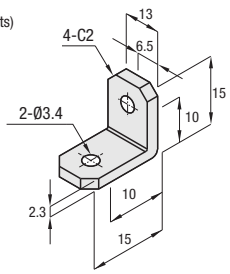
Days to Ship 6 Days P.88

■Brackets for Aluminum Frames 15mm Square Brackets

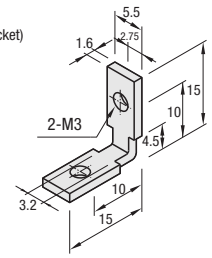


RoHS

HPTBS3
(Sheet Metal Brackets)



HBLPBS3
(Sheet Metal Blind Bracket)



M Material: 1.0330/DC01 S Surface Treatment: Trivalent Chromate Plating

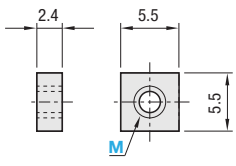
Part Number	Mass (g)	Applicable Extrusion	Applicable Screw · T Nut				Allowable Load (N)	€ Unit Price	Volume Discount Rate
Type			Screw	Qty.	T Nut	Qty.		1~99 pcs.	100~
HPTBS3	8	HFS3-1515	CBM3-6	2	HNSQ3-3	2	160		
HBLPBS3	2		Set Screw M3x4 (Included)				140		

■Brackets for Aluminum Frames 15mm Square Square Nuts



RoHS

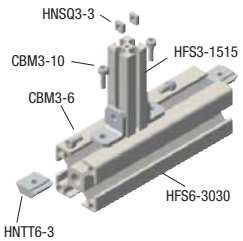
HNSQ



100 pcs. per package

M Material: 1.0038/S234JR
S Surface Treatment: Trivalent Chromate Plating

Example



Part Number		M	Applicable Extrusion	€ Unit Price	Volume Discount Rate	
Type	No.			1~4 package	5~9	10~20
HNSQ	3	3	HFS3-1515			

Order Example

Part Number	-	M
HPTBS3 HBLPBS3 HNSQ3	-	3

Days to Ship 6 Days P.87

Aluminum Bracket Extrusions

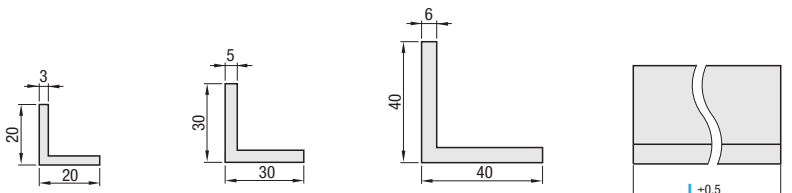
CAD Data

For Thin Brackets



RoHS

HFLBS5 HFLBS6 HFLBS8



M Material: AW-6061/EN AW-AlMg1SiCu
S Surface Treatment: Anodize

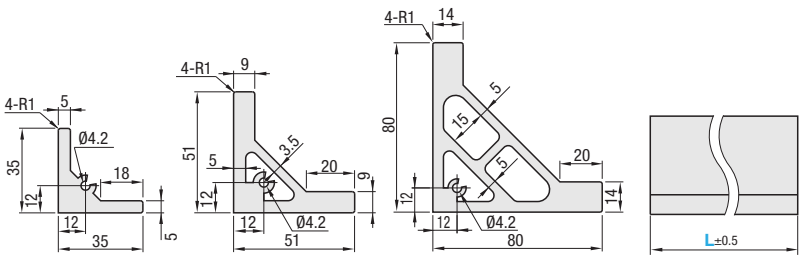
Part Number / Type	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFLBS5	50~3000	0.3	111	$0.4x10^4$	$0.4x10^4$		
HFLBS6		0.75	275	$2.2x10^4$	$2.2x10^4$		
HFLBS8		1.2	444	$6.4x10^4$	$6.4x10^4$		

For Thick Brackets



RoHS

HFLBT5 HFLBT6 HFLBT8



M Material: AW-6061/EN AW-AlMg1SiCu
S Surface Treatment: Anodize

Part Number / Type	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFLBT5	50~3000	1.13	420	$3.70x10^4$	$3.70x10^4$		
HFLBT6		2.3	850	$19.06x10^4$	$19.06x10^4$		
HFLBT8		5.3	1961	$109.9x10^4$	$109.9x10^4$		

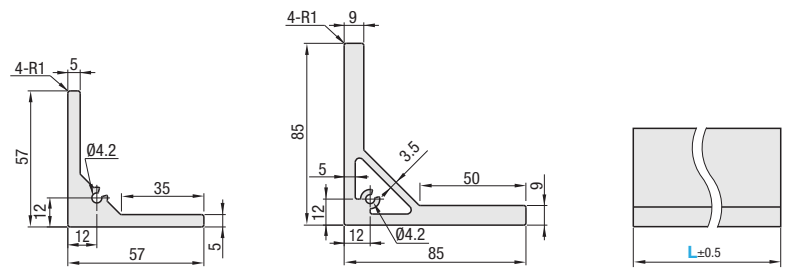
HFLBT6 is the base material component for HBLTS6 (**P. 529**) and HBLTS8 (**P. 603**)

For Thick Brackets



RoHS

HFLBTW5 HFLBTW6



M Material: AW-6061/EN AW-AlMg1SiCu
S Surface Treatment: Anodize

Part Number / Type	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFLBTW5	50~3000	1.9	700	$17.4x10^4$	$17.4x10^4$		
HFLBTW6		4.0	1491	$100.0x10^4$	$100.0x10^4$		

Order Example: Part Number HFLBT5 - L 800

Days to Ship: 7 Days

Express A EUR 8,00/ piece P.88

Price

When L is less than 300
€ Unit prices are indicated in the table regardless of the length.
ex:HFLBT5-180=EUR 4,00
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFLBT5-500
13,50x0.5m=EUR 6,70
(Round down to ten cent.)

Flat Extrusions · Extrusion Caps

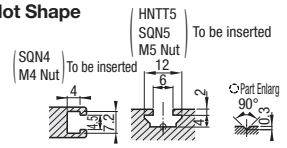
-Bar Nuts · Pre Assy. Insertion Nuts Common-



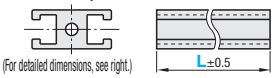
RoHS

M Material: EN AC-51400
S Surface Treatment: Anodize

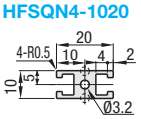
Slot Shape



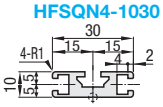
Cross Section Shape



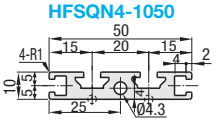
HFSQN4-1020



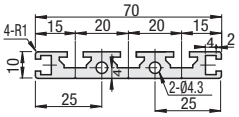
HFSQN4-1030



HFSQN4-1050



HFSQN4-1070



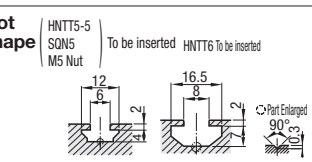
Part Number Type	Part Number Extrusions	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	Applicable Nut Bar Nuts	Applicable Nut Pre-Assembly Insertion Nuts	Applicable Extrusion End Caps		€Unit Price Less than 300mm	€Unit Price/m 300mm or more
HFSQN4	1020	50~3000	0.31	116	0.13x10⁴	0.3x10⁴	SQN4	-	HFCQN	4-1020		
	1030		0.46	171	0.18x10⁴	1.13x10⁴	SQN4 SQN5	HNTT 5-5		4-1030		
	1050		0.82	304	0.31x10⁴	5.64x10⁴				4-1050		
	1070		1.18	347	0.43x10⁴	16.2x10⁴				-		



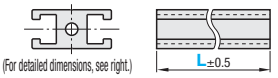
RoHS

M Material: EN AC-51400
S Surface Treatment: Anodize

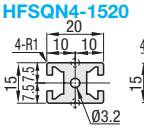
Slot Shape



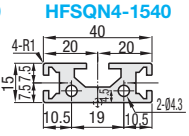
Cross Section Shape



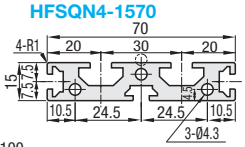
HFSQN4-1520



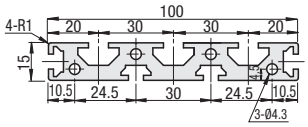
HFSQN4-1540



HFSQN4-1570



HFSQN4-15100



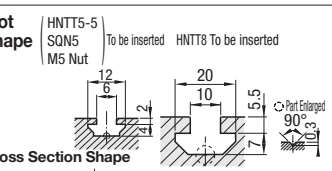
Part Number Type	Part Number Extrusions	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	Applicable Nut Bar Nuts	Applicable Nut Pre-Assembly Insertion Nuts		Applicable Extrusion End Caps		€Unit Price Less than 300mm	€Unit Price/m 300mm or more
HFSQN4	1520	50~3000	0.50	186	0.45x10⁴	0.44x10⁴	SQN4 SQN5	HNTT 5-5	HNTT 6-6	HFCQN	4-1520		
	1540		0.94	347	0.83x10⁴	4.49x10⁴					4-1540		
	1570		1.66	613	1.37x10⁴	24.6x10⁴					4-1570		
	15100		2.37	876	1.92x10⁴	72.2x10⁴					-		



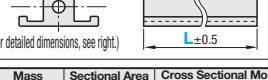
RoHS

M Material: EN AC-51400
S Surface Treatment: Anodize

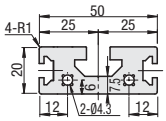
Slot Shape



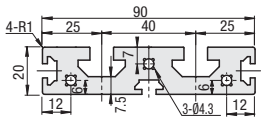
Cross Section Shape



HFSQN4-2050



HFSQN4-2090



Part Number Type	Part Number Extrusions	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	Applicable Nut Bar Nuts	Applicable Nut Pre-Assembly Insertion Nuts		€Unit Price Less than 300mm	€Unit Price/m 300mm or more
HFSQN4	2050	50~3000	1.84	681	2.78x10⁴	14.8x10⁴	SQN4	HNTT	HNTT		
	2090		3.34	1234	4.78x10⁴	84.1x10⁴	SQN5	5-5	8-8		

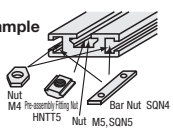
Order Example: Part Number HFSQN4-1050 - L 1000

Days to Ship: 6 Days P.88

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFSQN4-1050-185=EUR 4,20
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex: HFSQN4-1050-500
1,430x0.5m=EUR 7,10
(Round down to ten Cent.)

Example



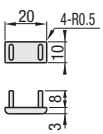
■Extrusion End Caps

RoHS

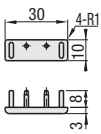


M Material: Polyamide (Black)

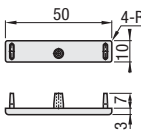
HFCQN4-1020



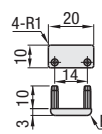
HFCQN4-1030



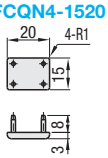
HFCQN4-1050



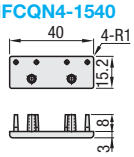
HFCFIN5-1020



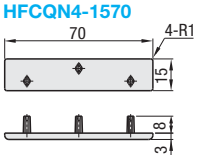
HFCQN4-1520



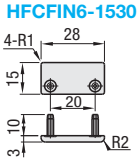
HFCQN4-1540



HFCQN4-1570



HFCFIN6-1530



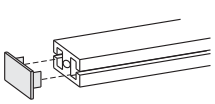
Extrusion end caps are not available for HFSPURE. The pin's shape and numbers of extrusion end caps may be changed to prevent caps from easily falling off.

Part Number Type	Part Number Extrusions	Color	€Unit Price Qty. 1~8	Volume Discount Rate 9~	Applicable Extrusion
HFCQN4	1020	B (Black)			HFSQN4-1020
	1030				HFSQN4-1030
	1050				HFSQN4-1050
	1520				HFSQN4-1520
	1540				HFSQN4-1540
	1570				HFSQN4-1570
HFCFIN5	1020				HFSFIN5-1020
HFCFIN6	1530				HFSFIN6-1530

Order Example: Part Number HFCQN4-1020 - Color B

Days to Ship: 6 Days P.87

Example

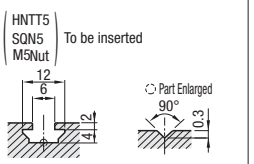


RoHS

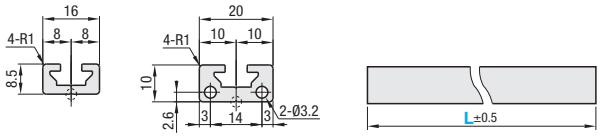


M Material: EN AC-51400
S Surface Treatment: Anodize

Slot Shape



HFSPURE5-8516 HFSFIN5-1020



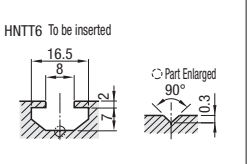
Part Number Type	No.	Extrusions	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	Applicable Extrusion End Caps	€Unit Price Less than 300mm	€Unit Price·m 300mm or more
HFSPURE	5	8516	50~3000	0.23	83	$0.05x10^4$	$0.24x10^4$	-		
HFSFIN		1020		0.36	131	$0.12x10^4$	$0.53x10^4$	HFCFIN5-1020		

RoHS

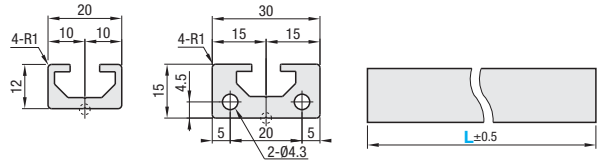


M Material: EN AC-51400
S Surface Treatment: Anodize

Slot Shape



HFSPURE6-1220 HFSFIN6-1530



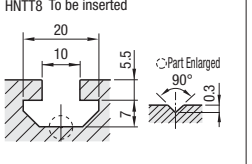
Part Number Type	No.	Extrusions	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	Applicable Extrusion End Caps	€Unit Price Less than 300mm	€Unit Price·m 300mm or more
HFSPURE	6	1220	50~3000	0.33	121	$0.17x10^4$	$0.58x10^4$	-		
HFSFIN		1530		0.82	302	$0.62x10^4$	$2.85x10^4$	HFCFIN6-1530		

RoHS

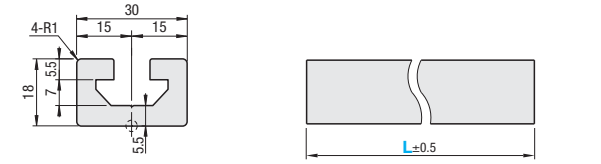


M Material: EN AC-51400
S Surface Treatment: Anodize

Slot Shape



HFSPURE8-1830



Part Number Type	Extrusions	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€Unit Price Less than 300mm	€Unit Price/m 300mm or more
HFSPURE8	1830	50~3000	0.98	361	$1.12x10^4$	$3.65x10^4$		

Order Example

Part Number - L

HFSFIN5-1020 - 1200

Days to Ship

6 Days P.88

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFSFIN5-1020-185= EUR 1,70
When L is 300 or more
Prices are calculated as follows:
Unit Price·m x Specified Full Length = Price
ex: HFSFIN5-1020-600
590x0.6m= EUR 3,50 (Round down to ten Cent.)

Alterations **Specified hole machining is available.** 8 Days

⊗Not applicable to HFSQN

The hole intervals are specified in XA, XB, XC, XD, XE order from the left end.

HFSFIN6 - 1530 - 150 - Z5 - XA20 - XB45 - XC80 - XD120

Alterations Code	Conterboring Z Selection			XA XB XC XD XE	€ Unit Price
Spec.	Z	d	d1	Distance from the Left End mm	One Counter-bore Hole
Specifications of Hole Size and Hole Position	3	3.5	6.5	7~L-7	
	4	4.5	8		
	5	5.5	9.5		
	6	6.5	11		
	8	9	14		

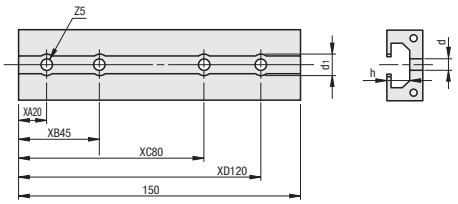


Table 1

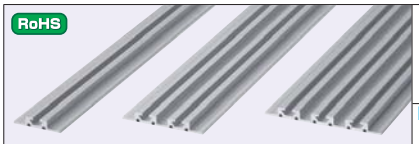
Counterbore Hole Z	d	d1
3	3.5	6.5
4	4.5	8
5	5.5	9.5
6	6.5	11
8	9	14

The counterbore depth h is from the extrusion surface.

Flanged Flat Extrusions / Extrusion Caps

-Bar Nuts · Pre Assy. Insertion Nuts Common-

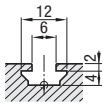
RoHS



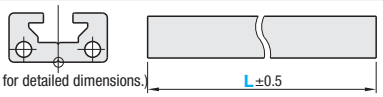
M Material: EN AC-51 400/AlMgSi0,7-T5
S Surface Treatment: Anodize

Slot Shape

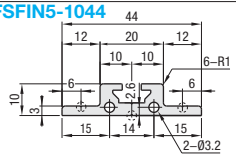
HNTT5
SQN5
M5Nut
To be inserted



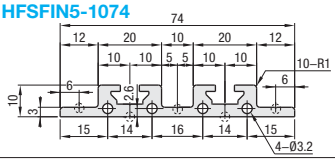




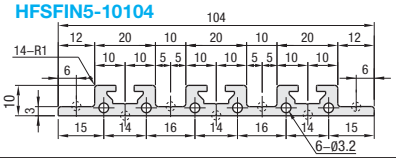
HFSFIN5-1044



HFSFIN5-1074



HFSFIN5-10104



Non-flanged HFSPURE5-8516, HFSFIN5-1020 are listed on the previous page.

Part Number		L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		Applicable Extrusion End Caps	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
Type	Extrusions				ℓx	ℓy			
HFSFIN5	1044	50~3000	0.55	203	1.70x10⁴	2.45x10⁴	HFCFIN5-1020		
	1074		0.99	364	0.32x10⁴	13.97x10⁴			
	10104		1.42	526	0.46x10⁴	41.90x10⁴			

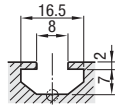
RoHS



M Material: EN AC-51 400/AlMgSi0,7-T5
S Surface Treatment: Anodize

Slot Shape

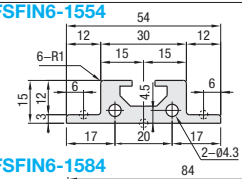
HNTT6 To be inserted



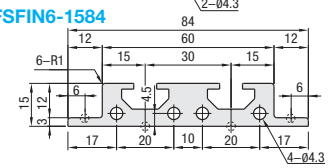




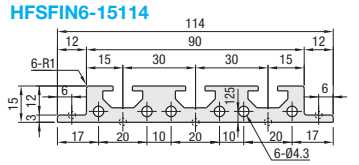
HFSFIN6-1554



HFSFIN6-1584



HFSFIN6-15114



Non-flanged HFSPURE6-1220, HFSFIN6-1530, HFSPURE8-1830 are listed on the previous page.

Part Number		L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		Applicable Extrusion End Caps	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
Type	Extrusions				ℓx	ℓy			
HFSFIN6	1554	50~3000	1.01	374	0.78x10⁴	6.10x10⁴	HFCFIN6-1530		
	1584		1.83	676	1.43x10⁴	28.69x10⁴			
	15114		2.64	979	2.07x10⁴	81.74x10⁴			

Order Example
Part Number - L
HFSFIN5-1044 - 1200

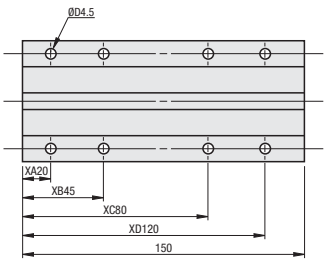
Days to Ship
6 Days

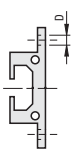
Price
When L is less than 300
€ Unit prices are indicated in the table regardless of the length.
ex: HFSFIN5-10,44-1,85=EUR 2,70
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFSFIN5-10,44-6,00
9,30x0.6=EUR 5,50 (Round down to ten cent.)

Alterations
8 Days

Specified hole machining is available.
The hole intervals are specified in XA, XB, XC, XD, XE order from the left end.
HFSFIN5 - 1044 - 150 - D4.5 - XA20 - XB45 - XC80 - XD120

Alterations	Through Hole						€ Unit Price
Code	D Selection	XA	XB	XC	XD	XE	One Through Hole
Spec.	ØD	Distance from the Left End mm					
Specifications of Hole Size and Hole Position	3.5	7~L-7					
	4.5						
	5.5						
	6.5						
	-						





Both top and bottom rows will be drilled for holes.

RoHS

M Material: EN AC-51 400/AlMgSi0,7-T5

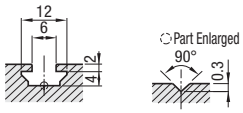
S Surface Treatment: Anodize



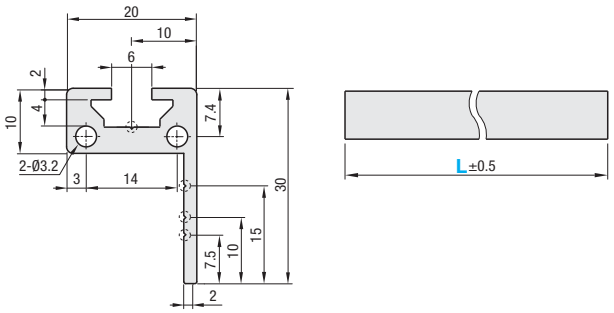
Slot Shape

HNTT5
SQN5
M5Nut

To be inserted



HFSFIL5-3020



Part Number		L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		Applicable Extrusion End Caps	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
Type	Extrusions				ℓx	ℓy			
HFSFIL5	3020	50~3000	0.45	166	0.89x10⁴	0.77x10⁴	HFCFIN5-1020		

Order Example: Part Number - L → HFSFIL5-3020 - 1200

Days to Ship: 6 Days

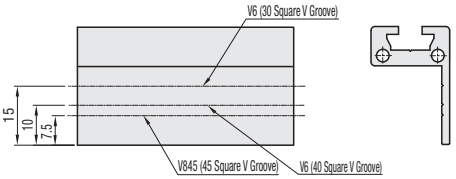
Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: For HFSFIL5-3020-185=EUR 2,70
When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex:HFSFIL5-3020-600
9,00x0.6m=EUR 5,40 (Round down to ten cent.)

Alterations: Specified hole machining is available. 8 Days

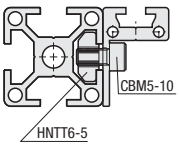
The hole intervals are specified in XA, XB, XC, XD, XE order from the left end.
HFSFIL5 - 3020 - 150 - V8 - XA20 - XB45

Alterations	Through Hole Position		€ Unit Price
Code	V V-Groove Selection	XA XB XC XD XE	One Through Hole
Spec.	Applicable V Groove	Distance from the Left End mm	
Hole Position * Hole diameter will be Ø5.5 only.	V6	7~L-7	
	V8		
	V845		

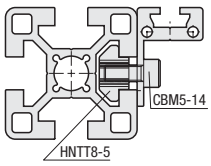


The V selection determines the hole centerline distances (7.5, 10, or 15) to make both extrusions even flat for each extrusion size.

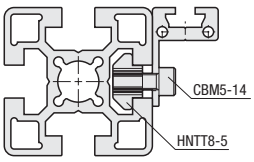
HFS6-3030

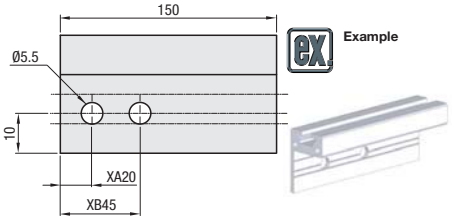


HFS8-4040



HFS8-4545





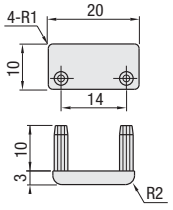
Example

Extrusion End Caps

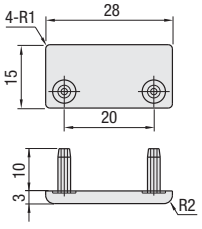
RoHS



HFCFIN5-1020



HFCFIN6-1530



M Material: Polyamide (Black)

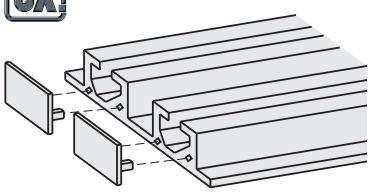
The pin's shape and numbers of extrusion end caps may be changed to prevent caps from easily falling off.

Part Number		Color	€ Unit Price	€ Volume Discount Rate	Applicable Extrusion
Type	Extrusions		Qty. 1~8	9~	
HFCFIN5	1020	B (Black)			HFSFIN5-1020 HFSFIN5-1044 HFSFIN5-1074 HFSFIN5-10104 HFSFIL5-3020
HFCFIN6	1530				HFSFIN6-1530 HFSFIN6-1554 HFSFIN6-1584 HFSFIN6-15114

Order Example: Part Number - Color → HFCFIN5-1020 - B

Days to Ship: 6 Days P.87

Example

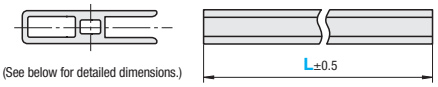


Fence Extrusions / Joint Brackets

■C Extrusions

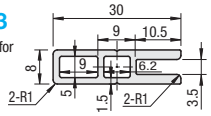


M Material: EN AW-6063/AlMg0,7Si-T5
S Surface Treatment: Anodize
RoHS

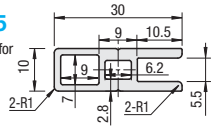


Ⓣ Cut surfaces are not anodized.

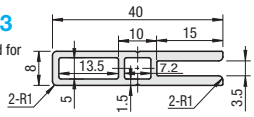
HFSFES30-3
3mm Thick One-Sided for 30 Square



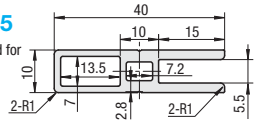
HFSFES30-5
5mm Thick One-Sided for 30 Square



HFSFES40-3
3mm Thick One-Sided for 40 Square

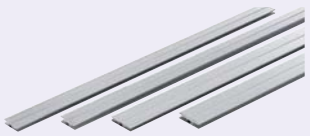


HFSFES40-5
5mm Thick One-Sided for 40 Square

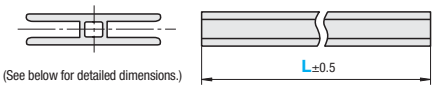


Part Number Type	No.	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFSFES	30-3	50~4000	0.34	125	1074	9933		
	30-5		0.41	150	2035	10690		
	40-3		0.42	153	1430	22510		
	40-5		0.48	176	2656	23830		

■H Extrusions

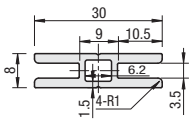


M Material: EN AW-6063/AlMg0,7Si-T5
S Surface Treatment: Anodize
RoHS

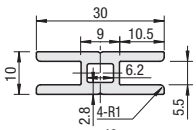


Ⓣ Cut surfaces are not anodized.

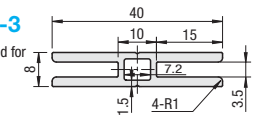
HFSFEW30-3
3mm Thick Both-Sided for 30 Square



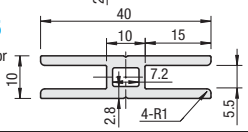
HFSFEW30-5
5mm Thick Both-Sided for 30 Square



HFSFEW40-3
3mm Thick Both-Sided for 40 Square



HFSFEW40-5
5mm Thick Both-Sided for 40 Square



Part Number Type	No.	L 1mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFSFEW	30-3	50~4000	0.395	145	1132	10040		
	30-5		0.476	175	2148	10160		
	40-3		0.51	188	1524	23770		
	40-5		0.64	235	2844	23890		

Order Example: Part Number - L → HFSFES30-3 - 1200

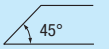
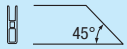
Days to Ship: 7 Days P.88

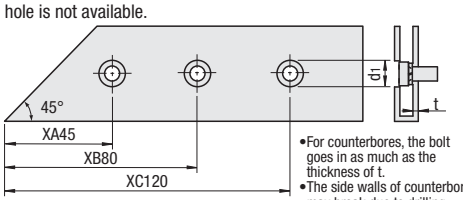
Price: When L is 300 or more
Prices are calculated as follows:
Unit Price/m x Specified Full Length = Price
ex: HFSFES30-3-2500
840x2.5m=EUR 21,00
(Round down to ten cent.)

Alterations: Specified hole machining is available. 3 Days

Alterations	Conterboring							Through Hole						€ Unit Price	
Code	Z Selection			XA	XB	XC	XD	XE	D Selection	XA	XB	XC	XD	XE	One Counterbore Hole	One Through Hole
Spec.	Z	d	d1	Distance from the Left End mm					ØD	Distance from the Left End mm						
Specifications of Hole Size and Hole Position	5	5.5	9.5	7~(L-7)					3.5	7~(L-7)						
	6	6.5	11						4.5							
	-								5.5							
									6.5							

■Specified Hole Machining
(1) Select hole type and size Z (for Counterbore) or D (for Through hole).
(2) Specify the distance from the left end to holes XA, XB, XC, XD and XE in order.
(3) Specify up to 5 counterbores or through holes. ⊗Combination of counterbore and through hole is not available.

Alteration	45° Cut Ⓣ Applicable to HFSFES only	
	Left	Right
Code	LCT45	RCT45
Spec.		
Price Adder	3,80	3,80



- For counterbores, the bolt goes in as much as the thickness of t.
- The side walls of counterbores may break due to drilling.

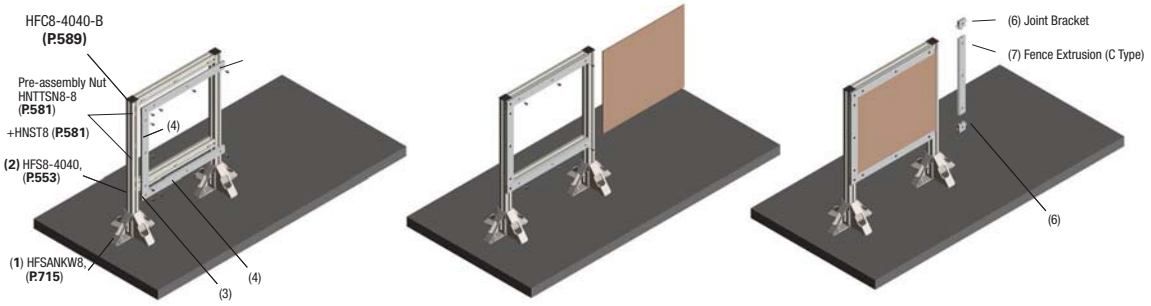
Order Example: Part Number - L - Alteration
HFSFES30-3 - 150 - LCT45 - Z5 - XA45 - XB80 - XC120

Panel Mounting

(1) Assembling Panel Extrusions
(3) Joint Brackets and (4) Fence Extrusions (C Type) are mounted with screws on the (2) Extrusion Frame fastened to the base with (1) Anchors.

(2) Inserting Panel
Panels are installed by sliding into the extrusion slots.

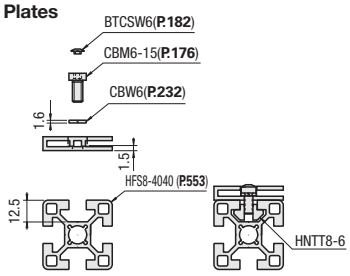
(3) Fixing Panel
Panels are mounted onto the (7) Fence Extrusions (C Type) with (6) Joint Brackets.
(Install additional aluminum extrusions with anchors.)



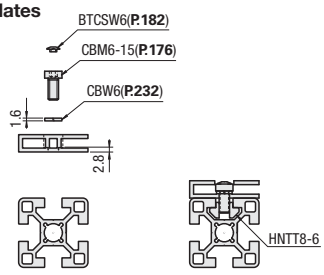
Connecting Fence Extrusions to Aluminum Frames

Fence extrusions need to be drilled before connecting to aluminum extrusion.
(1) Example of Counterbores (Even if the cover caps for bolts BTCSW are not used, there is no problem.)

3mm Thick Plates

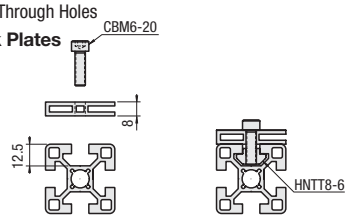


5mm Thick Plates

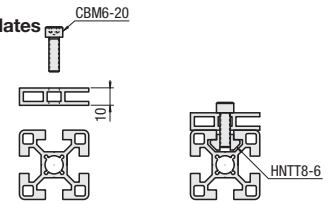


(2) Example of Through Holes

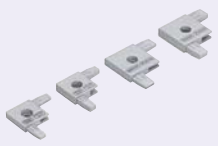
3mm Thick Plates



5mm Thick Plates

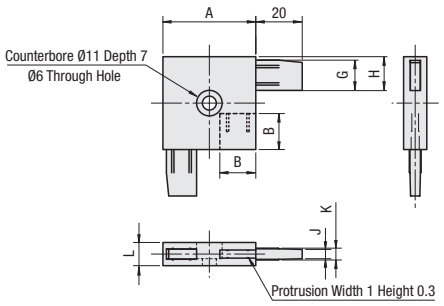


Joint Brackets



RoHS

HFSJD



Material: Polyamide

Part Number		A	B	G	H	J	K	L	€ Unit Price
Type	No.								
HFSJD	30-3	30	10.5	7.5	8.5	4	4.5	8	
	30-5	30	10.5	7.5	8.5	5.5	6.5	10	
	40-3	40	15.5	12	13	4	4.5	8	
	40-5	40	15.5	12	13	5.5	6.5	10	

Order Example — Part Number: HFSJD30-3

Days to Ship: 6 Days P.87

Price

Volume Discount Rate (Round down to one cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Discount Rate	Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

Aluminum Frames

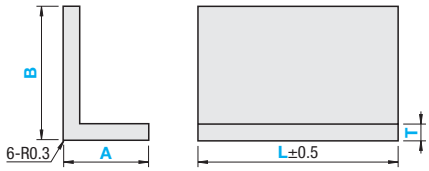
-Angles / Channels / Flat Bars / Square Tubing-

■Angle

RoHS



HFHL



M Material: EN AW-6063-T5 S Surface Treatment: Clear Anodize

Part Number Type	A	B	T	L 1mm Increment	Mass kg/m	Sectional Area mm²	Second Moment of Inertia of Cross Section ℓxx10⁴	ℓyx10⁴	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFHL (Angle)	15	30	2	50~2000	0.232	86	0.14	0.807		
	20	20	2		0.206	76	0.288	0.288		
			3		0.301	111	0.403	0.403		
	20	40	2		0.315	116	0.348	1.964		
			3		0.464	171	0.489	2.82		
	25	25	3		0.381	141	0.819	0.819		
		50	3		0.583	216	0.993	5.661		
	30	30	2		0.315	116	1.019	1.019		
			3		0.464	171	1.458	1.458		
			5		0.745	275	2.21	2.21		
	40	40	2		0.412	156	2.47	2.47		
			3		0.626	231	3.58	3.58		
			5		1.016	375	5.56	5.56		
	50	50	3		0.785	291	7.15	7.15		
	60	60	5		1.553	575	19.9	19.9		
	75	75	6		2.333	864	46.88	46.88		
	100	100			3.143	1164	114.3	114.3		
	150	150			4.763	1764	397.5	397.5		

Order Example Part Number - T - L : HFHL3030 - 3 - 800

Days to Ship 6 Days

Price (euros)

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFHL3030-2-180=1,80 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFHL3030-2-800
6,00x0.8m=1,80 EUR
(Round down to ten Cent.)

Alterations Part Number - T - L - N - (XA, ... YA, ...) : HFHL2040 - 2 - 90 - N8 - XA42-XB62-YA20-YB42

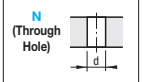
8 Days

Alterations	Through Hole	€ Unit Price / 1 Hole
Spec.	Adds through holes on the extrusion. N is a nominal diameter.	

Plane of Extrusion	N(Selection)
X	3 4 5 6 8
Y	

①5+N/2 is needed from an end.
②Only 1 Dia. is selectable for N.
③When A=15, only N3, N4 and N5 are available.
④One face has up to five holes.

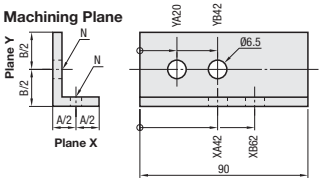
Hole Machining Details



Screw Nominal	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9

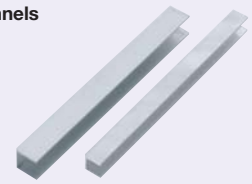
Ordering Code — Specification of Hole Size and Hole Position (Ex.)
N (Select from the table)
Plane of Flame
Hole machining on this plane (in the order of A, B and C
Distance from the end (1mm inclement)
N6 XA42-XB62
YA20-YB42

Machining Plane

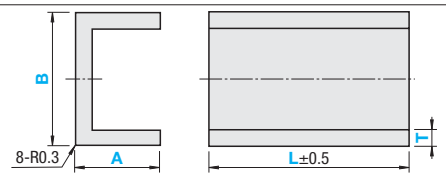


■Channels

RoHS



HFHC



M Material: EN AW-6063-T5 S Surface Treatment: Clear Anodize

Part Number Type	A	B	T	L 1mm Increment	Mass kg/m	Sectional Area mm²	Second Moment of Inertia of Cross Section ℓxx10⁴	ℓyx10⁴	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFHC (Channels)	15	15	2	50~2000	0.222	82	0.1433	0.227		
		30			0.304	112	0.232	1.471		
	20	20			0.304	112	0.453	0.719		
		40			0.412	152	0.576	3.688		
	25	25			0.381	142	1.479	0.911		
		50	3		0.761	282	1.640	10.42		

Order Example Part Number - T - L : HFHC1515 - 2 - 800

Days to Ship 6 Days

Price (euros)

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFHC2020-2-180=1,90 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFHC2020-2-600
6,50x0.6m=1,90 EUR
(Round down to ten Cent.)

Alterations Part Number - T - L - N - (XA / YA / ZA) : HFHC2040 - 2 - 90 - N8 - XA50-YA20-ZA20-ZB42

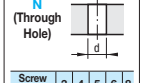
8 Days

Alterations	Through Hole	€ Unit Price / 1 Hole
Spec.	Adds through holes on the extrusion. N is a nominal diameter.	

Plane of Extrusion	N (Selection)
X	3 4 5 6 8
Y	
Z	

①5+N/2 is needed from an end.
②Only 1 Dia. is selectable for N.
③When A and B dimensions are 15, only N3, 4 and 5 can be selected.
④One face has up to five holes.

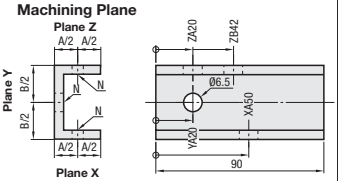
Hole Machining Details



Screw Nominal	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9

Ordering Code — Specification of Hole Size and Hole Position (Ex.)
N (Select from the table.)
Plane of Flame
Hole machining on this plane (in the order of, B and C)
Distance from the end (1mm inclement)
N6 XA50
YA20
ZA20-ZB42

Machining Plane

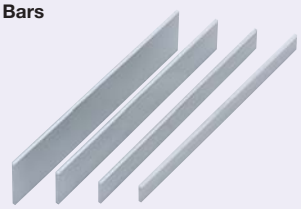


Price Reduction
Up to 30%

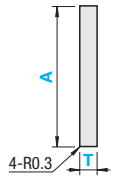
CAD Data

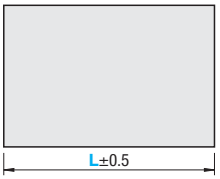
■Flat Bars

RoHS



HFHF





M Material: EN AW-6063-T5 S Surface Treatment: Clear Anodize

Part Number Type	A	T	L 1mm Increment	€ Unit Price Less Than 300mm T 2	3	5	More than 300mm € Unit Price T 2	3	5
HFHF (Flat Bars)	10	3	50~2000						
	15	2 3							
	20	2 3 5							
	25	2 3 5							
	30	2 3 5							
	40	3 5							
	50	3 5							

Order Example: Part Number - T - L → HFHF30 - 3 - 500

Days to Ship: 6 Days

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFHF25-2-180=1,00 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFHF25-2-500
3,50x0.5m=1,00 EUR
(Round down to ten Cent.)

A	Mass kg/m T 2	3	5 (6)	Sectional Area mm² T 2	3	5 (6)	Cross Sectional Moment of Inertia ℓx*10⁴ T 2	3	5 (6)	Cross Sectional Moment of Inertia ℓy*10⁴ T 2	3	5 (6)
10	-	0.081	-	-	30	-	-	0.003	-	-	0.023	-
15	0.08	0.122	-	30	45	-	0.001	0.003	-	0.056	0.084	-
20	0.108	0.163	0.271	40	60	100	0.001	0.005	0.021	0.133	0.200	0.333
25	0.135	0.202	0.338	75	125	184	0.002	0.006	0.026	0.029	0.389	0.649
30	0.163	0.244	0.406	60	90	150	0.002	0.007	0.031	0.450	0.675	1.125
40	-	0.330	0.542	-	120	200	-	0.009	0.042	-	1.600	2.670
50	-	0.405	0.675	-	150	250	-	0.011	0.052	-	3.125	5.208

Alterations: Part Number - T - L - N - (YA,...) → HFHF20 - 2 - 90 - N8 - YA20-YB55 | 8 Days

Alterations	Through Hole	€ Unit Price / 1 Hole
Spec.	Adds through holes on the extrusion. N is a nominal diameter.	

Plane of Extrusion	N(Selection)
Y	3 4 5 6 8

5+N/2 is needed from an end.
Only 1 Dia. is selectable for N.
When A=10, only N3, N4 and N5 are available.
One face has up to five holes.

Hole Machining Details



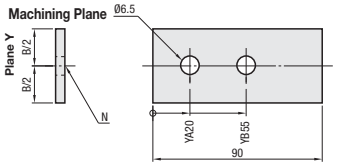
Screw Nominal	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9

Ordering Code: Specification of Hole Size and Hole Position (Ex.)

N (Select from the table)
Plane of Flame
Hole machining on this plane (in the order of A, B and C)
Distance from the end (1mm inclement)

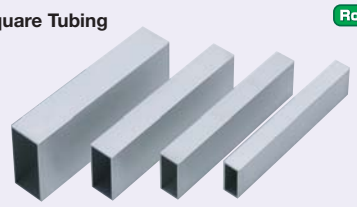
N6 Y A 20-YB55

Machining Plane

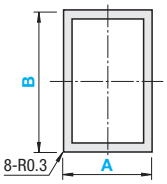


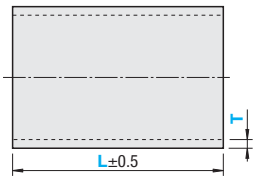
■Square Tubing

RoHS



HFHQ





M Material: EN AW6063-T5 S Surface Treatment: Clear Anodize

Part Number Type	A	B	T	L 1mm Increment	Mass kg/m	Sectional Area mm²	Second Moment of Inertia of Cross Section ℓxx10⁴	ℓyx10⁴	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
HFHQ (Square Tubing)	15	15	1.5	50~2000	0.220	81	0.249	0.249		
		30			0.342	126	0.454	1.406		
	20	20	2		0.390	144	0.787	0.787		
		40			0.607	224	1.437	4.445		
	25	25			0.497	184	1.634	1.634		
		50			0.766	284	2.96	9.007		
	30	30			0.607	224	2.941	2.941		
		60			0.934	344	5.297	15.94		
	40	40			0.824	304	7.336	7.336		
		80			1.257	464	13.11	38.97		
	50	50			1.036	384	14.77	14.77		

Order Example: Part Number - T - L → HFHQ3030 - 2 - 500

Days to Ship: 6 Days

Price

When L is less than 300
Unit prices are indicated in the table regardless of the length.
ex: HFHQ3060-2-180=5,20 EUR
When L is 300 or more
Prices are calculated as follows:
€ Unit Price/m x Specified Full Length = Price
ex: HFHQ3060-2-500
17,60x0.5m=5,20 EUR (Round down to ten Cent.)

Alterations: Part Number - T - L - N - (XA,...YA,...ZA,...QA,..) → HFHQ2040 - 2 - 90 - N8 - YA60-ZA20-QA45 | 8 Days

Alterations	Through Hole	€ Unit Price / 1 Hole
Spec.	Adds through holes on the extrusion. N is a nominal diameter.	

Plane of Extrusion	N (Selection)
X	3 4 5 6 8
Y	
Z	
Q	

5+N/2 is needed from an end.
Only 1 Dia. is selectable for N.
When A and B dimensions are 15, only N3, 4 and 5 can be selected.
One face has up to five holes.

Hole Machining Details



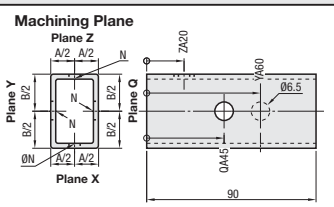
Screw Nominal	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9

Ordering Code: Specification of Hole Size and Hole Position (Ex.)

N (Select from the table)
Plane of Flame
Hole machining on this plane (in the order of A, B and C)
Distance from the end (1mm inclement)

N6 Y A 60
Z A 20
Q A 45

Machining Plane



Extrusion Load Capacity Calculations

■Deflection Calculations

The following pages assist in optimum extrusion type selections by providing a quick Load vs. Deflection Chart (below) and calculation formulas (right page). In general, load calculations are typically based on beam's both ends supported for structural safety.

Selection Example

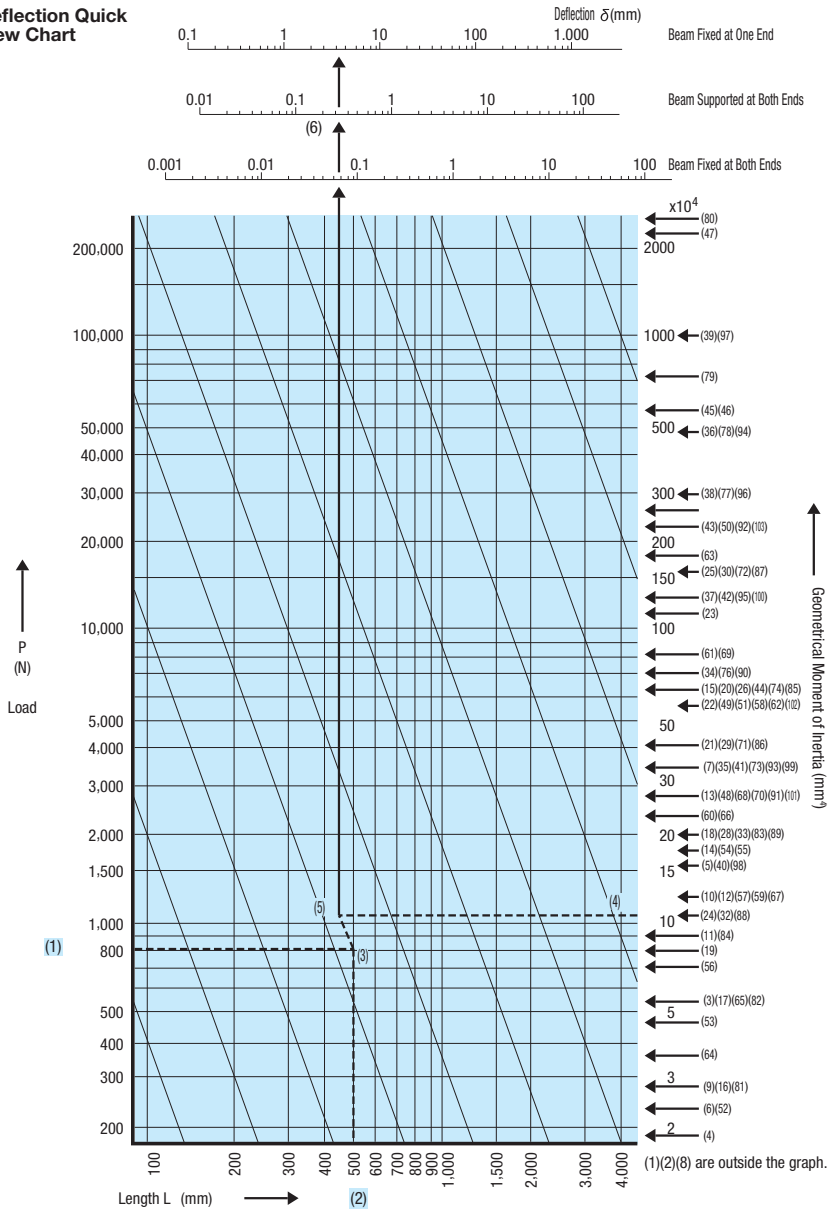
Values used for this example	
Load	800N
Extrusions	HFS8-4040
Length	500 mm

Step
(1) Find a point (1) on the Y (Load) axis for the applied load P (Unit: N).
(2) Find a point (2) on the X (Length) axis for the extrusion length.
(3) Draw a horizontal line from (1) and a vertical line from (2), and name the intersection of the two as (3).
(4) Find a point (4) on the right hand Y axis for the Cross Sectional Moment of Inertia of the extrusion used.
(5) Draw a horizontal line from (4), and draw a parallel line to the graph's diagonal lines from (3).
(6) Name the intersection of the lines as (5).
(7) Draw a line UP from (5) and locate an intersection (6) corresponding to the extrusion support method used.
Result: According to the example values used and the calculation based on the values, the deflection amount would be 0.3mm when the extrusion is supported at both ends.

*1) Conversion: 1kgf=9.80665N (Ex.) 81.6kgf=800N

•MISUMI defines the Load Capacity (Max Allowable Load) to be a deflection 1/1000 of the extrusion length.

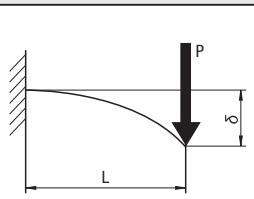
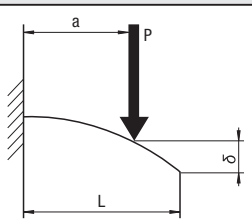
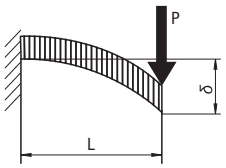
- Deflection Quick View Chart



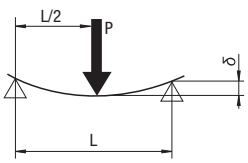
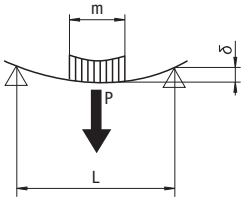
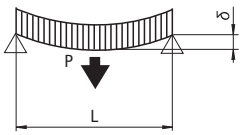
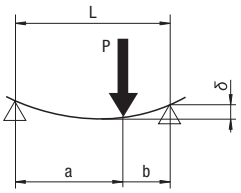
(1): Load 800N
(2): Frame Length
(3): Intersection of (1) and (2): Applicable extrusion HSF8-4040
(5): Intersection of a parallel line from (3) and (4)

The numbers in ○ corresponds to the extrusion numbers on **P.670·671** left hand tables.

- Deflection Calculations

	1	2	3
Cantilever			
Deflection δ	$\delta = \frac{P \cdot L3}{3E \cdot I}$	$\delta = \frac{P \cdot a^3}{3E \cdot I}$	$\delta = \frac{P \cdot L^3}{8E \cdot I}$

means that the load is equally distributed.

	4	5	6	7
Both Ends Supported				
Deflection δ	$\delta = \frac{P \cdot L^3}{48E \cdot I}$	$\delta = \frac{P \cdot L^3}{(48 + \frac{29m}{I}) \cdot E \cdot I}$	$\delta = \frac{5P \cdot L^3}{384E \cdot I}$	$\delta = \frac{P \cdot a^2 \cdot b^2}{3E \cdot I \cdot L}$

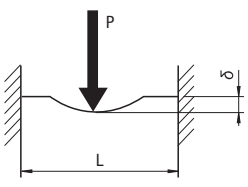
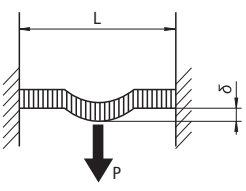
Example of No.4 as "Beam Supported on Both Ends"

P	(N)	Load
L	(mm)	Extrusion Length
E	(N/mm²)	Young's Modulus 69,972N/mm²
I	(mm⁴)	Second Moment of Inertia of Cross Section
δ	(mm)	Deflection

When the selection is calculated as "Beam Supported on Both Ends"

$$\delta = \frac{800 \times 500^3}{48 \times 69{,}972 \times 10.4 \times 10^4}$$

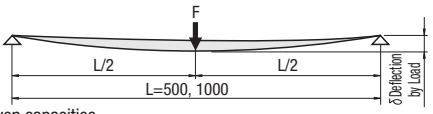
≈0.29 (mm)

	8	9
Both Ends Fixed		
Deflection δ	$\delta = \frac{P \cdot L^3}{192E \cdot I}$	$\delta = \frac{P \cdot L^3}{384E \cdot I}$

Aluminum Frames Load Capacity Guideline

Load Capacity Calculations

1. Calc. Conditions: Calculations are based on centralized loads on both ends supported extrusions.
2. The load capacities (allowable loads) are defined as: Load that generates a deflection amount 1/1000 of the extrusion length. These loads are the allowed maximum. Use within the given capacities.



Red Prints: Added Spec.

Part Number			Height x Width (mm)	Section Modulus x10³ (mm³)	Sectional Moment of Inertia x10⁴ (mm⁴)	For 500mm Extrusion Length Allowable Load (N)		For 1000mm Extrusion Length Allowable Load (N)	
Type	Extrusions					(N)	(kgf)	(N)	(kgf)
HFS5	2020	(1)	20x 20	0.74	0.74	99	10	24	2
	2040	(2)	20x 40	1.35	1.35	182	18	45	4
		(3)	40x 20	2.55	5.11	687	70	171	17
	2060	(4)	20x 60	1.97	1.97	264	26	66	6
		(5)	60x 20	5.32	15.96	2144	218	536	54
	2080	(6)	20x 80	2.58	2.58	347	35	86	8
		(7)	80x 20	9.02	36.11	4851	494	1212	123
	2525	(8)	25x 25	1.36	1.71	229	23	57	5
	2550	(9)	25x 50	2.37	2.96	398	40	99	10
		(10)	50x 25	5.09	12.74	1711	174	427	43
	4040	(11)	40x 40	4.45	8.9	1196	122	299	30
	4060	(12)	40x 60	6.3	12.62	1695	172	423	43
		(13)	60x 40	9	27	3627	369	906	92
	4080	(14)	40x 80	9.18	18.38	2469	251	617	62
		(15)	80x 40	15.87	63.49	8529	869	2132	217
HFS6	3030	(16)	30x 30	1.89	2.83	381	38	95	9
	3060	(17)	30x 60	3.55	5.33	716	73	179	18
		(18)	60x 30	6.84	20.53	2758	281	689	70
	3090	(19)	30x 90	5.62	8.43	1133	115	283	28
		(20)	90x 30	14.71	66.19	8892	906	2223	226
	6060	(21)	60x 60	13.78	41.35	5555	566	1388	141
	6090	(22)	60x 90	17.53	52.59	7065	720	1766	180
		(23)	90x 60	24.77	111.5	14979	1527	3744	381
	30120	(24)	30x120	7.52	11.29	1516	154	379	38
		(25)	120x 30	25.55	153.3	20595	2100	5148	525
	60120	(26)	60x120	23.06	69.18	9294	947	2323	236
		(27)	120x 60	41.18	247.1	33196	3385	8299	846
	5050	(28)	50x 50	8.66	21.66	2909	296	727	74
	50100	(29)	50x100	16.98	42.44	5701	581	1425	145
		(30)	100x 50	30.63	153.2	20581	2098	5145	524
	100100	(31)	100x100	53.08	265.4	35655	3635	8913	908
HFS8	4040	(32)	40x 40	5.24	10.48	1407	143	351	35
	4080	(33)	40x 80	9.95	19.91	2674	272	668	68
		(34)	80x 40	18.07	72.26	9707	989	2426	247
	40160	(35)	40x160	19.36	38.72	5201	530	1300	132
		(36)	160x 40	61.89	496.3	66676	6799	16669	1699
	8080	(37)	80x 80	32.45	129.8	17438	1778	4359	444
	80160	(38)	80x160	73.95	295.8	39739	4052	9934	1013
		(39)	160x 80	125.2	1002	134614	13726	33653	3431
	4545	(40)	45x 45	6.77	15.25	2048	208	512	52
	4590	(41)	45x 90	14.44	32.5	4366	445	1091	111
		(42)	90x 45	27.9	125.5	16860	1719	4215	429
	9090	(43)	90x 90	46.78	210.5	28279	2883	7069	720
	45180	(44)	45x180	27.14	61.05	8201	836	2050	209
		(45)	180x 45	89.87	808.8	108659	11080	27164	2770
	90180	(46)	90x180	133.3	600	80607	8219	20151	2054
		(47)	180x 90	237.9	2141	287635	29330	71908	7332
	5050	(48)	50x 50	10.91	27.28	3665	374	916	93
	50100	(49)	50x100	20.66	51.67	6942	707	1735	177
		(50)	100x 50	42.23	211.1	28383	2894	7093	723
	6060	(51)	60x 60	17.3	51.91	6973	711	1743	177
HFSL6	3030	(52)	30x 30	1.78	2.68	360	36	90	9
	3060	(53)	30x 60	3.24	4.87	654	66	163	16
		(54)	60x 30	5.95	17.88	2402	244	600	61
	5050	(55)	50x 50	7.51	18.79	2524	257	631	64
HFSL8	4040	(56)	40x 40	3.77	7.54	1013	103	253	25
	4080	(57)	40x 80	6.71	13.43	1804	183	451	45
		(58)	80x 80	13.25	52.98	7117	725	1779	181
	4545	(59)	45x 45	5.21	11.73	1575	160	393	40
	4590	(60)	45x 90	10.15	22.85	3069	313	767	78
		(61)	90x 45	19.26	86.68	11645	1187	2911	296
HFSG6	6060	(62)	60x 60	18.09	54.28	7292	743	1823	185
HFSH8	8080	(63)	80x 80	45.83	183.3	24625	2511	6156	627
GFS6	3030	(64)	30x 30	2.32	3.47	466	48	117	12
	3060	(65)	30x 60	3.96	5.9	792	81	199	20
		(66)	60x 30	7.95	23.78	3194	326	798	81
GFS8	4040	(67)	40x 40	6.83	13.76	1848	188	462	47
	4080	(68)	40x 80	12.56	25.21	3384	345	846	86
		(69)	80x 40	22.47	90.87	12208	1245	3052	311
	4545	(70)	45x 45	10.42	23.64	3172	323	793	81
	4590	(71)	45x 90	18.87	42.99	5772	589	1443	147
		(72)	90x 45	35.67	163.4	21792	2222	5448	556
	5050	(73)	50x 50	15.23	38.16	5124	523	1281	131
	50100	(74)	50x100	27.23	68.08	9147	932	2286	223
		(75)	100x 50	54.62	273.1	36706	3742	9173	935
	6060	(76)	60x 60	26.58	79.86	10728	1094	2682	273
	9090	(77)	90x 90	71.17	320.2	43016	4386	10754	1097
	100100	(78)	100x100	93.48	465.8	62576	6381	15644	1595
	100200	(79)	100x200	174.8	874.3	117507	11982	29365	2994
		(80)	200x100	317.7	3179	427334	43576	106791	10890

Part Number			Height x Width (mm)	Section Modlus x10³ (mm³)	Sectional Moment of Inertia x10⁴ (mm⁴)	For 500mm Extrusion Length		For 1000mm Extrusion Length	
Type	Extrusions					Allowable Load (N)		Allowable Load (N)	
						(N)	(kgf)	(N)	(kgf)
EFS8	3030	(81)	30x 30	1.89	2.85	382	39	95	9
	3060	(82)	30x 60	3.66	5.48	736	75	184	19
		(83)	60x 30	6.86	20.46	2758	281	689	70
	3090	(84)	30x 90	5.86	8.80	1181	120	295	30
		(85)	90x 30	15.19	69.0	9185	2296	936	234
	30120	(86)	30x120	7.65	11.48	1583	161	395	40
		(87)	120x 30	26.29	157.62	20628	2103	5157	525
	4040	(88)	40x 40	5.24	10.49	1409	144	352	35
	4080	(89)	40x 80	9.96	19.93	2677	273	669	68
		(90)	80x 40	18.13	72.55	9745	994	2436	248
	40120	(91)	40x120	14.5	29.0	3940	401	985	100
		(92)	120x 40	37.03	223.51	29958	3054	7489	763
	40160	(93)	40x160	19.47	38.8	5203	530	1300	132
		(94)	160x 40	63.17	506.0	67114	6843	16778	1710
	8080	(95)	80x 80	32.55	130.0	17494	1783	4373	445
	80160	(96)	80x160	75.85	304.4	40708	4151	10177	1037
		(97)	160x 80	125.86	1007	134584	13723	33646	3430
	4545	(98)	45x 45	6.85	15.42	2071	211	517	53
	4590	(99)	45x 90	14.52	32.67	4389	448	1097	112
		(100)	90x 45	27.84	125.3	16860	1719	4215	430
	5050	(101)	50x 50	10.79	26.98	3665	374	916	93
	50100	(102)	50x100	21.2	53	7120	726	1780	182
		(103)	100x 50	42.24	211.2	28385	2894	7094	723

Aluminum Frames Load Capacity Guideline

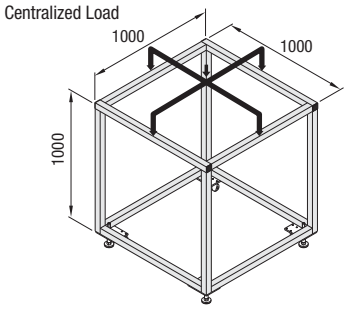
Load Capacity Guideline for Extrusion Frame Units

Condition: Calculated as: Loads causing 1mm deflection at the center of each extrusion of a 1000mm x 1000mm square frame.

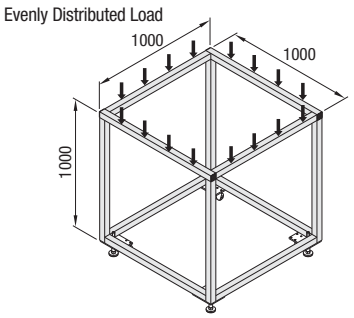
Red Prints: Added Spec.

Part Number		Height x Width (mm)	Allowable Load (N)			
			Centralized Load		Evenly Distributed Load	
Type	Extrusions		(N)	(kgf)	(N)	(kgf)
HFS5	2020	20x 20	99	10	199	20
	2040	20x 40	182	18	364	37
		40x 20	687	70	1375	140
	2060	20x 60	264	26	529	53
		60x 20	2144	218	4288	437
	2080	20x 80	347	35	694	70
		80x 20	4851	494	9702	989
	2525	25x 25	229	23	459	46
	2550	25x 50	398	40	797	81
		50x 25	1711	174	3423	349
	4040	40x 40	1196	121	2393	244
	4060	40x 60	1695	172	3390	345
		60x 40	3627	369	7254	739
	4080	40x 80	2469	251	4938	503
		80x 40	8529	869	17059	1739
HFS6	3030	30x 30	380	38	762	77
	3060	30x 60	716	73	1433	146
		60x 30	2758	281	5516	562
	3090	30x 90	1133	115	2266	231
		90x 30	8892	906	17784	1813
	6060	60x 60	5555	566	11110	1132
	6090	60x 90	7065	720	14130	1440
		90x 60	14979	1527	29959	3054
	30120	30x120	1516	154	3033	309
		120x 30	20594	2100	41190	4200
	60120	60x120	9293	947	18588	1895
		120x 60	33196	3385	66393	6770
	5050	50x 50	2909	296	5819	593
	50100	50x100	5701	581	11403	1162
		100x 50	20581	2098	41163	4197
	100100	100x100	35654	3635	71310	7271
HFS8	4040	40x 40	1407	143	2815	287
	4080	40x 80	2674	272	5349	545
		80x 40	9707	989	19415	1979
	40160	40x160	5201	530	10403	1060
		160x 40	66674	6798	133352	13598
	8080	80x 80	17437	1778	34876	3556
	80160	80x160	39738	4052	79479	8104
		160x 80	134611	13726	269229	27453
	4545	45x 45	2048	208	4097	417
	4590	45x 90	4366	445	8732	890
		90x 45	16859	1719	33720	3438
	9090	90x 90	28279	2883	56559	5767
	45180	45x180	8201	836	16403	1672
		180x 45	108656	11079	217318	22160
	90180	90x180	80605	8219	161215	16439
		180x 90	287627	29329	575270	58661
	5050	50x 50	3665	374	7330	747
	50100	50x100	6942	707	13883	1415
		100x 50	28383	2894	56721	5783
	6060	60x 60	6973	711	13947	1422
HFSL6	3030	30x 30	360	36	720	73
	3060	30x 60	654	66	1309	133
		60x 30	2402	244	4804	489
	5050	50x 50	2524	257	5048	514
HFSL8	4040	40x 40	1013	103	2027	206
	4080	40x 80	1804	183	3608	367
		80x 40	7124	726	14235	1451
	4545	45x 45	1575	160	3151	321
	4590	45x 90	3071	313	6139	626
		90x 45	11648	1187	23290	2374
HFSG6	6060	60x 60	7292	743	14584	1487
HFSH8	8080	80x 80	24622	2510	49251	5022
GFS6	3030	30x 30	466	48	932	95
	3060	30x 60	792	81	1585	162
		60x 30	3194	326	6389	651
GFS8	4040	40x 40	1848	188	3696	377
	4080	40x 80	3384	345	6768	690
		80x 40	12208	1245	24416	2490
	4545	45x 45	3172	323	6344	647
	4590	45x 90	5772	589	11544	1177
		90x 45	21792	2222	43584	4444
	5050	50x 50	5124	523	10248	1045
	50100	50x100	9147	932	18292	1865
		100x 50	36706	3742	73380	7482
	6060	60x 60	10728	1094	21456	2188
	9090	90x 90	43016	4386	86032	8773
	100100	100x100	62576	6381	125152	12762
	100200	100x200	117507	11982	234918	23955
		200x100	427334	43576	854170	87101

Centralized Load: Concentrated load is applied at the center.

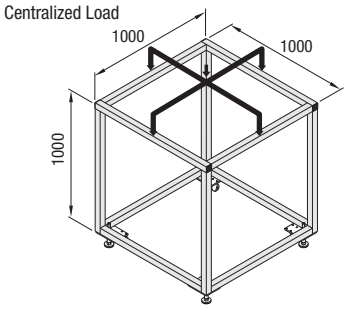


Evenly Distributed Load: When the load is evenly distributed over the extrusion.

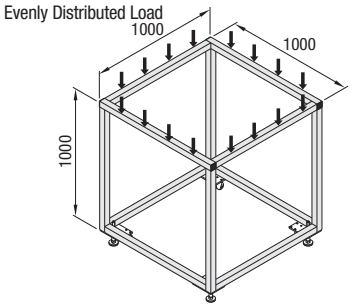


Part Number		Height x Width (mm)	Allowable Load (N)			
			Centralized Load		Evenly Distributed Load	
Type	Extrusions		(N)	(kgf)	(N)	(kgf)
EFS8	3030	30x 30	382	39	765	78
	3060	30x 60	736	75	1472	150
		60x 30	2758	281	5516	562
	3090	30x 90	1181	120	2362	240
		90x 30	9185	2296	18371	1873
	30120	30x120	1583	161	3166	322
		120x 30	20628	2103	41257	4207
	4040	40x 40	1409	144	2818	287
	4080	40x 80	2677	273	5355	546
		80x 40	9745	994	19493	1988
	40120	40x120	3940	401	7881	803
		120x 40	29958	3054	59916	6109
	40160	40x160	5203	530	10407	1061
		160x 40	67114	6843	134228	13687
	8080	80x 80	17494	1783	34988	3567
	80160	80x160	40708	4151	81417	8302
		160x 80	134584	13723	269168	27447
	4545	45x 45	2071	211	4143	422
	4590	45x 90	4389	448	8778	895
		90x 45	16860	1719	33720	3438
	5050	50x 50	3665	374	7330	747
	50100	50x100	7120	726	14240	1452
		100x 50	28385	2894	56748	5787

Centralized Load: Concentrated load is applied at the center.



Evenly Distributed Load: When the load is evenly distributed over the extrusion.



Aluminum Extrusion Frame Assembly

Prior to Beginning

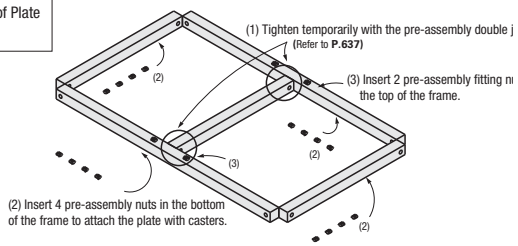
1. **Provide a large and flat work space for the assembly.**
2. **Sort the extrusions into parts and sizes.**
3. **Count and confirm the qty. of the nuts to be pre-inserted.**

*Insert any Pre Assy. nuts needed at this point if mounting a top plate and/or covers also. This assy. example also shows installation of Plate Type Adjusters and Casters.

Assembly of Single Joint connected type.

1 Bottom Frame Assy.

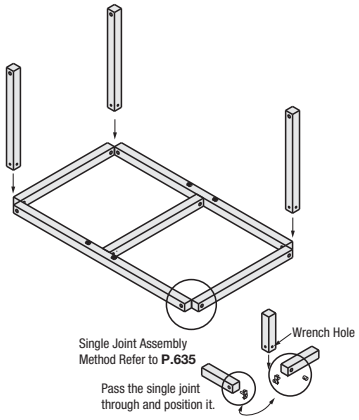
(1) Begin assembling with the Bottom Frame.
(2) Center joist is connected with Pre Assy. Ins. Double Joints.
(3) Insert the nuts prior to assembly.



* Do not forget to insert the nuts.

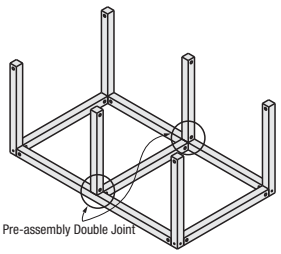
2 Mount the Posts.

Connect the corners with Single Joints,



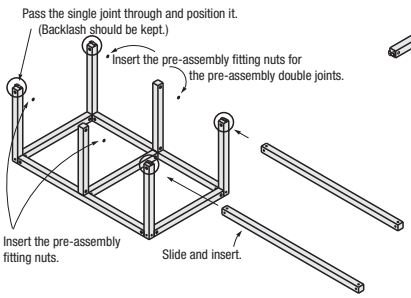
3 Mount the Middle Posts.

Connect the middle extrusions with Pre Assy. Ins. Double Joints.

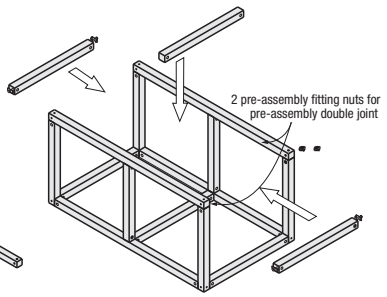


4 Top Frame Assy. (1)

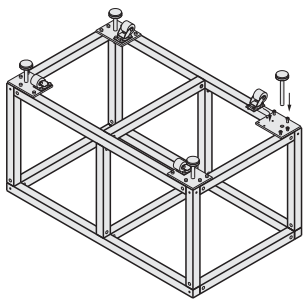
Pre-install Single Joints on the ends of four posts.



5 Top Frame Assy. (2)

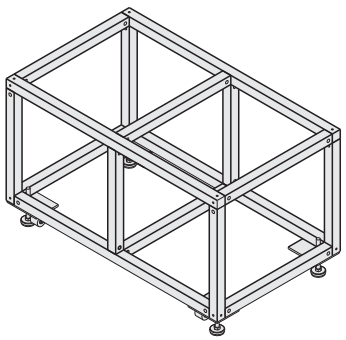


6 Adjuster and Caster Mounting



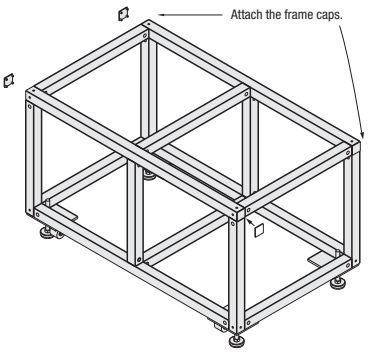
Invert the unit and mount the adjusters and casters.
(Adjusters and Casters are sold separately **P.705**)

7 Final Tightening



Fully tighten while adjusting the extrusion positions.

8 Surface Cleaning



Wipe clean the surfaces with alcohol, etc. after the assy. work.

Aluminum Extrusion Q&A

Aluminum Extrusion Q&A

Q. I want to size aluminum extrusions, what's a guideline?

AMISUMI Aluminum Frames are comprised of the following product series.

Slot Width 6: HFS5 Series (20, 40mm square) for small coverings, parts racks...
Slot width 8: HFS6 Series (30, 50, 60mm square) for medium coverings, conveyor frames...
Slot Width 10:HFS8 Series (40, 80mm square), HFS8-45 Series (45, 90mm square), HFS8-50 Series (50, 100mm square), HFS8-60 (60mm square) for larger clean booths, equipment bases and structural material...
Find the weight that will apply on the extrusion frame, and select the extrusions from the tables on **P.671**

Q. I want to size some brackets, what's a guideline?

A Applicable brackets and load capacity guidelines for each extrusion type are separately listed on bracket product pages.
- If brackets interfere with panels and etc., use Blind Brackets (**P.495** etc.), Simple Joint (**P.633**), Tapping Joint (**P.627**), Screw Joint (**P.628**), Single Joint (**P.635**), Center Joint (**P.629**), Post Assy. Insertion Double joint (**P.631**), Pre Assy. Insertion Double Joint (**P.637**).

Q. What is the aluminum material used?

A EN AW-6063/AlMg0,7Si (JIS) is used. High rigidity material with more strength compared to an aluminum alloy EN AW-6063/AlMg0,7Si typically used for extrusions.
For detailed data for this material, see Alum. Extrusion Material Data. (**P.476**)
* The High Rigidity type is made with EN AW-6061/EN AW-Al--mg1SiCu-T6 with more strength.

Q. What is cutting tolerance?

A Within ±0.5mm of customer specified length.

Q. What are the surface treatment methods used?

A The extrusion surfaces are anodized (9µm or more). Cut surfaces are not treated.
* Glossy clear coated extrusions are pre-anodized (9µm or more), then clear paint coat (7µm) is applied.

Q. How are the extrusions cut?

A The extrusions are cut with carbide tipped saws for soft steel material. Use the Frame Caps (**P.509** etc.) to cover the open cut ends after assembly.

Q. What is the cut's perpendicularity?

A Since the extrusions do not have any datums, perpendicularity of cuts are not defined.

Q. Can JIS standard hex nuts and square nuts be used with the extrusions?

A No, they cannot be used. Our dedicated nuts are designed with larger seating areas to prevent aluminum from buckling under load.
* Flat Extrusions (**P.661・663**) can be used with standard nuts.

Q. The nuts fall within extrusion slots when the extrusions are vertically positioned.

A Use Pre Assy. Insertions Nuts with "Stoppers (**P.500・543・581・615**), then insert into the slots.
Post Assy. Insertion Nut and Stopper Sets (**P.503・546・584・618**) are also available.
When many nuts are required, Pre Assy. Insertion Spring Nuts (**P.501・544・582・616**) and Post Assy.
Insertion Spring Nuts (**P.504・547・585・619**) are more convenient to use.

Q. What are the proper tightening torques for the nuts and hex socket cap screws?

A See the tightening torque (Nm) references on various nut listing pages.
Post Assy. Simple Bracket →**P.485・525・565**, Pre Assy. Ins. Nuts →**P.500・543・581・615**, Post Assy. Ins. Nuts →**P.503・546・584・618**, Long Nuts →**P.507・550・588・622**, Flanged Nuts →**P.506・549・587・621**
* Conditions vary depending on bracket and washer uses. Use as approximated references.

Q. I want to mount resin panels on extrusion frames...

A There are following methods to mount resin panels. Select an applicable method specific to your application. (**P.680**)
(1) Mounting panels on brackets within the frames.
This method results in aesthetically good appearance, and makes for easy install/remove of the panels. Recommended for Safety Covers, etc.
(2) Fitting in the extrusion slots.
Requires no panel drilling or screws, and recommended for applications where designed appearance is of high priority.
(Some notching of the panels may be required depending on the type of brackets in use.)
(3) Mounting panels on the outside of the frames.
Pre-insert nuts with stoppers in the extrusion slots, and use Panel Mounting Screws (**P.641・644**) to mount the panels.
Specify M5 tap for the nuts to be used (Ex. HNTT6-5)

Q. How can I mount doors on my extrusion frame?

A There are following methods to mount doors. Select an applicable method specific to your application.
Resin plate doors... Hinges, Handles, etc. (**P.719**~**728**)
Extrusion frame doors... Use Cover Plates and HFS5-2020/HFS6-3030 extrusions to construct the doors.
* Extrusions for Doors HFTF Series (**P.761**) can be used in place for the HFS Series for even easier door creation.

Q. I want to mount adjusters and casters...

A Casters useable for each extrusion size are offered (**P.703**~**715**)

Q. Any precautions on the assembly?

A
- Provide a flat and ample space for the assembly work.
- For orthogonality checks and face leveling during the assembly, use plates (assembly jigs on **P.748**) for your convenience.
- We recommend that you purchase some Post Assy. Ins. Nuts prior to the assembly work as spares.
- Be sure to check the screw torques after the assembly is complete.

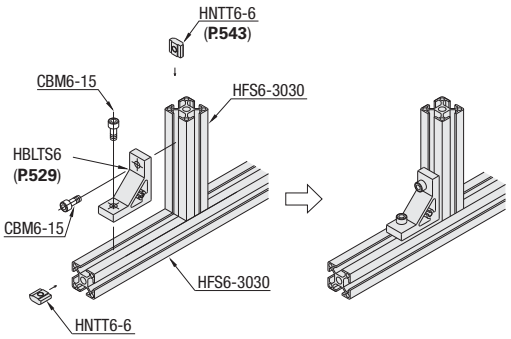
Q. Is Express-T for extrusions free of charge?

A Yes, and we intend on keeping it free. If a same day shipping is desired, simply specify as Express-T. There is no additional charge for the service.
(Extrusions for Brackets (**P.660**), General Purpose Extrusions (**P.667・668**), Fence Extrusions (**P.665**) are not subject to free Express-T service.)

Alum. Extrusion Assy. Examples

Example of Frame Connection

Connection with Thick Bracket



Blind Bracket Connections

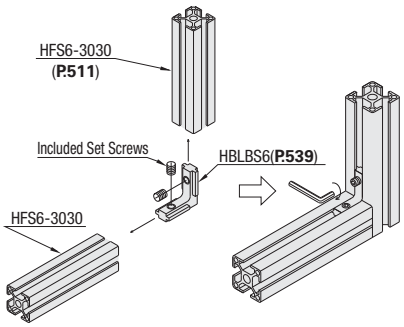
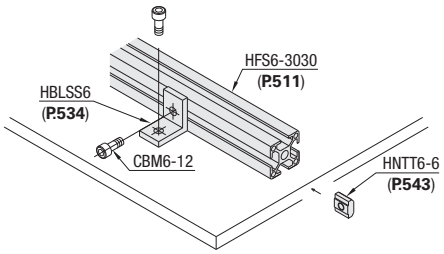
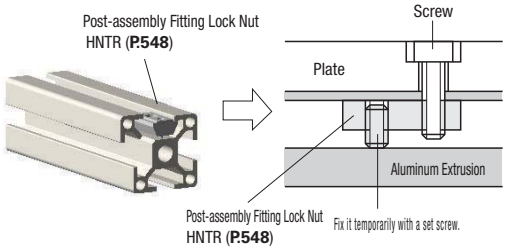


Plate on Extrusion Mounting

Thin Bracket Connections

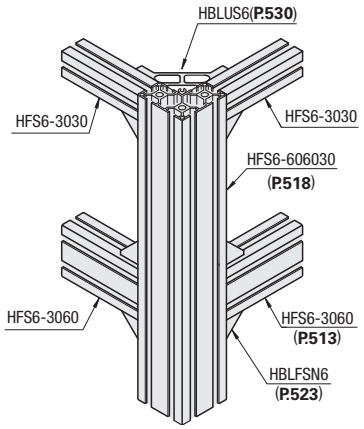


Post Assy. Ins. Locknut Connections

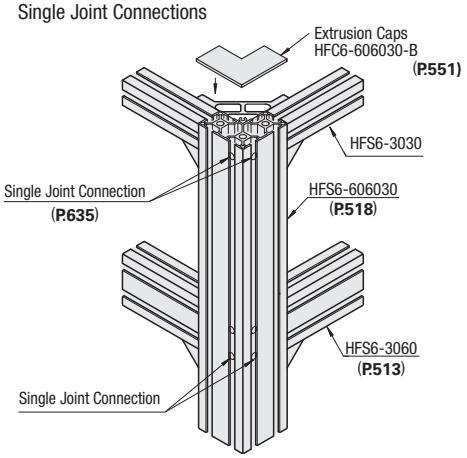


Example of L-Shaped Extrusion

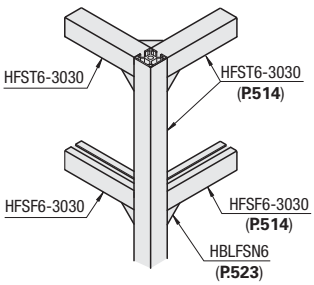
Bracket Connections



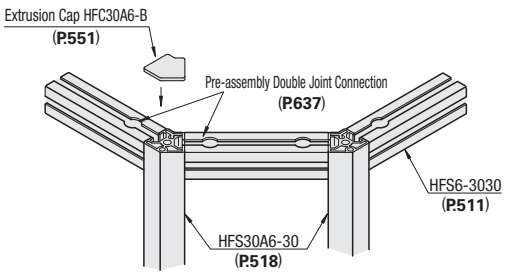
Single Joint Connections



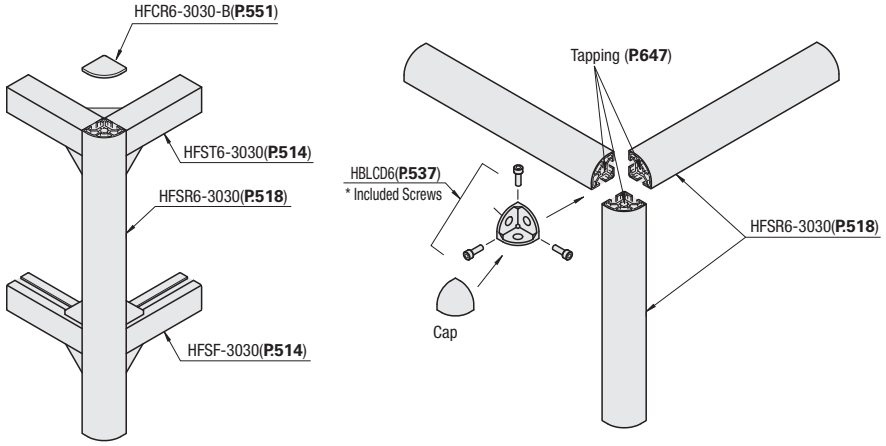
1 and 2 Smooth Sided Extrusions



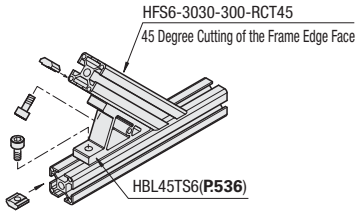
Angled Extrusions



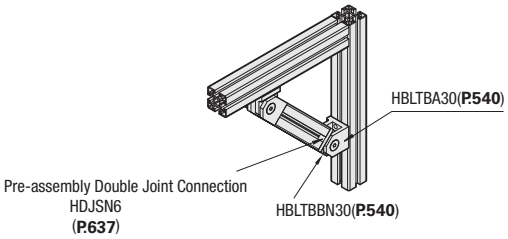
■Example of Use: R Extrusion



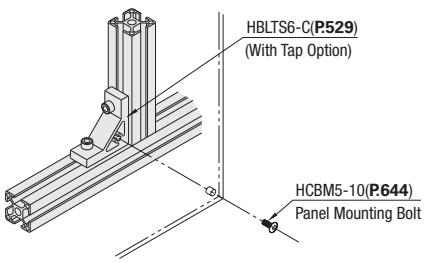
■Example of Use: 45° Angle Brackets



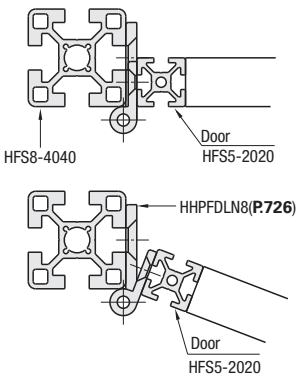
■Free Angle Bracket App. Example



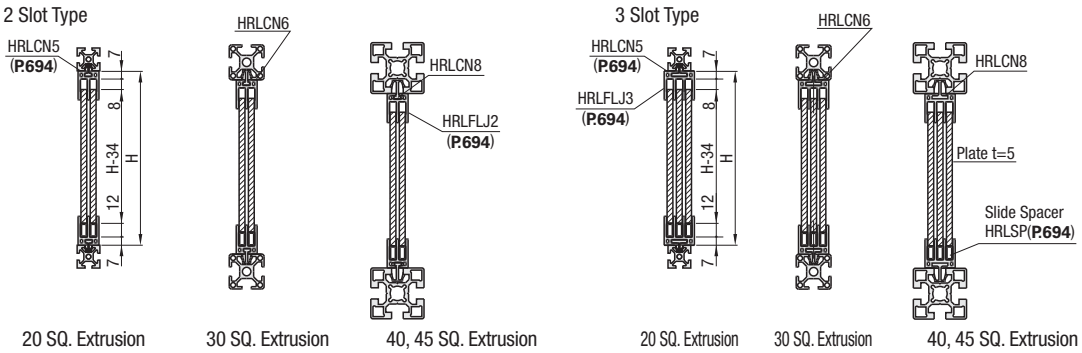
■Example of Cover Mounting on the Bracket



■Connecting Unequal Sized Extrusions with Flag Hinges



■Sliding Rail Mounting Dimensions



Mounting Plate Size Calculations

■Door Plate Size for Slide Rail Type

5mm thick plates are used. When both plates are assembled, they can be inserted into the slide rail.

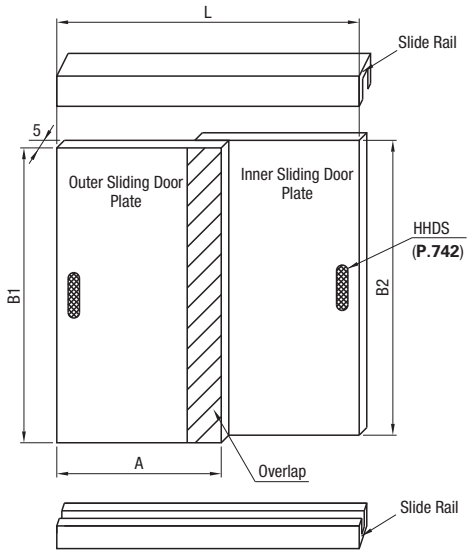
When the slide rail width is L and the height is H (**P.694** See assy. cross section view) the size for the plates will be as follows.

Thickness T=5

Width $A = \frac{(L+20)\text{(with a 20mm overlap)}}{2}$

Height B_1=H-30 (Outer door plate height)

B_2=H-31 (Inner door plate height)



■Door Plate Size

Thickness is arbitrary.

- For Single Door

  Perimeter length will be 2mm less than the frame opening on each side.

  A plate with the below size is needed.

  Width A=L_1-4

  Height B=L_2-4

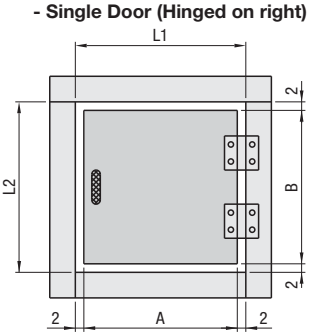
- For Double Doors

  Perimeter length will be 2mm less than the frame opening on each side. There needs to be 2 plates in the following size, and a 2mm gap between the two plates.

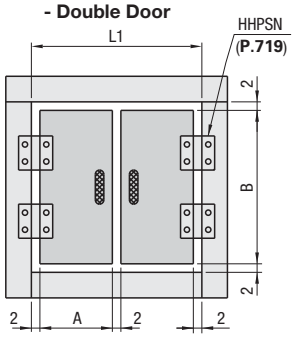
  Width $A = \frac{(L1-6)}{2}$

  Height B=L2-4

- Single Door (Hinged on right)



- Double Door



■Cover Plate Size (For bracket mounting)

The thicknesses are assumed as below.

- For M5 (HFS5 Series) extrusions: 3mm thick
- For M6 and M8 (HFS6 · HFS8(-45) extrusions: 5mm thick

Cover mounting holes will be pre-drilled (-C option) on the bracket's cover mounting side. If the bracket intervals are wide, Panel Support Brackets (**P.683**) are used in between.

Plate size is as follows.

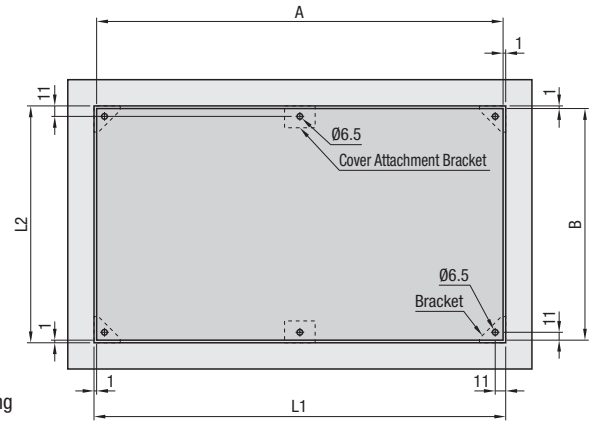
Width A=L1-2

Height B=L2-2

Mounting holes Ø6.5 are drilled at 11mm from each corner.

(**P.683** Steel Type and Stainless Steel Type have different mounting hole locations)

(Recommended Plates: **P.865~880** Resin Plates)



Ex. When ordering an acrylic plate with A=1000, B=600, T=5, 6 mounting hole locations

Part Number	-	A	-	B	-	T	-	F	-	G	-	Screw Nominal D.I.A. N
ACAE6H	-	1000	-	600	-	5	-	F489	-	G578	-	N6

Panel Size Calculations

There are following panel mounting methods.

- **Bracket Mounting***

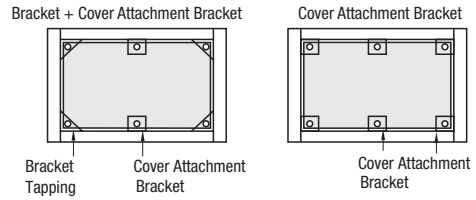
  Brackets and Cover Attachment Brackets (alum. type) are used (See **P.683**)
  Tapping is specified for the brackets (Ex. HBLTS6-C)
  When mounting with Panel Support Brackets only, sheet steel or stainless steel can be selected, and the brackets are already tapped. (**P.683**)

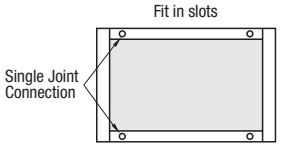
- **Fit in slots**

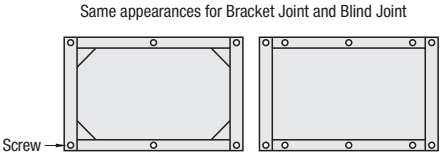
  A method useable when he extrusions are connected with: Simple Joints, Screw Joints, Center Joints, Single Joints, Pre Assy. Insertion Double Joints, and Post Assy. Insertion Double Joints (**P.631**~**632**).
  (**P.687**) is reversed and inserted into the slot, then the cover is inserted.
  Notches on four corners are needed in order to insert the panel into the slots.
  (See illustration below)

- **Direct Mounting***

  Mounted to cover the entire extrusion frame.
  Screw heads will protrude.
  *Panel Mounting Screws (**P.684**) are used for panel mounting.







			Panel Mounting Method			Notes
			Bracket Mounting *1	Inserting into slots *2	Direct Mounting	
Panel Thickness (mm)	Extrusions	HFS5 Series	3,5	3,5	No limitations on panel thickness	*1 HBLFSN5 same as Direct Mounting *2 Use Slot Covers
		HFS6 Series				
		HFS8 Series	5			
		HFS8-45 Series				
Ease of panel removal			O	X	O	When removing for maintenances
Gap between panels and extrusions			Yes	No	No	-
Aesthetics			Normal	Excellent	Extrusions are covered and screw heads are more noticeable *3	*3 Use of Ultra Low Head Screws (**P.191**) makes for less noticeable.
Panel Size Calculations			Easy	Calculations for the corners needed *4	Easy	*4 See below for the calculations

Panel notching dimensions for slot fitting **P.864** **Resin Plates Standard · Anti-static grades can be specified to have notched as shown below.**

	Simple Joint Kits (P.633)	Single Joint Kits (P.635) Screw Joint Kits (P.628)		Pre Assy. Insertion Double Joint Kits (P.637)		Center Joint (P.629)	Post-Assembly Insertion Double Joints (P.631)
		Single Joint Kit Standard Type	Single Joint Kit Narrow Type Screw Joint Kits	Standard Type	Offset Nut Type		
By Joint Notching Shapes	(Ex. 1) (Ex. 2) Panel notching not needed for the case of Example 2.		ⓡIllustration is a Single Joint Kit Narrow Type			(Ex. 1) (Ex. 2)	
HFS5 Series	-	-	-	-	-	5, 1, 5, 5	5, 26, 5
HFS6 Series	8, 9, 13, 8	Portion that fits into slot. 8, 9, 13, 8	8, 2, 13, 8	8, 9, 3, 8, 31, 8	8, 9, 39, 8	8, 1, 8, 8	8, 36, 8
HFS8 Series	-	11.5, 12, 19, 11.5	11.5, 2, 17, 11.5	11.5, 13, 1, 10, 42, 11.5	11.5, 13, 52, 11.5	11.5, 1, 12, 11.5	11.5, 48, 11.5
HFS8-45 Series	-	12, 12, 17, 12	12, 2, 17, 12	12, 13, 1, 10, 48, 12	12, 13, 58, 12	* Notching is not needed. 12, 12	Ø10.5, 15, 5.5

ⓡThe panels above have 1mm play allowances where fitting into the extrusion slots.
Resin plates have large thermal coefficient of expansion. Allow sufficient clearances.
Ex.: An acrylic plate will expand/shrink by 0.7mm per 1m length with 10°C temperature differential. If the temperature swings by 30°C, approx. 2mm allowance will be needed.

Accessories for Aluminum Frames · HEPA Filters

Accessories for Aluminum Frames/ HEPA Filters

Addition











Product Name	Panel Brackets	Panel Clamps	Panel Clamps	Slot Covers -Resin · Resin Soft · Rubber · Sponge-	-Aluminum Low Profile / Aluminum-
Page	683	685	686	687	688

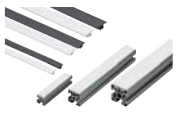






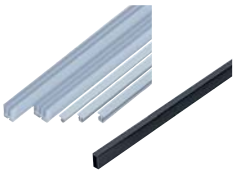






Non-Plastic / Seal / Protection Covers	Latch Magnets with Adhesive Tape	One-sided Rollers for Aluminum Frames	Rollers for Aluminum Frames	Conveyor Roller Shaft Holders	Slip Covers
689	690	691	691	692	692







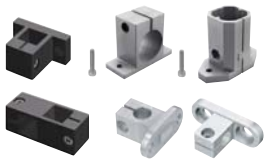




Sliders for Aluminum Frames	Slide Rails for Aluminum Frames -Resin- · Slide Spacers	PVC Sheets · Sheet Holders	Polyethylene Laminated Sheets	Curtains /-Curtain Fasteners
693	694	695	696	697

Modified











Fluorescent Light Unit	Holders for Aluminum Frames · Clamps	Cable Clamps · Cable Cover	Hooks	Casters & Leveling Mounts Assembly
698	699- 700	701	702	703











–Side Mounting–	Plates with Casters · Leveling Mounts	Foot Base	Pads for Aluminum Frames	Foot Bases for 40 · 45 Squares	Casters for Aluminum Frames
704	705	707	708	708	709

Addition

















Casters for Aluminum Frames - Male Thread	Foot Mount Brackets	–With Mounting Plate–	-Heavy Load Type-	Casters for Aluminum Frames -with Adjuster-	Floor Stoppers for Aluminum Frames	Leveling Mounts	Caster Kits for Doors
710	710	711	711	712	713	714	715











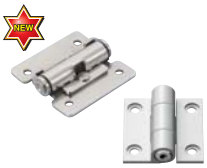


Anchors for Aluminum Frames	Anchor Stands for Aluminum Frames	Aluminum Hinges / Aluminum Hinges for Different Extrusion Sizes	Aluminum Hinges with Tabs / Aluminum Hinges with Slotted Holes	Aluminum Hinges -Short / Long-	Plastic Hinges
715- 716	717- 718	719	720	721	721



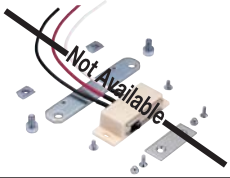
Compact Plastic Hinges	Stop Hinges / Low Particulate Hinges	Stainless Steel / Steel Hinges	Hinges with Slotted Holes	Stainless Steel Hinges for Heavy Load	Aluminum Detachable Hinges	Stainless Steel Detachable Hinges	Hinge Nuts
721	722	723	724	724	724	725	725







Flag Hinges · Flag Hinges for Different Extrusion Sizes	Aluminum Long Hinges	Torque Hinges -Fixed · Adjustable Type-	Latch Magnets for Aluminum Frames	Latch Magnets for Aluminum Frames
726	727	728	729	730

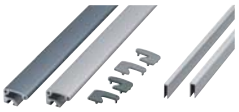







Latch Magnets for Aluminum Frames	Latch Magnets for Panels	Latch Magnets for Panels	Latch Sets for Extrusions	Slide Bolt Sets for Aluminum Frames	Safety Door Switches
731	732	733	734	734	735





Locks for Aluminum Frames	Slide Locks	Hook	Aluminum Handles / Reinforcing Covers	Handles - Welded Round Bar	Handles - Offset
736	737	737	738	739	739









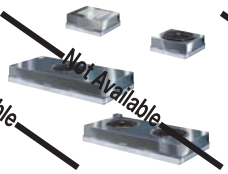
Handles - Stainless Steel Cast	Handles for Aluminum Frames	Designed Handles · Cast Handles	Handles	Handles for Plates	Handles with Cap · Nylon Handles	Aluminum Hollow Handles
740	740	741	741	742	743	744

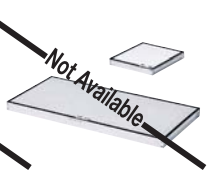






Aluminum Frames for Sliding Doors	Pulley Kits for Sliding Doors	Tensioners for Aluminum Frames · Stainless Steel Wires	Jigs for Assembly	Drilling Jigs
745	745	747	748	748





Repair Pen	HEPA / ULPA Filter Units	HEPA Filters with Air Volume Adjustment	Replacement Filters	Mounting Brackets for Filter Units	Clean Exhaust Units
748	751	751	752	752	754

Panel Brackets

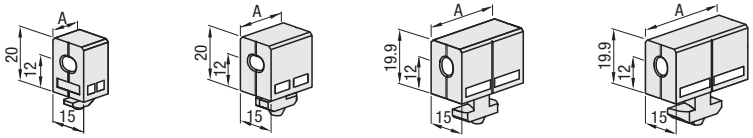
■Panel Brackets Resin Type



RoHS

M Material: Polyamide

HCBR5 (Light Gray) **HCBRB5** (Black)
HCBR6 (Light Gray) **HCBR6S** (Light Gray) **HCBRB6** (Black) **HCBRB6S** (Black)
HCBR8 (Light Gray) **HCBRB8** (Black)
HCBR8-45 (Light Gray) **HCBRB8-45** (Black)

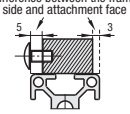


Ⓣ M5 insert-nut is included inside. Use M5 screw with length 15 to attach panels.

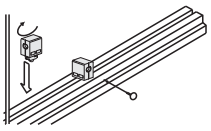
Example

Since Resin Type HCBR has an eccentric T-shaped stopping part, it can be used for both panels with thickness 5mm and 3mm.

Difference between the frame side and attachment face



■Resin Type Mounting Method
Easy installation by inserting into slot and turning 90°. Use screws with L dimension of 15 to attach resin type panels.



Part Number Type	No.	Mass	A	Difference between the frame side and attachment face	€ Unit Price Qty. 1~8	Volume Discount 9~
HCBR HCBRB	5	4.3	12	3 or 5		
	6	6.8	20	5		
	6S	6.0	24	3		
	8	10.9	30	5		
	8-45*	13.2	35	5		

Ⓣ Select No.8 for 45 square light type (HFSL-8 -45) series.

Order Example — Part Number: HCBR6

Days to Ship — 6 Days / 2 Days P.87

■Panel Brackets Steel · Stainless Steel Type



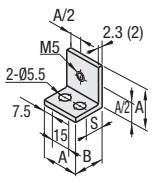
RoHS

Ⓣ ☐ Part Number Not RoHS compliant

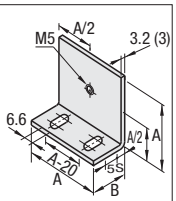
Type	M Material	S Surface Treatment
Steel Type	1.0330	JIS STKM Bright Chromate Plating
Stainless Steel Type	1.4301	-

■For middle mounting

Steel Type **HCBV5**
Stainless Steel Type **SHCBV5**

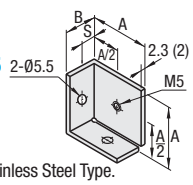


Steel Type **HCBV6** **HCBV8** **HCBV8-45**
Stainless Steel Type **SHCBV6** **SHCBV8** **SHCBV8-45**

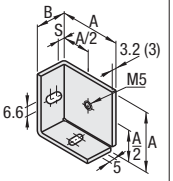


■For corner mounting

Steel Type **HCBCV5**
Stainless Steel Type **SHCBCV5**



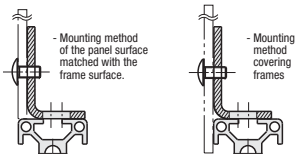
Steel Type **HCBCV6** **HCBCV8** **HCBCV8-45**
Stainless Steel Type **SHCBCV6** **SHCBCV8** **SHCBCV8-45**



Ⓣ The values in ( ) are for Stainless Steel Type.
Ⓣ So as to enhance reinforcement, the plate attachment hole height A/2 differs from that of Aluminum Type and Resin Type

Example

Two methods of mounting panels are available for No. 6, 8 and 8-45 of Steel Type and Stainless Type, for these products have slotted holes (thickness of panel is 5mm or less).



■Steel Type

Part Number Type	No.	Mass HCBCV	Mass HCBV	Difference between the frame side and attachment face	S	A	B	Screws	Quantity	Nuts	Quantity	HCBV € Unit Price Qty. 1~8	HCBV Volume Discount 9~	HCBCV € Unit Price Qty. 1~8	HCBCV Volume Discount 9~
HCBV HCBCV	5	29	23	5	10	30	18	CBM5-8	2	HNTT5-5	2				
	6	79	60	0~5 (Variable)		40	25	CBM6-12		HNTT6-6					
	8	124	94		15	50	35	CBM6-15		HNTT8-6					
	8-45				17.5										

■Stainless Steel Type

Part Number Type	No.	Mass SHCBCV	Mass SHCBV	Difference between the frame side and attachment face	S	A	B	Screws	Quantity	Nuts	Quantity	SHCBV € Unit Price Qty. 1~8	SHCBV Volume Discount 9~	SHCBCV € Unit Price Qty. 1~8	SHCBCV Volume Discount 9~
SHCBV SHCBCV	5	23	18.5	5	10	30	18	SCB5-8	2	HNTTSN5-5	2				
	6	62.5	50	0~5 (Variable)		40	25	SCB6-12		HNTTSN6-6					
	8	113	85.5		15	50	35	SCB6-15		HNTTSN8-6					
	8-45				17.5										

Order Example — Part Number: HCBV6 SHCBCV8

Alterations — Part Number - (SET): HCBV6 - SET

Days to Ship — 6 Days P.87

Alteration	Code	Spec.	Bracket	Screws · Nuts For Frame Fitting Screws	Quantity	Nuts	Quantity	For Panel Fitting Screws	Quantity	Price Adder
Applicable Screw Nut Set	SET	Applicable screws and nuts come in a set. Ⓣ When SET is specified, the product is not RoHS compliant.	HCBCV5 HCBV5	CBM5-8	2	HNTT5-5	2	HCBM5-10 (Right)	1	0,95
			HCBCV6 HCBV6	CBM6-12		HNTT6-6				1,00
			HCBCV8 HCBCV8-45 HCBV8 HCBV8-45	CBM6-15		HNTT8-6				1,15
			SHCBCV5 SHCBV5	SCB5-6		HNTTSN5-5		SHCBM5-10 (Right)		1,05
			SHCBCV6 SHCBV6	SCB6-10		HNTTSN6-6				1,10
			SHCBCV8 SHCBCV8-45 SHCBV8 SHCBV8-45	SCB6-15		HNTTSN8-6				1,25

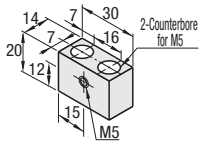
■Panel Brackets Aluminum Type



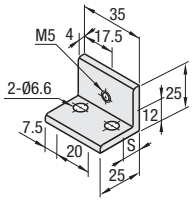
RoHS

M Material: EN AW-6063/AlMg0,7Si-T5
S Surface Treatment: Anodize

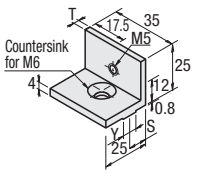
HCBA5
HCBAB5 (Black Anodize)



HCBA6
HCBA6S
HCBA8
HCBAB6 (Black Anodize)
HCBAB6S (Black Anodize)
HCBAB8 (Black Anodize)

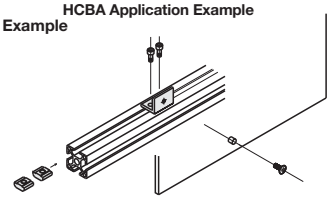


HCBAN6 (1-Point Stopper Type)
HCBAN8 (1-Point Stopper Type)

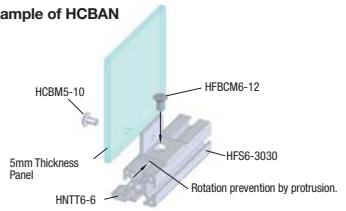


Example

HCBA Application Example



Example of HCBAN



Part Number Type	No.	Mass	Difference between the frame side and attachment face	S	T	Y	Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HCBA	5	19	3	-			CBM5-20	2	HNTT5-5	2		
	6	17	5	10			CBM6-12		HNTT6-6			
	6S		3	12								
	8*		5*2	15	-	-	CBM6-15		HNTT8-6			
HCBAB (Black Anodize)	5	19	3	-			CB5-20	2	HNTT5-5	2		
	6	17	5	10			CB6-12		HNTT6-6			
	6S		3	12								
	8*		5*2	15			CB6-15		HNTT8-6			
HCBAN (1-Point Stopper Type)	6	18	5	10	3	7.8	HFBCM6-12	1	HNTT6-6	1		
	8		5*2	15	4	9.8	HFBCM6-15	1	HNTT8-6	1		

8 is used in common with 8–45.*5*2 is for 40 square aluminum frames

Order Example — Part Number: HCBA6

Days to Ship: 6 Days / 2 Days P.87

Alterations

Part Number - (SET)
HCBA6 - SET

Alteration	Code	Spec.	Bracket	Screws · Nuts: For Frame Fitting Screws	Quantity	Nuts	Quantity	Screws · Nuts: For Panel Fitting Screws	Quantity	Price Adder
Applicable Screw Nut Set	SET	Applicable screws and nuts come in a set. When SET is specified, the product is not RoHS compliant.	HCBA5	CBM5-20	2	HNTT5-5	2	HCBM5-10 (Below)	1	0,95
			HCBA6 HCBA6S	CBM6-12		HNTT6-6				1,00
			HCBA8	CBM6-15		HNTT8-6				1,15
			HCBAB5	CB5-20		HNTT5-5				1,05
			HCBAB6 HCBAB6S	CB6-12		HNTT6-6		HCBM5-10 (Below)		1,10
			HCBAB8	CB6-15		HNTT8-6				1,25
			HCBAN6	HFBCM6-12	1	HNTT6-6	1	HCBM5-10 (Below)		0,74
			HCBAN8	HFBCM6-15		HNTT8-6				0,82

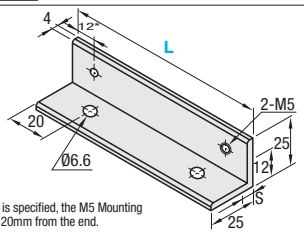
■Panel Brackets Length Configurable Aluminum Long Type



RoHS

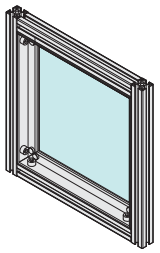
M Material: EN AW-6063/AlMg0,7Si
S Surface Treatment: Anodize

HCBAL6
HCBAL6S
HCBAL8



* When Alteration CTW45 is specified, the M5 Mounting Hole will be provided at 20mm from the end.

Example



The clearance between the frame and panel can be filled. Also, use for reinforcements.

Part Number Type	No.	L 1mm Increment	Difference betweena the frame side and attachment face	S	Screws · Nuts: Screws	Quantity	Nuts	Quantity	€ Unit Price L50~300	L301~700	L701~1100	L1101~1500	L1501~2000
HCBAL	6	50~2000	5	10	CBM6-12	2	HNTT6-6	2					
	6S		3	12									
	8*		5*2	15	CBM6-15		HNTT8-6						

8 is used in common with 8–45.*5*2 is for 40 square aluminum frames

Order Example — Part Number: HCBAL6 - Length: 1000

Days to Ship: 7 Days P.88

Alterations

Part Number - Length - (CTW45 · MH)
HCBAL6 - 500 - CTW45
HCBAL8 - 700 - MH

Days to Ship: 8 Days

Alteration	Code	Spec.	Price Adder
Panel Brackets Aluminum Long Type Cut 45 Degrees on Upper Slot	CTW45	Cuts in 45 degrees on both ends of Panel Brackets Aluminum Long Type.	3,90
One Mounting Hole Addition	MH	Adds one M5 mounting hole on the middle of L Dimensions.	1,60

Take cautions not cut hands by the sharp cut surfaces.

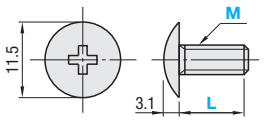
■Panel Mounting Screws



RoHS

Part Number Not RoHS compliant

HCBM
SHCBM (Stainless Steel)
HCBMB (Trivalent Chromate)



Type	M Material	S Surface Treatment
HCBM	JIS STKM for Mechanical Structure	JIS STKM Bright Chromate Plating
SHCBM	1.4301/X5CrNi18-10	-
HCBMB	JIS STKM for Mechanical Structure	Trivalent Chromate (Black)

Part Number Type	M	Length L	HCBM € Unit Price	HCBM Volume Discount	SHCBM € Unit Price	SHCBM Volume Discount	HCBMB € Unit Price	HCBMB Volume Discount
			Qty. 1~99	100~	Qty. 1~99	100~	Qty. 1~99	100~
HCBM	5	10						
SHCBM (Stainless Steel)		12						
HCBMB (Trivalent Chromate)		15						

L dimension 15 is for HCBR. For other screws, refer to **P.641**

Order Example — Part Number: HCBM5 - L: 10

Days to Ship: 6 Days P.87

For package sales for HCBM·SHCBM·HCBMB, set of 500 pieces are available for each size.

M-L	HCBM Set of 500 pcs. (SET1)	SHCBM Set of 500 pcs. (SET1)	HCBMB Set of 500 pcs. (SET1)
5-10			
5-12			
5-15			

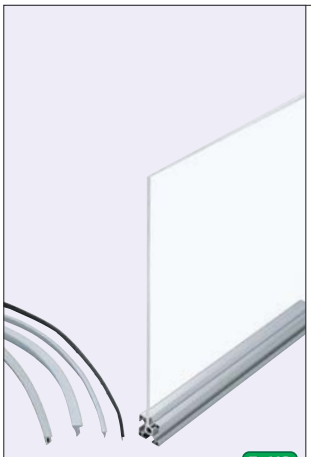
When placing an order, please make sure that quantity is correct. The order of HCBM5–10–SET1 comes with 500 pieces.

Order Example — Part Number: HCBM5 - L: 10 - SET1 (500 pcs.)

Days to Ship: 6 Days P.87

Panel Clamps

CAD Data

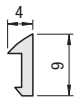


RoHS

Type	Color	Material	Heat Resistance Temperature
HSCP	Black	EPDM	-40~120°C
HSCPF	Light Gray	Olefin Type Elastomer	-20~80°C

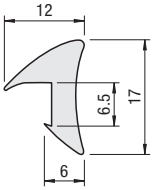
1mm Width Insert Type

HSCP1H
HSCPF1H

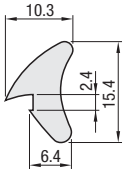


5mm Width Insert Type

HSCP5H
HSCPF5H

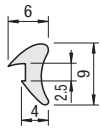


HSCP5HN
HSCPF5HN



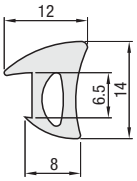
3mm Width Insert Type

HSCP3H
HSCPF3H



7mm Width Insert Type

HSCP7H
HSCPF7H



Color: Outgas Testing Results of S Panel Clamp

Measuring Method	GCMS	GCMS	GCMS	GCMS
Outgas	Acetal-dehyde	t-Trimethyl-pentene	Dimethyl-heptane	Xylene
60°C 60min.	Below detection limit	Below detection limit	Below detection limit	Below detection limit
Detection Limit	0.01μg/g	0.01μg/g	0.01μg/g	0.01μg/g

Standard Length

Part Number Type	Part Number No.	Color	Length m	Extrusions (Series)	Applicable Panel Plate Thickness	B (Black) Length 6m € Unit Price Qty. 1~8	B (Black) Length 6m Volume Discount 9~50	S (Light Gray) Length 6m € Unit Price Qty. 1~8	S (Light Gray) Length 6m Volume Discount 9~50	B (Black) Length 12m € Unit Price Qty. 1~8	B (Black) Length 12m Volume Discount 9~50	S (Light Gray) Length 12m € Unit Price Qty. 1~8	S (Light Gray) Length 12m Volume Discount 9~50
HSCP	1H	B (Black) S (Light Gray)	6 12	HFS5	5								
	3H			HFS5	3								
	5HN			HFS6	5								
	5H			HFS6	3								
	7H			HFS8	5								
				HFS8-45									
				HFS8	3								
				HFS8-45									

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	Color	-	Length
HSCP3H	-	B	-	12
HSCPF3H	-	B	-	1520

Days to Ship **7 Days**

Configurable Length

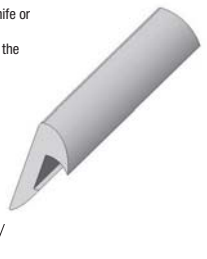
Part Number Type	Part Number No.	Color	Length 1mm Increment	Ex-trusions (Series)	Applicable Panel Plate Thickness	€ Unit Price/m B (Black)	€ Unit Price/m S (Light Gray)
HSCPF	1H	B (Black) S (Light Gray)	100~3000	HFS5	5		
	3H			HFS5	3		
	5HN			HFS6	5		
	5H			HFS6	3		
	7H			HFS8	5		
				HFS8-45			
				HFS8	3		
				HFS8-45			

Price

€ Unit Price/m x Specified Full Length = Sales Price
ex:HSCPF3H-B-800
5,70 x 0.8m = 4,50 EUR (Round down to ten Cent.)

Example

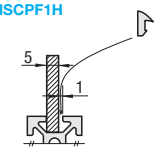
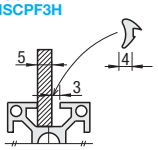
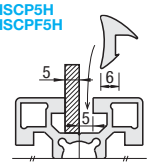
Can be cut to length with scissors, knife or other sharp tools.
Better appearance will be obtained if the corner is cut at 45 °.



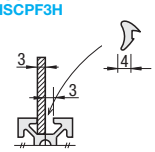
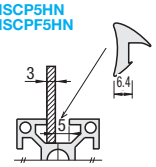
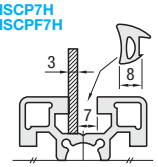
<After Assembly>



Panel plate thickness 5mm

Extrusions	HFS5	HFS6	HFS8 HFS8-45
Drawing	HSCP1H HSCPF1H 	HSCP3H HSCPF3H 	HSCP5H HSCPF5H 

Panel plate thickness 3mm

Extrusions	HFS5	HFS6	HFS8 HFS8-45
Drawing	HSCP3H HSCPF3H 	HSCP5HN HSCPF5HN 	HSCP7H HSCPF7H 

Panel Clamps

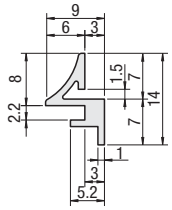
CAD Data

■Post-Assembly Panel Holder

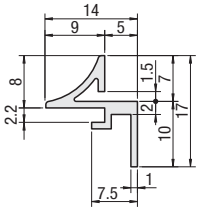


RoHS

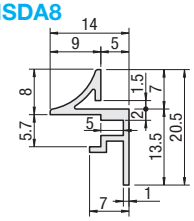
For HFS5 series
HSDA5



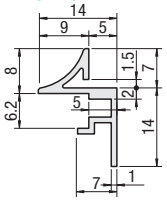
For HFS6 series
HSDA6



For HFS8 series
HSDA8



For HFS8 · 45 series
HSDA8-45



Use in combination with the Post-Assembly Clamps for Panel Holder.

M Material: EN AC51 400/AlMgSi0,7-T5 S Surface Treatment: Anodize

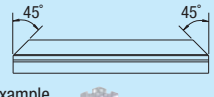
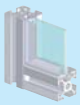
Part Number Type	No.	Length 1mm Increment	Extrusions (Series)	Compatible Panel Plate Thickness	€ Unit Price 300mm or less	€ Unit Price/m 300mm or more
HSDA	5	100 ~ 3000	HFS5	3		
	6		HFS6	5		
	8		HFS8			
	8-45		HFS8-45*			

Select No.8 for 45 square light type (HFSL-8 -45) series.

Alterations

Part Number - Length - (CTW45) — HSDA5 - 800 - CTW45

8 Days

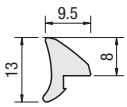
Alteration	Code	Spec.	Price Adder
Cut 45 Degrees on Upper Slot	CTW45	Cuts the upper side of panel holder slot by 45 degrees. To connect extrusions, use the tapping joint.  Mounting Example 	12,00

■Post-Assembly Clamps for Panel Holder

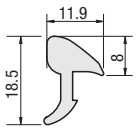


RoHS

For HFS5 · HFS6 series
HSDP5-6
HSDPF5-6



HFS8 · HFS8-45 Series
HSDP8-845
HSDPF8-845



Use in combination with the Post-Assembly Panel Holder.

The Post-Assembly Clamps for Panel Holder can be cut with a cutter.

Type	Color	M Material	Heat Resistance Temperature
HSDP HSDPF	Light Gray	EPDM	-40~120°C

■Standard Length Clamps for Panel Holder

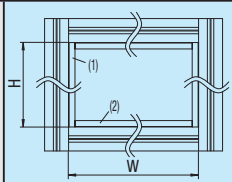
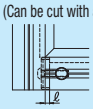
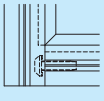
Part Number Type	No.	Length (m)	Extrusions (Series)	€ Unit Price Qty. 1~8	Volume Discount 9~50
HSDP	5-6	12	HFS5 HFS6		
	8-845		HFS8 HFS8-45		

For orders larger than indicated quantity, please request a quotation.

■Configurable Length Clamps for Panel Holder

Part Number Type	No.	Length 1mm Increment	Extrusions (Series)	€ Unit Price/m
HSDPF	5-6	100~3000	HFS5 HFS6	
	8-845		HFS8 HFS8-45	

■Dimension by Joints

Joints Used	Single Joint Kits	Tapping Joints Screw Joint Kit Simple Joint
Post-Assembly Panel Holder	 - Post-Assembly Panel Holder Dimension (1)=H-1 (2)=W-17 When the alteration of 45° cut in the upper part is applied (1)=H-1 (2)=W-1 - Mounting Panel Dimension Height=H-3 Width=W-3	
Clamps for Panel Holder	Upper Side 45° Cut Notching at ℓ dimension of the slot (Can be cut with a utility knife.)  Joints Used / ℓ: HSJ6 4; HSJ8 4.5; HSJ8-45 4 For Narrow Type, notching the slot is not required.	Upper Side 45° Cut (Can be cut with a utility knife.) 

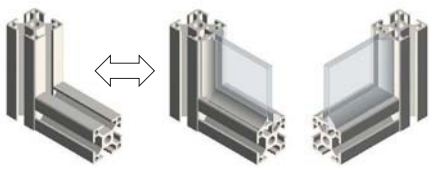
Order Example

Part Number	-	Length
HSDA5	-	800
HSDP5-6	-	12

Days to Ship 7 Days

Example

Before Mounting / After Mounting

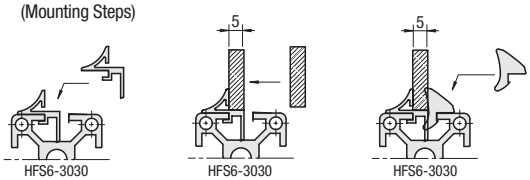


Panel Holder Side / Clamp Side

- Panel can be installed after frame is assembled.
- Panel replacement is easy without disassembling the frame.

Clamps for panel holder can be cut with a cutter.

(Mounting Steps)



(1)Insert a panel holder into the slot of the frame.

(2)Insert a panel onto the panel holder.

(3)Insert clamp for Panel into the gap.

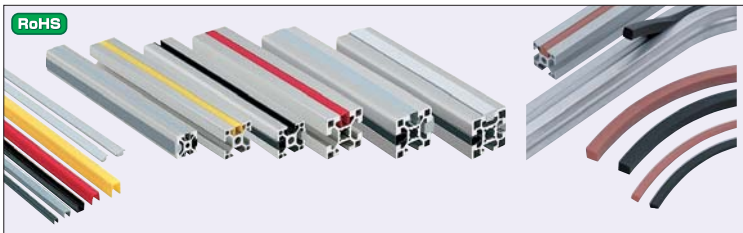
NEW

Slot Covers

-Resin Type · Soft Resin Type · Rubber Type · Sponge Type-

CAD Data

RoHS



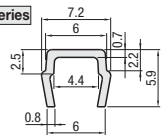
Type	Material	Heat Resistance Temperature(℃)
HSCA	Polyethylene (Black, Light Gray, Yellow, Red)	-40~80
HSCL	Low Density Polyethylene (Black, Light Gray)	
HSCB	Styrene Type Elastomer (Shore A60) (Light Gray)	-75~130

HSCA (Polyethylene) and HSCL (Low density polyethylene) may expand or contract about 0.5% as temperature changes by 20°C.

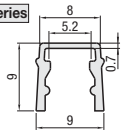
Type	Material	Color	Heat Resistance Temperature
HSCJ	Chloroprene Rubber Sponge	Black	100°C
HSCJF	Silicon Rubber Sponge	(Vermilion)	200°C

Slot Covers (Resin · Resin Soft)

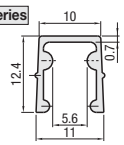
For HFS5 series
HSCA5
HSCL5



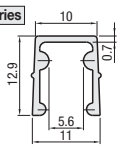
For HFS6 series
HSCA6
HSCL6



For HFS8 series
HSCA8
HSCL8



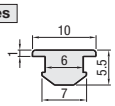
For HFS8 · 45 series
HSCA845
HSCL845



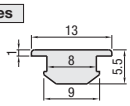
The panel holder is used by reversing the slot cover. HFS5 can hold a 3mm plate, HFS6 · HFS8 and HFS8-45 can hold a 5mm plate.
HSCL (Resin Soft) is softer than HSCA (Resin). Can be easily inserted after assembling the frames. (For details, see below.**P.687**)

Slot Covers (Elastomer)

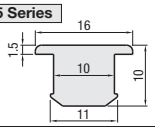
For HFS5 series
HSCB5



For HFS6 series
HSCB6



For HFS8, HFS8-45 Series
HSCB8

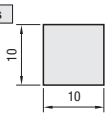


Slot Covers (Sponge)

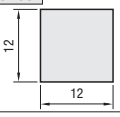
For HFS5 series
HSCJ5
HSCJF5



For HFS6 series
HSCJ6
HSCJF6



For HFS8, HFS8-45 Series
HSCJ8
HSCJF8



Sponge type of slot covers can be used for a curved aluminum extrusions (**P.482, 522, 562**)

Standard Length (Resin / Soft Resin)

Part Number Type	No.	Color	Length m	Extrusions (Series)	€ Unit Price Qty. 1~8	Volume Discount 9~100
HSCA (Resin Type)	5	B (Black)	2	HFS5		
	6	S (Light Gray)		HFS6		
	8	Y (Yellow)		HFS8		
	845	R (Red)		HFS8-45		
HSCL (Resin Soft Type)	5	B (Black)	2	HFS5		
	6	S (Light Gray)		HFS6		
	8			HFS8		
	845			HFS8-45		

HSCA can be cut with a utility knife while HSCL can be cut with scissors.
For orders larger than indicated quantity, please request a quotation.

Standard Length (Elastomer)

Part Number Type	No.	Color	Length m	Extrusions (Series)	€ Unit Price Qty. 1~8	Volume Discount 9~100
HSCB	5	S (Light Gray)	2.7	HFS5		
	6			HFS6		
	8			HFS8 HFS8-45		

Can be cut with a utility knife.
For orders larger than indicated quantity, please request a quotation.

Standard Length (Sponge)

Part Number Type	No.	Color	Length m	Extrusions (Series)	(1) Chloroprene Rubber Sponge Unit Price Qty. 1~8	(1) Chloroprene Rubber Sponge Volume Discount 9~50	(2) Silicon Rubber Sponge Unit Price Qty. 1~8	(2) Silicon Rubber Sponge Volume Discount 9~50
HSCJ	5	B (Black)	12	HFS5				
	6	R (Vermilion)		HFS6				
	8			HFS8 HFS8-45				

For orders larger than indicated quantity, please request a quotation.

Configurable Length (Sponge)

Part Number Type	No.	Color	Length 1mm Increment	Extrusions (Series)	€ Unit Price/m (1) Chloroprene Rubber Sponge	€ Unit Price/m (2) Silicon Rubber Sponge
HSCJF	5	B (Black)	100~3000	HFS5		
	6	R (Vermilion)		HFS6		
	8			HFS8 HFS8-45		

Order Example

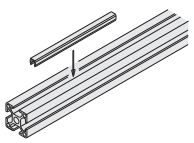
Part Number	-	Color	-	Length
HSCA6 HSCJ8	-	B R	-	12

Days to Ship 7 Days

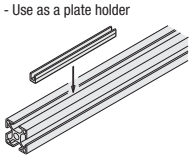
Price € Unit Price/m x Specified Full Length = Sales Price
ex: HSCJF6–B–800 6,30x0.8m = 5,00 EUR(Round down to ten Cent.)

Example

- Use as a slot cover



- Use as a plate holder



Alterations

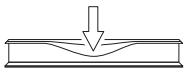
Part Number	-	Color	-	SET
HSCA8	-	S	-	SET

7 Days ⊗Available for HSCA and HSCL only.

Features of HSCL (Resin Soft)

It is softer than HSCA (Resin).
It is easy to insert into a groove and can be easily cut with scissors.

-Comparison of HSCA (Resin) and HSCL (Resin Soft)



Part Number	HSCA	HSCL
Deflection mm	0.5	2

[Measuring Method]
Put HSCA, HSCL longitudinally and apply weight of 500g, then measure the deflection.

Package Purchase of HSCA and HSCL

A set of 100 pieces are available for each size.

No.	€ HSCA Set of 100 pcs. (SET)	€ HSCL Set of 100 pcs. (SET)
5		
6		
8		
845		

Prices in the table are the sum of 100 pcs. prices.

When placing an order, please make sure that quantity is correct.
The order of 1 HSCA5–B–SET comes with 100 pieces.

Slot Covers
-Aluminum Low Profile · Aluminum Type-

CAD Data

RoHS

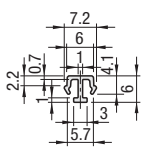
■Aluminum
Low Profile Type



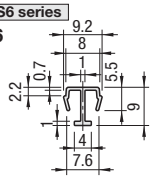
Type	Material	Surface Treatment
HSCZ	Aluminum (EN AW6063-T5)	Anodize

Slot Covers (Aluminum Low Profile)

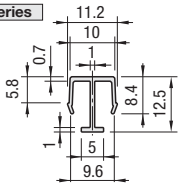
For HFS5 series
HSCZ5



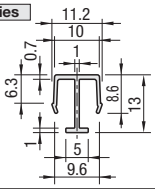
For HFS6 series
HSCZ6



For HFS8 series
HSCZ8



For HFS8 · 45 series
HSCZ845



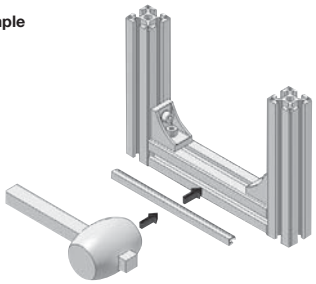
■Configurable Length (Aluminum)

Part Number		Length 1mm Increment	Extrusions (Series)	€ Unit Price Less than 300mm	Volume Discount Less than 300mm		€ Unit Price/m 300mm or more	Volume Discount 300mm or more	
				Qty. 1~9	10~19	20~	Qty. 1~9	10~19	20~
HSCZ	5	50~4000	HFS5						
	6		HFS6						
	8		HFS8						
	845		HFS8-45						

Order Example: Part Number HSCZ5 - Length 100

Days to Ship: 7 Days

Example



Protrudes less than the HSCM type due to slot fitting configuration.
Insert by using a wooden hammer or a plastic mallet.

Price: € Unit Price/m x Specified Full Length = Sales Price
ex:HSCZ8-800 7,10x0.8m=5,60 EUR (Round down to ten Cent.)

RoHS

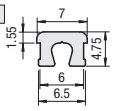
■Aluminum Type



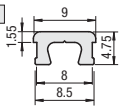
Type	Material	Surface Treatment
HSCM	Aluminum (EN AW6063-T5)	Anodize

Slot Covers (Aluminum)

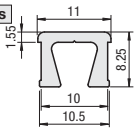
For HFS5 series
HSCM5



For HFS6 series
HSCM6



For HFS8, HFS8-45 Series
HSCM8



■Configurable Length (Aluminum)

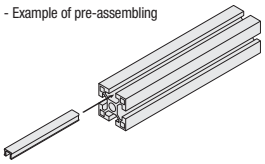
Part Number		Length 1mm Increment	Extrusions (Series)	€ Unit Price/m
HSCM	5	50~4000	HFS5	
	6		HFS6	
	8		HFS8 HFS8-45	

Order Example: Part Number HSCM5 - Length 100

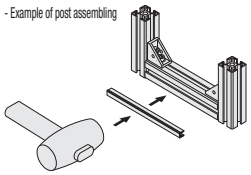
Days to Ship: 7 Days

Example

- Example of pre-assembling



- Example of post assembling



Post-assembling additions are possible for already assembled frames. (Insert them by using a wooden hammer or a resin hammer.)

Price: € Unit Price/m x Specified Full Length = Sales Price
ex:HSCM8-800 15,40x0.8m=12,30 EUR (Round down to ten Cent.)

Non-Slip Covers / Seal Covers / Protection Covers / Panel Spacers / Latch Magnets with Adhesive Tapes

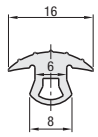


RoHS

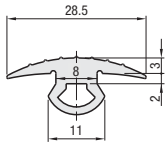
M Material: EPDM
H Hardness: Shore A60
Heat Resistant Temperature: –40~120°C

Non-Slip Covers

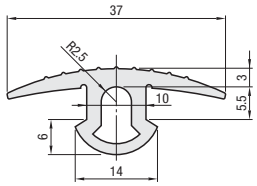
For HFS5 series
HSCG5
HSCGF5



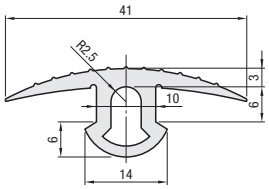
For HFS6 series
HSCG6
HSCGF6



For HFS8 series
HSCG8
HSCGF8

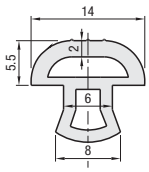


For HFS8-45 series
HSCG845
HSCGF845

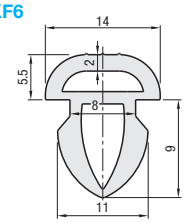


Seal Covers

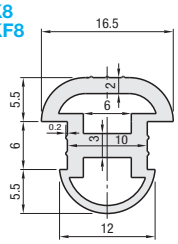
For HFS5 series
HSCK5
HSCKF5



For HFS6 series
HSCK6
HSCKF6

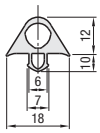


HFS8 · HFS8-45 Series
HSCK8
HSCKF8

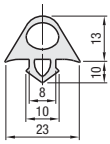


Protection Covers

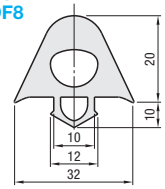
For HFS5 series
HSCD5
HSCDF5



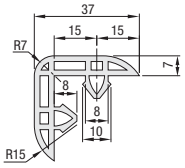
For HFS6 series
HSCD6
HSCDF6



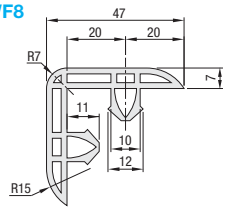
HFS8 · HFS8-45 Series
HSCD8
HSCDF8



For HFS6 (30mm Angle) series
HSCWF6



For HFS8 (40mm Angle) series
HSCWF8



Standard Length

Part Number Type	No.	Color	Length m	Extrusions (Type)	€ Unit Price Qty. 1~8	Volume Discount 9~20
HSCG	5	B (Black)	12	HFS5		
	6			HFS6		
	8			HFS8		
	845			HFS8-45		
HSCK	5	S (Light Gray)		HFS5		
	6			HFS6		
	8			HFS8 / HFS8-45		
HSCD	5	S (Light Gray)		HFS5		
	6			HFS6		
	8			HFS8 / HFS8-45		

Only light gray color is available for protection covers.

For orders larger than indicated quantity, please request a quotation.

Configurable Length

Part Number Type	No.	Color	Length 1mm Increment	Extrusions (Type)	€ Unit Price/m
HSCGF	5	B (Black)	50~3000	HFS5	
	6			HFS6	
	8			HFS8	
	845			HFS8-45	
HSCKF	5	S (Light Gray)		HFS5	
	6			HFS6	
	8			HFS8 / HFS8-45	
HSCDF	5			HFS5	
	6			HFS6	
	8			HFS8 / HFS8-45	
HSCWF	6		50~2000	HFS6	
	8			HFS8	

Only light gray color is available for protection covers.

Order Example

Part Number	-	Color	-	Length
HSCG6	-	B	-	12
HSCGF845	-	S	-	1520

Days to Ship 7 Days

Price
€ Unit Price/m x Specified Full Length = Sales Price
ex:HSCGF5-B-800
6,20x0.8m=4,90 EUR
(Round down to ten Cent.)

CAD Data

Example



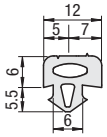
Protection of the corners of the aluminum extrusion with covers prevents the frame from damage by collision which occurs while moving of casters.

Panel Spacers

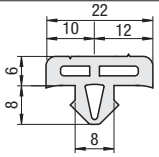


RoHS

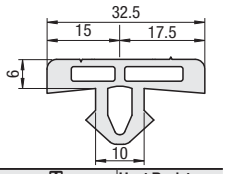
HSCS5 HSCSF5



HSCS6 HSCSF6



HSCS8 HSCSF8



Color: Outgas Testing Results of S Panel Spacer

Measuring Method	GCMS	GCMS	GCMS	GCMS
Outgas	Acetaldehyde	t-Trimethylpentene	Dimethylheptane	Xylene
60°C 60min.	Below detection limit	Below detection limit	Below detection limit	Below detection limit
Detection Limit	0.01μg/g	0.01μg/g	0.01μg/g	0.01μg/g

Type	Color	Material	Heat Resistance Temperature
HSCS HSCSF	Black	EPDM	-40~120°C
	Light Gray Economy		
	Light Gray	Olefin Type Elastomer	−20~80°C

Standard Length

Part Number Type	No.	Color	Length m	Extrusions (Series)	B(Black) € Unit Price	B(Black) Volume Discount	SE(Light Gray Economy) € Unit Price	SE(Light Gray Economy) Volume Discount	S(Light Gray) € Unit Price	S(Light Gray) Volume Discount
					Qty. 1~8	9~50	Qty. 1~8	9~50	Qty. 1~8	9~50
HSCS	5	B (Black) SE (Light Gray) conomy S (Light Gray)	12	HFS5						
	6			HFS6						
	8			HFS8 HFS8-45						

Configurable Length

Part Number Type	No.	Color	Length 1mm Increment	Extrusions (Series)	€ Unit Price/m B (Black)	€ Unit Price/m SE (Light Gray Economy)	€ Unit Price/m S (Light Gray)
HSCSF	5	B (Black) SE (Light Gray) Economy S (Light Gray)	100~3000	HFS5			
	6			HFS6			
	8			HFS8 HFS8-45			

EFor orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	Color	-	Length
HSCS5 HSCSF5	-	B	-	12
	-	SE	-	1520

Days to Ship: 7 Days

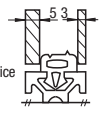
Price

€ Unit Price/m x Specified Full Length = Sales Price
ex:HSCSF5-B-800
6,40x0.8m=5,10 EUR
(Round down to ten cent.)

Example

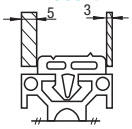
- It can be used to fill a gap between the panel and the frame by using the mounting holes for a cover on a bracket.
- It can be also used as a stopper for panel doors.

HSCS5 HSCSF5



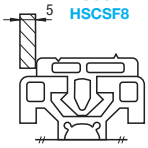
HFS5 Series

HSCS6 HSCSF6



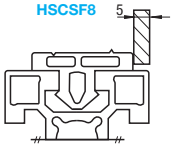
HFS6 Series

HSCS8 HSCSF8



HFS8 Series

HSCS8 HSCSF8

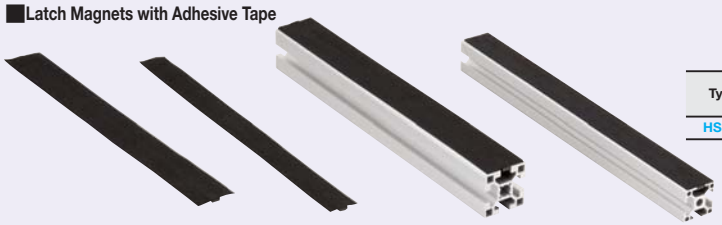


HFS8−45 Series



Latch Magnets with Adhesive Tape

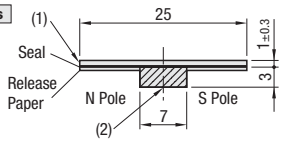
RoHS



Type	(1) Sponge Material	(2) Magnet Material	Heat Resistance Temperature
HSMG	Chloroprene	Anisotropic Ferrite Magnet	50°C

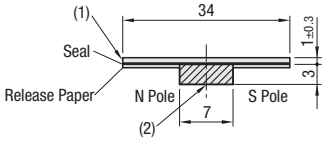
For HFS6 series

HSMG6



HFS8 · HFS8-45 Series

HSMG8



The N pole has an N mark. For mounting, refer to the Example of Use.

Part Number Type	No.	Color	Length mm	Extrusions (Type)	Magnet Type	Attraction Force per 100mm (g)	Surface Magnetic Flux Density Gauss [G]	€ Unit Price 1~4 Qty.	Volume Discount 5~20
HSMG	6	B (Black)	1000	HFS6	Anisotropic Ferrite Magnet (Plastic Magnet)	75	500		
	8			HFS8					

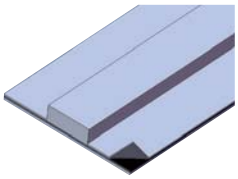
The attraction force is a reference value checked in the room temperature (20°C). Usable as simplified magnet catches if attached on door frame.
The attraction force is a reference value gained when two HSMG attracted each other.
Can be cut with scissors.
For orders larger than indicated quantity, please request a quotation.

Order Example

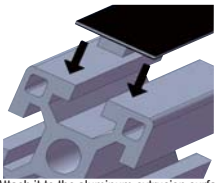
Part Number	-	Color
HSMG6	-	B

Days to Ship: 7 Days

Example



1. Peel off the backing paper to expose the adhesive.



2. Attach it to the aluminum extrusion surface.

One-sided Rollers for Aluminum Frames / Rollers for Aluminum Frames

CAD Data

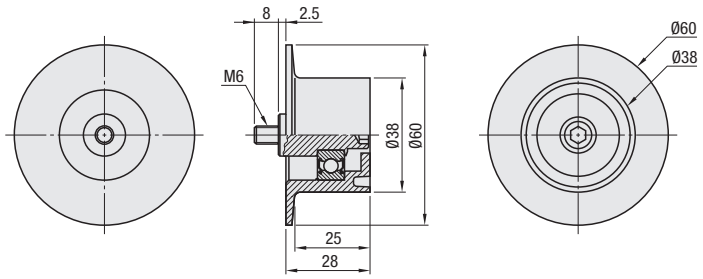
■One-sided Rollers for Aluminium Extrusions

RoHS



Name of Parts	Material	Surface Treatment
Roller	6 Nylon	-
Shaft Part	1.0038/S235JR	Trivalent Chromate
Bearing	1.3505/100Cr6	-

HFROLK6



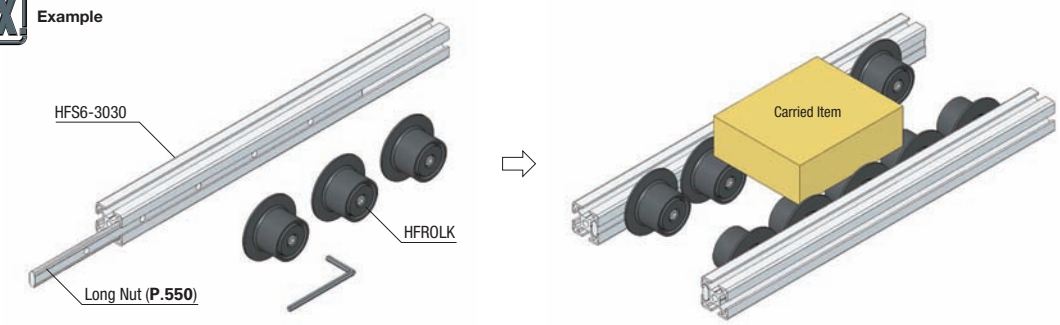
Part Number / Type	Extrusions (Series)	Color	Allowable Load N (kgf)	€ Unit Price 1~2 Packs	Volume Discount 3~
HFROLK6	HFS6	Black	50N (5kgf)		

(P)10 Pcs. per Package

Order Example — Part Number: HFROLK6

Days to Ship — 6 Days P.87

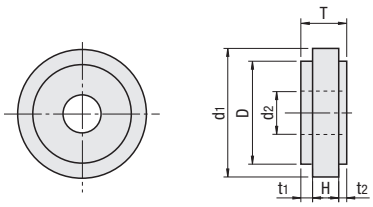
ex Example



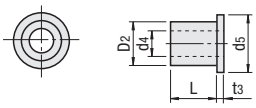
■Rollers for Aluminum Frames



HFROLL (Included Collar: 6 Nylon)
HFROLLM (Included Collar:1.0330/DC01)



Included Collar



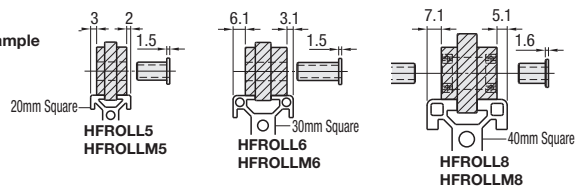
Type	Material: Roller	Material: Included Collar
HFROLL	6 Nylon	6 Nylon
HFROLLM		1.0330/DC01 - JIS STKM Bright Chromate

Part Number Type	No.	Extrusions (Series)	H	D	T	t1	t2	d1	d2	Color	Bearing	Accessory: Collar L	Collar t3	Collar D2	Collar d4	Collar d5	Quantity	Allowable Load N (kgf)	HFROLL € Unit Price Qty. 1~9	HFROLL Volume Discount 10~	HFROLLM € Unit Price Qty. 1~9	HFROLLM Volume Discount 10~
HFROLL HFROLLM	5	HFS5	6	24	15	4	5	29	9.2	Black	Not Provided	16.5	1.5	9	6.2	13	1	49 (5)				
	6	HFS6	7.8		20.8	5	8					22.3						98 (10)				
	8	HFS8 · HFS8-45	9.8	26	27.8	8	10	39.5	10		Provided	13.4	1.6	10		14	2	147 (15)				

Order Example — Part Number: HFROLL6

Days to Ship — 6 Days P.87

ex Example



Conveyor Roller Shaft Holders / Slip Covers

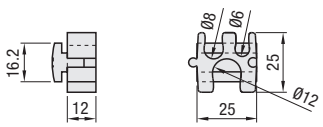
CAD Data

Conveyor Roller Shaft Holders

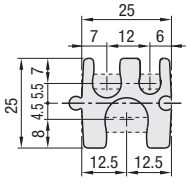


RoHS

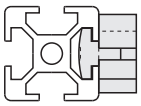
HSCX6-25



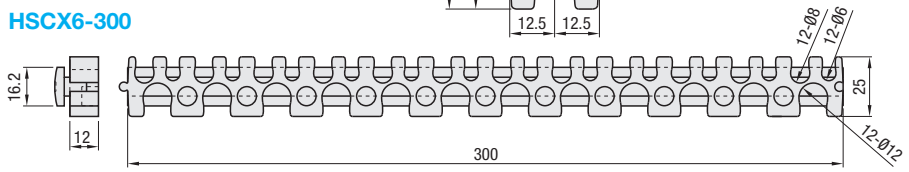
‹Detailed Dimensions and Pitches›



‹Frame Installation Example›



HSCX6-300



When using a shaft of Ø12, reverse the top and the bottom.

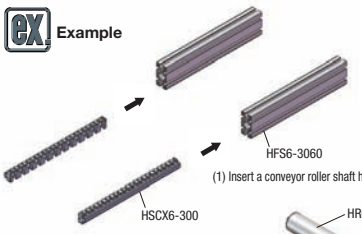
M Material: Glass Fiber Reinforced ABS Resin

Part Number Type	Part Number No.	L	Extrusion (Series)	Applicable Roller Shaft Diameter	€ Unit Price Qty. 1~9	Volume Discount 10~
HSCX	6	25 300	HFS6	Ø6 Ø8 Ø12		

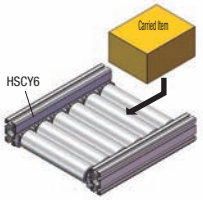
Order Example: Part Number HSCX6 - L 300

Days to Ship: 6 Days P.87

Example

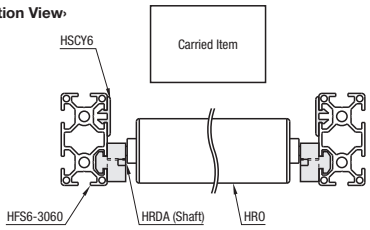


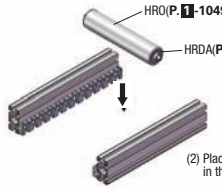
(1) Insert a conveyor roller shaft holder into the frame slots.



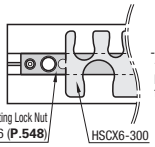
(3) With parallel use of slip covers, a carrier line can be easily made.

‹Section View›





(2) Place a shaft on a conveyor roller and fit the shaft in the roller by pushing from above.



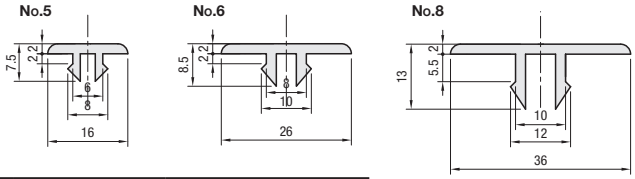
-In the edge part, use post-assembly lock nuts or frames as stoppers.
It prevents the conveyor roller shaft holder from falling out of the extrusion.

Slip Covers



RoHS

HSCY HSCYF



Type	M Material	Heat Resistance Temperature
HSCY	Ultra High Molecular Weight Polyethylene	–100~80°C

Standard Length

Part Number Type	Part Number No.	Color	Length m	Extrusions (Series)	€ Unit Price Qty. 1~8	Volume Discount 9~50
HSCY	5	W(White) B(Black)	2	HFS5		
	6			HFS6		
	8			HFS8*		

* Not applicable to HFS8-45 series.

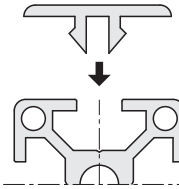
For orders larger than indicated quantity, please request a quotation.

Configurable Length

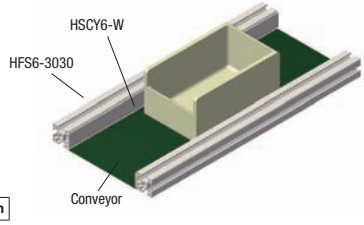
Part Number Type	Part Number No.	Color	Length 1mm Increment	Extrusions (Series)	€ Unit Price/m
HSCYF	5	W(White) B(Black)	50~2000	HFS5	
	6			HFS6	
	8			HFS8*	

* Not applicable to HFS8-45 series.

Example



Attach by pushing it into the extrusion slot.



Order Example: Part Number HSCYF5 - Color B - Length 1200; HSCY6 - W - 2

Days to Ship: 7 Days

Price: € Unit Price/m x Specified Full Length = Sales Price
ex:HSCYF6-W-800
16,00x0.8m=12,80 EUR
(Round down to ten Cent.)

Characteristic Values

Item	Unit	Value
Specific Gravity	-	0.96
Tensile Strength	MPa	43
Elongation	%	10
Hardness	Rockwell R Scale	60
Impact Strength	IZOD Notch kJ/m	100
Thermal Expansion Coefficient	10^{-4}/°C	1.3
Water Absorption Ratio	%	<0.01
Dielectric Constant	-	2.4
Insulation Breakdown Voltage	kV/mm	44

Sliders for Aluminum Frames

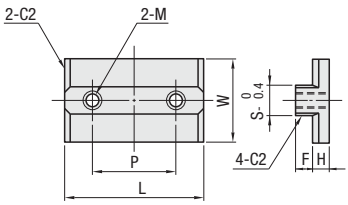
CAD Data

■Sliders for Aluminum Frames Female Thread Type

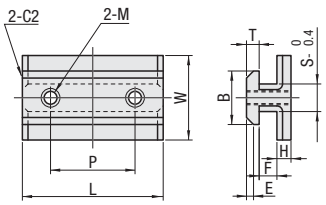


RoHS

HFAFSTA (Female Thread Type Without Slot-T)



HFAFSTB (Female Thread Type With Slot-T)



M Material: Polyacetal (White)

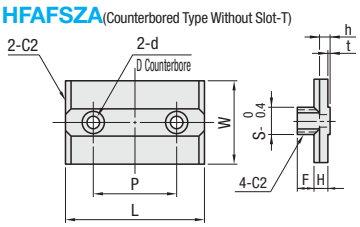
Part Number Type	No.	Extrusions (Series)	H	F	S	T	E	B	L	P	W	M	Applicable Screws Screws	€ Unit Price Qty. 1~9	Volume Discount 10~
HFAFSTA	5	HFS5	5	3	5.8	-	-	-	35	20	18	3	M3		
	6	HFS6		4	7.8				40	24	24	4	M4		
	8	HFS8 · HFS8-45		6	9.8				50	30	30	5	M5		
HFAFSTB	5	HFS5		2.5	5.8	3.5	3	10	35	20	18	3	M3		
	6	HFS6			7.8	5.3	3.5	14.1	40	24	24	4	M4		
	8	HFS8 · HFS8-45		6.3	9.8	4.5	2.5	19	50	30	30	5	M5		

■Sliders for Aluminum Frames Counterbored Type

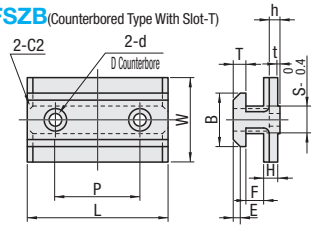


RoHS

HFAFSZA (Counterbored Type Without Slot-T)



HFAFSZB (Counterbored Type With Slot-T)



M Material: Polyacetal (White)

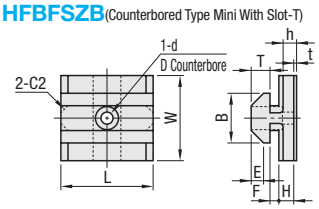
Part Number Type	No.	Extrusions (Series)	H	F	S	T	E	B	L	P	W	D	d	h	t	Screw · Nut Screws	Screw · Nut Nuts	€ Unit Price Qty. 1~9	Volume Discount 10~
HFAFSZA	6	HFS6	5	4	7.8	-	-	-	40	24	24	6.5	3.4	3.8	0.8	CBM3-10	HNTT6-3		
	8	HFS8 · HFS8-45		6	9.8				50	30	30	8	4.5			CBM4-12	HNTT8-4		
HFAFSZB	6	HFS6		2.5	7.8	5.3	3.5	14.1	40	24	24	6.5	3.4	3.8	0.8	CBM3-10	HNTT6-3		
	8	HFS8 · HFS8-45		6.3	9.8	4.5	2.5	19	50	30	30	8	4.5			CBM4-12	HNTT8-4		

■Sliders for Aluminum Frames Counterbored Type Mini



RoHS

HFBFSZB (Counterbored Type Mini With Slot-T)



M Material: Polyacetal (White)

Part Number Type	No.	Extrusions (Series)	H	F	S	T	E	B	L	W	D	d	h	t	Screw · Nut Screws	Screw · Nut Nuts	€ Unit Price Qty. 1~9	Volume Discount 10~
HFBFSZB	6	HFS6	5	2.5	7.8	5.3	3.5	14.1	26	24	6.5	3.4	3.8	0.8	CBM3-10	HNTT6-3		
	8	HFS8 · HFS8-45		6.3	9.8	4.5	2.5	19	34	30	8	4.5			CBM4-12	HNTT8-4		

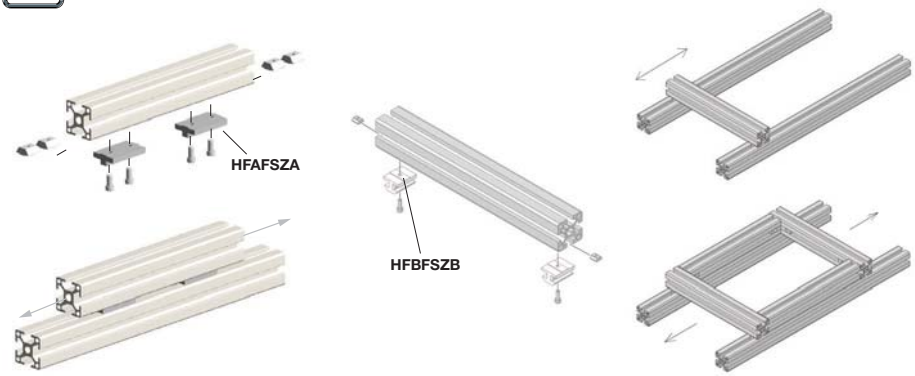
Order Example — Part Number: HFAFSTA6

Days to Ship: 6 Days P.87

Example

■Features

It is used to slide over aluminum extrusions.



Slide Rails / Slide Spacers

-Resin Type-

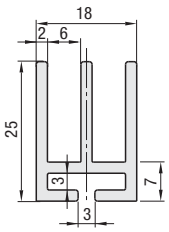
CAD Data

■Slide Rails

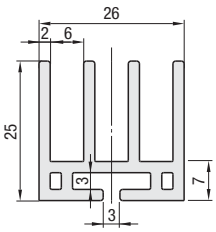
RoHS



HRLFLJ 2
(For 2 Rows of 5mm Thick Plates)



HRLFLJ 3
(For 3 Rows of 5mm Thick Plates)



Use the Slide Rail Connectors to connect the Slide Rail to Aluminum Frames.

M Material: ABS Resin (Light Gray)

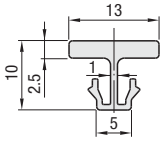
Part Number Type	No.	Length 1mm Increment	Extrusions (Series)	Mass kg/m	€ Unit Price/m
HRLFLJ	2	50~2000	HFS5 HFS6 HFS8 (~45)	0.185	
	3			0.277	

■Slide Rail Connectors

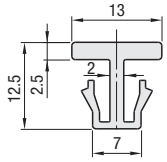
RoHS



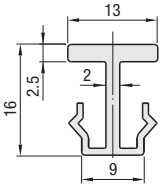
HRLCN 5



HRLCN 6



HRLCN 8



Used to connect the Slide Rails to the Aluminum Frames.

M Material: Polypropylene (Light Gray)

Part Number Type	No.	Length 1mm Increment	Extrusions (Series)	Mass kg/m	€ Unit Price/m
HRLCN	5	50~2000	HFS5	0.045	
	6		HFS6	0.064	
	8		HFS8 (~45)	0.072	

Order Example

Part Number	-	Length
HRLFLJ3	-	1000
HRLCN6	-	1000

Days to Ship: **7 Days**

Express A 8,00 EUR/ piece P.88

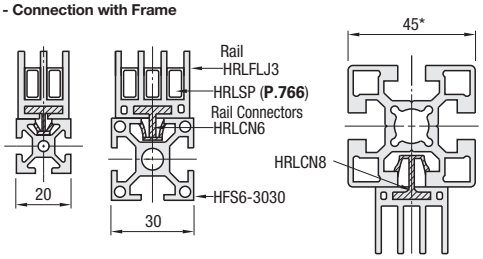
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

€ Unit Price/m x Specified Full Length = Sales Price
ex:HRLFLJ3-800
5,70 x 0.8m = 4,50 EUR (Round down to ten Cent.)
4,50 EUR for 50~52mm.

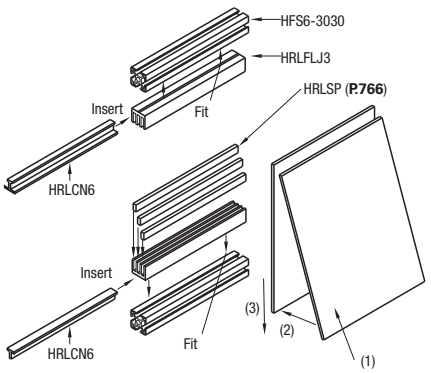
Example

- Connection with Frame



* Use HRLCN8 also for HFS8-50 and HFS8-60.

- Select HRLFLJ3 and HRLCN6 in order to attach 3-rows rail to the frames of HFS6 series.



- Post-assembly Side View

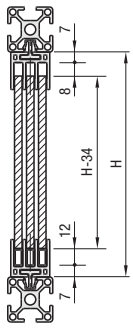


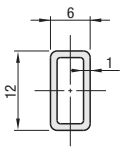
Plate Dimension

■Slide Spacers

RoHS

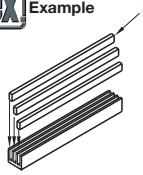


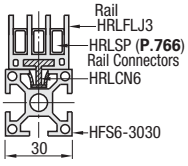
HRLSP



Type	Material	Heat Resistance Temperature
HRLSP	Polyethylene (Black)	–45~80°C

Example





To be Inserted into the lower rows of Slide Rails
Can be cut with scissors or a knife.

Part Number	Length mm	€ Unit Price Qty. 1~9	Volume Discount 10~49
HRLSP	2000		

Part Number	Length mm	€ Unit Price (Set of 30 pcs.)
HRLSP-SET (Set of 30 pcs.)	2000	

Order Example

Part Number
HRLSP
HRLSP-SET

Days to Ship: **7 Days**

Express A 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

PVC Sheets / Sheet Holders

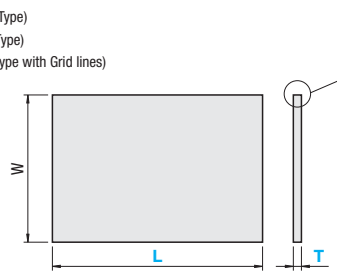
-Standard Type · Antistatic Type · Antistatic Type with Grid lines-

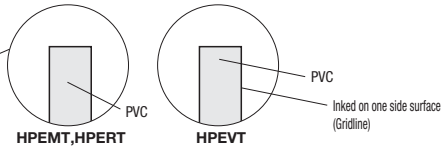
■PVC Sheets



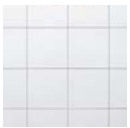
RoHS

HPEMT (Standard Type)
HPERT (Antistatic Type)
HPEVT (Antistatic Type with Grid lines)





*HPEVT
(Grid Interval 100 x 100mm)



	Type	Material	Color	Heat Resistance Temperature
(1)	HPEMT	Vinyl Chloride (PVC)	Transparent	0 ~ 60°C
(2)	HPERT		* Transparent (With carbon prints)	
(3)	HPEVT			

Part Number Type	T (Nominal)	Length L (m)	Thickness T Actual Dim.	Width W (m)	Mass (kg)* L1	L10	L50	L1 € Unit Price Qty. 1~9	L1 Volume Discount 10~50	L10 € Unit Price Qty. 1~9	L10 Volume Discount 10~50	L50 € Unit Price Qty. 1~9	L50 Volume Discount 10~50
HPEMT	0.2	1 10 50	0.2	1.2	0.3	4.2	16.2						
HPERT													
HPEVT													

In 1m Increment. * The mass includes paper cores (Except for L1).
For orders larger than indicated quantity, please request a quotation.

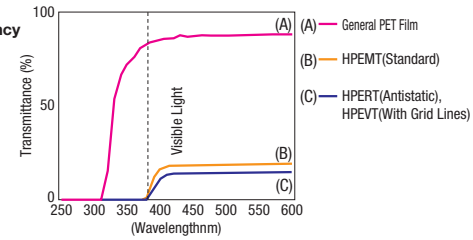
Order Example: Part Number HPEMT0.2 - L 50

Days to Ship: 7 Days

■Film Properties

Item	Direction	Values HPEMT (Standard Type)	Values HPERT · HPEVT (Antistatic Type · Antistatic Type with Grid lines)
Tensile Strength	Vertical	300kgf/cm²	290kgf/cm²
	Horizontal	265kgf/cm²	260kgf/cm²
Tear Strength	Vertical	1520gf	1500gf
	Horizontal	1430gf	1450gf
Heat Resistance	-	60°C	60°C
Surface Resistivity	-	$10^{16}\Omega$	$10^{12}\Omega$

■Optical Transparency



Item		HPEMT (Standard Type)	HPERT (Antistatic Type)	HPEVT (Antistatic Type with Grid lines)
Chemical Resistance	Oil	○		X
	Acid	Δ		X
	Alkali	○		X
	Solvent (Toluene · Acetone · Ethyl Acetate)	X		X

○=Good Δ=Acceptable ×=Not Acceptable HPEVT is not chemically resistant because the color change / degradation might occur to the ink of the grid.

Not flame-proof. (However, Vinyl Chloride has self-extinguishing property.)
Not suitable for a clean room due to a large quantity of phthalate compounds as plasticizer.

■Comparison of Transparency (Sheet - Subject Distance: 50mm)

(A)General PET Film



(B)HPEMT



(C)HPEVT

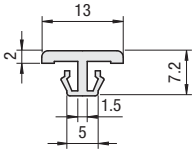


■Sheet Holders

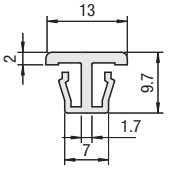


RoHS

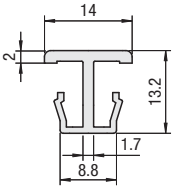
HRLCS5



HRLCS6



HRLCS8



Material: Polypropylene (Light Gray)

Part Number Type	No.	Length 1mm Increment	Mass kg/m	Extrusions (Series)	€ Unit Price/m
HRLCS	5	50~2000	0.045	HFS5	
	6		0.064	HFS6	
	8		0.072	HFS8 HFS8-45	

Order Example: Part Number HRLCS5 - Length 500

Days to Ship: 7 Days

Price

€ Unit Price/m x Specified Full Length = Sales Price
ex:HRLCS6-1200
4,60x1.2m = 5,50 EUR
(Round down to ten Cent.)

■Features

- The sheet holder is used when a PVC or non-PVC sheet is attached to the aluminum extrusions.

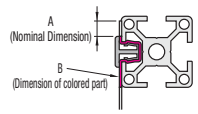
Example



HRLCS6
Secure by rolling up the sheet.

Sheets (P.695~P.696)

■Dimension of Sheet Nominal • Wrapped Portion as a guide



Part Number	Extrusion Used	A (mm)	B (mm)
HRLCS5	HFS5-2020	3 or More	25
HRLCS6	HFS6-3030	5 or More	35
HRLCS8	HFS8-4040		45
	HFS8-4545		50

Polyethylene Laminated Sheets

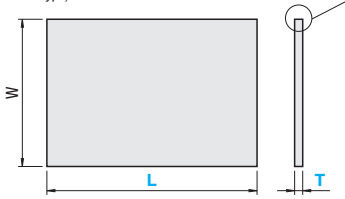
-Standard · Antistatic · High-Grade Antistatic · Light-Shielding · UV Protection-

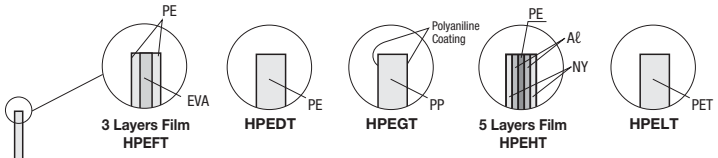
■Polyethylene Laminated Sheets



RoHS

HPEFT (Standard Type)
HPEDT (Antistatic Type)
HPEGT (High-Grade Antistatic Type)
HPEHT (Light-Shielding Type)
HPELT (UV Protection Type)





Type		Material	Color	Heat Resistance Temperature
(1)	HPEFT	Polyethylene (PE) · Ethylene Vinyl Acetate (EVA)	Transparent	−20°C~110°C
(2)	HPEDT	Polyethylene (PE)	Transparent	
(3)	HPEGT	Polypropylene (PP)	Transparent (Green)	−20°C~80°C
(4)	HPEHT	Polyethylene (PE) · Nylon (NY) / Aluminum (Aℓ)	Silver	
(5)	HPELT	Polyester (PET)	Transparent	

HPEHT (Light-Shielding Type) has 99.9% rate of shading.

Part Number		Length L (m)	Thickness T Actual Dim.	Width W (m)	Mass (kg)*			L1		L10		L50	
Type	T (Nominal)				L1	L10	L50	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
								Qty. 1~9	10~50	Qty. 1~9	10~50	Qty. 1~9	10~50
HPEFT	0.2	1 10 50	0.2	1.2	0.4	4.2	13.1						
HPEDT													
HPEGT			0.22	1.1	0.3	2.6	12.7						
HPEHT			0.18	1.2	0.3	2.5	12.6						
HPELT			0.19	0.82	0.2	2.4	12.0						

In 1m Increment. * The mass includes paper cores (Except for L1).

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number HPEHT0.2 - L 50

Days to Ship: 7 Days

■Film Properties

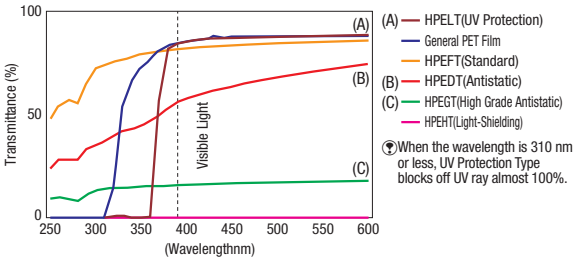
Item	Direction	Values				
		Standard Type	Antistatic Type	High-Grade Antistatic Type	Light-shielding Type	UV Protection Type
Tensile Strength	Vertical	343kgf/cm²	242kgf/cm²	360kgf/cm²	463kgf/cm²	714kgf/cm²
	Horizontal	329kgf/cm²	225kgf/cm²	380kgf/cm²	433kgf/cm²	670kgf/cm²
Tear Strength	Vertical	93gf	536gf	1400gf	144gf	1490gf
	Horizontal	100gf	704gf	1200gf	154gf	1400gf
Heat Resistance	-	110°C	80°C	80°C	80°C	80°C
Surface Resistivity	-	$10^{14}\Omega$	$10^{12}\Omega$	$10^{8}\Omega$	-	-

■Outgas Testing Results of Antistatic and High-Grade Antistatic Type

Sheets	Measuring Method	SIM Method	SIM Method	SIM Method	SIM Method
Antistatic Type	Outgas	Diethyl Malonate	Ethyl Acetate	Dibutyl Phthalate	Dioctyl Phthalate
	60°C 60min.	Below detection limit	Below detection limit	Below detection limit	Below detection limit
	Detection Limit	2.5ng/g	2.5ng/g	5.0ng/g	25.0ng/g
High-Grade Antistatic Type	Outgas	The total amount of hydrocarbon compound is 167μg/g when 85°Cx16h.			Dioctyl Phthalate
	85°C 16hr				Below detection limit
	Detection Limit				25.0ng/g

SIM:Select Ion Monitoring, one of the gas chromatography analysis methods.
Conducts high precision quantitative analysis only on materials of pre-registered molecular weight.

■Optical Transparency



When the wavelength is 310 nm or less, UV Protection Type blocks off UV ray almost 100%.

■*Comparison of Transparency (Sheet - Subject Distance: 50mm)

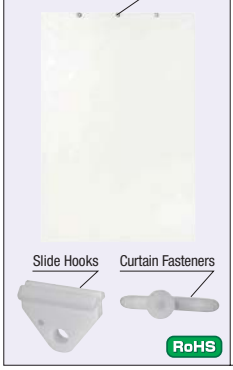
(A)HPELT (B)HPEDT (C)HPEGT



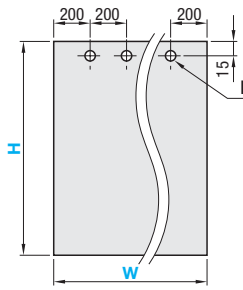
Curtains / Curtain Fasteners

CAD Date

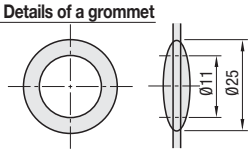
Curtains



HPEFC (Standard Type)
HPEDC (Antistatic Type)



Details of a grommet

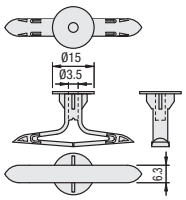


(Curtain)
M Material: JIS C5212B
S Surface Treatment: Nickel Plating

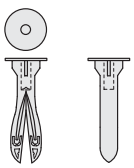
Grommets are provided at 200mm pitch.

A Accessory: Curtain Fasteners

Opened



Closed



(Curtain Fasteners)
M Material: Polypropylene Resin

A Accessory: Slide Hooks (**P.702**)

Curtains

Part Number		Height H 100mm Increment	Width W 200mm Increment	Sheets used P.696
Type	No.			
HPEFC	6 8	1200~2400	600~1200	HPEFT0.2
HPEDC				HPEDT0.2

Order Example

Part Number	-	H	-	W
HPEFC6 HFCFC		- H2000	-	W1000

7 Days

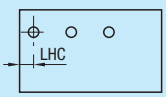
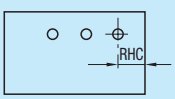
Price

For orders larger than indicated quantity, please request a quotation.

H	No. 6 € Unit Price Qty. 1~4							
	HPEFC6 W				HPEDC6 W			
	600	800	1000	1200	600	800	1000	1200
1200								
1300								
1400								
1500								
1600								
1700								
1800								
1900								
2000								
2100								
2200								
2300								
2400								
No.8 UP Price (No. 6 € Unit Price +)								

Alterations

Part Number	-	H	-	W	-	(LHC · RHC)
HPEDC6		- H2000	-	W1000	-	LHC50-RHC100

Alterations	Adds a grommet on the left edge.	Adds a grommet on the right edge.
		
Code	LHC	RHC
Spec.	Adds a grommet on the left end. LHC=10mm Increment 20≤LHC≤140 1 set of slide hooks and 1pc of curtain fastener are added.	Add a grommet on the right end. RHC=10mm Increment 20≤RHC≤140 1 set of slide hooks and 1pc of curtain fastener are added.
Price Adder	No.6: 7,00 No.8: 7,20	No.6: 7,00 No.8: 7,20

Curtain fastener only

10 Pcs. per Package

Part Number	€ Unit Price	Volume Discount
Type	1~9 Pkgs.	10~20
HFCFC		

For orders larger than indicated quantity, please request a quotation.

Details of accessories

Part Number	Extrusion (Series)	Curtain Width W	No. of Grommets	Included Slide Hooks · Curtain Fasteners		
				Slide Hooks	No. of Sets	No. of Curtain Fasteners
HPEFC6 HPEDC6	HFS6 (P.511)	600	2	HFCFS6	2	2
		800	3		3	3
		1000	4		4	4
		1200	5		5	5
HPEFC8 HPEDC8	HFS8 (-45) (P.553)	600	2	HFCFS8	2	2
		800	3		3	3
		1000	4		4	4
		1200	5		5	5

How to mount the curtain fastener

Example

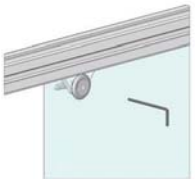
(1) Align the holes of a slide hook and a grommet.



(2) Insert the curtain fastener through both holes.

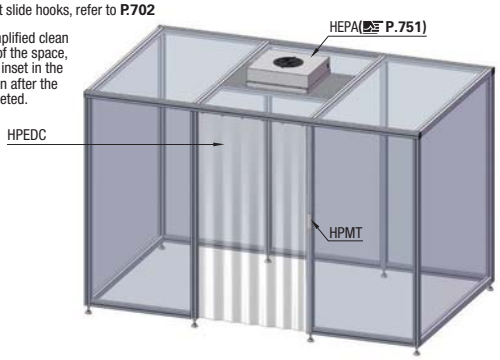


(3) Push into the hole of the fastener with a small rod less than Ø3.5 (such as a hex wrench).

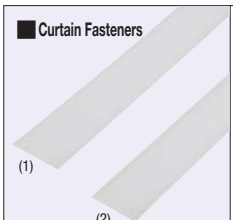


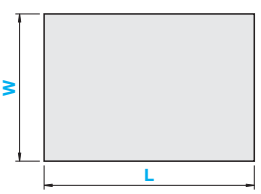
For how to mount slide hooks, refer to **P.702**

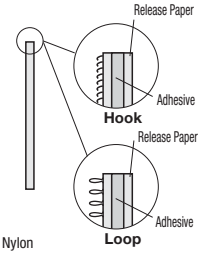
- As an inlet of a simplified clean booth or partition of the space, the curtain can be inset in the aluminum extrusion after the assembly is completed.



Curtain Fasteners







Hook and Loop as a set. M Material: 6 Nylon

Part Number		Length L (m)	€ Unit Price	Volume Discount
Type	Width W(mm)		Qty. 1~9	10~20
HPMT	50	1		

Can be cut by scissors. For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	L
HPMT50	-	1

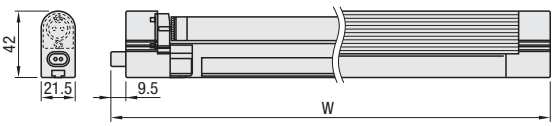
Days to Ship 7 Days

Fluorescent Light Unit

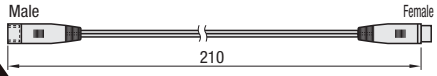
CAD Data



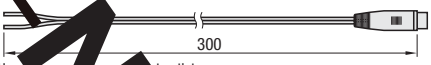
(Fluorescent Light Unit) PS E Compliant



(Connection Cable)

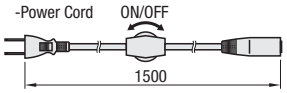


(Power Cable with 2 open end leads)



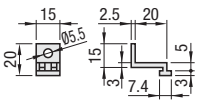
* Used for connections without outlets.

<Accessories>



-Mounting PartA(2pcs.) Material:ABS

-Mounting PartB(2pcs.) Material: ABS



-Cross Recessed small Screw (2 pcs. for each)
3.8x20
2.7x13

Screws and nuts for frames are not included.

RoHS

Fluorescent Light Unit

Part Number		Mass g	W		Frequency	Power Consumption	Lamp Power	Fluorescent Light Spec.	€ Unit Price	Volume Discount
Type	Wattage								1~4 Qty.	5 ~ 9
	8	160	354		50Hz	10.5W	8W	Day Light Lamp (FL8N)		
	24	260	616		50Hz	21W	24W	Color Enhancing Lamp (FHF24SEN)		

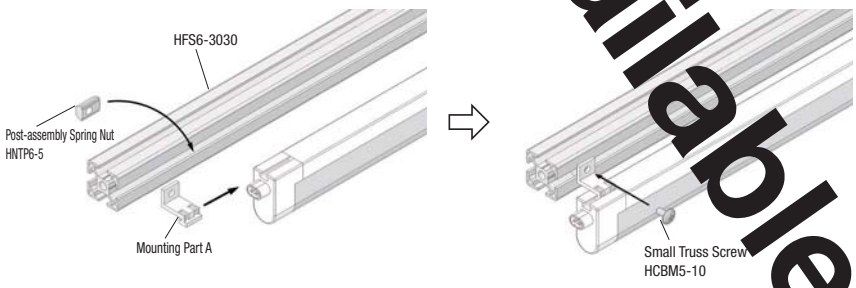
Inter-connection Cable · Power Cable with 2 open end leads

Part Number	€ Unit Price	Volume Discount
Type	1~4 Qty.	5 ~ 9
(Connection Cable)		
(Power Cable with 2 open end leads)		

Order Example — Part Number — Days to Ship: 8 Days / 6 Days

Example

<How to Install to the Frame>

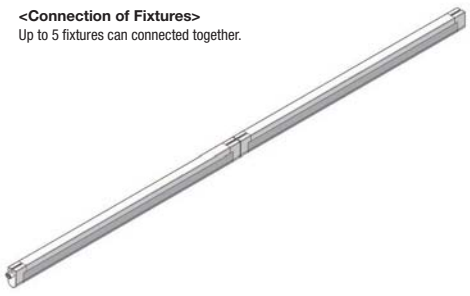


<Installation to the Panel / Top Panel>



- Installable to panels on the ceiling as well as to top panels.
For resin and metal panels, use screws and nuts (for the back).
For top wooden panels, use included wooden screws and Connecting Parts B.

<Connection of Fixtures>
Up to 5 fixtures can connected together.



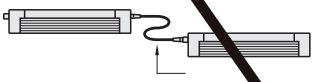
•Connecting Method (1)

Direct connection of body terminals

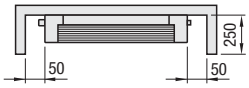


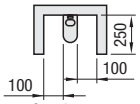
•Connecting Method (2)

Connection with a connecting cord



<About Install Locations>
For locations with openings, provide larger gaps than shown in the drawing.





Cautions

- This product is for indoor use only, keep within 5°C ~ 35°C.
The fluorescent lights will be hard-starting in low temperatures, and may suffer overheat damages in high temperatures.
- Not suitable for locations with water and moisture, as the product is not waterproof.
Please be aware of fire and electrocution hazards.
- Not usable in tightly closed spaces.

<Replacement of Fluorescent Light>
When Fluorescent Light does not light due to the end of its service life etc., remove the body cover and replace it.
* Fluorescent Light as a singule item is not available.

<Reference> For Frame Installation

Extrusions (Series)	Nut *	Screws (M-Length)
HFS5	HNTP5-5	M5-8
HFS6	HNTP6-5	M5-10
HFS8	HNTP8-5	M5-12
HFS8-45	HNTP8-5	M5-12

* Any type of nut is useable if the tap size is correct.
<Special nuts for aluminum frames only>

Not Available

Holders for Aluminum Frames · Clamps

-Square Post · Circular Post · Clamps - Stands for Factory Frames-

Part Number & Spec.Change Printed in Purple

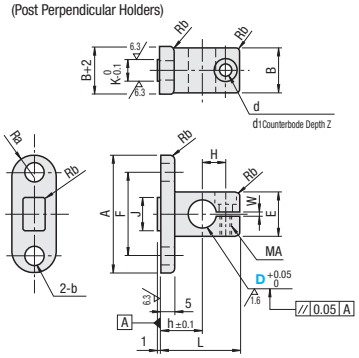
■Circular Post

RoHS



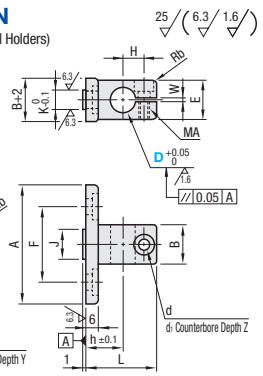
LCSA

(Post Perpendicular Holders)



LCSBN

(Post Parallel Holders)



Part Number and Specification for LCSB has changed to LCSBN.
The mounting holes for the extrusions have changed to Counterbored Holes.

M Material: EN AW-2017/AlCu4MgSi
S Surface Treatment: Anodize

Example

Insert the protrusion on the base into the slot of the aluminum extrusion.



Part Number Type	No.	D	Extrusions Series	A	B	h	L	H	F	b	J	K	E	d	d1	Z	MA	W	Ra	Rb	Included Screws	€ Unit Price Qty. 1~8	Volume Discount 9~50
LCSA	5	6	HFS5	33	10	10	20.5	6.5	22	5.5	10	5.8	10	3.5	6.5	3.5	M3	1	5	1	SCB3-6		
		8		36	12	12	23	7	25		12		12						6		SCB3-8		
		10		39	16	15	28.5	8.5	28				16	4.5	8	4.5	M4	1.5	8		SCB4-10		
	6	8	HFS6	38	12	12	23	7	25	6.6	8	7.8	12	3.5	6.5	3.5	M3	1	6		SCB3-8		
		10		42	16	15	28.5	8.5	30		12		16	4.5	8	4.5	M4	1.5	8		SCB4-10		
		12		44	18		29	9	32				18						9		SCB4-12		

Part Number Type	No.	D	Extrusions Series	A	B	h	L	H	F	b	b1	Y	J	K	E	d	d1	Z	MA	W	Ra	Rb	Included Screws	€ Unit Price Qty. 1~8	Volume Discount 9~50
LCSBN	5	6	HFS5	35	10	10	20.5	6.5	22	5.5	9	3.5	10	5.8	10	3.5	6.5	3.5	M3	1	6	1	SCB3-6		
		8		37	12	12	23	7	24				12		12						7		SCB3-8		
		10		41	16	15	28.5	8.5	28						16	4.5	8	4.5	M4	1.5	9		SCB4-10		
	6	8	HFS6	41	12	12	23	7	26	6.6	11	4	8	7.8	12	3.5	6.5	3.5	M3	1	7		SCB3-8		
		10		45	16	15	28.5	8.5	30				12		16	4.5	8	4.5	M4	1.5	9		SCB4-10		
		12		47	18		29	9	32						18						10		SCB4-12		

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number LCSA6 - D 10

Days to Ship: 7 Days P.88

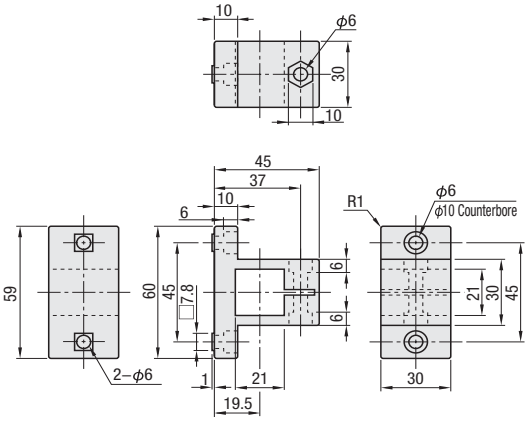
■Square Post

RoHS



LCAH

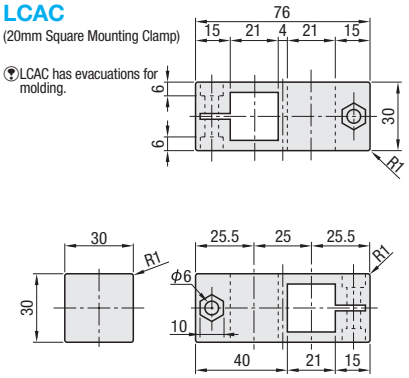
(20mm Square Perpendicular Mounting Holder)



LCAC

(20mm Square Mounting Clamp)

LCAC has evacuations for molding.



Components	M Material	S Surface Treatment
Body	Polyamide (Black)	-
Screws	Structural Alloy Steel	Trivalent Chromate
Nuts	1.0038/S235JR	Trivalent Chromate

Part Number Type	No.	D (Nominal)	Extrusion Mounting Side	Extrusion Post Side	Applicable Screws and T Nuts for the Mounting side Screws	Quantity	T Nuts	Quantity	Included Screws and Nuts for the Post side Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~50
LCAH	6	20	HFS6	HFS5 -2020	CBM6-12	2	HNTT6-6	2	M6x23	1	M6 (JIS Class 1)	1		
LCAC			-		-	-	-	-	M6x23	2	M6 (JIS Class 1)	2		

Screws and nuts for the mounting side are not included.

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number LCAH6 - D 20

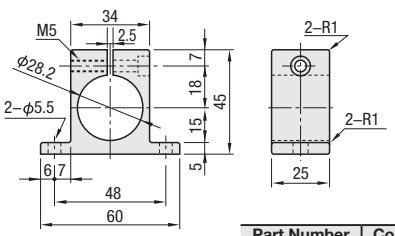
Days to Ship: 6 Days P.87

■Clamps · Stands for Factory Frames

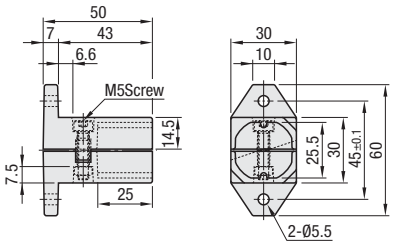
RoHS



FFS105



FFS205



Part Number	Components	Material	Surface Treatment
FFS105	Body	EN AC-46100/G-AlSi12Cu	-
	Screws	1.7220/34CrMo4	Trivalent Chromate
FFS205	Body	EN AC-46100/G-AlSi12Cu	-
	Screws	1.7220/34CrMo4	Trivalent Chromate
	Nuts	1.0038/S235JR	Trivalent Chromate

Part Number / Type	Extrusion / Post Side	Screw · Nut: Screws	Quantity	Nuts	Quantity	€ Unit Price: Qty. 1~19	Volume Discount: 20~49
FFS105	FFA28 FFAS28 (P.988) FFAU28	M5-22	1	-	-		
FFS205		M5-20	1	M5 (JIS Class 1)	1		

Order Example

Part Number
FFS105

Days to Ship

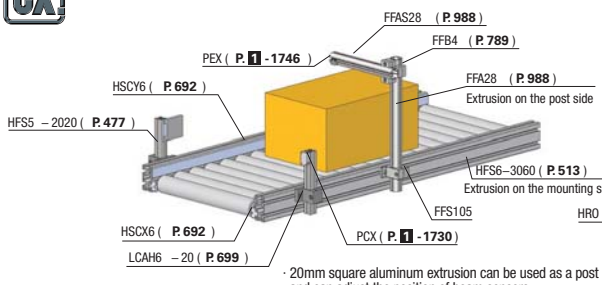
6 Days P.87

■Applicable Screws and Nuts (Mounting Side)

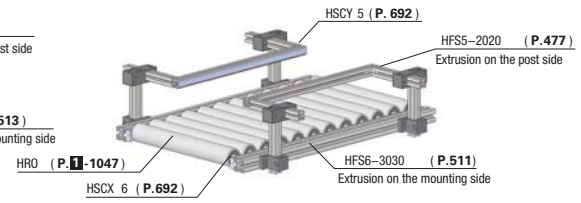
Screws and nuts for the mounting side are not included.

No.	Extrusion on the mounting side	Screws · Nuts: Screws	Quantity	Nuts	Quantity
FFS105	HFS5	CBM5-10	2	HNTT5-5	2
	HFS6	CBM5-12		HNTT6-5	
	HFS8	CBM5-15		HNTT8-5	
	HFS8-45				
FFS205	HFS5	CBM5-12		HNTT5-5	
	HFS6	CBM5-15		HNTT6-5	
	HFS8	CBM5-18		HNTT8-5	
	HFS8-45				

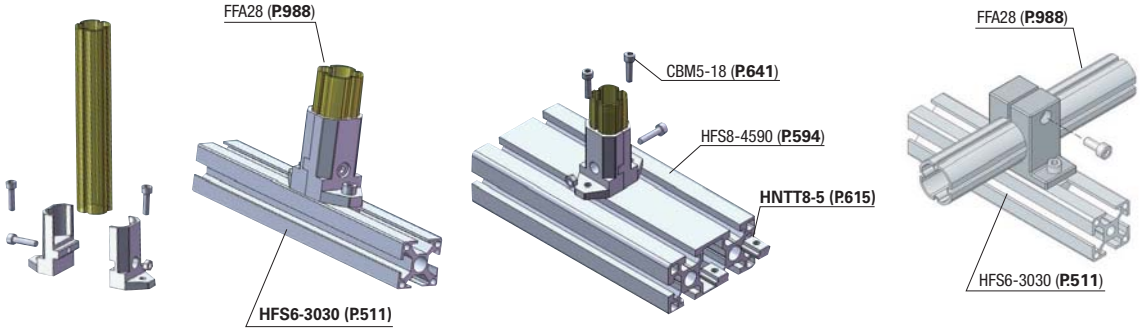
Example



· 20mm square aluminum extrusion can be used as a post and can adjust the position of beam sensors



· Adjusting the position of slip covers is possible depending on the size of a work to be conveyed.



Cable Clamps / Cable Covers

CAD Data

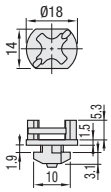
Cable Clamps Diamond Shape Type



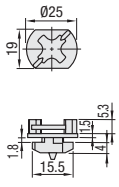
RoHS

The photograph is of HFCN8.

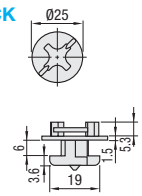
HFCN5 PACK
(50 pcs./Pkg.)



HFCN6 PACK
(50 pcs./Pkg.)



HFCN8 PACK
(50 pcs./Pkg.)



Material: Polyamide
Color: Light Gray

Attachable by hand.

Part Number Type	Part Number No.	Extrusions (Series)	€ Unit Price 1~2 Packs	Volume Discount 3~
HFCN	5PACK	HFS5		
	6PACK	HFS6		
	8PACK	HFS8 HFS8-45		

Alterations

Part Number - (SET)
HFCN6PACK - SET

Alteration	Code	Price Adder
Set of 300 pcs.	SET	135,00

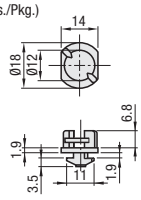
Cable Clamps Circular Type



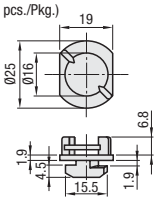
RoHS

The photograph is of HFCC8.

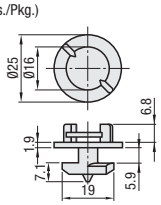
HFCC5 PACK
(50 pcs./Pkg.)



HFCC6 PACK
(50 pcs./Pkg.)



HFCC8 PACK
(50 pcs./Pkg.)



Material: Polyamide
Color: Light Gray

Attachable by hand.

50 pcs. per set

Part Number Type	Part Number No.	Extrusions (Series)	€ Unit Price 1~2 Packs	Volume Discount 3~
HFCC	5PACK	HFS5		
	6PACK	HFS6		
	8PACK	HFS8 HFS8-45		

When using No.8 for HFS8-45, the fit becomes slightly firmer.

Order Example: Part Number HFCC6PACK

Days to Ship: 6 Days P.87

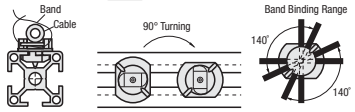
Alterations

Part Number - (SET)
HFCC6PACK - SET

Alteration	Code	Price Adder
Set of 300 pcs.	SET	102,00

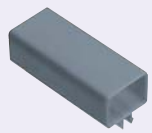
When placing an order, please make sure that quantity is correct. 300pcs will be delivered for an order of 1 HFCC5PACK-SET.

Example



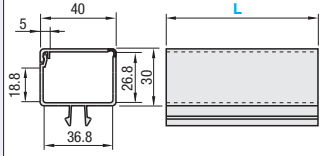
Cable clamps secure cables to an aluminum extrusion.
Bands are not included.

Cable Covers



RoHS

HSCE(Standard Length)
HSCEF(Configurable Length)



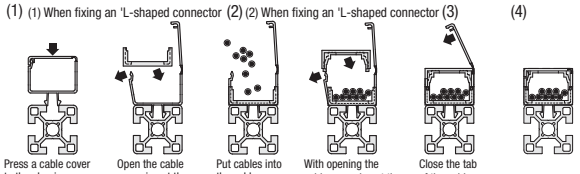
Material: Polypropylene Resin

Example

How to use a cable cover

Cables can be easily housed.

(1) (1) When fixing an 'L-shaped connector (2) (2) When fixing an 'L-shaped connector (3) (4)



Press a cable cover to the aluminum extrusion (HFS8 Series).

Open the cable cover, insert the L-shaped connector into the cable cover.

Put cables into the cable cover.

With opening the cable cover, insert the L-shaped connector to the cable covers.

Close the tab of the cable cover.

When mounting upside down, the cable cover may open depending on weight of cables.

Cable Covers Standard Length

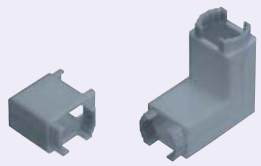
Part Number Type	Part Number No.	Color	L m	Extrusion (Series)	€ Unit Price 1~5 Qty.	Volume Discount 6~20
HSCE	8	S (Light Gray)	2	HFS8		

Cable Covers Configurable Length

Part Number Type	Part Number No.	Color	L 1mm Increment	Extrusion (Series)	€ Unit Price/m
HSCEF	8	S (Light Gray)	100~2000	HFS8	

€ Unit Price/m x Specified Full Length = Price HSCEF8-S-1500 18,00x1.5m=27,00 EUR (Round down to ten Cent.)

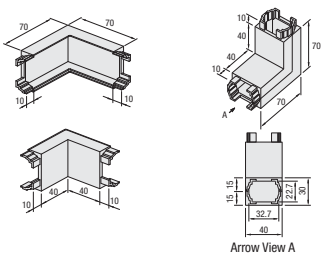
Cable Cover L-shaped Connectors



RoHS

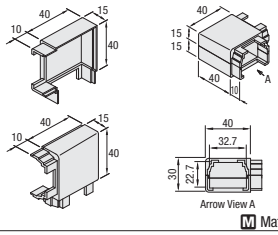
HSCELA(Vertical L-shaped)

When these parts are set up



HSCELB(Flat L-shaped)

When these parts are set up



Material: ABS Resin

Part Number Type	Part Number No.	Color	€ Unit Price 1~5 Qty.	Volume Discount 6~20
HSCELA	8	S (Light Gray)		
HSCELB				

Order Example: Part Number - Color - L
HSCE8 - S - 2
HSCELB8 - S

Days to Ship: 7 Days P.88

Example



Encase a cable duct along an aluminum extrusion with 2 pcs. of L-shaped connectors.

Slide Hooks / Accessory Hooks

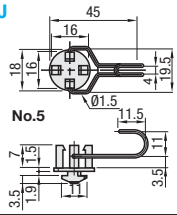
CAD Data

■Accessory Hook J-Shaped



RoHS

HFCFJ



Type	Body	Hook
	Materials	Materials
HFCFJ	Polyamide	1.4301/X5CrNi18-10

20 pcs. per set

Part Number		Allowable Load (kgf)	€ Unit Price	Volume Discount
Type	No.		1~9 Pkgs.	10~
HFCFJ	5(For HFS5) 6(For HFS6) 8[For HFS8 (–45)]	1.8		

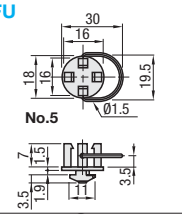
When using No.8 for HFS8-45, the fit becomes slightly firmer.

■Accessory Hook U-Shaped



RoHS

HFCFU



Type	Body	Hook
	Materials	Materials
HFCFU	Polyamide	1.4301/X5CrNi18-10

20 pcs. per set

Part Number		Allowable Load (kgf)	€ Unit Price	Volume Discount
Type	No.		1~9 Pkgs.	10~
HFCFU	5(For HFS5) 6(For HFS6) 8[For HFS8 (–45)]	1.8		

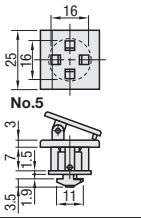
When using No.8 for HFS8-45, the fit becomes slightly firmer.

■Accessory Hook Clip Type



RoHS

HFCFK



Type	Body	Shafts · Springs	
	Materials	Materials	Surface Treatment
HFCFK	Polyamide	JIS SWC	Trivalent Chromate

20 pcs. per set

Part Number		Allowable Load (kgf)	€ Unit Price	Volume Discount
Type	No.		1~9 Pkgs.	10~
HFCFK	5(For HFS5) 6(For HFS6) 8[For HFS8 (–45)]	0.5		

When using No.8 for HFS8-45, the fit becomes slightly firmer.

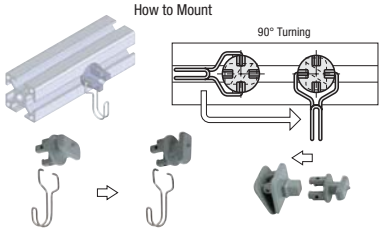
Order Example — Part Number: HFCFJ5, HFCFU6, HFCFK8

Days to Ship: 6 Days P.87

ex Example

The hooks and clips are removable.

How to Mount

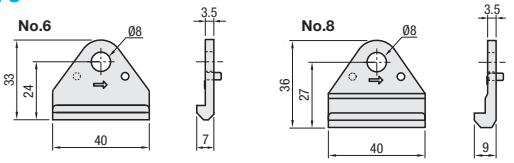


■Slide Hooks



RoHS

HFCFS



There are 2 pcs. of slide hooks in 1 set.

M Material: Polyacetal (White)

Part Number		Extrusion (Series)	Allowable Load (kgf)	€ Unit Price	Volume Discount
Type	No.			Qty. 1~9 Sets	10~
HFCFS	6	HFS6	1.0		
	8	HFS8 (-45)			

1 set has 2 pcs. of slide hooks

Order Example — Part Number: HFCFS6

Days to Ship: 6 Days P.87

ex Example

■Features

Post-assembly fitting is possible.



(1) Insert a slide hook into the slot while noting for the arrow direction.



(2) Slightly lean the slide hook and move it in the slot to the direction of the arrow.



(3) Inset a protrusion of the slide hook into the hole to unite the 2 parts.

Casters & Leveling Mounts Assembly

-Standard · Conductive · Side Mount-

RoHS



Part Number	
Type	Wheel Material (Color)
HCFT · SHCFT	Nylon (Gray)
HCFTU	Urethane (Green)
HCFTM	MC Nylon (Blue)
HCFTD · SHCFTD	Conductive MC Nylon (Black)

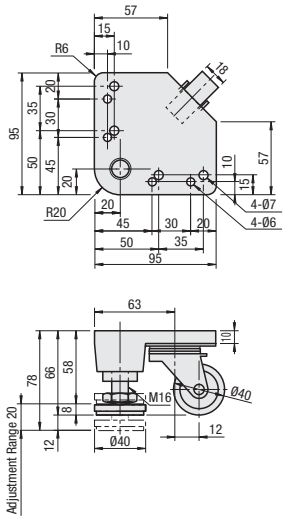
※Only HCFT8–500 is phenol (black).
※HCFTFD250/350 are gray.

No.	Body		Jack Bolt	
	M Material	S Surface Treatment	M Material	S Surface Treatment
60 130	EN AC-46100/ G-AlSi12Cu	Black Paint	1.0038/ S235JR	Trivalent Chromate
250 350	1.0320/St.22	Trivalent Chromate (Black)		
500	EN-JS 1040	Black Paint		

※Material of jack bolt and caster is 1.4301/X5CrNi18-10 for SHCFT or SHCFTD.

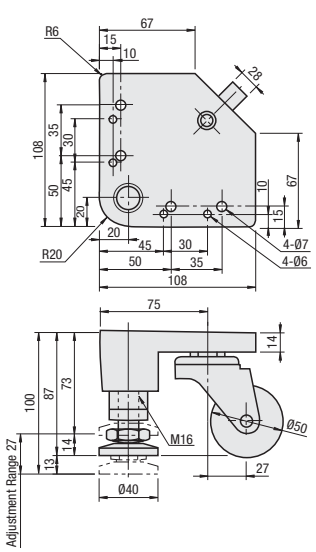
HCFT

No.5-60
6-60



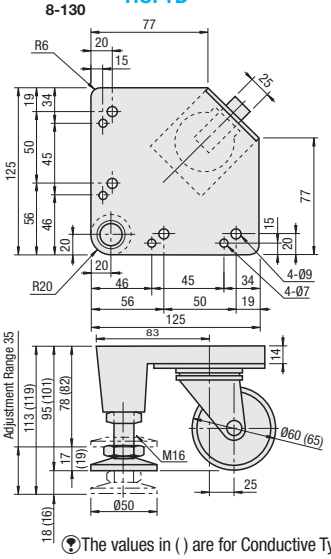
SHCFT(Conductive)

No.5-60
6-60



HCFT SHCFT(Conductive) HCFTM SHCFTD(Conductive) HCFTD

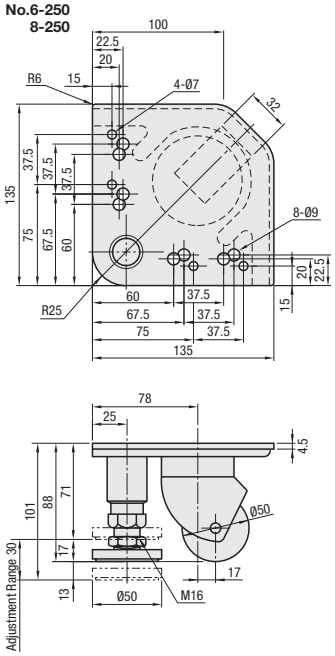
No.6-130
8-130



※The values in ( ) are for Conductive Type.

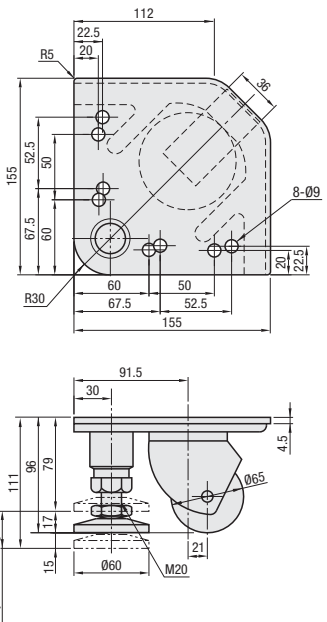
HCFT HCFTM HCFTU HCFTD

No.6-250
8-250



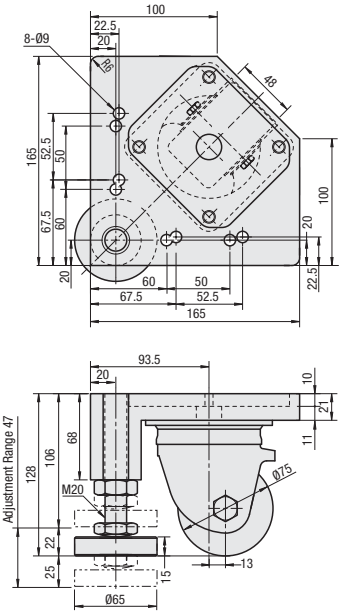
HCFT HCFTM HCFTU HCFTD

No.8-350



HCFT HCFTM HCFTD

No.8-500



※When moving the unit using the casters, raise the adjustment pads completely.

Standard Type

Part Number Type	No.	Load	Allowable Load kg	N	Mass g	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price HCFT	HCFTU	HCFTM	HCFTD
HCFT	5	60	60	588	600	CBM5-15	4	HNTT5-5	4				
	6					CBM6-15		HNTT6-6					
HCFT HCFTM HCFTD	6	130	130	1275	1100	CBM6-20							
	8		130	1275	1100	CBM8-25		HNTT8-8					
HCFT HCFTU HCFTM HCFTD	6	250	250	2452	1445	CBM6-12		HNTT6-6					
	8					CBM8-15							
		350	350	3432	2170			HNTT8-8					
HCFT HCFTM HCFTD	8	500	500	4902	5600	CBM8-30							

Conductive

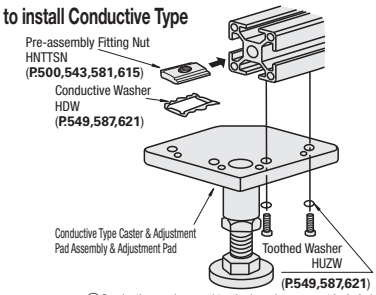
Part Number Type	No.	Load	Allowable Load kg	N	Mass g	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price SHCFT	SHCFTD
SHCFT	5	60	60	588	600	SCB5-20	4	HNTTSN5-5	4		
	6					SCB6-20		HNTTSN6-6			
SHCFT SHCFTD	8	130	130	1275	1100	SCB8-25		HNTTSN8-8			

Pad and caster are made of stainless steel (1.4301/X5CrNi18-10).

Order Example: Part Number **HCFT6-130**

Days to Ship: **6 Days** P.87

How to install Conductive Type



Conductive washers and toothed washers are not included with the Conductive Type.

Alterations

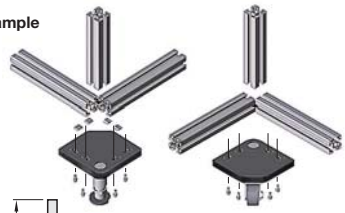
Part Number - (SET · BL)

HCFT6-130 - SET - BL100 (Alteration BL100 · BL150)

8 Days

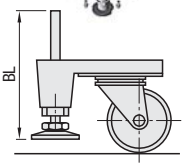
Alteration	Code	Spec.	Caster Assembly Units Type	No.	Load	Components Screws	Quantity	Nuts	Quantity	Price Adder
Applicable Screw Nut Set	SET	Applicable screws and nuts come in a set. ⊗No set unit is available for the conductive type.	HCFT	5	60	CBM5-15	4	HNTT5-5	4	1,70
			HCFT	6	60	CBM6-15		HNTT6-6		1,90
			HCFT,HCFTM,HCFTD		130	CBM6-20				
			HCFT,HCFTU,HCFTM,HCFTD		250	CBM6-12				
			HCFT,HCFTM,HCFTD	8	130	CBM8-25		HNTT8-8		2,40
			HCFT,HCFTU,HCFTM,HCFTD		250	CBM8-15				
					350					
			HCFT,HCFTM,HCFTD		500	CBM8-30				

Example



Alterations Code	Adjustment Pad Length BL100 Load	Height from Floor Standard	After Change	Price Adder	BL150 Load	Height from Floor Standard	After Change	Price Adder
Spec. Changes the length of standard adjustment pads.	60	78	132		60	78	178	
	130	113	152	3,40	130	113	200	4,00
	250	101	145		250	101	191	
	350	111	150	4,20	350	111	200	4,60
	-				500	150	210	

*The height from the floor can be increased by using a longer adjusting pad. However, the adjustment pad sticks out from the plate surface.

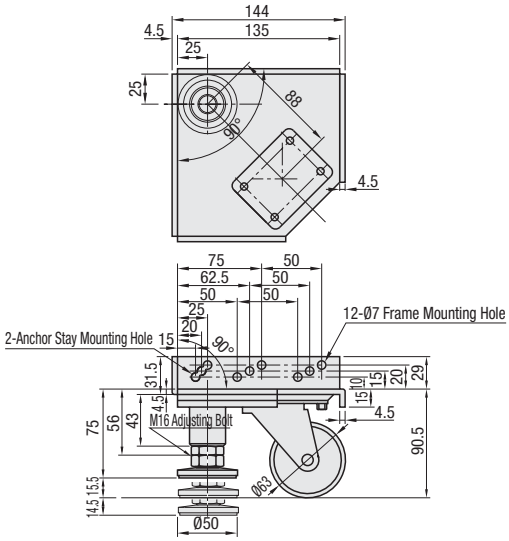


Side Mounting Type

RoHS



Part Number Type	Wheel Material	Body M Material	Body S Surface Treatment	Jack Bolt M Material	Jack Bolt S Surface Treatment
HCFY	Nylon	1.0320/ St.22	Trivalent Chromate (Black)	1.0038/ S235JR	Trivalent Chromate
HCFYM	MC Nylon				
HCFYD	Conductive MC Nylon				



Example



Use a washer between the frame and the Anchor Bracket.





Part Number Type	No.	Load	Allowable Load kg	N	Mass g	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price HCFY	HCFYM	HCFYD
HCFY HCFYM HCFYD	6	130	130	1275	1550	CBM6-12	4	HNTT6-6	4			
						CBM6-16		HNTT8-6				

Order Example: Part Number **HCFY6-130**

Days to Ship: **6 Days** P.87

Features: When mounting on the aluminum extrusions, no need to get under the unit nor to turnover the unit for screw tightening, thus the improved productivity.
- Excellent in holding lateral load and stability due to the side plate holding mechanism.
- Quake-resistant capability can be obtained by mounting optional anchor brackets (**P995**) and anchor bolts.

Plates with Casters / Leveling Mounts

CAD Data



Leveling Mounts Units

Part Number		Allowable Load kN (kgf)	Mass kg	Components						€ Unit Price	Vol. Discount
Type	No.			Plate	Adjustment Pad	Screws	Qty.	Nuts	Qty.	Qty. 1~8	9~20
HAJPS	5	4.9 (500)	0.45	HAJP5	NFJN12-100	CBM5-10	4	HNTT5-5	4		
	6		0.46	HAJP6		CBM6-12		HNTT6-6			
	8*	16.6 (1700)	1.15	HAJP8	FJFN16-150	CBM8-20		HNTT8-8			
	5050			HAJPC5050		CBM6-15	8	HNTT6-6	8		
	6060		1.6	HAJPC6060							
	8080	39.2 (4000)	2.5	HAJPC8080	FJFN20-150	CBM8-25		HNTT8-8			
	9090		2.9	HAJPC9090							

(?)8* is used in common with 8 – 45. (?)Washers are included with HAJPS8080 only.
(?)No. 6060, 8080 and 9090 are applicable to HFS6-6060, HFS8-8080 and HFS8-9090.

(?)For orders larger than indicated quantity, please request a quotation.



Plate with Casters (Casters with Stoppers)

Part No.		Allowable Load kN (kgf)	Mass kg	Components						€ Unit Price	Vol. Discount
Type	No.			Plate	Caster	Screws	Qty.	Nuts	Qty.	Qty. 1~8	9~20
HCHPS	5	0.9 (100)	0.69	HAJP5	HCHAS12-100	CBM5-10	4	HNTT5-5	4		
	6	1.4 (150)	0.7	HAJP6	HCHAS12-100	CBM6-12		HNTT6-6			
	8*	1.7 (170)	1.8	HAJP8	HCHAS16-170	CBM8-20		HNTT8-8			

(?)8* is used in common with 8 – 45.
(?)No.5 and 6 apply to frames with 6-slot width 20 Square Type and 8-slot width 30 Square Types. No.8 apply to Frames 10-slot width 40 Square - 45 Square Type.

(?)For orders larger than indicated quantity, please request a quotation.



Leveling Mounts+Plate with Caster Unit

Part Number		Caster Allowable Load kN (kgf)	Adjustment Pad Allowable Load kN (kgf)	Mass kg	Components									Unit Price	Vol. Discount
					Plate	Adjustment Pad	Caster			Frame Mounting					
Type	No.						Body	Mounting Screw	Qty.	Mounting Screw	Qty.	Nuts	Qty.	Qty. 1~8	9~20
HAJCHP	5	0.9 (100)	4.9 (500)	0.86	HAJPC5	NFJN12-100	HCHA12-100	-	-	CBM5-10	4	HNTT5-5	4		
	2525				HAJPC2525										
	54040	1.4 (150)	16.6 (1700)	1.62	HAJPC54040	NFJN16-150	CHJF50S	CBM6-10	4	CBM5-15	8		8		
	6		4.9 (500)	0.9	HAJPC6	NFJN12-100	HCHA12-150	-	-	CBM6-12	4	HNTT6-6	4		
	8*		16.6 (1700)	2.2	HAJPC8	FJFN16-150	CHJF50S	CBM6-12	4	CBM8-20		HNTT8-8			
	5050	1.7 (170)			HAJPC5050			CBM6-10		CBM6-15	8	HNTT6-6	8		
	6060	1.4 (150)		1.9	HAJPC6060										
	8080	2.9 (300)	39.2 (4000)	3.4	HAJPC8080	FJFN20-150	CSHN-S50-N	CBM8-12		CBM8-25		HNTT8-8			
	9090			3.9	HAJPC9090										

(?)8* is used in common with 8–45.(?)Washers are included with HAJCH8080 only.

(?)For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number
HAJCHP6060

Days to Ship

8 Days

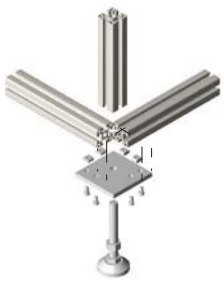
Express A | 8,00 EUR/ piece

P.88

(?)A Express Charge of 21,60 EUR for 3 or more identical pieces.

Example

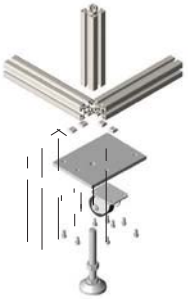
Mounting Example
- Mounting of the Plate with Leveling Mounts



- Mounting of the Caster Plate



- Mounting of the Leveling Mounts+ the Caster Plate



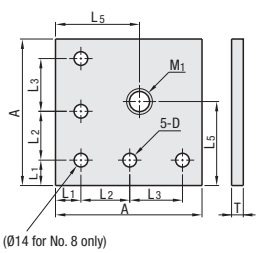
- Mounting of HAJPD (Next Page)



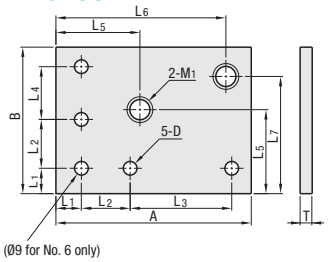
Plates

CAD Data

HAJP 5 · 6 · 8
HAJPSS

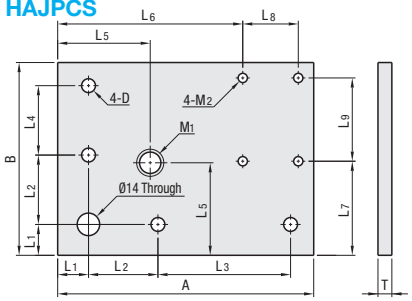


HAJPC 5 · 6 · 2525
HAJPCS

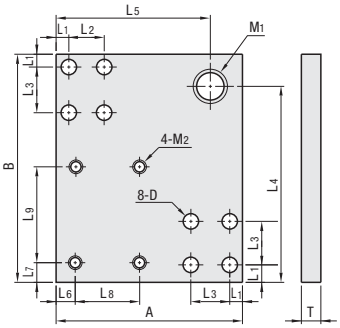


HAJPC 8
HAJPCS

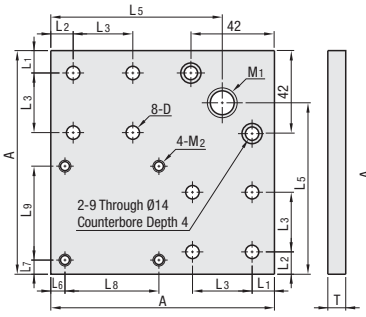
RoHS



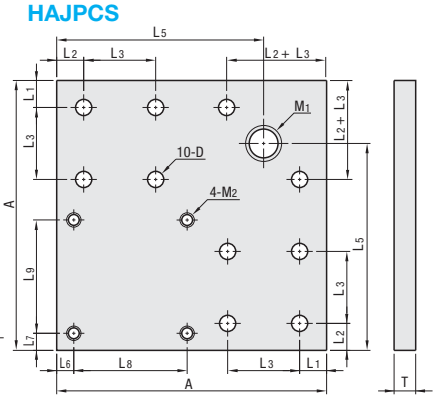
HAJPC 54040 · 5050
HAJPCS



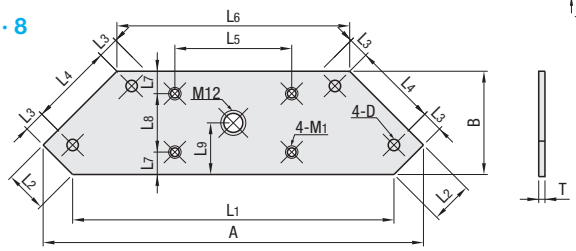
HAJPC 6060
HAJPCS



HAJPC 8080 · 9090
HAJPCS



HAJPC 5 · 6 · 8
HAJPDS



Type	Material	Surface Treatment
HAJP · HAJPC · HAJPD	1.0038/S235JR (Hot Rolled) Rough Finish	Trivalent Chromate
HAJPSS · HAJPCS · HAJPDS	1.4301/X5CrNi18-10	-

Part Number Type	No.	A	B	T	M_1	M_2	D	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9	Mass kg	HAJP · HAJPC · HAJPD € Unit Price Qty. 1~8	HAJP · HAJPC · HAJPD Vol. Discount 9~20	HAJPSS · HAJPCS · HAJPDS € Unit Price Qty. 1~8	HAJPSS · HAJPCS · HAJPDS Vol. Discount 9~20
HAJP HAJPSS	5	75	-	6	12	-	5.5	8	30	27	-	43	-	-	-	-	0.24				
	6						7	13	25	31											
	8*	100		9	16		9	20	45	25		60					0.65				
HAJPC HAJPCS	5	135	75	6	12		5.5	8	30	87	27	43	122	60	-	-	0.45				
	2525							10.5													
	54040	100	125	9	16	6		8	20	20	107	82	11	10	36	54	0.82				
	6	135	75	6	12	-	7	13	25	87	31	43	122	60	-	-	0.44				
	8*	166	125	9	16	6	9	20	45	86	45	60	120	61	36	54	1.03				
	5050						7	10	60	20	65	106	10	10							
	6060	125	-	12	20	8	9	12	12	30	-	98	17	8	63	63	2				
	8080	150						15	15	40		115	9.5	9.5							
	9090	165								45		130	14	14			2.5				
HAJPD HAJPDS	5	184	50	6	6	-	5.5	154	20	10	40	56	112	11	28	25	0.53				
	6	237	74	9	8		7	193	30	20	50	55	129	16	42	37	0.9				
	8	250	82	12			9		40		55		144	20		41	2.1				

(For orders larger than indicated quantity, please request a quotation.)

(8* is used in common with 8–45.
No. 6060, 8080 and 9090 are applicable to HFS6-6060, HFS8-8080 and HFS8-9090.
No.5 and 6 apply to frames with 6-slot width 20 Square Type and 8-slot width 30 Square Types. No.8 apply to Frames 10-slot width 40 Square and 45 Sq. Type.
No. 5040 is applicable to the frame HFS5-4040. No. 5050 is applicable to the frame HFS6-5050.

Order Example

Part Number
HAJP5

Days to Ship

- HAJP · HAJPSS · HAJPCS · HAJPDS
8 Days | Express A | 8,00 EUR/ piece | P.88
(A Express Charge of 21,60 EUR for 3 or more identical pieces.)

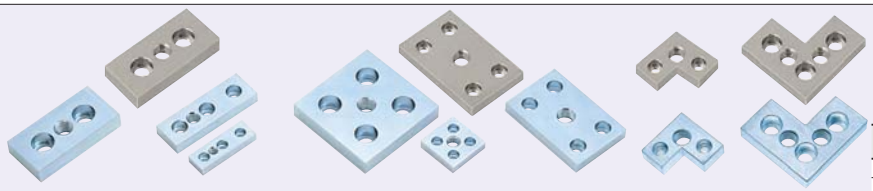
- HAJPC · HAJPD
6 Days | P.87

Example

See left page.

Foot Base

CAD Data

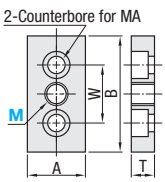


RoHS

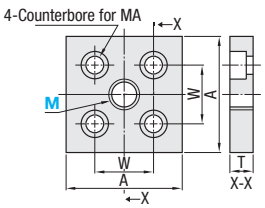
Type	Material	Surface Treatment
HLF · GLF	1.0038/S235JR	Trivalent Chromate
HLFS	1.4301/ X5CrNi18-10	-

HLF5 · 6 · 8 **HLFS5 · 6 · 8** (Stainless Steel)
GLF8

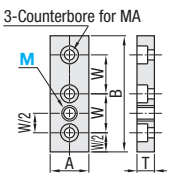
Shape AA



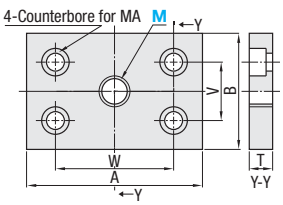
Shape AB



Shape AC



Shape AD



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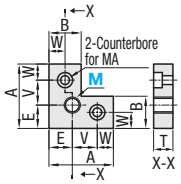
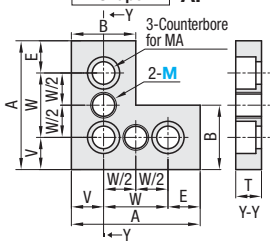
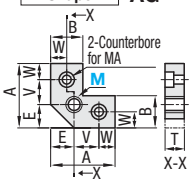


Shape AF



Shape AG



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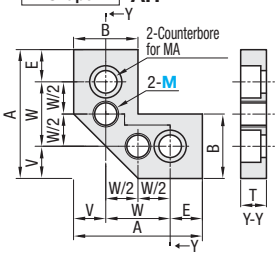
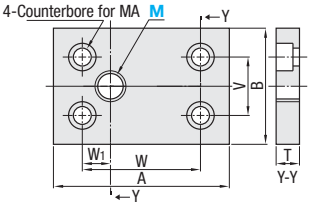


Shape AJ



HLF and GLF Types have no plating finish on tapped holes.

Part Number Type	HLF (GLF)	Adjustment Pad M	Shape Pattern	A	B	W	W1	V	E	T	Counter-bore MA	Mass kg HLF (GLF) / HLFS	Screws	Quan-tity	HLF (GLF) € Unit Price	HLF (GLF) Volume Discount	HLFS € Unit Price	HLFS Volume Discount
															Qty. 1~8	9~50	Qty. 1~8	9~50
HLF5 HLFS5	2040	8	AA	20	40	20	-	-	-	9	5	0.05	M5-15	2				
	2550	8		25	50	25				12	8	0.07	M8-25					
	2060	8	AC	20	60	20				9		0.06	M5-15					
	2080	8	AA		80	60						0.1						
	4040	8 10 12	AB		-	20						0.09		4				
	404020	12	AE	40	20	10		15.5	14.5	12		0.08	M5-20	2				
	404020A	12	AG									0.06	-	2				
	4060	12	AJ	60	40	40	10	20	-	9		0.14	M5-15	4				
	4080	12	AD	80		60	-					0.21						
HLF6 HLFS6	3060	10 12 16	AA	30	60	30	-	-	-	12	8	0.13	M8-25	2				
	3090	12	AC		90							0.24						
	30120	12	AA		120	90						0.31						
	5050	10 12	AB	50	-	20						0.28		4				
	50100	10 12 16	AD	100	50	70		20				0.42						
	100100	16 20	AB		-			-				0.9						
	6060	10 12 16										0.28						
	606030	12	AF	60	30	30		15	15			0.18		3				
	606030A	12	AH									0.16	-	2				
	6090	16	AD	90	60	60		30	-			0.47		4				
	60120	16		120		90						0.63						
HLF8 HLFS8	4080*	12 16	AA	40	80	40	-	-	-	16	12	0.31	M12-30	2				
	40160	16			160	120						0.79						
	4590*	16		45	90	45						0.427						
	45180	16 20			180	135						0.94	M12-20					
	50100*	16	AA	50	100	50					12	0.55						
	8080	12 16 20	AB	80	-	40					8	0.73	M8-30	4				
	808040	16	AF		40			20	20		12	0.38	M12-30	3				
	808040A	16	AH									0.35	-	2				
	80160	16 20	AD	160	80	120		40	-		8	1.56	M8-30	4				
	9090	16 20	AB	90	-	45		-				0.95						
	909045	16	AF		45			22.5	22.5		12	0.54	M12-20	3				
	909045A	16	AH									0.51	-	2				
	90180	16 20	AD	180	90	135		45	-		8	1.99	M8-30	4				
GLF8	9090	20	AB	90	-	45	-	-	-	16	12	0.95	M12-25	4				
	100100			100		50						1.12	M12-20					

Foot bases marked with * in the specification table are also applicable to high rigid aluminum extrusion.

Mounting screws are not included.
For orders larger than indicated quantity, please request a quotation.

Order Example

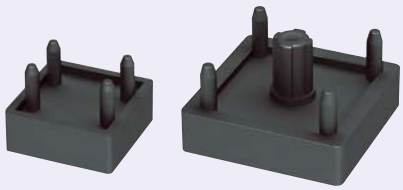
Part Number	-	M
HLF6-3060	-	10

Days to Ship **7 Days**

Pads for Aluminum Frames / Foot Bases for 40 and 45 Squares

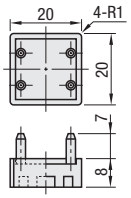
CAD Data

Pads for Aluminum Frames

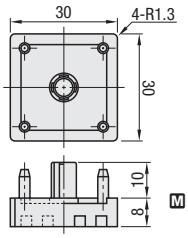


RoHS

HFPD5-2020



HFPD6-3030



M Material: TPE (Thermoplastic Elastomer)

Part Number Type	Part Number No.	Extrusions		Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~50
HFPD	5-2020	HFS5 Series	20 Square, Single Slot	4		
	6-3030	Series HFS6 Series HFSL6 Series GFS6 Series	30 Square, Single Slot 30 Square, Single Slot 30 Square, Single Slot 30 Square, Single Slot	9		

Order Example — Part Number: HFPD6~3030

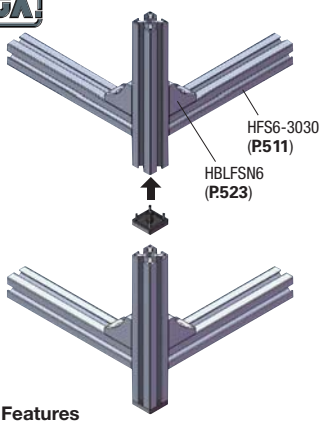
Days to Ship — 6 Days P.87

Characteristic Values

Item	Unit	Value
Hardness *1	Shore	D59
Tensile Strength *2	Mpa	19.9
Plastic Deformation Rate by Compression *3	%	28
Specific Volume Resistivity	Ω·cm	$6.5x10^5$

*1 Based on JIS K 7215 Type D Durometer
*2 Based on JIS K 7113
*3 Based on JIS K 7113
For comparing electrical conductivities to those of other materials, refer to **P.449**
Above data are standard values, not standard values nor guaranteed values.

Example



Features

- Pad that can be directly mounted to the end of Aluminum Frames.
- Tapping aluminum frame end faces not necessary.

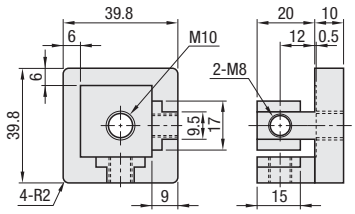
Foot Bases for 40/45 Squares

RoHS

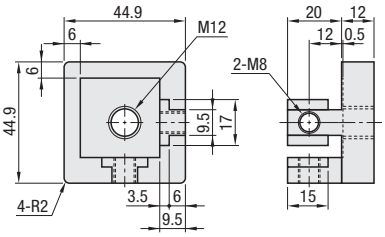


Part Number	Components	M Material	S Surface Treatment
HLFC8-4040 HLFC8-4545	Body	1.4308/ G-X6CrNi18-9	-
	Set Screw	1.4301/ X5CrNi18-10	-

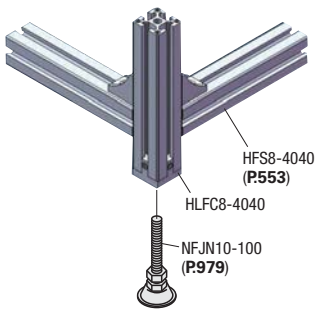
HLFC8-4040



HLFC8-4545



Example



Tapping aluminum frame end faces not necessary.

Part Number Type	Part Number No.	Extrusions	Accessory	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~50
HLFC8	4040	EFS8-4040 HFS8-4040 HFSL8-4040 GFS8-4040	M8 Set Screws x 2	150		
	4545	EFS8-4545 HFS8-4545		210		

Order Example — Part Number: HLFC8-4040

Days to Ship — 6 Days P.87

Casters for Aluminum Frames

-Double Wheels Swivel / Screwed Fitting Type-

CAD Data

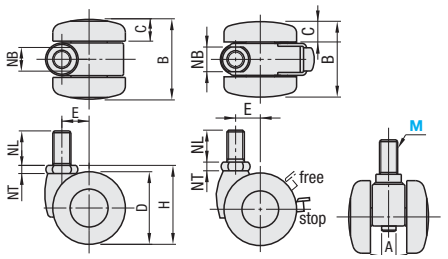


Type	Body		Wheel	Bearing	
	M Material	S Surface Treatment	M Material (Color)	Swiveling Part	Wheel Part
HCHA • HCHAS	Nylon	-	Nylon	-	-

The "r" indicates the swivel radius of the wheel and turning radius of the pedal.

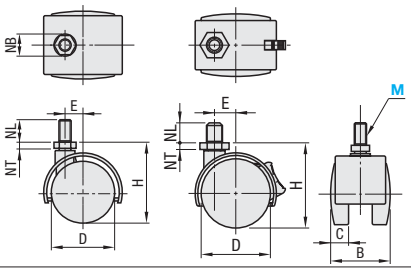
HCHA **HCHAS**

(8-40, 8-60, 8-100, 12-60, 12-100, 12-150, 16-150, 16-170)



HCHA **HCHAS**

(8-20, 8-30, 12-20, 12-30)



Part Number Type	M (Coarse)	Allowable Load W (kgf)	W (N)	D	H	A	B	C	E	NB	NT	NL	HCHA € Unit Price Qty. 1~9	HCHA Volume Discount 10~	HCHAS € Unit Price Qty. 1~9	HCHAS Volume Discount 10~
HCHA HCHAS (With Stopper)	8	20*	196	42	54	-	40	14	12	12	4	15				
		30*	294	52	64		47	14.5	16		5					
		40	396	40	43.5	7	44	12	15	14	4.5	12				
		60	594	50	57.5	8	49	14	17	17	6	14				
		100	990	60	68.5											
	12	20*	196	42	54	-	40	14	12	19	5	15				
		30*	294	52	64		47	14.5	16							
		60	594	50	57.5	8	49	14	17	17	6	14				
		100	990	60	68.5							22				
		150	1485		69	10	59	17.5		22	8					
	16	150										25				
		170	1683	75	84.5		64	18.5	20							

Order Example: Part Number - W → HCHA12 - 100

Days to Ship: - HCHAS 6 Days P.87 - HCHA 8 Days

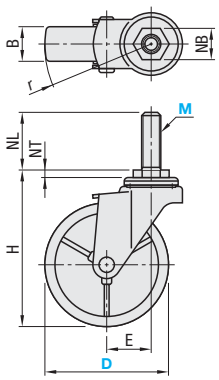
■Installation Method

Turn the hex bolt head at the lower part of wheel, (the part shown with A) then the upper thread part of screw will turn. For clamping, use the two flats shown at NB. For *marked types, install and tighten the NB part with a wrench.



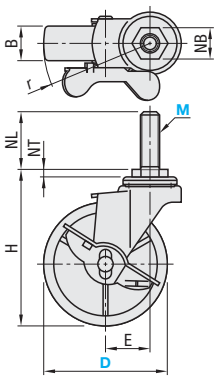
HSGN

(Swivel Screwed Fitting)



HSGNS

(Swivel Screwed Fitting + with Stopper)



Body		Wheel	Bearing	
M Material	S Surface Treatment	M Material (Color)	Swiveling Part	Wheel Part
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) · Urethane (Brown) · Nylon (White)	Provided	Not Provided

Body Type	Part Number Type	D	M (Coarse)	Wheel Material	H	Wheel Width B R	U	N	E	NB	NT	NL	r	Allowable Load (N) -R	-U	-N	Mass (g) -R	-U	-N	€ Unit Price -R	-U	-N
Swivel Screwed Fitting Type	HSGN	50	8	R (Rubber) U (Urethane) N (Nylon)	68	20	21	21	22	14	4.8	14	47	300	380	400	195	175	165			
			12																165			
		65	12		85	21	21	21	23	19		35	56		400		270	220	210			
		75	12		95				27				65	400	450	500	310	240	225			
		100	12		126	25	28	25	31	21	4	40	82	500	600	600	585	435	405			
			16							23												
Swivel Screwed Fitting Stopper Type	HSGNS	50	8		68	20	21	21	22	14	4.8	14	49	300	380	400	220	200	190			
			12							19		35										
		65	12		85	21	21	21	23				57	300	400		305	255	235			
		75	12		95				27				65	400	450	500	340	275	250			
		100	12		126	25	28	25	31	21	4	40	82	500	600	600	650	620	585			
			16							23												

Order Example: Part Number - M - Wheel Material → HSGN75 - 12 - U

Days to Ship: 8 Days

Price: € euros

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	0.05	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters for Aluminum Frames / Side Mount Caster Brackets / Foot Mount Brackets
-Rubber Wheel Type-

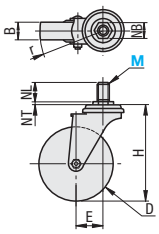
CAD Data

RoHS

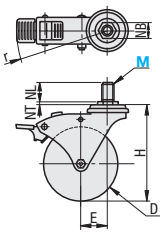


Body		Wheel	Bearing	
M Material	S Surface Treatment	M Material (Color)	Swiveling Part	Wheel Part
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black)	Provided	Provided

HSMA



HSMAS



Body Type	Part Number Type	M (Coarse)	Allowable Load W (kgf)	W (N)	D	H	B	E	NB	NT	NL	r	Mass (g)	€ Unit Price
Swivel Type	HSMA	12	60	594	75	105	25	30	23	4	25	72	500	
		16	70	695	100	137		35				89	700	
Swivel with Stopper Type	HSMAS	12	60	594	75	105	25	30	23	4	25	105	640	
		16	70	695	100	137		35				128	950	

Order Example: Part Number HSMA16 - W 70 — Days to Ship: 8 Days — Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	0.05	10%	18%

For orders larger than indicated quantity, please request a quotation.

Side Mount Caster Brackets

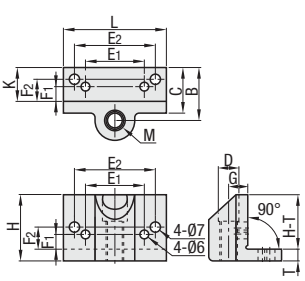
RoHS



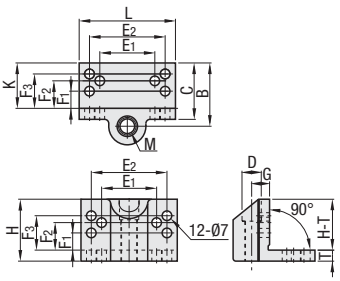
For the Mounting Hole Specified Type, refer to **P.960**

CPHAL

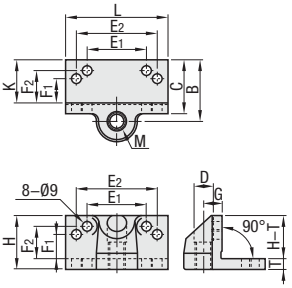
No.10 · 12



No.12A



No.16



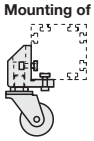
M Material: EN AC-46100/G-AlSi12Cu S Surface Treatment: Baked Finish (Silver)

Part Number Type	No.	Extrusions	M (Coarse)	H	L	B	K	C	T	D	G	Mounting Hole Dimension E1	E2	F1	F2	F3	Mass (g)	€ Unit Price Qty. 1~19	Volume Discount 20~
CPHAL	10	20 · 30 Square	10	45	70	36	23	31	8	14	13	40	55	10	15	-	135		
	12		12																
	12A	25 · 40 · 50 Square				46	33	41						12.5	20	25	165		
	16	45 · 60 Square	16	50	95	57	40	50	10	20	17	55	75	22.5	30	-	285		

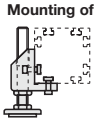
Order Example: Part Number CPHAL10 — Days to Ship: 6 Days P.87

Example

Mounting of Casters



Mounting of Leveling Pads





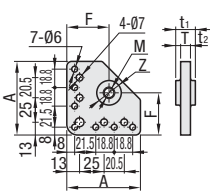
Foot Mount Brackets

RoHS

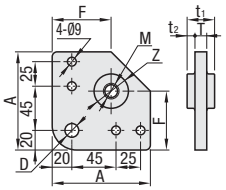


HPLAT

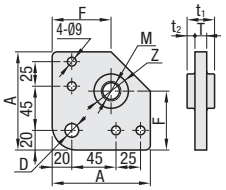
No.5



No.6



No.8



M Material: EN AC-46100/G-AlSi12Cu–ADC12

Part Number Type	No.	Extrusions	A	T	M	Z	D	F	t1	t2	Mass (g)	€ Unit Price Qty. 1~8	Volume Discount 9~20
HPLAT	5	20 / 30 Square	75	10	12	25	-	43	20	5	120		
	6	40 Square	100	12	16	35	14	60	28	8	281		
	8				20						273		

Order Example: Part Number HPLAT6 — Days to Ship: 6 Days P.87

Casters for Aluminum Frames
-With Mounting Plate-

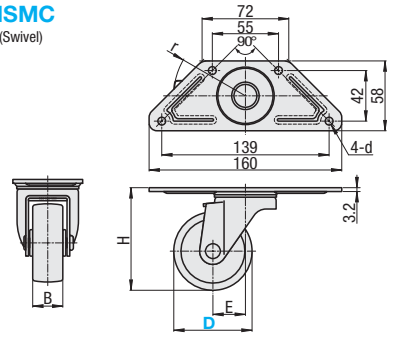
CAD Data

■Light Load Type

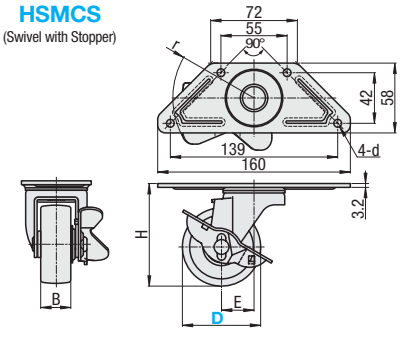
RoHS



HSMC (Swivel)



HSMCS (Swivel with Stopper)



The "r" indicates the swivel radius of the wheel and turning radius of the pedal.

Type	Body		Wheel	Bearing	
	M Material	S Surface Treatment	M Material	Swiveling Part	Wheel Part
HSMC HSMCS	1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) Nylon (White) · Urethane (Brown)	Provided	Not Provided

Body Type	Part Number Type	Part Number D	Wheel Material	Extrusions	H	B	d	E	r	Mass (g) R (Rubber Wheel)	Mass (g) N (Nylon Wheel)	Mass (g) U (Urethane Wheel)
Swivel Type	HSMC	50	R (Rubber) N (Nylon) U (Urethane)	HFS5-2020	70	28	5.3	27	53	462	437	-
		65		HFS6-3030	85	25	6.5		60	526	460	475
		75		HFS8-4040 / 8-4545	93		8.8	28	66	552	458	478
Swivel Stopper Type	HSMCS	50		HFS5-2020	70	28	5.3	27	67	521	496	-
		65		HFS6-3030	85	25	6.5		68	538	472	487
		75		HFS8-4040 / 8-4545	93		8.8	28		604	510	530

Order Example: Part Number **HSMC75** - Wheel Material **R**

Days to Ship: **6 Days** P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	€ Unit Price Rubber	Nylon	Urethane
HSMC	50			
	65			
	75			
HSMCS	50			
	65			
	75			

■Allowable Load

Part Number Type	D	Allowable Load N Rubber	Nylon	Urethane
HSMC	50	500	600	-
	65	500	700	600
	75	600	800	700
HSMCS	50	500	600	-
	65	500	700	600
	75	600	800	700

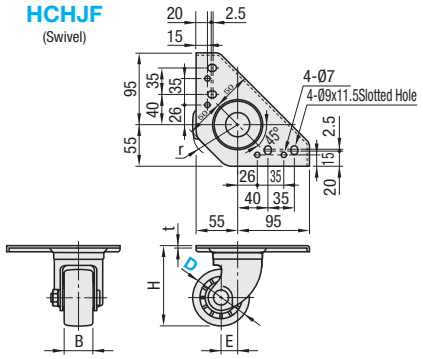
■Heavy Load Type

RoHS

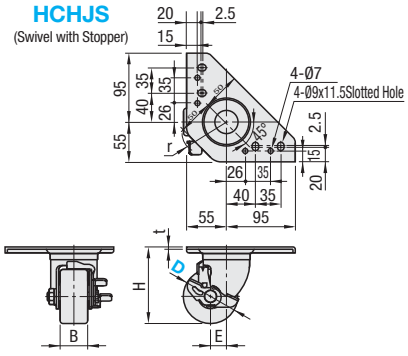




HCHJF (Swivel)



HCHJS (Swivel with Stopper)



Type	Body		Wheel	Bearing	
	M Material	S Surface Treatment	M Material	Swiveling Part	Wheel Part
HCHJF HCHJS	1.0320/St.22	Trivalent Chromate	Reinforced Nylon (Black) Phenol (Black)	Provided	Provided

Body Type	Part Number Type	Part Number D	Wheel Material	Extrusions	H	r	t	Allowable Load (N)	Mass (g)	€ Unit Price N	€ Unit Price P
Swivel Type	HCHJF	65	N (Reinforced Nylon) P (Phenol)	HFS6-3030 HFS8-4040 HFS8-4545	92	57	3.2	2000	1170		
		75			106	61			1270		
Swivel Stopper Type	HCHJS	65			92	67		2000	750		
		75			106				850		

Order Example: Part Number **HCHJF65** - Wheel Material **N**

Days to Ship: **8 Days**

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters for Aluminum Frames
-Adjuster Mounted Type-

CAD Data

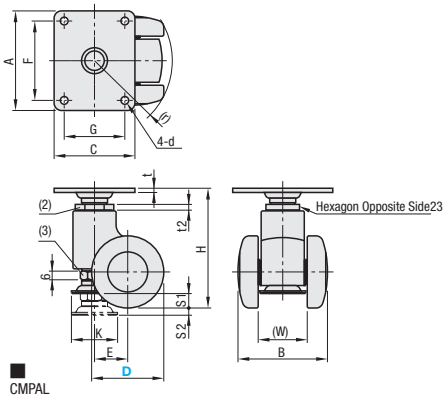
■Light Load Type

RoHS



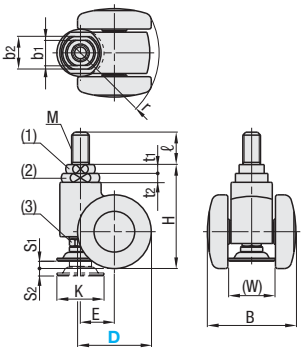


CMPAL (Swivel with Plate)



■CMPAL
- Mount the upper plate to the mating extrusion.
- Turn t2 Nut (2) to adjust the height of the leveling pad.
- Tightening nut (3) locks the leveling pad.

CMPAN (Swivel with Screwed Fitting)



CMPAN
- Turning t1 nut (1) attaches the body to the frame.
- Turn t2 Nut (2) to adjust the height of the leveling pad. (Nut (1) and (2) are not one unit.)
- Tightening nut (3) locks the leveling pad.

Type	Body		Wheel	Bearing		Adjustment Pad	
	M Material	S Surface Treatment	M Material (Color)	Swiveling Part	Wheel Part	M Material	S Surface Treatment
CMPAL · CMPAN	Nylon	-	Nylon	Provided	-	1.0038/S235JR	Trivalent Chromate

Body Type	Part Number Type	D	Wheel Material	H	B	(W)	S1	S2	K	A	C	F	G	d	t	t2	E	(r)	Allowable Load (N)	Mass (g)	€ Unit Price
Plate Type	CMPAL	50	N (Nylon)	83	62	34	10	5	32	69	56	55	42	5.5	3	4	23	54	1000	290	
		60		88	69	37												61		300	

Body Type	Part Number Type	D	Wheel Material	H	B	(W)	S1	S2	K	Mounting Screw Dims. M (Coarse Thread)	ℓ	Wrench Engage Dims. t1	t2	b1	b2	E	(r)	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel + Screw-in	CMPAN	50	N (Nylon)	76	62	34	10	5	32	12	22	4	4	17	23	23	54	1000	240	
		60		81	69	37											61		250	

Order Example: Part Number CMPAN50 - Wheel Material N

Days to Ship: · CMPAN 6 Days P.87 · CMPAL 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Heavy Load Type

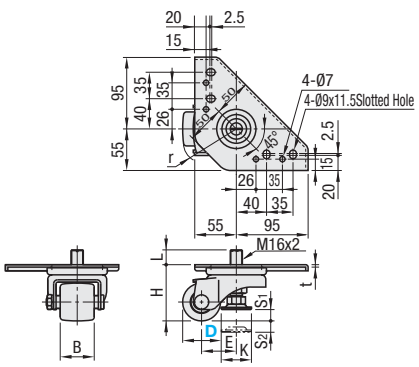
RoHS





HCMAS

(Swivel)



Type	Body		Wheel	Bearing	
	M Material	S Surface Treatment	M Material	Swiveling Part	Wheel Part
HCMAS	1.0320/St.22	Trivalent Chromate	Reinforced Nylon (Black)	Provided	Provided

Body Type	Part Number Type	D	Wheel Material	Extrusions	H	r	Adjuster Pad S1	S2	K	b	L	E	b	t	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Type	HCMAS	50	N (Reinforced Nylon)	HFS6-3030	74	73	15	15	40	24	19.6	46	45	3.2	2000	2160	
		65		HFS8-4040 HFS8-4545	95	84					18.8	51				2290	

Order Example: Part Number HCMAS65 - Wheel Material N

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Floor Stoppers for Aluminum Frames

CAD Data

Can be used as a securing protector for Aluminum Extrusion Units.

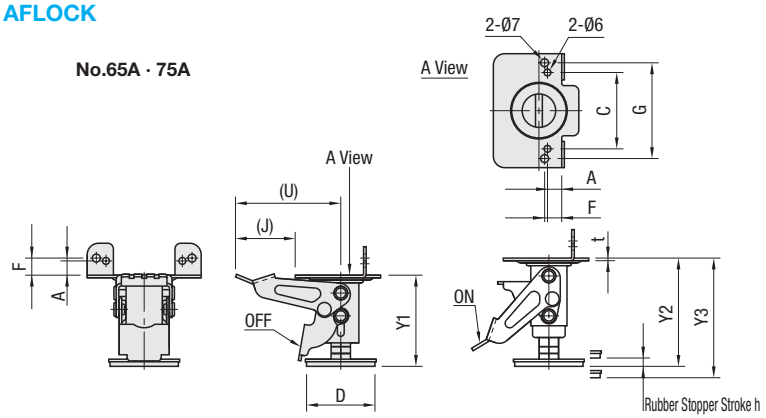
RoHS

AFLOCK

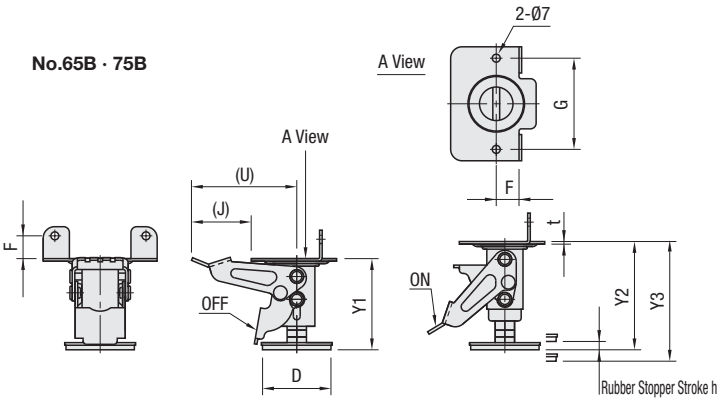




No.65A · 75A



No.65B · 75B



M Material: Main Body: 1.0320/St.22 Built-in Spring: JIS SWP-A
S Surface Treatment: Trivalent Chromate

Part Number Type	No.	Extrusions	Mounting Height	stroke Y1 Released	stroke Locked (Adjustment Range) Y2 (min)	stroke Locked (Adjustment Range) Y3 (max)	D	Mounting Plate Dimensions A	C	F	G	t	h	(U)	(J)	Pressure N	Mass kg	€ Unit Price
AFLOCK	65A	25 · 30 Square (Single-row Slot)	85	75	90	95	60	12.5	67	15	84	2.3	5	93	53	200	0.7	
	65B	40 Square (Single-row Slot)						-	-	20	80					200	0.8	
	75A	25 · 30 Square (Single-row Slot)	90	80	95	106		12.5	67	15	84					200	1.2	
	75B	40 Square (Single-row Slot)						-	-	20	80					250	1.3	

Order Example **AFLOCK65A** — Part Number

Days to Ship: **6 Days** P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	0.05	10%	18%

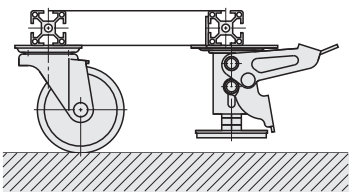
For orders larger than indicated quantity, please request a quotation.

Example

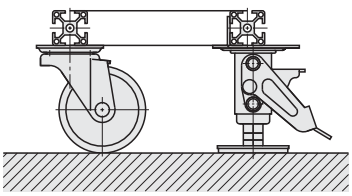
■ Precautions for Use

This Floor Stopper is not designed to support objects solely.
For tolerable loads, refer to the allowable loads of the Casters or Leveling Mounts used with this product.

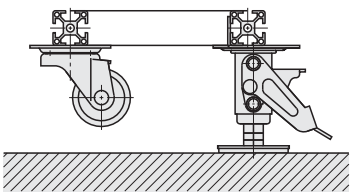
Movable



Secured



NG



Leveling Mounts for Aluminum Frames

NEW

Price Reduction

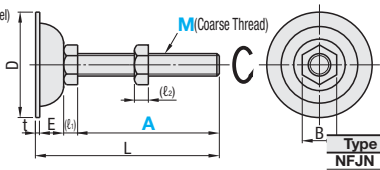
CAD Data

Standard Type

RoHS



NFJN
NFJNS (Stainless Steel)
NFJNF



M	D	ℓ1	ℓ2	E	B	t
5	30	3.5	4	5.4	8	1.6
6		4	5		10	
8	38	5.5	6.5	11	13	
10		7	8		17	
12	60	8	10	18	19	2.0
16	75	10	13	20	24	
20		13	16		30	

Type	M Material	S Surface Treatment
NFJN	1.0038/S235JR equivalent	Trivalent Chromate
NFJNF		
NFJNS	1.4301/X5CrNi18-10	Electrolityc Polishing

Screw shafts can turn independently of the base, and tilt by 3 to 5 degrees.

A Dimension Selectable Type

Part Number Type	Part Number M-A	L	Allowable Vertical Load (kN) NFJN · NFJNS	Mass (g)	€ Unit Price NFJN	€ Unit Price NFJNS
NFJN NFJNS (Stainless Steel)	5 - 30	40.5	1.5	15		
	5 - 60	70.5		19		
	6 - 40	51	2.1	21		
	6 - 80	91		28		
	8 - 50	68.1	3.9	50		
	8 -100	118.1		65		
	10 - 75	94.6	4.3	88		
	10 -100	119.6		100		
	12 - 75	103	4.9	166		
	12 -100	128		184		
	12 -125	153		200		
	12 -150	178		219		
	16 - 75	107	5.9	287		
	16 -100	132		317		
	16 -130	162		356		
	16 -150	182		383		
	16 -180	212		422		
	20 -100	135	8.8	493		
	20 -130	163		557		
	20 -150	183		605		
	20 -180	213		671		

A Dimension Configurable Type

Part Number Type	M	A 10mm Increment	L	€ Unit Price
NFJNF	10	80~200	A+19.6	
	12	80~250	A+28	
	16	80~300	A+32	
	20	110~300	A+35	

Tips of screws are painted.

Order Example: Part Number - A
NFJN12-100
NFJNF10 - 80

Days to Ship: - NFJN · NFJNS (Cells) 6 Days P.87 | - NFJNF 8 Days

2 Days

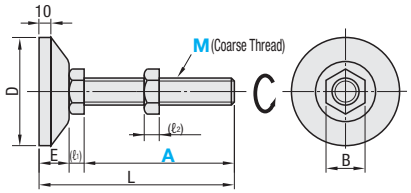
Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

Heavy Load Type

RoHS



FJFN
FJFNS
FJFNF



M	D	ℓ1	ℓ2	E	B
10	60	7	8	18	17
12		8	10		19
16		10	13		24
20		13	16		30
24	70	16	19	20	36

Type	M Material	S Surface Treatment
FJFN FJFNF	1.0038/ S235JR	Trivalent Chromate
FJFNS	1.4301/ X5CrNi18-10	-

Screw shafts can turn independently of the base, and tilt by 3 to 5 degrees.

A Dimension Selectable

Part Number Type	Part Number M-A	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price FJFN	€ Unit Price FJFNS
FJFN FJFNS (Stainless Steel)	10-75	100	10	319		
	10-100	125		330		
	12-75	101	13	339		
	12-100	126		357		
	12-125	151		376		
	12-150	176		393		
	16-75	103	16.6	436		
	16-100	128		446		
	16-130	158		505		
	16-150	178		532		
	16-180	208		571		
	20-100	131	39.2	626		
	20-130	161		692		
	20-150	181		729		
	20-180	211		800		
FJFN	24-130	166	49.4	1100		
	24-180	216		1250		

Kgf (Load) = Nx0.101972

A Dimension Configurable Type

Part Number Type	M	A 10mm Increment	L	€ Unit Price
FJFNF	10	80~200	A+25	
	12	80~250	A+26	
	16	80~300	A+28	
	20	110~300	A+31	

Tips of screws are painted.

Order Example: Part Number - A
FJFN10-75
FJFNF20 - 150

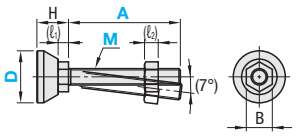
Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

Days to Ship: - FJFN · FJFNS(Cells) - Others
6 Days P.87 | 8 Days | 2 Days

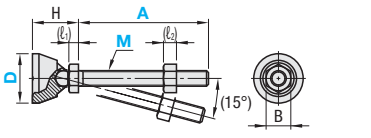
Space Saving Type



HNFJN



HNFJR



M Material: 1.0038/S235JR or equivalent
S Surface Treatment: Trivalent Chromate

Rotary Type

Part Number Type	Part Number D	M (Coarse)	A	Extrusions *	H HNFJN	H HNFJR	ℓ1	ℓ2	B	Allowable Vertical Load (kN)	Mass (g) HNFJN	Mass (g) HNFJR	€ Unit Price HNFJN	€ Unit Price HNFJR
HNFJN	28	8	20 50 100	30 Square	17.7	28.2	5.2	6.5	13	6.5	48	50		
	38	12	30 80 100	40 Square	23	35.4	7.4	10	19	13	55	59		
HNFJR (Rotary Type)	48	8	20 50 100	50 Square	20.7	33.2	5.2	6.5	13	6.5	77	73		
		12	30 80 100		23	35.4	7.4	10	19	13	90	85		
	58	8	20 50 100	60 Square	20.7	33.2	5.2	6.5	13	6.5	121	115		
		12	30 80 100		23	35.4	7.4	10	19	13	133	129		

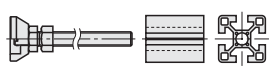
Can be used for the end of extrusions with one tapped hole alterations for mounting. It cannot be directly mounted to the extrusions with multiple tapped holes on their ends.

Order Example: Part Number - M - A
HNFJN28 - 8 - 50

Days to Ship: 6 Days P.87

Price

Example



Mount directly to each single slot type to prevent the mounts from protruding the outer envelope.

Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~99
Discount Rate	€ Unit Price	10%

For orders larger than indicated quantity, please request a quotation.

Caster Kits for Doors / Anchors for Aluminum Frames

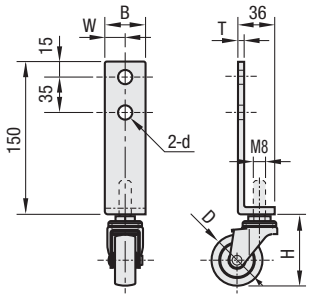
CAD Data

Caster Kits for Doors

RoHS



SQCM



P.761 Usable for aluminum extrusions for doors.

M Material: Plate: 1.0038/S235JR Trivalent Chromate
Caster: 1.0320/St.22 Trivalent Chromate
Rubber Wheel

Part Number		Applicable Extrusions	Caster Allowable Load N	Mass (g)	€ Unit Price	Volume Discount
Type	No.				Qty. 1~9	10~20
SQCM	6	30 Square	350	160		
	8	40 Square				

For orders larger than indicated quantity, please request a quotation.

No.	Components										
	Plate				Dedicated Caster			Extrusion Mounting			
	B	W	T	d	D	H	Quantity	Mounting Screw	Quantity	Nuts	Quantity
6	30	15	6	7	50	68	1	SCB6-14	2	HNTP6-6	2
8	40	20		8.5				SCB8-18		HNTP8-8	

Order Example Part Number SQCM6

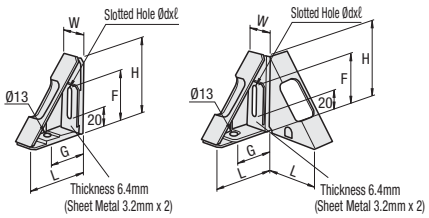
Days to Ship 8 Days Express A 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Anchors for Aluminum Frames



HFSANK HFSANKW



M Material: 1.0320/St.22 S Surface Treatment: Chromate Treatment

ex

(1)Drive in anchor bolts using a hammer.



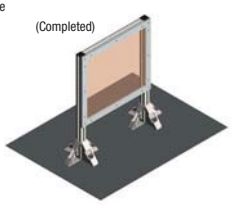
(2)Tighten the nuts of anchor bolts with a wrench from the side.



(3)Insert a wrench into the slot in the anchor's sloped face and secure the anchor on to the aluminum extrusion.



(Completed)



Part Number		Mass g	Extrusions (Series)	Screws · Nuts				H	F	G	W	L	d	ℓ	€ Unit Price	Volume Discount
Type	No.			Screws	Quantity	Nuts	Quantity								Qty. 1~9	10~
HFSANK	6	318	HFS6	CBM6-15	2	HNTT6-6	2	100	60	40	30	86.5	7	40		
	8	512	HFS8*	CBM8-15		HNTT8-8		120	80	50	40	96.5	10	60		
HFSANKW	6	624	HFS6	CBM6-15	4	HNTT6-6	4	100	60	40	33.2	86.5	7	40		
	8	1020	HFS8*	CBM8-15		HNTT8-8		120	80	50	43.2	96.5	10	60		

*Not applicable to HFS8-45.
Screws and nuts are not included.

Order Example Part Number HFSANK6

Days to Ship 6 Days P.87

Alterations Part Number HFSANK6 - (SET · SST) -

Alteration	Code	Spec.	Applicable Anchor	Price Adder SET	Price Adder SST
Applicable Screw / Nut Set	SET SST (Stainless Steel)	Set of screws and nuts for mounting the anchor to an aluminum extrusion. Anchor bolts are not included. When SST is specified, screw and nut will be the set of stainless steel type. (Ex.)Screw: SCB6–15 Nut: HNTTSN6–6	HFSANK6	0,95	1,00
			HFSANK8	1,15	1,20
			HFSANKW6	1,90	2,00
			HFSANKW8	2,30	2,40

Anchors for Aluminum Frames

CAD Data

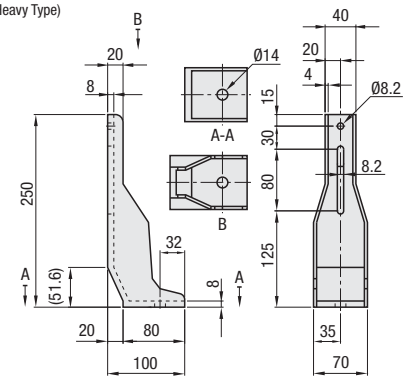


(Reference) Combination use with the Aluminum Extrusion HFS8-4040



This is sold as single Anchor.

HFHANK8 (Heavy Type)



M Material: 1.1191/C45E
S Surface Treatment: Black Baked Paint

Part Number	Mass g	Extrusions (Series)	Screws / Nuts				€ Unit Price	Volume Discount
			Screws	Quantity	Nuts	Quantity	Qty. 1~9	10~
HFHANK8	1650	HFS8 HFS8-45	CBM8-20	2	HNTT8-8	2		

This is sold as single Anchor.

Order Example — Part Number: HFHANK8

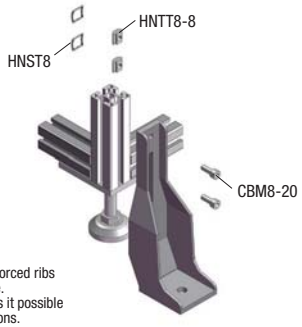
Days to Ship: 6 Days P.87

Alterations — Part Number - (SET): HFHANK8 - SET

Alteration	Code	Spec.	Extrusions (Series)	Price Adder
Applicable Screw/ Nut Set	SET	Set of screws and nuts for mounting the anchor to an aluminum extrusion. Anchor bolts are not included.	HFS8 HFS8-45	1,20

When –SET is specified, the product is not RoHS compliant.

Example



■Features
This is a Heavy Type with reinforced ribs thicker than the Standard Type.
25mm increased height makes it possible to be mounted in higher positions.

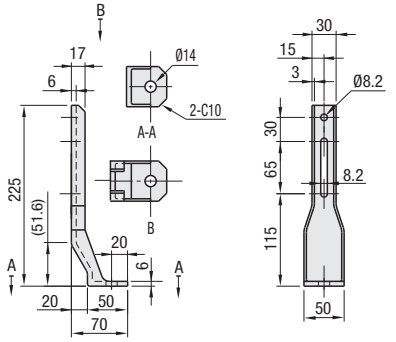


(Reference) Combination use with the Aluminum Extrusion HFS6-3030



This is sold as single Anchor.

HFANK225 (Standard Type)



M Material: 1.1191/C45E
S Surface Treatment: Black Baked Paint

Part Number	Mass g	Extrusions (Series)	Screws / Nuts				€ Unit Price	Volume Discount
			Screws	Quantity	Nuts	Quantity	Qty. 1~9	10~
HFANK225	577	HFS6	CBM6-14	3	HNTT6-6	3		
		HFS8 HFS8-45	CBM8-18	2	HNTT8-8	2		

Screws and nuts are not included.
When mounting to HFS6 series, washers are required.

Order Example — Part Number: HFANK225

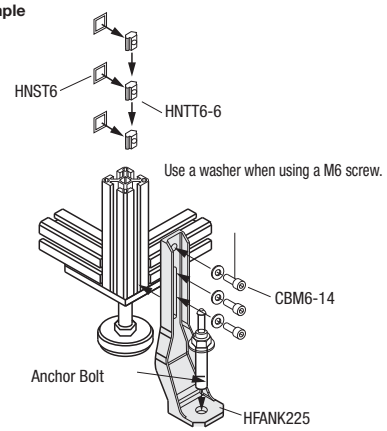
Days to Ship: 6 Days P.87

Alterations — Part Number - (SET1 · SET2): HFANK225 - SET1

Alteration	Code	Spec.	Extrusions (Series)	Price Adder
Applicable Screw / Nut Set	SET1	Set of screws and nuts for mounting the anchor to an aluminum extrusion. Anchor bolts are not included.	HFS6	1,55
	SET2		HFS8 HFS8-45	1,20

* When SET1 is selected, three washers (WSSM12–6–1) are included.
When specifying SET1 and SET 2, the products are not RoHS–compliant.

Example



Anchor Stands for Aluminum Frames

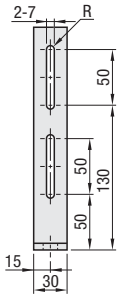
RoHS



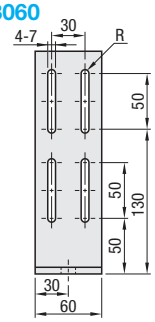


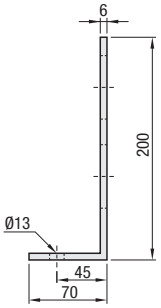
Type	Material	Surface Treatment
HFLANK	1.0038/ S235JR	Trivalent Chromate
HFLANB		Black Oxide

HFLANK6-3030
HFLANB6-3030

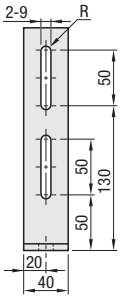


HFLANK6-3060
HFLANB6-3060

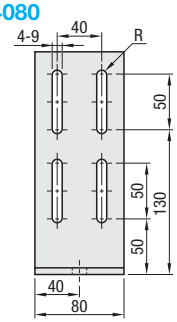


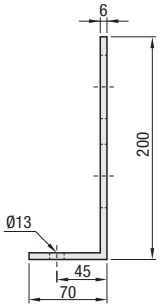


HFLANK8-4040
HFLANB8-4040



HFLANK8-4080
HFLANB8-4080





Part Number		Extrusions (Series)	Mass g	Screws · Nuts				HFLANK		HFLANB	
				Screws	Quantity	Nuts	Quantity	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
								Qty. 1~9	10~19	Qty. 1~9	10~19
HFLANK6 HFLANB6	3030	HFS6-3030	380	CBM6-14	2	HNTP6-6	2				
	3060	HFS6-3030* · HFS6-3060	750		4		4				
HFLANK8 HFLANB8	4040	HFS8-4040	500	CBM6-18	2	HNTP8-8	2				
	4080	HFS8-4040* · HFS8-4080	1000		4		4				

*When erecting 2 aluminum extrusions, reinforce the extrusions with sheet metal plates (Refer to the example below).
Applicable screws or nuts are not included.

Order Example

Part Number
HFLANK6-3060

Days to Ship

6 Days P.87

Alterations

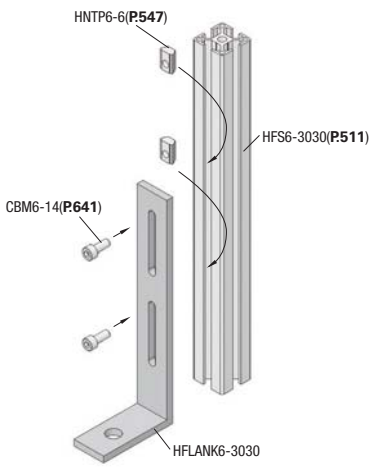
Part Number	-	(SET)
HFLANK6-3030	-	SET

Alteration	Code	Spec.	Stand		Price Adder
Applicable Screw / Nut Set	SET	Screws and nuts come in a set for mounting the anchor to an aluminum extrusion. Anchor bolts are not included. Screw→CBM Nut→HNTP	HFLANK HFLANB	6-3030	1,00
				6-3060	2,00
				8-4040	1,00
				8-4080	2,00

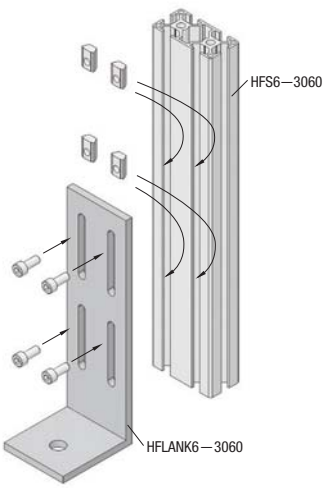
When -SET is specified, product is not RoHS compliant.

Example

<Example of 1 Slot Extrusion>

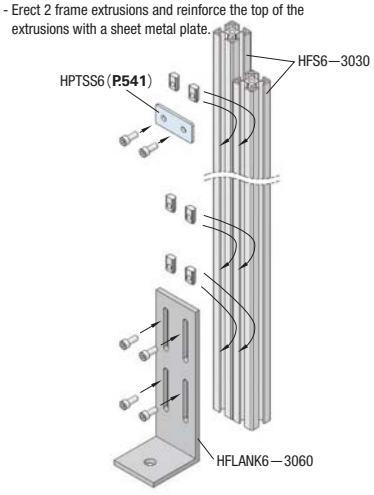


<Example of 2 Slot Extrusion x 1>



<Example of 1 Slot Extrusion x 2>

- Erect 2 frame extrusions and reinforce the top of the extrusions with a sheet metal plate.



NEW

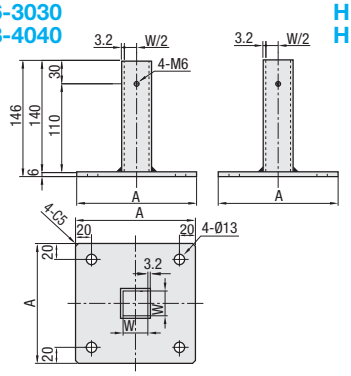
CAD Data

RoHS

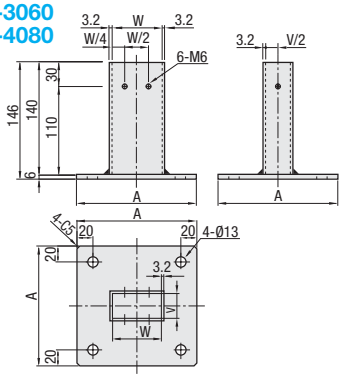


4-point Anchor Type

HFTANK6-3030
HFTANK8-4040

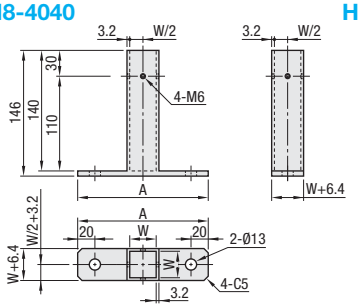


HFTANK6-3060
HFTANK8-4080

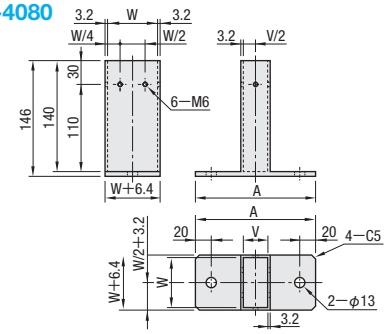


2-point Anchor Type

HFTANM6-3030
HFTANM8-4040



HFTANM6-3060
HFTANM8-4080



M Material: 1.0320/St.22 S Surface Treatment: Trivalent Chromate
Since the inside of the rectangular cylinder is deep, surface treatment is thinly applied.

4-point Anchor Type

Part Number		Extrusion (Series)	Mass g	A	W	V	Applicable set screws are included (P.205)		€ Unit Price	Volume Discount
							Set Screws	Quantity	1~4 Qty.	5~9
HFTANK6	3030	HFS6-3030	1350	150	31	-	MSSF6-12	4		
	3060	HFS6-3030* · HFS6-3060	1650		62	31	MSSF6-12	6		
HFTANK8	4040	HFS8-4040	1900	170	41	-	MSSF6-16	4		
	4080	HFS8-4040* · HFS8-4080	2210		82	41	MSSF6-16	6		

2-point Anchor Type

Part Number		Extrusion (Series)	Mass g	A	W	V	Applicable set screws are included (P.205)		€ Unit Price	Volume Discount
							Set Screws	Quantity	1~4 Qty.	5~9
HFTANM6	3030	HFS6-3030	800	150	31	-	MSSF6-12	4		
	3060	HFS6-3030* · HFS6-3060	1000		62	31		6		
HFTANM8	4040	HFS8-4040	1100	170	41	-	MSSF6-16	4		
	4080	HFS8-4040* · HFS8-4080	1400		82	41		6		

*When erecting 2 aluminum extrusions, reinforce the extrusions with sheet metal plates (Refer to the example below).
Applicable set screws are not included.
For orders larger than indicated quantity, please request a quotation.

Order Example Part Number: HFTANK6-3030

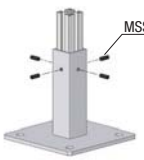
Days to Ship 6 Days P.87

Example



HPTSS (**P.541**)

-When using a stand to erect 2 aluminum extrusions, reinforce the extrusions with sheet metal plates (**P.541**)

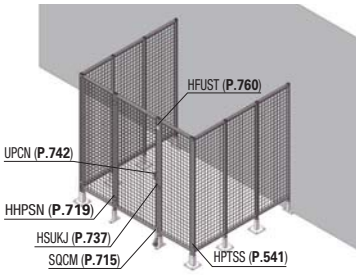


MSSF (**P.205**)

- Can be mounted with set screws instead of nuts for aluminum extrusions.

Alterations Part Number - (SET) HFTANK6-3030 - SET

Alteration	Code	Spec.	Stand	Price Adder
Applicable set screws are included	SET	Set Screws for mounting the anchor to an aluminum extrusion come in a set. Anchor bolts are not included.	HFTANK6-3030 HFTANK8-4040 HFTANM6-3030 HFTANM8-4040	2,00
			HFTANK6-3060 HFTANK8-4080 HFTANM6-3060 HFTANM8-4080	3,00



- Can be used to let the Safety Fence Units self-stand.

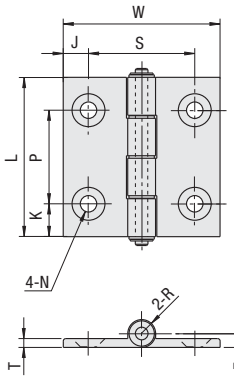
Aluminum Hinges / Aluminum Hinges for Different Extrusion Sizes

CAD Data

■Aluminum Hinges RoHS
■Aluminum Hinges for Different Extrusion Sizes

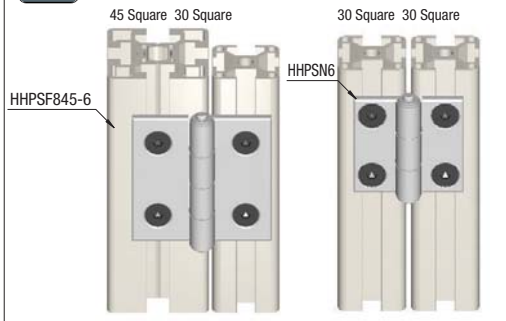


HHPSN (Clear Anodize)
HHPBSN (Black Anodize)
HHPSF (For Different Extrusion Sizes: Clear Anodize)



M Materials: EN AW-6063/AlMg0,7Si–T5 Bushing: Polyacetal
S Surface Treatment: Anodize

Example



-Hinges for Different Extrusion Sizes
HHPSF 6–5: Attaches HFS5-20mm to HFS6-30mm.
HHPSF8-6: Attaches HFS6-30mm to HFS8-40mm.
HHPSF845-5: Attaches HFS5-30mm to HFS8-45mm.
HHPSF 8–5: Attaches HFS5-20mm to HFS8-40mm
HHPSF 845-6: Attaches HFS6-30mm to HFS8-45mm
When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

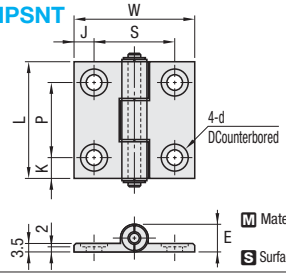
Part Number		*Allowable Load		Mass g	L	W	K	P	J	S	N		T	E	R	Screws · Nuts				Clear Anodize		Black Anodize	
Type	No.	kg	N								Through	Counter-sunk				Screws	Quantity	Nuts	Quantity	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
																				Qty. 1~8	9~	Qty. 1~8	9~
HHPSN HHPBSN (Black Anodize)	5	10	98	22	47	36	11	25	7.5	21	5.5	11	3.5	5	5	Flathead Screw 5-8	4	HNTT5-5	4				
	6			33		48	8.5	30	8	32	6.5	13		5.5	5.5	Flathead Screw 6-10		HNTT6-6					
	8			48	63	62	13	37	10	42						Flathead Screw 6-12		HNTT8-6					
	8-45	15	147	81		80	10	43	16.5	47			4.5			Flathead Screw 6-15							
HHPSF (For Different Extrusion Sizes)	6-5	10	98	33	47	44.75	8.5	30	10.75	26.5	5.5	11	3.5	5.5	5.5	Flathead Screw 5-8	2	HNTT5-5	2				
											6.5	13				Flathead Screw 6-10	2	HNTT6-6	2				
	8-5	10	98	48	63	54.25	13	37	15.25	31.5	5.5	11	3.5	5.5	5.5	Flathead Screw 5-8	2	HNTT5-5	2				
											6.5	13				Flathead Screw 6-10	2	HNTT8-6	2				
	845-5	10	98	81	63	55.5	13	37	14	34	5.5	11	3.5	5.5	5.5	Flathead Screw 5-8	2	HNTT5-5	2				
											6.5	13				Flathead Screw 6-10	2	HNTT8-6	2				
	8-6	15	147	48	63	62	13	37	12.5	37	6.5	13	3.5	5.5	5.5	Flathead Screw 6-10	2	HNTT6-6	2				
																Flathead Screw 6-12		HNTT8-6					
	845-6	15	147	48	63	62	13	37	11.5	39	6.5	13	3.5	5.5	5.5	Flathead Screw 6-10	2	HNTT6-6	2				
																Flathead Screw 6-15		HNTT8-6					

*The allowable load is the value when 2 pieces are used.

■Aluminum Hinges Extra Low Head Cap Screw Type RoHS

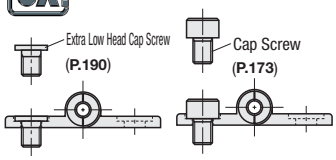


HHPSNT



M Material: EN AW-6063/AlMg0,7Si
Bushing: Polyacetal
S Surface Treatment: Clear Anodize

Example
Normal cap bolts are available for installation.



When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

Part Number		*Allowable Load		Mass g	L	W	K	P	J	S	d Through	D Counterbore	E	Screws · Nuts				€ Unit Price	Volume discount Rate
Type	No.	kg	N											Screws	Quantity	Nuts	Quantity	Qty. 1~8	9~
HHPSNT	5	10	98	22	47	36	11	25	7.5	21	5.5	10	5	CBSA5-6	4	HNTT5-5	4		
	6			34		48	8.5	30	8	32	6.5	11	5.5	CBSA6-8		HNTT6-6			
	8			49	63	62	13	37	10	42				CBSA6-10		HNTT8-6			

*The allowable load is the value when 2 pieces are used.

Order Example
Part Number
HHPSN6

Alterations
Part Number - (SET · SST)
HHPSN6 - SET

Days to Ship
6 Days
P.87

Alterations	Code	Spec.	Hinges	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. (When SET is specified, the material of the Flathead Screws is 1.7220/34CrMo4 and their surface treatment is Black Oxide.)	HHPSN HHPBSN	5	1,80	2,35
				6	1,92	2,90
				8 8-45	2,24	3,20
			HHPSNT	5	7,12	-
				6	7,76	-
				8	7,96	-
			HHPSF	6-5 845-5	2,08	2,60
				8-5 8-6		
				845-6		

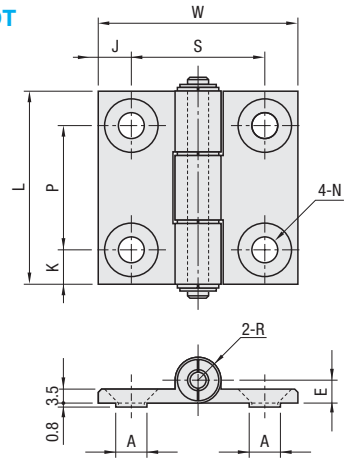
Aluminum Hinges with Tabs / Aluminum Hinges with Slotted Holes

CAD Data

Aluminum Hinges with Tabs RoHS



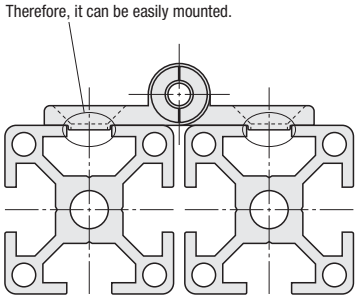
HHPSDT



M Material: EN AW-6063/AlMg0,7Si Bushing: Polyacetal
S Surface Treatment: Clear Anodize

Example

The protrusion prevents misalignment when attached. Therefore, it can be easily mounted.



When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

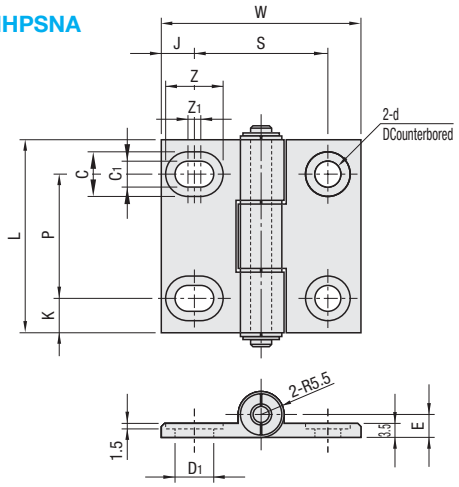
Part Number Type	No.	*Allowable Load kg	N	Mass g	L	W	K	P	J	S	N Through	N Countersunk	E	A	R	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HHPSDT	5	10	98	23	47	36	11	25	7.5	21	5.5	11	5	5.5	5	Flathead Screw 5-8	4	HNTT5-5	4		
	6			35		48	8.5	30	8	32	6.5	13	5.5	7.5	5.5	Flathead Screw 6-10		HNTT6-6			
	8			51	63	62	13	37	10	42				9.5		Flathead Screw 6-12		HNTT8-6			

* The allowable load is the value when 2 pieces are used.

Aluminum Hinges with Slotted Holes RoHS

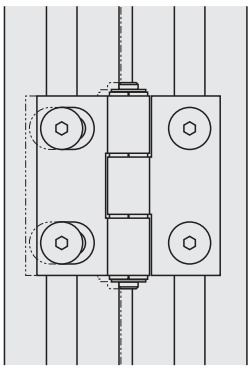


HHPSNA



M Material: EN AW-6063/AlMg0,7Si Bushing: Polyacetal
S Surface Treatment: Clear Anodize

Example



Slotted mounting holes make it possible to adjust right and left positions.

When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

Part Number Type	No.	*Allowable Load kg	N	Mass g	L	W	K	P	J	S	d Through	D Counter-bore	D1	C	C1	Z	Z1	E	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HHPSNA	5	10	98	22	47	36	11	25	7.5	21	5.5	10	7	10	5.5	11.5	1.5	5	CBSA5-6	4	HNTT5-5	4		
	6			32		48	8.5	30	8	32	6.5	11	9.5	11	6.5	14	3	5.5	CBSA6-8		HNTT6-6			
	8			47	63	62	13	37	10	42			11.5			16	5		CBSA6-10		HNTT8-6			

*The allowable load is the value when 2 pieces are used.

Order Example — Part Number: HHPSDT6, HHPSNA6

Days to Ship: 6 Days P.87

Alterations — Part Number - (SET · SST): HHPSDT6 -

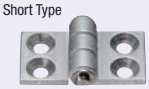
Alterations	Code	Spec.	Hinges	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When is specified, stainless steel screw and nut are included. HHPSNA is available for -SET only. (- When SET is specified, the material of the Flathead Screws is 1.7220/34CrMo4 and their surface treatment is Black Oxide.	HHPSDT	5	1,80	2,35
				6	1,92	2,90
				8	2,24	3,20
			HHPSNA	5	7,12	-
				6	7,76	-
				8	7,96	-

Aluminum Hinges Long Type - Short Type / Plastic Hinges / Compact Plastic Hinges

CAD Data

Aluminum Hinges RoHS

Short Type

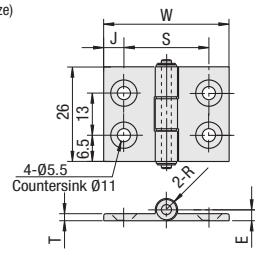


Long Type



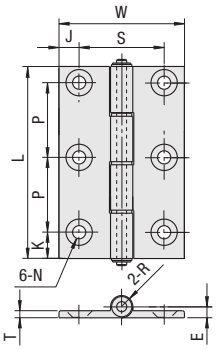
Short Type

HHPSNC
(Clear Anodize)
HHPBSNC
(Black Anodize)



Long Type

HHPSNL
(Clear Anodize)
HHPBSNL
(Black Anodize)



M Material: EN AW-6063/AlMg0,7Si-T5
Bushing: Polyacetal
S Surface Treatment: Anodize

Short Type

Part Number		* Allowable Load		Mass	W	J	S	T	E	R	Screws · Nuts				Clear Anodize		Black Anodize	
											Screws	Quantity	Nuts	Quantity	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	No.	kg	N	g											Qty. 1~8	9~	Qty. 1~8	9~
HHPSNC HHPBSNC (Black Anodize)	5	10	98	19	36	7.5	21	3.5	5	5	Flathead Screw 5-8	4	HNTT5-5	4				
	6			24	48	8	32		5.5	5.5	Flathead Screw 5-10		HNTT5-6					
	8			27	62	10	42				Flathead Screw 5-12		HNTT5-6					
	8-45	15	147	36	80	16.5	47	4.5			Flathead Screw 5-15							

*The allowable load is the value when 2 pieces are used.

Long Type

Part Number		* Allowable Load		Mass	L	W	K	P	J	S	N		T	E	R	Screws · Nuts				Clear Anodize		Black Anodize	
											Through	Counter-sunk				Screws	Quantity	Nuts	Quantity	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	No.	kg	N	g																Qty. 1~8	9~	Qty. 1~8	9~
HHPSNL HHPBSNL (Black Anodize)	5	15	147	49	66	36	8	25	7.5	21	5.5	11	3.5	5	5	Flathead Screw5-8	6	HNTT5-5	6				
	6			69	78	48	9	30	8	32	6.5	13		5.5	5.5	Flathead Screw6-10		HNTT6-6					
	8			106	113	62	13.5	43	10	42						Flathead Screw6-12		HNTT8-6					
	8-45	23	220	144		80			16.5	47			4.5			Flathead Screw6-15							

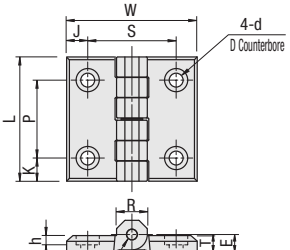
*The allowable load is the value when 2 pieces are used.

Plastic Hinges



RoHS

HHPSJ



When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on P.725

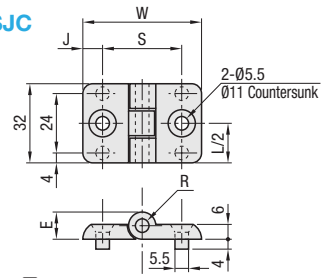
M Material: Leaf - Nylon 6 / Shaft - 1.4301

Compact Plastic Hinges



RoHS

HHPSJC



M Material: Leaf - Nylon 6 / Shaft - 1.4301/X5CrNi18-10

Part Number		Color	* Allowable Load		Mass	L	W	K	P	J	S	D	d	T	E	R	h	Screws · Nuts				€ Unit Price	Volume Discount
																		Screws	Quantity	Nuts	Quantity		
Type	No.		Kg	N	g																	Qty. 1~9	10~
Plastic Hinges HHPSJ	6	B(Black) W(White)	10	96	21	48	47	9	30	8	32	9.5	5.5	6	6.5	12.6	3.8	CBS5-8	4	HNTT6-5	4		
	8		15	147	35	59	62	11	37	10	42	11	6.6	7.5	8	14.5	4.4	CBS6-12		HNTT8-6			
	845				44	70	80	13.5	43	16.5	47							CBS6-12		HNTT8-6			

*The allowable load is the value when 2 pieces are used. The default color will be black unless specified.

Part Number		* Allowable Load		Mass	W	J	S	E	R	€ Unit Price	Volume Discount
Type	No.	kg	N	(g)						Qty. 1~9	10~
Compact Plastic Hinges HHPSJC	5	10	98	12.5	36	7.5	21	10	5		
	6	10	98	15.8	48	8	32	11	5.5		
	8	10	98	26.2	62	10	42	11	5.5		

*The allowable load is the value when 2 pieces are used.

Order Example

Part Number	-	Color
HHPSJ6	-	B
HHPSJC5		

Days to Ship

6 Days P.87

2 Days

Alterations

Part Number	-	Color	-	(SET · SST)
HHPSJ6	-	B	-	

Alterations	Code	Spec.	Hinges	No.		Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. (- When SET is specified, the material of the Flathead Screws is 1.7220/34CrMo4 and their surface treatment is Black Oxide.)	HHPSNC HHPBSNC	5		1,80	2,35
				6		1,92	2,90
				8	8-45	2,24	3,20
			HHPSNL HHPBSNL	5		2,52	3,25
				6		2,64	3,92
				8	8-45	3,06	4,02

Alterations	Code	Spec.	Hinges	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. (Ex.) Screw: CBSST5-8 Nut: HNTTSN6-5	HHPSJ	6	2,28	2,60
				8	2,48	2,84
				845		
			HHPSJC	5	1,36	1,56
				6	1,40	1,60
				8	1,50	1,70

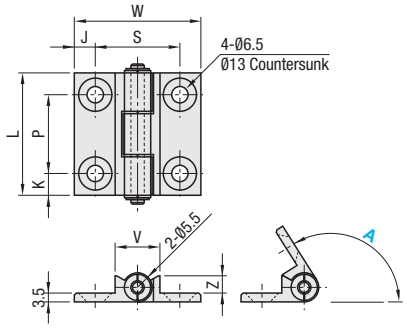
Stop Hinges / Low Particulate Hinges

CAD Data

■Stop Hinges RoHS



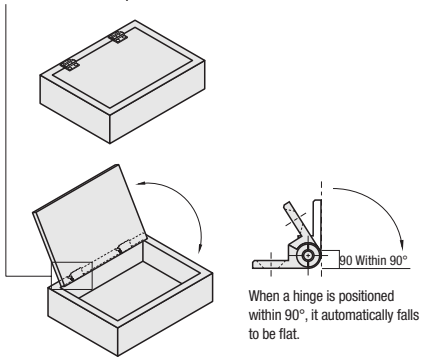
HHPSNH



M Material: EN AW-6063/AlMg0,7Si-T5 Bushing: Polyacetal
S Surface Treatment: Clear Anodize

ex Example

The lid of the box stops at a constant bevel.



When a hinge is positioned within 90°, it automatically falls to be flat.

When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

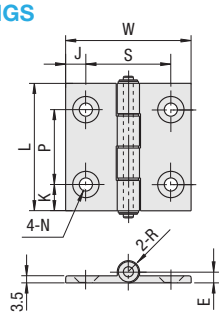
Part Number Type	No.	A (Angle)	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	V	Z	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HHPSNH	6	120	10	98	37	47	48	8.5	30	8	32	17	6.8	Flathead Screw 6-10	4	HNTT6-6	4		
		135			36								5.4						
		150			35								4.2						
	8	120	10	98	58	63	62	13	37	10	42	21	7.3	Flathead Screw 6-12	4	HNTT8-6	4		
		135			56								5.8						
		150			55								4.5						

* The allowable load is the value when 2 pieces are used.

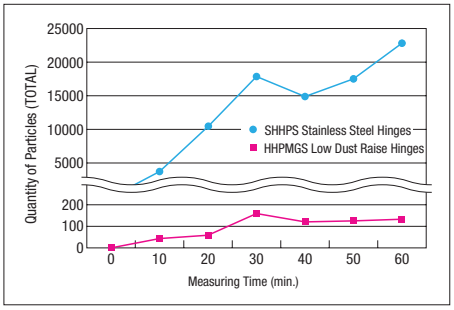
■Low Particulate Hinges RoHS



HHPMGS



M Material: EN AW-6063/AlMg0,7Si-T5
Bushing : Oil Soaked Polyacetal
S Surface Treatment: Electroless Nickel Plating



Features

■Excels in friction resistance and sliding compared with conventional hinges as the sliding section resin is made from the special material (oil embedded Polyacetal) .

■The aluminum part is electroless nickel plated instead of conventional anodizing providing excellent conductivity, resulting in less static and dust.

■ When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

Part Number Type	No.	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	N Through	N Countersunk	E	R	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HHPMGS	5	10	98	22	47	36	11	25	7.5	21	5.5	11	5	5	SHFBS5-8	4	HNTTSN5-5	4		
	6			33		48	8.5	30	8	32	6.5	13	5.5	5.5	SHFBS6-10		HNTTSN6-6			
	8			48	63	62	13	37	10	42					SHFBS6-12		HNTTSN8-6			

*The allowable load is the value when 2 pieces are used.

Order Example Part Number HHPMGS6

Alterations Part Number HHPMGS6 - (SET · SST)

Days to Ship 6 Days P.87

Alterations	Code	Spec.	Hinges	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. ※-SET is available for Stop Hinges only. (- When SET is specified, the material of the Flathead Screws is 1.7220/34CrMo4 and their surface treatment is Black Oxide.)	HHPSNH HHPMGS	5	1,80	2,35
				6	1,92	2,90
				8	2,24	3,20

Stainless Steel Hinges / Steel Hinges

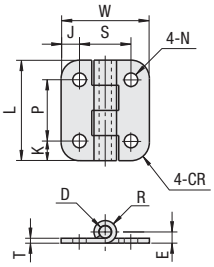
CAD Data

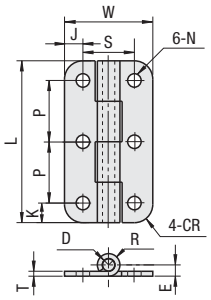
Stainless Steel Hinges RoHS





SHHPS(Stainless Steel)
SHHPSK(Stainless Steel Satin Finish)
SHHPT(Steel)





When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

Type	M Material	S Surface Treatment
SHHPS	1.4401/ X5CrNiMo17-12-2	-
SHHPSK	1.4301/ X5CrNi18-10	Satin finish
SHHPT	1.0330/1.0320/ St.22 or SPHC	Chrome Plating

Part Number Type	No.	Holes on One Side	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	N	T	E	R	CR	D	SHHPS € Unit Price Qty. 1~8	SHHPS Volume Discount 9~	SHHPSK € Unit Price Qty. 1~8	SHHPSK Volume Discount 9~
SHHPS SHHPSK	5	2	9	88	43	41	36	8	25	7.5	21	5.5	2	4.6	4.6	7.5	5				
		3	11	108	70	66															
	6	2	12	117	60	48	48	9	30	8	32										
		3	15	147	98	78															
	8	2	25	245	130	59	62	11	37	10	42	6.5	3	5.6	5.6	10	6				
		3	38	372	230	96								6.1	6.1						
	845	2	30	294	190	70	80	13.5	43	16.5	47			5.6	5.6		5				
		3	40	392	325	113								6.1	6.1		6				

Part Number Type	No.	Holes on One Side	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	N	T	E	R	CR	D	€ Unit Price Qty. 1~8	Volume Discount 9~
SHHPT	5	2	9	88	36	41	36	8	25	7.5	21	5.5	2	4.6	4.6	4	5		
		3	11	108	59	66													
	6	2	12	117	50	48	48	9	30	8	32								
		3	15	147	83	78													
	8	2	25	245	124	59	62	11	37	10	42	6.5	3.2	6.5	6.5	5	6		
		3	38	372	207	96													
	845	2	30	294	181	70	80	13.5	43	16.5	47								
		3	40	392	298	113													

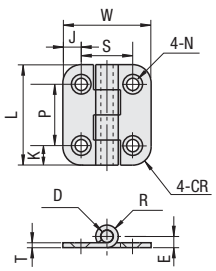
* The allowable load is the value when 2 pieces are used.

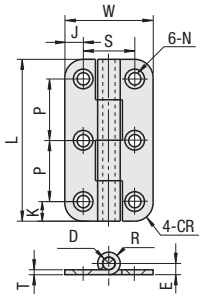
Stainless Steel Hinges (Countersunk Type) RoHS





SHHPSD
(Countersunk Type)





M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	Holes on One Side	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	Through	Countersunk	T	E	R	CR	D	€ Unit Price Qty. 1~8	Volume Discount 9~
SHHPSD	5	2	9	88	34	41	36	8	25	7.5	21	5.5	8.6 (For M4)	2	4.6	4.6	4	5		
		3	11	108	56	66														
	6	2	12	117	49	48	48	9	30	8	32									
		3	15	147	80	78														
	8	2	25	245	111	59	62	11	37	10	42	6.5	10.6 (For M5)	3	6.1	6.1	5	6		
		3	38	372	185	96														
	845	2	30	294	162	70	80	13.5	43	16.5	47									
		3	40	392	266	113														

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number	-	No. of Holes on One Side
SHHPS6	-	2

Days to Ship

6 Days P87

2 Days

Alterations

Part Number	-	Holes on One Side	-	(SET)
SHHPS6	-	3	-	SET

Alteration	Code	Spec.	Hinges	No.	Holes on One Side	Price Adder
Applicable Screw Nut Set	SET	Applicable screws and nuts come in a set. ※Stainless steel screws and nuts are included.	SHHPS SHHPSK SHHPT SHHPSD	5	2	3,12
					3	4,68
				6	2	2,84
					3	4,26
				8	2	3,16
					3	4,74
				845	2	3,16
					3	4,74

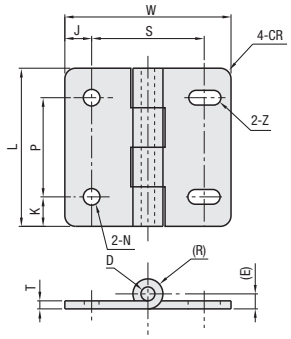
Hinges with Slotted Holes/Stainless Steel Hinges for Heavy Loads / Aluminum Detachable Hinges

CAD Data

■Hinges with Slotted Holes RoHS



SHPSNA



When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**

Material: 1.4301/X5CrNi18-10

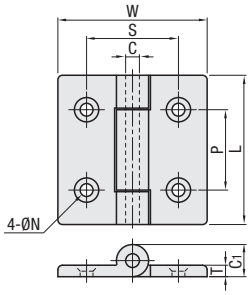
Part Number Type	No.	* Allowable Load kg	N	Mass (g)	L	W	K	P	J	S	N	Z	T	(E)	(R)	CR	D	€ Unit Price 1~19	Volume Discount 20~
SHPSNA	5	9	88	34	41	36	8	25	7.5	21	5.5	5.5x6.5	2	4.6	4.6	4	5		
	6	12	117	48	48	48	9	30	8	32		5.5x10							
	8	25	245	111	59	62	11	37	10	42	6.5	6.5x10	3	6.1	6.1	5	6		

* The allowable load is the value when 2 pieces are used.

■Stainless Steel Hinges for Heavy Loads RoHS



SHHPSZ



	Material	Surface Treatment
(1) Body	1.4401/	Buffed Finish
(2) Shaft	X5CrNiMo17-12-2	-

Part Number Type	No.	* Allowable Load (N)	Weight (g)	L	W	P	S	C	C1	T	N Through	N Countersunk	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
SHHPSZ	6	350	110	47	48	30	32	6	14	5	5.5	11	Flathead Screw 5-10	4	HNTT6-5	4		
	8	450	190	63	62	37	42	6	14	5	6.5	13	Flathead Screw 6-12		HNTT8-6			
	8-45	450	190	63	80	43	47	8	16	6	6.5	13	Flathead Screw 6-15					

* The allowable load is the value when 2 pieces are used.

■Detachable Hinges RoHS



HHPNL
(For Left-hand Use)
HHPNR
(For Right-hand Use)

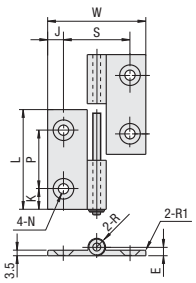


Figure is for left-hand use type

When the Hinges are mounted to the panels, etc.use the recommended Hinge Nuts on **P.725**

Material: EN AW-6063/AlMg0,7Si-T5
Bushings : Polyacetal
Surface Treatment: Anodize

Part Number Type	No.	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	N Through	N Countersunk	E	R	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
Detachable Hinges	5	10	98	22	47	36	11	25	7.5	21	5.5	11	5	5	Flathead Screw 5-8	4	HNTT5-5	4		
HHPNL (For Left-hand Use)	6			33		48	8.5	30	8	32	6.5	13	5.5	5.5	Flathead Screw 6-10		HNTT6-6			
HHPNR (For Right-hand Use)	8			48	63	62	13	37	10	42					Flathead Screw 6-12		HNTT8-6			

* The allowable load is the value when 2 pieces are used.

Order Example Part Number: SHHPSZ6, HHPNL6

Days to Ship 6 Days P.87

Alterations Part Number - (SET · SST): SHHPSZ6 -

When - SET is specified, the product is not RoHS compliant.

Alteration	Code	Spec.	Hinges	No.	Price Adder SET	SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. (When - SET is specified, the material of the Flathead Screws is 1.7220/34CrMo4 and their surface treatment is Black Oxide.)	SHPSNA	5	-	3,12
				6	-	2,84
				8	-	3,16
			SHHPSZ	6	1,64	2,70
				8	1,85	3,20
				8-45		
			HHPNL HHPNR	5	1,80	2,35
				6	1,92	2,90
				8	2,24	3,20

Stainless Steel Detachable Hinges / Hinge Nuts

-Easy Detachable Type-

CAD Data

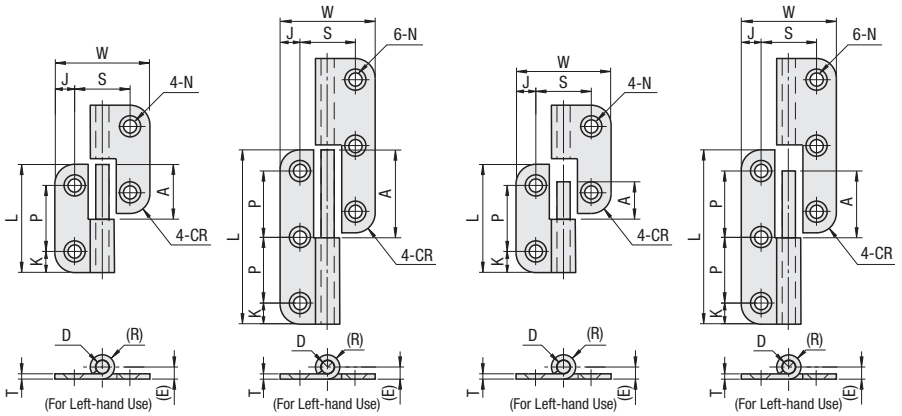
■Stainless Steel Detachable Hinges



RoHS

SHHPSL (For Left-hand Use)
SHHPSR (For Right-hand Use)

SHHPSLC (For Left-hand Use) (Short Pin Type)
SHHPSRC (For Right-hand Use) (Short Pin Type)

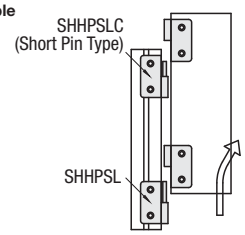


Material: 1.4301/X5CrNi18-10

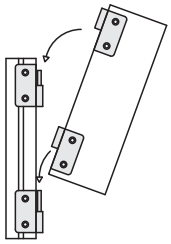
Part Number Type	No.	Holes on One Side	* Allowable Load kg	N	Mass (g)	L	W	SHHPSL SHHPSR A	SHHPSLC SHHPSRC A	K	P	J	S	N Through	N Countersunk	T	(E)	(R)	CR	D	Applicable Screw Screws	Applicable Screw Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
SHHPSL SHHPSLC (For Left-hand Use)	5	2	9	88	34	41	36	19	14	8	25	7.5	21	5.5	8.6 (For M4)	2	4.6	4.6	4	5	SHFBS4-8	4		
		3	11	108	55	66		31	26													6		
	6	2	12	117	49	48	48	22	17	9	30	8	32								SHFBS4-10	4		
		3	15	147	80	78		37	32													6		
SHHPSR SHHPSRC (For Right-hand Use)	8	2	25	245	111	59	62	29	24	11	37	10	42	6.5	10.6 (For M5)	3	6.1	6.1	5	6	SHFBS5-12	4		
		3	38	372	185	96		47	42													6		
	845	2	30	294	162	70	80	34	29	13.5	43	16.5	47									4		
		3	40	392	266	113		56	51													6		

* The allowable load is the value when 2 pieces are used. ⓟThe applicable screws and nuts can be provided as a set.

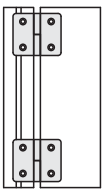
Example



1.Remove the panel from the extrusion.



2.When re-mounting the panel on the frame, insert the lower hinge first as the Pin (the upper hinge in the above drawing) is shorter .



3.Installing and removing the panels is easy since the upper hinge is inserted after locating with the lower hinge.

Order Example Part Number: SHHPSL5 - Holes on One Side: 2

Days to Ship 6 Days P.87

2 Days

Alterations Part Number: SHHPSL5 - Holes on One Side: 2 - (SST)

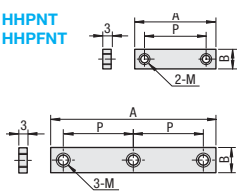
Alteration	Code	Spec.	Hinges	No.	Holes on One Side	Price Adder SST
Applicable Screw Nut Set	SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. (Ex.) Screw: SHFBS4-8 Nuts: HNTTSN5-4	SHHPSL SHHPSLC SHHPSR SHHPSRC	5	2	3,12
					3	4,68
				6	2	2,84
					3	4,26
				8	2	3,16
					3	4,74
				845	2	3,16
					3	4,74

■Hinge Nuts



RoHS

HHPNT
HHPFNT



Material: 1.4301/X5CrNi18-10

Part Number Type	No.	No. of Holes	B	A	P	M	€ Unit Price Qty. 1~9	Volume Discount 10~
HHPNT	5	2	9	34	25	5		
		3		59				
	6	2	10	40	30	6		
		3		70				
	8	2	12	49	37			
		3		86				
	845	2		55	43			
		3		98				
HHPFNT	5	2	14	33	20	5		
	6	2	16	38	25	6		
	8	2	18	48	30			

■Applicable Hinge Nuts for Hinges on Panel

Hinges	No.	No. of Holes	Applicable Hinge Nuts
HHPSN HHPBSN HHPSJ SHHPS HHPSDT HHPSNA HHPSNH HHPMGS SHPSNA SHHPSZ HHPNL HHPNR HHPSSD	5	2	HHPNT5-2
	6		HHPNT6-2
	8		HHPNT8-2
	8-45		HHPNT845-2
HHPSF	8-6		HHPNT8-2
	845-6		
SHHPS	5	3	HHPNT5-3
	6		HHPNT6-3
	8		HHPNT8-3
	845		HHPNT845-3
HHPFLN HHPFRN HHPFDLN HHPFDRN	5	2	HHPFNT5-2
	6		HHPFNT6-2
	8		HHPFNT8-2
	8-45		

ⓟNot applicable to HHPSJ6, SHPSNA6 and SHHPSZ6.

Order Example Part Number: HHPNT5 - No. of Holes: 3

Days to Ship 6 Days P.87

Aluminum Detachable Hinges / Flag Hinges / Flag Hinges for Different Extrusion Sizes

CAD Data CAD File Name Example: HHPFDLN→hhpfdl6 HHPFLN→hhpfl5

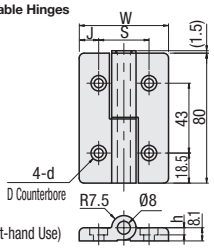
■Aluminum Detachable Hinges



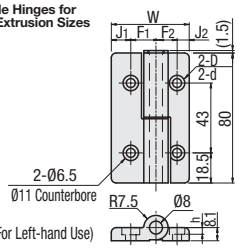
RoHS

	Type		Leaf		Bushings
	Detachable Hinges	Detachable Hinges for Different Extrusion Sizes	M Material	S Surface Treatment	M Material
For Left-hand Use	HHPNLK	HHPNDLK	EN AC-46100/ G-AlSi12Cu	Shot Blasted	Polyacetal
	HHPNLK-B			Baked Finish (Black)	
	HHPNLK-S			Baked Finish (Silver Metallic)	
For Right-Hand Use	HHPNRK	HHPNDRK	EN AC-46100/ G-AlSi12Cu	Shot Blasted	Polyacetal
	HHPNRK-B			Baked Finish (Black)	
	HHPNRK-S			Baked Finish (Silver Metallic)	

Detachable Hinges



Detachable Hinges for Different Extrusion Sizes



Part Number Type	No.	* Allowable Load kg	N	Mass (g)	W	J	S	D	d	h	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~19	Volume Discount 20~
Detachable Hinges HHPNLK HHPNLK-B HHPNLK-S	5-25	10	98	86	41	7.5	26	9.5	5.5	4.1	CBS5-8	4 Pcs.	HNTT5-5	4 Pcs.		
HHPNRK HHPNRK-B HHPNRK-S	6			103	55	12	31						HNTT6-6			
	8	15	147	120	73	16	41	11	6.5	4.4	CBS6-12		HNTT8-6			
	8-45			130	83	18.5	46									

Part Number Type	No.	* Allowable Load kg	N	Mass (g)	W	J1	F1	D	d	h	J2	F2	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~19	Volume Discount 20~
Detachable Hinges for Different Extrusion Sizes HHPNDLK HHPNDRK	6-5	10	98	95	48	12	15.5	9.5	5.5	4.1	7.5	13	CBS5-8 / CBS6-12	2 Pcs. Each	HNTT5-5 / HNTT6-6	2 Pcs. Each		
	8-5	15	147	103	57	16	20.5				7.5	13	CBS5-8 / CBS6-15		HNTT5-5 / HNTT8-6			
	845-5			108	62	18.5	23				7.5	13						
	8-6			111	64	16	20.5	11	6.5	4.4	12	15.5	CBS6-12	4 Pcs.	HNTT6-6 / HNTT8-6			
	845-6			116	69	18.5	23				12	15.5						

* The allowable load is the value when 2 pieces are used.



(Photo is for left-hand use type)

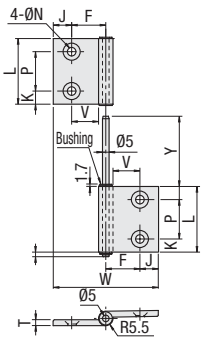
(Photo is for right-hand use type)

RoHS

Flag Hinges

HHPFLN
(For Left-hand Use)

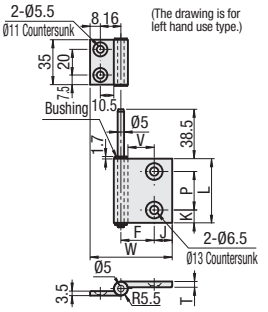
HHPFRN
(For Right-hand Use)



Flag Hinges for Different Extrusion Sizes

HHPFDLN
(For Left-hand Use)

HHPFDRN
(For Right-hand Use)



M Material: EN AW-6063/AlMgSi0,7-T5 Bushing: Polyacetal (White)
S Surface Treatment: Anodize

Part Number Type	No.	* Allowable Load kg	N	Mass g	L	W	K	P	J	F	V	N Through	N Countersunk	T	Y	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HHPFLN HHPFRN	5	10	98	36	35	48	7.5	20	8	16	10.5	5.5	11	3.5	38.5	Flathead Screw 5-8	4	HNTT5-5	4		
	6			46	40	62	7.5	25	10	21	15.5				43.5	Flathead Screw 6-10		HNTT6-6			
	8	15	147	74	50	80	10	30	14	26	20.5	6.6	13	4.5	53.5	Flathead Screw 6-15		HNTT8-6			
	8-45			74	50	80	10	30	11.5	28.5	23										

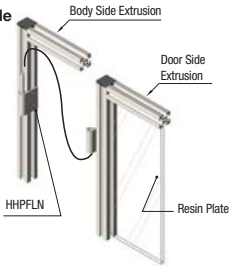
Part Number Type	No.	*Allowable Load kg	N	Mass g	W	L	K	P	J	F	V	T	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HHPFDLN HHPFDRN	6	10	98	42	55	40	7.5	25	10	21	15.5	3.5	Flathead Screw 6-10 / Flathead Screw 5-8	2 pcs. for each	HNTT6-6 / HNTT5-5	2 pcs. for each		
	8	15	147	56	64	50	10	30	14	26	20.5	4.5	Flathead Screw 6-15 / Flathead Screw 5-8		HNTT8-6 / HNTT5-5			
	8-45					50	10	30	11.5	28.5	23							

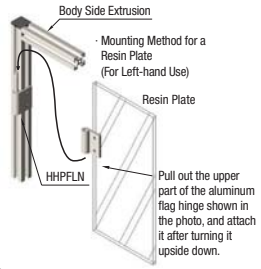
* The allowable load is the value when 2 pieces are used.

Order Example Part Number HHPFLN5 HHPNLK5-25

Days to Ship 6 Days 2 Days P.87

Example





· Example of Flag Hinge for Different Extrusion Sizes



When the Hinges are mounted to the panels, etc., use the recommended Hinge Nuts on **P.725**



Alterations Part Number - (SET · SST)
HHPFLN5 - SET
When -SET is specified, the product is not RoHS compliant.

Alteration	Code	Spec.	Hinges	No.	Price Adder SET	SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. (Ex.) Screw: CBSST5-8 Nut: HNTTSN6-5 When SET is specified, the material of the Screws is 1.7220/34CrMo4 and their surface treatment is Black Oxide.	HHPNLK HHPNRK	5-25	2,05	2,15
				6	2,25	2,35
				8	2,50	2,60
				8-45	2,50	2,60
			HHPNDLK HHPNDRK	6-5	2,15	2,25
				8-5	2,30	2,40
				845-5	2,30	2,40
				8-6	2,40	2,50
				845-6	2,40	2,50
			HHPFLN HHPFRN	5	1,80	2,00
				6	1,92	2,40
				8	2,24	2,70
				8-45		
			HHPFDLN HHPFDRN	6	1,86	2,20
				8	2,02	2,30
				8-45		

Aluminum Long Hinges

CAD Data

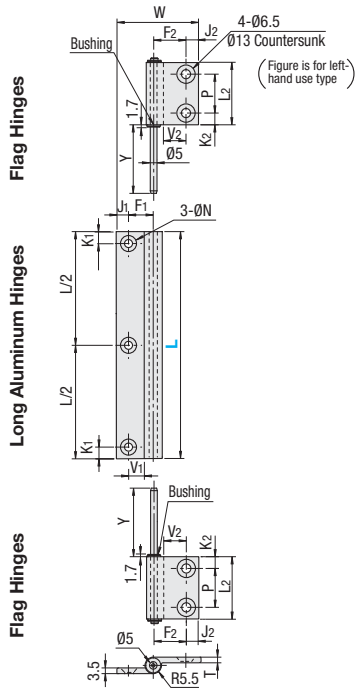
■Aluminum Long Hinges

RoHS



HHPV

(For Right and Left Hand Use)



M Material: EN AW-6063/AlMg0,7Si-T5
Bushing: Polyacetal
S Surface Treatment: Anodize*

* No anodizing on ends of L dimension specified part.

Part Number		Hinge Frame L	Allowable Load		W	L_2	P	K_1	K_2	J_1	J_2	F_1	F_2	V_1	V_2	N		T	Y	Screws / Nuts (L Dimensions Less than 500mm)				€ Unit Price /m	Flag Hinges / 2 pcs. Countersink at 3 places
Type	No.	1mm Increment	kg	N												Through	Countersunk			Screws	Qty.	Nuts	Qty.		
HHPV	6-5	100~1000	10	98	55	40	25	7.5	7.5	8	10	16	21	10.5	15.5	5.5	11	3.5	43.5	Flathead Screw 6-10	4	HNTT6-6	4		
																				Fl. Screw 5-8	3	HNTT5-5	3		
	6-6				62															Fl. Screw 6-10	7	HNTT6-6	7		
	8-6				71	50	30	8	10	10	14	21	26	15.5	20.5	6.5	13	4.5	38.5	Fl. Screw 6-15	4	HNTT8-6	4		
																				Fl. Screw 6-10	3	HNTT6-6	3		
	845-6										11.5		28.5		23					Fl. Screw 6-15	4	HNTT8-6	4		
																				Fl. Screw 6-10	3	HNTT6-6	3		

Order Example

Part Number	-	L
HHPV6-5	-	200

Example



Days to Ship

8 Days

Price

€ Unit Price/m x Length of Hinge Frame + Aluminum Flag Hinges 2 pcs. + Countersink at 3 places =Total Price
ex: HHPV6-5-200
21,00 x 0.2m + 15,50 = 19,70 EUR (Round down to ten Cent.)

Alterations

Part Number	-	L	-	(SET · SST)
HHPV8-6	-	250	-	SET

Alteration	Code	Spec.	Hinges	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included.	HHPV	6-5	3,25	3,60
				6-6	3,35	3,70
				8-6	3,65	3,80
				845-6		

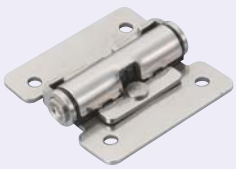
Single Joint Connection P.635

Torque Hinges

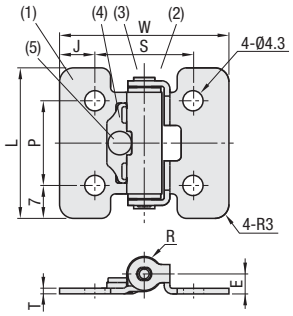
-Torque Fixed Type · Torque Adjustable Type-

CAD Data

■Torque Fixed Type RoHS



HHPT



Operating Temp. Range: -10°C~50°C
Operating Humidity Range: 90% RH or less

■Cautions on Use
- Use 2 pcs. per door (flap)
- Place the axes of 2 Hinges on a common line.
- Do not use in places where oil or grease contacts, or in the outdoors.
- Do not use for locations requiring frequent open/close.
- For its product properties, the Hinges are not designed for vertical use. Therefore, for allowable loads and the torque values at vertical use, refer to those of the products actually used.

Name of Parts	Material
(1) Wing	1.4301/X5CrNi18-10
(2) Resin Tube	Polyacetal
(3) Shaft	1.4305/X10CrNiS18-9
(4) Plate	1.4301/X5CrNi18-10
(5) Swaging Pin	1.4567/X3CrNiCu18-9-4

For Torque Hinges selection, refer to the Formula of Selection Guide on **P.1063**

Part Number Type	No.	* Torque Rating N·m	kgf·cm	Mass (g)	L	W	P	J	S	T	E	R	Extrusions (Series)	Screws / Nuts Screws	Qty.	Nuts	Qty.	€ Unit Price Qty. 1~19	Volume Discount 20~
HHPT	3	0.35	3.4	15	32	36	18	7.5	21	1.2	4.25	7.5	HFS5	Socket Head Cap Screw 4-6	4	HNTT5-4	4		
	7	0.7	6.9	28	40	48	26	8	32	1.2	4.75	8.5	HFS6	Socket Head Cap Screw 4-10	4	HNTT6-4	4		
	15	1.5	14.7	64	50	48	36	8	32	2	6.5	12							

* The Torque Rating may have tolerance ranges about +40%~-20%.
* The torque value of 1 pc. of Hinge is shown as the Torque Ratings.

Order Example Part Number: HHPT15

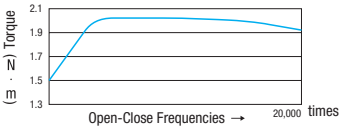
Days to Ship 6 Days P.87

Alterations Part Number - (SET): HHPT7 - SET

Alteration	Code	Spec.	Hinges	No.	Price Adder
Applicable Screw Nut Set	SET	Applicable screws and nuts come in a set. ⓟ Stainless steel screws and nuts are included.	HHPT	3	2,15
				7	2,35
				15	2,40

Example

Reference: Torque variations Ambient Temp. (20±15°C), Operating Humidity Range: 90%RH or Low

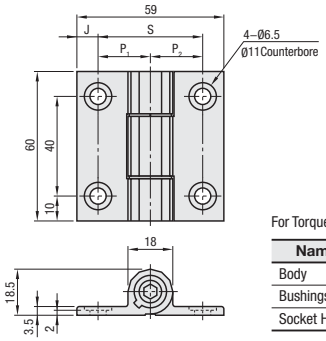


Data above are not guaranteed values but reference values of HHPT15.
Open-Close intervals: 5 times /min. (Single open-close operation = 0°⇔160°)
* Considering torque deteriorations caused by aging, temperature and humidity variation, the torque value is set higher than the rated torque value at shipping.

■Torque Adjustable Type RoHS



HHPTF HHPTFB



For Torque Hinges selection, refer to the Formula of Selection Guide on **P.1063**

Name of Parts	Material	Surface Treatment
Body	EN AW-6063/AlMg0,7Si	Anodized
Bushings	Polyacetal (White)	-
Socket Head Cap Screw	1.4567/X3CrNiCu18-9-4	-

Part Number Type	No.	* Allowable Load kg	N	** Torque Rating N·m	kgf-cm	Mass (g)	S	P1	P2	J	Screws / Nuts Screws	Qty.	Nuts	Qty.	Clear Anodize € Unit Price Qty. 1~8	Clear Anodize Vol. Discount 9~	Black Anodize € Unit Price Qty. 1~8	Black Anodize Vol. Discount 9~
HHPTF HHPTFB (Black Anodize)	6	10	98	0~4.9	0~50	54	32	16	16	13.5	Socket Head Cap Screw 6-10	4	HNTT6-6	4				
	8-6						37	16	21	13.5	Socket Head Cap Screw 6-10	2	HNTT6-6	2				
											Socket Head Cap Screw 6-12	2	HNTT8-6	2				
	8						42	21	21	8.5	Socket Head Cap Screw 6-12	4	HNTT8-6	4				

* The allowable load is the value when 2 pieces are used. ** The torque value of 1 pc. of Hinge is shown as the Torque Rating.

Order Example Part Number: HHPTF8

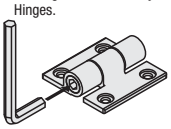
Days to Ship 6 Days P.87

Alterations Part Number - (SET · SST): HHPTF6 - SET

Alterations	Code	Spec.	Hinges	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET SST (Stainless Steel)	Applicable screws and nuts come in a set. When SST is specified, stainless steel screw and nut are included. ⓟWhen -SET is specified, the product is not RoHS compliant. (When SET is specified, the material of the Screws is 1.7220/34CrMo4 and their surface treatment is JIS STKM Bright Chromate Plating.)	HHPTF HHPTFB	6	1,80	2,35
				8-6	1,92	2,50
				8	2,24	2,60

Example

The torque value is adjustable using a Hexa-gonal Wrench.
ⓟSwaging by 1.5Nm or more using a hexagonal wrench may break the Hinges.



Latch Magnets for Aluminum Frames

CAD Data

Latch Magnets for Aluminum Frames

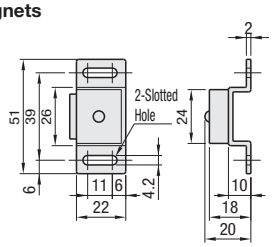


RoHS

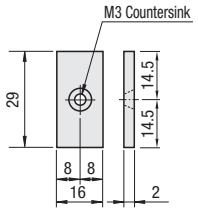
* When requesting magnets only, refer to HMEN-T on **P.1070**

Parts		M Material	S Surface Treatment
Latch Magnets	Housing	1.4301/ X5CrNi18-10	Dark Brown Paint
	Magnet	Ferrite	-

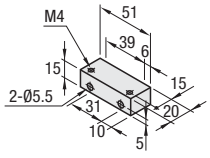
HMEN-T Latch Magnets



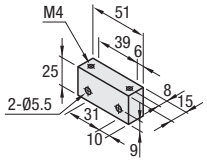
Catch Plate



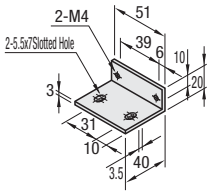
MG5-5 Plate



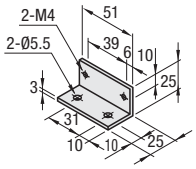
MG6-5 Plate



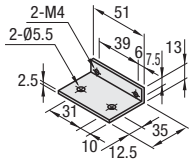
MG8-5 Plate



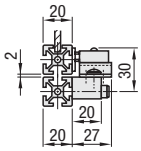
MG6-6 Plate



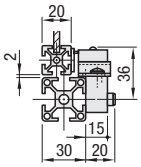
MG8-6 Plate



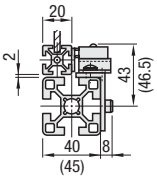
5-5 Mounting Example



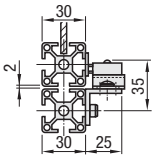
6-5 Mounting Example



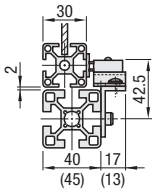
8-5 Mounting Example



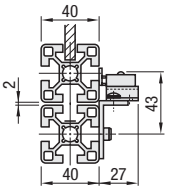
6-6 Mounting Example



8-6 Mounting Example



8-8 Mounting Example



Dimensions in ( ) are for 45 square extrusions.

Part Number		Components													Unit Price	Volume Discount Rate
		Magnet Side								Door Side (Extrusion)						
					For Magnet Mounting					For Frame Fitting						
Type	No.	Magnet	Retaining Force N (kgf)	Installation Plate	Mounting Screws	Quantity	Screws	Quantity	Nuts	Quantity	Flathead Screw	Quantity	Nuts	Quantity	1~4 Qty.	5~50
HMEN	5-5	HMEN-T	29.4 (3)	MG5-5	Truss Screw M4 –5	2	SCB5-25	2	HNTT5-5	2	M3-6	1	HNTT5-3	1		
	6-5			MG6-5			SCB5-22		HNTT6-5							
	8-5			MG8-5			SCB5-15		HNTT8-5							
	6-6			MG6-6			SCB5-10		HNTT6-5		M3-8		HNTT6-3			
	8-6			MG8-6			SCB5-12		HNTT8-5							
	8-8			MG8-5			SCB5-15		HNTT8-5		M3-10		HNTM8-3			

Selection Standard			
Door Side Plate	Body Side Extrusion		
	20 Square	30 Square	40/45 Square
20 Square	HMEN5-5	HMEN6-5	HMEN8-5
30 Square	-	HMEN6-6	HMEN8-6
40 Square	-	-	HMEN8-8

Order Example

Part Number
HMEN6-6

Days to Ship

6 Days P.87

* When requesting magnets only, refer to HMEN-T on **P.1070**

Latch Magnets for Aluminum Frames / Thin Latch Magnets for Extrusions

CAD Data

Latch Magnets for Aluminum Frames

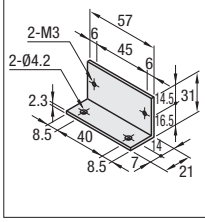
* When requesting magnets only, refer to MGCE on P.1069



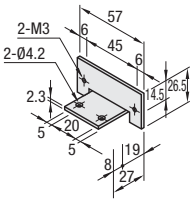
RoHS

Parts		Material	Surface Treatment
Latch Magnets	Housing	Aluminum Alloy	Anodize
	Magnet	Ferrite	-
	Absorption Board	1.0330/DC01	430 Stainless Steel

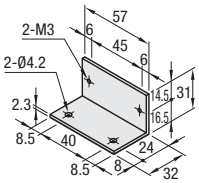
ME5-5 Plate



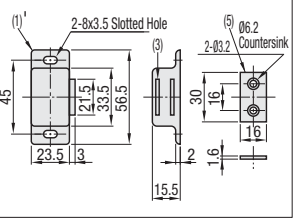
ME6-5 Plate



ME6-6 Plate



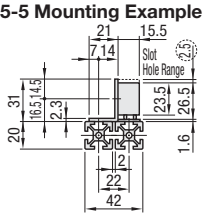
MGCE1



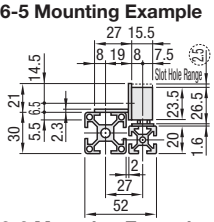
Part Number		Components												€ Unit Price	Volume Discount
		Frame Side							Door Side						
Type	No.	Magnet	Mounting Plate	Mounting Screw	Quantity	Nuts	Quantity	Mounting Screws	Quantity	Mounting Screws	Quantity	Nuts		Qty. 1~9	10~
HMGCE	5-5	MGCE1	ME5-5	SCB4-6	2	HNTT5-4	2	SCB3-6	2	HFBCM3-6	2	HNTT5-3			
	6-5		ME6-5	SCB4-8		HNTT6-4				HFBCM3-6					
	6-6		ME6-6							HFBCM3-8		HNTT6-3			

Example

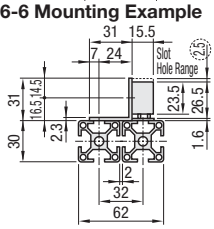
5-5 Mounting Example



6-5 Mounting Example



6-6 Mounting Example



Thin Latch Magnets for Extrusions

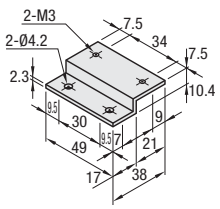
* When requesting magnets only, refer to MGCBU on P.1071



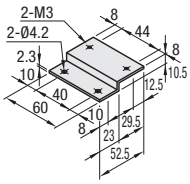
RoHS

Parts		Material	Surface Treatment
Latch Magnets	Housing	ABS Resin	-
	Magnet	Ferrite	-
	Absorption Board	1.0330/DC01	Chrome Plating

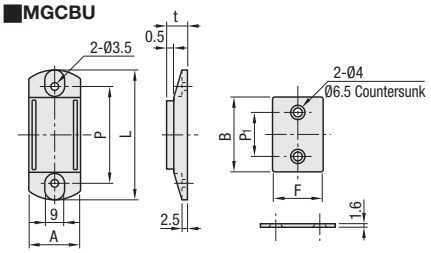
MB5-5



MB6-6



MGCBU



Part Number		Components																				€ Unit Price	Volume Discount
		Frame Side												Door Side									
Type	No.	Magnet	L	P	A	t	F	B	P1	Installation Plate	Mounting Screws	Quantity	Nuts	Quantity	Mounting Screws	Quantity	Mounting Screws	Quantity	Nuts	Quantity		Qty. 1~9	10~
HMBCE	5-5	MGCBU49	49	34	17	6.5	16.5	24	13	MB5-5	SCB4-6	2	HNTT5-4	2	SCB3-6	4	HFBCM3-6	2	HNTT5-3	2			
	6-6	MGCBU59	59	44	23.5	6.7	23	34	20	MB6-6	SCB4-8		HNTT6-4		SCB3-6		HFBCM3-8		HNTT6-3				

Order Example

Part Number
HMGCE5-5
HMBCE6-6

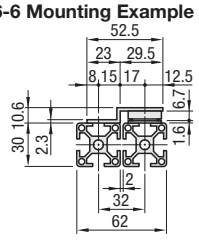
Days to Ship

6 Days

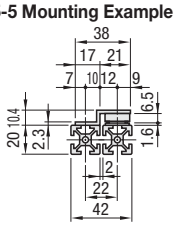
P.87

Example

6-6 Mounting Example



5-5 Mounting Example



Latch Magnets with Sensors for Aluminum Frames

CAD Data

Latch Magnets with Sensors for Aluminum Frames



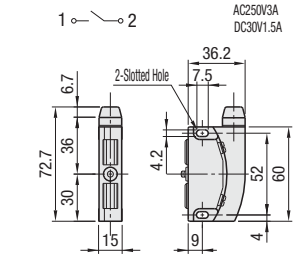
RoHS

Parts		M Material	S Surface Treatment
Latch Magnets	Housing	Polybutylene Terephthalate (PBT)	-
	Terminal Cover	Polycarbonate	-
	Absorption Board	1.0330/DC01	430 Stainless Steel

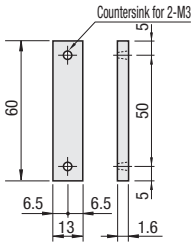
K Magnet

ON for Closing Position

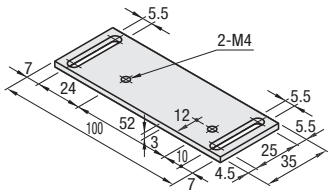
Contact Capacity
AC125V3A
AC250V3A
DC30V1.5A



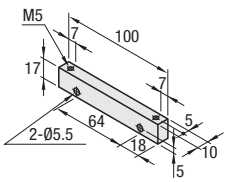
Catch Plate



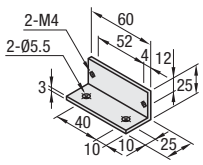
HMER-ML



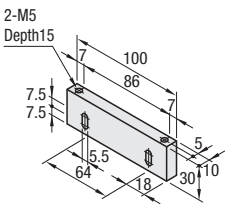
ML5-5 Plate



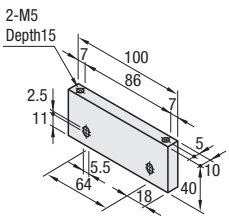
ML6-6 Plate



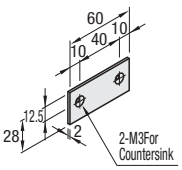
ML68-5 Plate



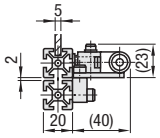
ML8-6 Plate



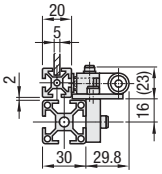
MLG Plate



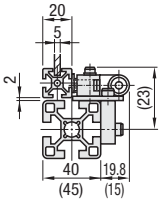
5-5 Mounting Example



6-5 Mounting Example

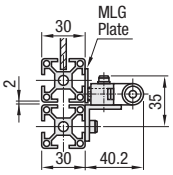


8-5 Mounting Example



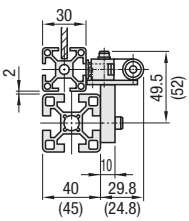
Dimensions in ( ) are for 45 square extrusions.

6-6 Mounting Example



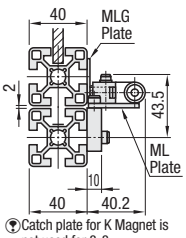
Catch plate for K Magnet is not used for 6-6.

8-6 Mounting Example



Dimensions in ( ) are for 45 square extrusions.

8-8 Mounting Example



Catch plate for K Magnet is not used for 8-8.

Part Number		Components																	Unit Price	Volume Discount
		Magnet Side													Door Side (Extrusion)					
					For Magnet Mounting				For Frame Fitting											
Type	No.	Magnet	Retaining Force N (kgf)	Installation Plate	Screws	Quantity	Flat Washer	Quantity	Screws	Quantity	Screws	Quantity	Nuts	Quantity	Flathead Screw	Quantity	Nuts	Quantity	1~4 Qty.	5~50
With Sensor	5-5	K Magnet	29.4 (3)	ML5-5	SCB4-18	2	PWF4	2	SCB5-15	2	4	-	-	HNTT5-5	2	M3-6	2	HNTT5-3	2	
	6-5			ML68-5,8							SCB5-18	2	HNTT6-5							
	8-5			ML68-5,8							SCB5-22		HNTT8-5							
	6-6			ML6-6 MLG Plate	SCB5-10				-		SCB4-20		HNTT6-5			M3-8		HNTT6-3		
	8-6			ML8-6	SCB5-22				SCB5-15		SCB4-18		HNTT8-5							
	8-8			ML68-5,8 MLG Plate	SCB4-18				SCB5-22	2	SCB5-15	2	HNTT8-5			M3-10		HNTM8-3		

Selection Standard			
Door Side Plate	Body Side Extrusion		
	20 Square	30 Square	40 · 45 Square
20 Square			
30 Square	-		
40 Square	-	-	(40 Square only)

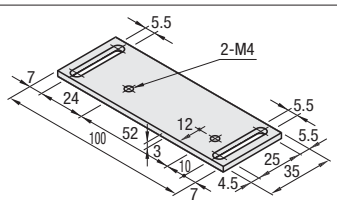
Order Example — Part Number

Days to Ship — 6 Days P.87

Non-Set Mounting Plate



RoHS



Part Number	€ Unit Price	Volume Discount
	Qty. 1~9	10~50
HMER-ML		

For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number: HMER-ML

Days to Ship — 6 Days P.87

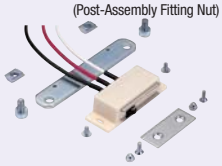
Latch Magnets for Panels

CAD Data

HMGN(Pre-Assembly Fitting Nut)
HMGNA(Post-Assembly Fitting Nut)



With Sensor
(Pre-Assembly Fitting Nut)
(Post-Assembly Fitting Nut)

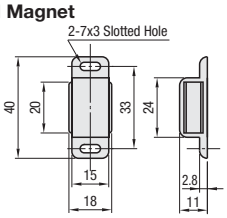
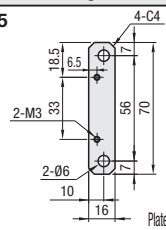
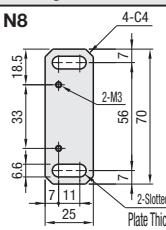
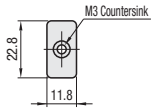
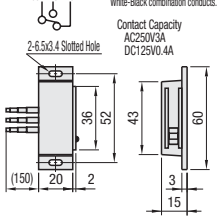
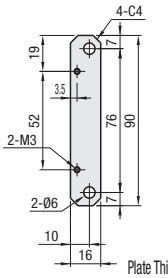
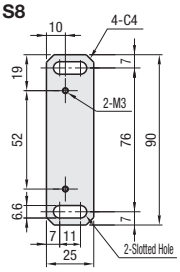
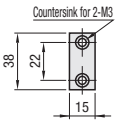
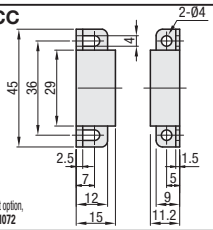
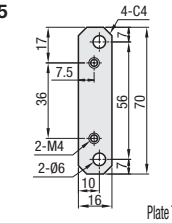
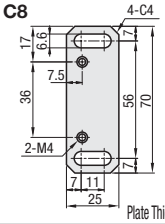
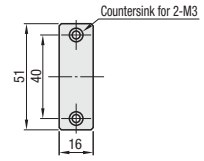


Low Particulate Generation
HMGCC(Pre-Assembly Fitting Nut)
HMGCCA(Post-Assembly Fitting Nut)



■Dust-Proof Latch Magnets
- The encapsulated structure of the magnet is effective in preventing rust and dust.
- These latch magnets are the best for the use in clean rooms.

Parts		Material	Surface Treatment
Latch Magnets	N Magnet	Polyethylene	-
	MGCC	Polyacetal	
Door Side Plate	N Plate/S Plate	1.0330/DC01	430 Stainless Steel
	C Plate	1.4016/X6(8)Cr17	-
Mounting Plate	N Plate/S Plate	1.0330/DC01	430 Stainless Steel
	C Plate	Aluminum Alloy	-

Type	Magnet Side	Mounting Plate for M5	Mounting Plate for M6·M8	Door Side Plate
Latch Magnets	**N Magnet** 	**N5**  Plate Thickness 3.2mm	**N6 · N8**  Plate Thickness 3.2mm	**N Plate**  Plate Thickness 1.4mm
Latch Magnets with Sensor	* For non-set option, refer to P.1073 When the magnet housing and the catch plate are attracted, White-Red combination conducts. When the magnet housing and the catch plate are separated, White-Black combination conducts. White Red COM NO Black NC Contact Capacity AC250V3A DC125V0.4A 	**S5**  Plate Thickness 3.2mm	**S6 · S8**  Plate Thickness 3.2mm	**S Plate**  Plate Thickness 1.6mm
Low Particulate Latch Magnets	**MGCC**  * For non-set option, refer to P.1072	**C5**  Plate Thickness 3mm	**C6 · C8**  Plate Thickness 3mm	**C Plate**  Plate Thickness 1.5mm

Part Number		Magnet	Components											Pre-Assembly Fitting Nuts		Post-Assembly Fitting Nut	
					Magnet Side							Door Side					
					For Magnet Mounting		For Frame Fitting										
Type	No.		Pull Force N (kgf)	Mounting Plate	Mounting Screws	Quantity	Screws	Quantity	Pre-Assembly Fitting Nuts	Post-Assembly Fitting Nut	Quantity	Door Side Plate	Mounting Screws	Pack Nuts	Unit Price 1~4 Qty.	Volume Discount 5~	Unit Price 1~4 Qty.	Volume Discount 5~
HMGN (Pre-Assembly Fitting Nut) HMGNA (Post-Assembly Fitting Nut)	5	N Magnet	9.8 (1)	N5	M3x6	2	SCB5-8	2	HNTT5-5	HNTA5-5	2	N Plate	M3x8	1				
	6			N6			SCB6-10		HNTT6-6	HNTA6-6			M3x10					
	8			N8			SCB6-15		HNTT8-6	HNTA8-6								
(Pre-Assembly Fitting Nut) (Post-Assembly Fitting Nut)	5		19 (2)	S5	M3x6	2	SCB5-8	2	HNTT5-5	HNTA5-5	2	S Plate	M3x8	2				
	6			S6			SCB6-10		HNTT6-6	HNTA6-6			M3x10					
	8			S8			SCB6-15		HNTT8-6	HNTA8-6								
HMGCC (Pre-Assembly Fitting Nut) HMGCCA (Post-Assembly Fitting Nut)	5	1(MGCC1: Black) 2(MGCC2: Gray) 3(MGCC3: White)	MGCC1 (1.0) MGCC2 (1.4) MGCC3 (2.0)	C5	M4x4	2	SCB5-8	2	HNTT5-5	HNTA5-5	2	C Plate	M3x8	2				
	6			C6			SCB6-10		HNTT6-6	HNTA6-6			M3x10					
	8			C8			SCB6-15		HNTT8-6	HNTA8-6								

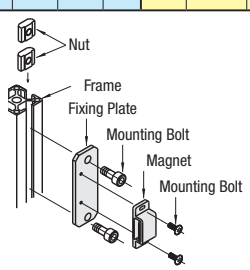
Order Example

Part Number	-	Magnet
HMGN6 HMGCC5	-	1

Days to Ship

6 Days P.87

Example



Latch Magnets for Panels / Ball Catch Sets for Frames

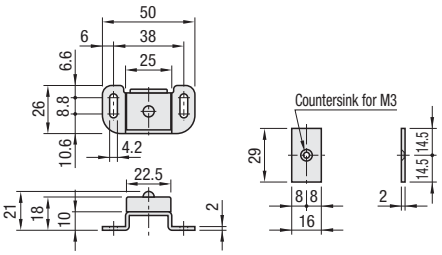
CAD Data

■For Panel Fitting Latch Magnets

RoHS

HMENP





Name of Parts	Material	Surface Treatment
Housing	1.4301/X5CrNi18-10	Dark Brown Paint
Magnet	Ferrite	-
Plate	1.0330/DC01	Trivalent Chromate

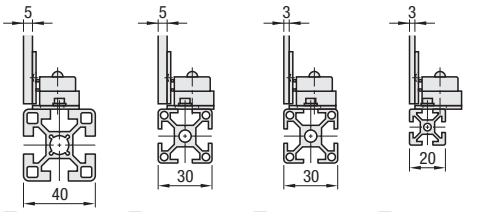
Part Number	€ Unit Price Qty. 1~9	Volume Discount 10~50
HMENP		

For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number: HMENP

Days to Ship — 6 Days P.87

Example



■When mounting 5mm thick panel to 40 square

■When mounting 5mm thick panel to 30 square

■When mounting 3mm thick panel to 30 square

■When mounting 3mm thick panel to 20 square

■Ball Catch

RoHS

HBCS



Material: Ball Catch (1)(2): Zinc Alloy (Chrome Plating)
Bracket (3)(4): 1.0320/St.22 (Chrome Plating)
(5)(6): EN AW-6063/AlMg0,7Si

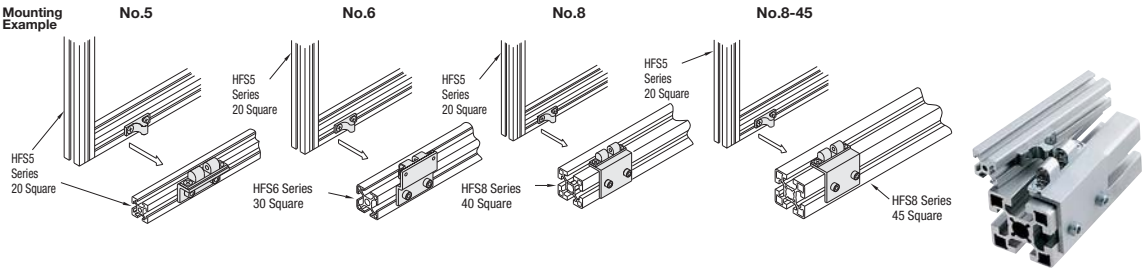
Part Number Type	No.	Components: Ball Catch Side: Ball Catch	Mounting Bracket	For Catch Fitting: Mounting Screws	Quantity	For Frame Fitting: Screws	Quantity	T Nut	Quantity	Door Side: Door Side Catch	For Catch Fitting: Mounting Screws	Quantity	T Nut	Quantity	Push Force	Pull Force	Unit Price Qty. 1~9	Volume Discount 10~
HBCS	5	(1)	(3)	Flathead Screw M4x6	2	SCB5-8	2	HNTT5-5	2	(2)	Flathead Screw M4x8	2	HNTT5-4	2	27.5N	18.6N		
	6		(4)			SCB5-10		HNTT6-5										
	8		(5)			SCB5-12		HNTT8-5										
	8-45		(6)			SCB5-15		HNTT8-5										

Order Example — Part Number: HBCS6

Days to Ship — 6 Days P.87

Example

Mounting Example



Latch Sets for Extrusions / Slide Bolt Sets for Frames

CAD Data

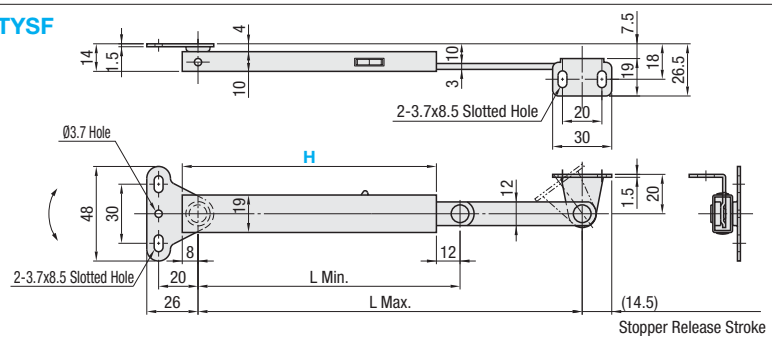
Latch Sets for Extrusions

RoHS

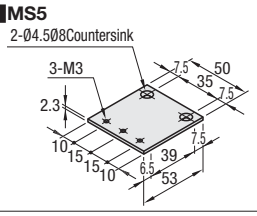


Parts	M Material	S Surface Treatment
Latch	1.4301/ X5CrNi18-10	Brushed Finish
Mounting Plate	1.0330/DC01	Trivalent Chromate

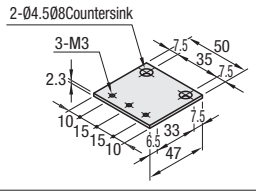
STYSF



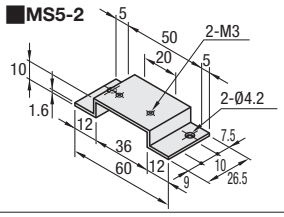
MS5



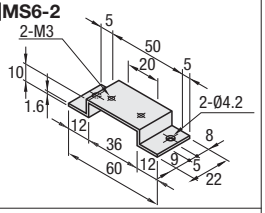
MS6



MS5-2



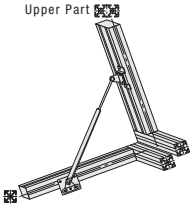
MS6-2



Mounting Example

STYF Stay can be attached by using metals with aluminum frame extrusions.STYFBracket can be attached.

	STYSFCombination of Fitting and Aluminum Frame	
	STYSF5	STYSF6
Upper Part	HFS5-2040	HFS6-3060
Lower Part	HFS5-2020	HFS6-3030

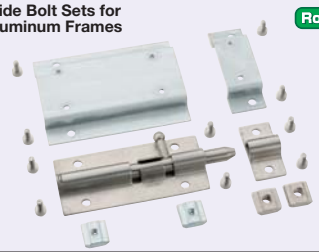


Part Number			Components																Unit Price	Volume Discount
			Frame Side										Door Side							
Type	No.	H	Min. Length L Min	Max. Length L Max	Max. Retainable Load N (kgf) /pc.	Installation Plate	Mounting Screws	Quantity	Screws	Quantity	Nuts	Quantity	Installation Plate	Mounting Screws	Quantity	Screws	Quantity	Nuts	Quantity	1~4 Qty.	5~50
STYSF	5	129	133	195	147 (15)	MS5	SHFBS4-6	2	SCB3-6	3	HNTT5-4	2	MS5-2	SCB4-6	2	SCB3-6	2	HNTT5-4	2		
		166	170	270		MS5	SHFBS4-6	2	SCB3-6		HNTT5-4		MS5-2	SCB4-6		SCB3-6		HNTT5-4			
	6	129	133	195		MS6	SHFBS4-8	2	SCB3-6		HNTT6-4		MS6-2	SCB4-8		SCB3-6		HNTT6-4			
		166	170	270		MS6	SHFBS4-8	2	SCB3-6		HNTT6-4		MS6-2	SCB4-8		SCB3-6		HNTT6-4			

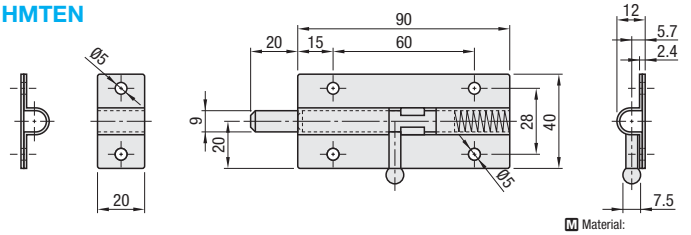
Mounting brackets are the same for different length latches. Brackets will differ for different frames.

Slide Bolt Sets for Aluminum Frames

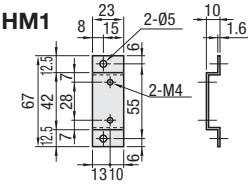
RoHS



HHMTEN

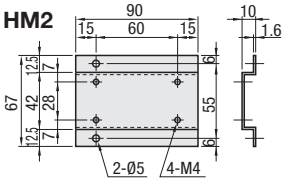


HM1



M Material: 1.0330/DC01
S Surface Treatment: Trivalent Chromate

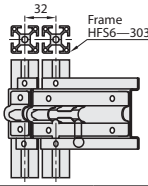
HM2



M Material: 1.0330/DC01
S Surface Treatment: Trivalent Chromate

Example

Slide Bolts (HHMT90) can be directly attached to Aluminum Frame HFS6 by using slide bolts fitting metals.HHMT90) can be directly mounted to Aluminum Frame HFS6 by using slide bolts fitting metals.HFS6



Part Number		Components											Unit Price	Volume Discount
		Frame Side						Door Side						
Type	No.	Slide Bolt	Installation Plate	Mounting Screws	Quantity	Nuts	Quantity	Installation Plate	Mounting Screws	Quantity	Nuts	Quantity	Qty. 1~9	10~
HHMTEN	6	HHMT90	HM1	SCB4-8	4	HNTT6-4	2	HM2	SCB4-8	6	HNTT6-4	2		

Order Example

Part Number	-	H
STYSF6 HHMTEN6	-	129

Days to Ship: 6 Days

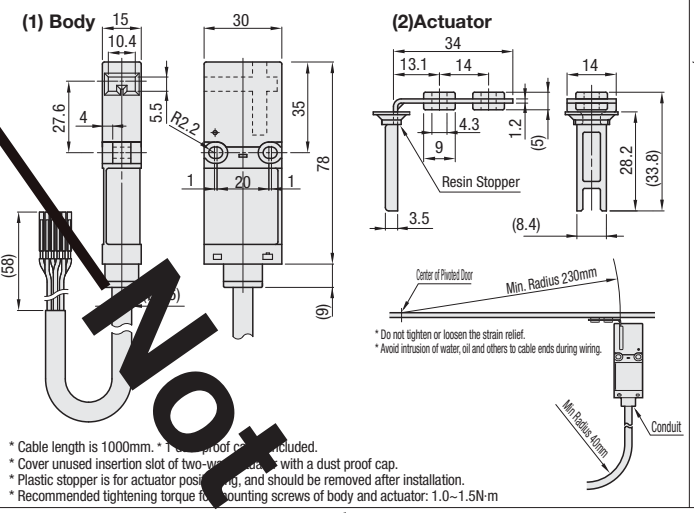
P.87

Safety Door Switches / Locks for Aluminum Frames

RoHS



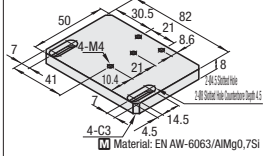
(Contact Type 1NO / 1NC)
(Contact Type 3NC)



* Cable length is 1000mm. * 1 dust proof cap included.
* Cover unused insertion slot of two-way actuator with a dust proof cap.
* Plastic stopper is for actuator positioning, and should be removed after installation.
* Recommended tightening torque for mounting screws of body and actuator: 1.0~1.5N·m

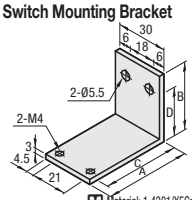
Components

(3) Switch Mounting Bracket



Material: EN AW-6063/AlMg0,7Si

(4) Switch Mounting Bracket



Material: 1.4301/X5CrNi18-10

Body Side Extrusion	Actuator Side Extrusion	A	B	C	D
HFS5-2020	HFS5-2020	46	19	41.4	14.5
HFS6-3030		36	27	31.4	19.5
HFS8-4040		26	34	21.4	24.5
HFS8-4545		21		16.4	27
HFS6-3030	HFS6-3030	46	31	41.4	24.5
HFS8-4040		36	40	31.4	29.5
HFS8-4545		31		26.4	32

Not Available

Part Number Type	No.	Body Mounting Side	Actuator Mounting Side	Accessories: Body Mounting Side Frame Side — Mounting Brackets for Body	(5) Screw	Quantity	(6)	Quantity	(7) Mounting Screws for Body	Quantity	Actuator Mounting Door Side — (8) Screw	Quantity	(9) Nut	Quantity	€ Unit Price Qty. 1~9	Volume Discount 10~	€ Unit Price Qty. 1~9	Volume Discount 10~
	5	HFS5-2020	Panel (3mm or 5mm)	(3)	SCB4-8		HNTASN4-4		SCB4-18		SCB4-12		SLBNR4					
	6	HFS6-3030	Panel (3mm or 5mm)		SCB4-10		HNTASN6-4											
	8	HFS8-4040 HFS8-4545	Panel (3mm or 5mm)		SCB4-12		HNTASN8-4											
	5-5	HFS5-2020			SCB5-8	2	HNTASN5-5	2		2	SCB4-10	2	HNTFSN5-4	2				
	6-5	HFS6-3030			SCB5-10		HNTASN6-5											
	8-5	HFS8-4040			SCB5-14		HNTFSN8-5											
	845-5	HFS8-4545		(4)	SCB5-15				SCB4									
	6-6	HFS6-3030	HFS6-3030		SCB5-10		HNTASN6-5											
	8-6	HFS8-4040			SCB5-15		HNTASN8-5				SCB4-12		HNTFSN6-4					
	845-6	HFS8-4545																

■Contact Ratings

			300V		
Rated Insulation Voltage (Ui)					
Rated Current (Ith)			2.5A		
Rated Operating Voltage (Ue)			30V	125V	250V
Rated Operating Current (Ie) *	AC	Resistive Load (AC–12)	-	2.5A	1.5A
		Inductive Load (AC–15)	-	1.5A	0.75A
	DC	Resistive Load (DC–12)	2.5A	1.1A	0.55A
		Inductive Load (DC–13)	2.3A	0.55A	0.27A

Min. Load (Reference Values)=AC/DC3V, 5mA
(Useable operating range may change depending on load conditions and types.)
* Safety Standard Certification Rating C300: AC–15 0.75A/240V Q300: DC–13 0.27A/250V

■Performance Specifications

Applicable Standards	ISO14119, EN1088, IEC60947–5–1, EN60947–5–1 (DEMKO Certification), GS-ET-15 (BG Certification), UL508 (UL Listing Certification), CSA C22.2 No.14 (c-UL Listing Certification)
Application Standards	IEC60204-1/EN60204-1
Applicable Directives	73 / 23 / EEC (Low Voltage Directive)
Standard Use Condition	Operating Ambient Temperature: –25~70°C (No condensation) Relative Humidity: 45~85% (No condensation) Storage Ambient Temperature: –40~80°C (No condensation) Operating Environment: Pollution Level 3
Impulse Withstand Voltage	4kV
Insulation Resistance	Charged part and non-charged part: 100MΩ or more (with DC 500V High Resistance Meter) Between polar charged parts: 100MΩ or more (with DC 500V mega)
Contact Resistance	Less than 300mΩ (Initial value, cable length 1m)
Appliance Class	Class II (IEC61140)
Degree of Protection	IP67 (IEC60529)
Impact Resistance	Malfunction: 300m/s2 Endurance: 1000m/s2
Vibration Resistance	Malfunction: 5~55Hz, Amplitude 0.5mm or more Endurance: 30Hz, Amplitude 1.5mm or more
Actuator Operating Speed	0.05~1.0m/s
Direct Opening Action Stroke	8mm or More
Direct Opening Force	60N or More
Operating Frequency	1200 times/h
Mechanical Durability	Over 1,000,000 Times (GS–ET–15)
Electrical Durability	Over 100,000 Times (Operating Frequency 1200 times/h, Load Condition: AC–12 250V 1.5A, DC-12 250V 0.2A)
Conditional Short-Circuit Current	50A (250V) (Note)
Body Color	Black
Cable	UL2464 No.20 AWG (6-Conductors)
Mass	About 120g (For body)

Note) Please use 250V/10A fast-blow fuse as short-circuit protection device.

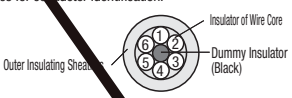
■Contact Configuration & Operation Characteristics

Type	Contact Configurations	Operating Characteristics
	1NC	0.8 (Actuator Installation Standards) 0 5.5 5.8 28.2 (Stroke: mm)
	3NC	(Actuator Inserted) (Actuator Pulled Out)

: Contact Point ON (Close) : Contact Point OFF (Open)

Please refer to insulation colors and white lines for conductor identification.

No.	Insulator Color	No.	Insulator Color
1	Orange / White	4	Brown
2	Blue / White	5	Blue
3	Brown / White	6	Orange



Safety Cautions

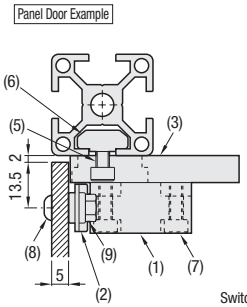
- Shut off the power before attaching, detaching, wiring, maintaining and examining. There is a possible risk of fire or electric shock.
- If a relay is to be placed between a emergency stop switch and a potentially hazardous load, use special safety relays to make the system redundant. The safety may be compromised by using non-safety relays due to fused contacts.
- Do not place a PLC between the safety switch and potentially hazardous load. PLC malfunction may compromise safety.
- Do not disassemble, modify, or interfere with the safety switch functions in any means. Malfunctions and accidents may occur.
- Mount an actuator in places where human body do not come in contact when opening and closing the door. It may injuries.

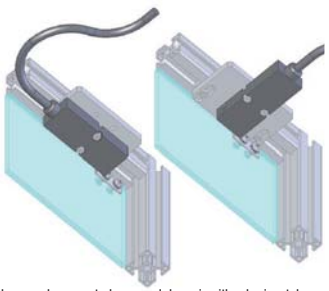
Cautions for Use

- Do not use the safety switches as a door stopper for any door type. Add a mechanical door stopper at the end of the door stroke. Protect safety switches from being overloaded.
- Do not open/close the door roughly in order to avoid causing excessive impacts on the the safety switch. An impact over 300m/s2 may cause safety switch failure.
- Prevent any foreign objects from getting inside the safety switch through actuator's insertion slot. Excess amount of foreign objects or dust in the safety switch may affect the internal mechanisms and cause failures.
- Safety switches should not be stored in dusty or wet locations, or locations witch are subject to organic gas or direct sunlight.
- Operation without an actuator designed for the safety switch may cause switch failures.

Example

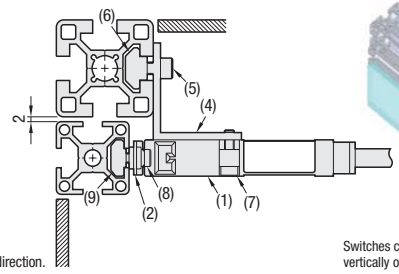
Panel Door Example

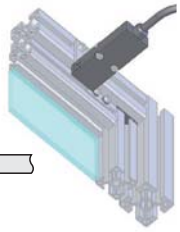




Switches can be mounted on panel doors in either horizontal or vertical direction.

Example of Frame Door





Switches can only be mounted vertically on a extrusion door.

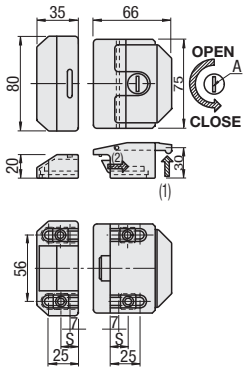
Order Example **Part Number**

Days to Ship **6 Days** P.87

■Locks for Aluminum Frames



HFLOCK



To lock (1), insert a key into A and rotate 180 degrees counterclockwise.

When (1) is lifted, (2) is retracted.

S: Moving range of special nuts
7≤S≤25

Cannot be used for sliding doors

Material: EN AC-46100/G-AlSi12Cu–ADC12

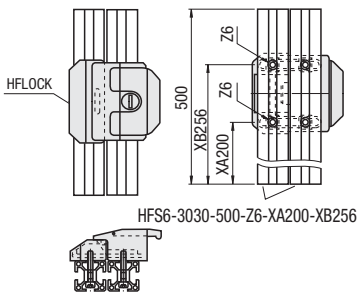
Part Number		Extrusions (Series)	Accessory						€ Unit Price	Volume Discount
Type	No.		Screws		Nuts		Key		Qty. 1~9	10~
HFLOCK	5	HFS5	CBM6-20	4 pcs.	Dedicated M6 Nut	4 pcs.	Key	2 pcs.		
	6	HFS6	CBM6-30							
	8	HFS8	CBM6-35							
	8-45	HFS8-45	CBM6-40							

Order Example **Part Number** HFLOCK5

Days to Ship **6 Days** P.87

Example

■Extrusion Installation Example



Alteration examples of counterbore machining on extrusions for HFLOCK mounting

Frame Square	Alternation Instruction	Qty.
20	HFS5-2020-500-Z6-XA200-XB256	2
30	HFS6-3030-500-Z6-XA200-XB256	2
40	HFS8-4040-500-Z6-XA200-XB256	2
45	HFS8-4545-500-Z6-XA200-XB256	2

HFLOCK is a lock for aluminum extrusions. The lock is mounted on the counterbored extrusion using the included screws, as shown on the Alteration Examples above.

Slide Locks / Hooks

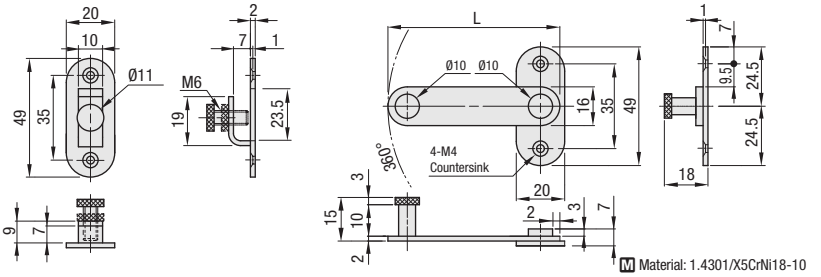
CAD Data

Slide Locks

RoHS



HSUKJ



M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Buffed Finish

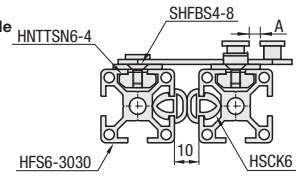
Part Number Type	No.	L	Screws · Nuts Screws	Quantity	Post-Assembly Fitting Nut	Quantity	€ Unit Price Qty. 1 - 2	Volume Discount 3~
HSUKJ	5	61	SHFBS4-6	4	HNTASN5-4	4		
	6	71	SHFBS4-8		HNTASN6-4			
	8	81	SHFBS4-10		HNTASN8-4			

Pre-assembly fitting nut is also applicable.

Order Example — Part Number: HSUKJ5

Days to Ship: 6 Days P.87

Example



Keep gap A larger than 4mm.
(In the example, the gap is 4.5mm.)



Alterations — Part Number - (SET): HSUKJ5 - SET

Alterations	Code	Spec.	Type	No.	Price Adder
Applicable Screw / Nut Set	SET	Applicable screws and nuts come in a set.	HSUKJ	5	2,50
				6	2,60
				8	2,70

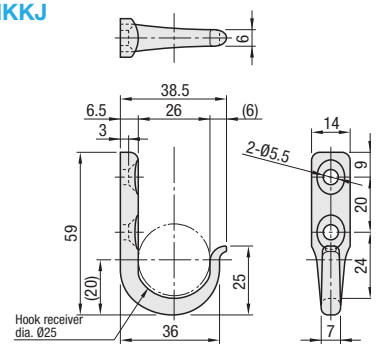
Hook

RoHS

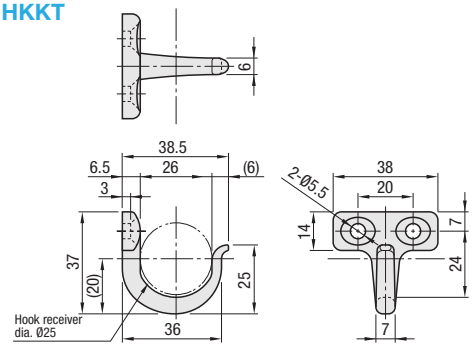


Type J Shape	Type T Shape	M Material	S Surface Treatment
HKKJ	HKKT	1.4301/X5CrNi18-10	Buffed Finish

HKKJ



HKKT



Part Number Type	Allowable Load (N)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~
HKKJ	196	36		
HKKT	196	45		

Order Example — Part Number: HKKJ / HKKT

Days to Ship: 6 Days P.87

Example



Recommended Screws and Nuts when Mounting on the Aluminum Frames

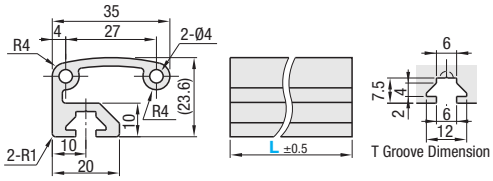
Applicable Extrusions	Screws	Quantity	Post-Assembly Fitting Nut	Quantity
HFS5	SHFBS5-8	2	SHNTP5-5	2
HFS6	SHFBS5-10		SHNTP6-5	
HFS8 (8-45)	SHFBS5-15		SHNTP8-5	

Aluminum Handles / Reinforcing Covers

CAD Data

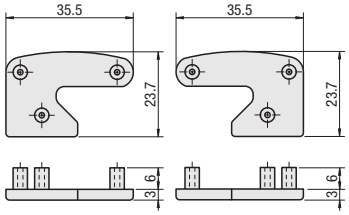


Handle HFHDL5-35 HFHDLB5-35 (Black Anodize)



Applicable nut is HNTT5.

Handle Covers HFC5-35L HFC5-35R



(Handle) M Material: EN AC-51 400/AlMgSi0,7-T5
(Handle) S Surface Treatment: Anodize
(Handle Covers) M Material: Polyamide (Black, Light Gray)

Handle

Part Number	L 1mm Increment	Mass kg/m	Sectional Area mm²	Less Than 300mm € Unit Price	More Than 300mm € Unit Price/m
HFHDL5-35	50~2000	0.73	271		
HFHDLB5-35 (Black Anodize)					

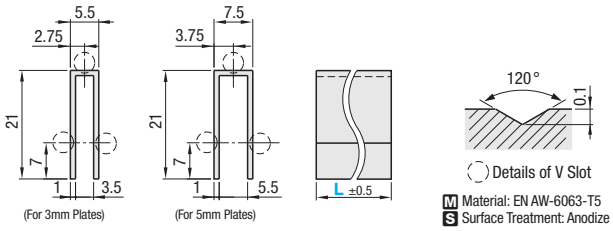
Handle Covers

Part Number	Color	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~19	Volume Discount 20~
HFC5-35L	B(Black) S(Light Gray)	1.9			
HFC5-35R					

Light gray is the default color unless specified.



Reinforcement Covers HFPCV 3 HFPCV 5



M Material: EN AW-6063-T5
S Surface Treatment: Anodize

Part Number Type	Part Number No.	L 1mm Increment	Mass kg/m	Sectional Area mm²	Less than 300mm € Unit Price Qty. 1~9	Less than 300mm Volume Discount 10~19	Less than 300mm Volume Discount 20~	300mm or more € Unit Price/m Qty. 1~9	300mm or more Volume Discount/m 10~19	300mm or more Volume Discount/m 20~
HFPCV	3	50~3000	0.12	45.4						
	5		0.13	47.4						

Order Example

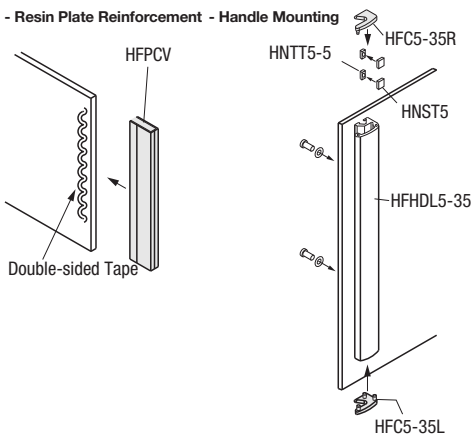
Part Number	-	L - Color
HFHDL5-35	-	400
HFC5-35L	-	S
HFPCV3	-	800

Days to Ship

- Handles · Reinforcing Covers: 6 Days P.88
- Handle Covers: 6 Days P.87

Example

- Resin Plate Reinforcement - Handle Mounting



Price

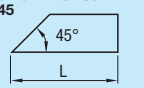
€ Unit Price/m x Specified Full Length = Sales Price
ex:HFPCV5-800
3,70x0.8m=2,90 EUR
(Round down to ten Cent.)

Alterations

Part Number	-	L	-	(Alteration Code)
HFPCV5	-	300	-	LCT45

8 Days

Reinforcement Covers HFPCV is only applicable.

Alterations Code		45°Cut LCT45	45°Cut RCT45
Spec.		One End 45° Miter Cut Ex.LCT45 	
HFPCV	3	450	450
	5		

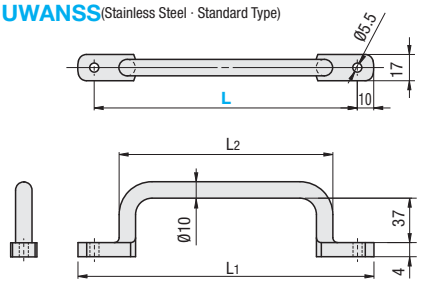
Handles

■Welded Round

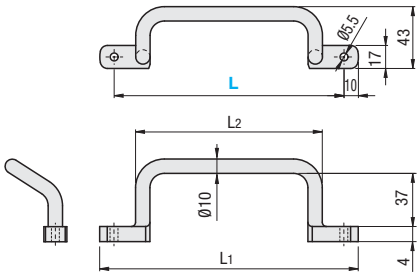
RoHS



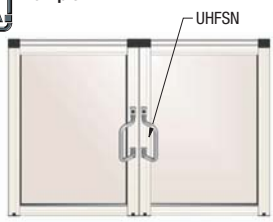
UWASN (Steel · Standard Type)
UWASNB (Steel · StandardType)
UWANSS (Stainless Steel · Standard Type)



UHFSN (Steel · Angle Type)
UHFSNB (Steel · Angle Type)
UHFNSS (Stainless Steel · Angle Type)



Example



■Handles - Offset

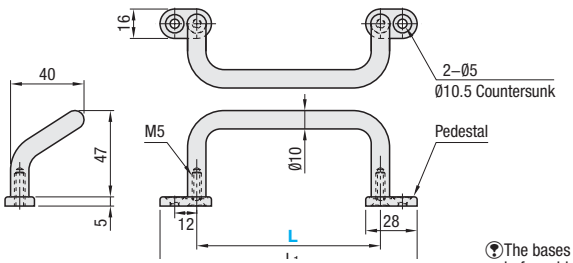
RoHS



The base is rotatable to be set at the optional location.

Type	M Material	S Surface Treatment	A Accessory: Pedestal G M Material	Pedestal G S Surface Treatment	Pedestal S M Material	Pedestal S S Surface Treatment	Screw M Material
UHFNGG	1.0715/9SMn28	Chrome Plating	Zinc Diecast	Electrostatic Paint (Silver)	1.4301/ X5CrNi18-10	-	SHFBS5-12 M Material 1.4301/X5CrNi18-10
UHFNSG	1.4301/X5CrNi18-10	Buffed Finish					
UHFNEAG	Aluminum Alloy	Clear Anodize					

Handle comes with 2 screws included.



The bases are detached from the handles before shipping.

Part Number Type	L	Pedestal Selection	L1	Allowable Load (N)	Reference Mass (g)	€ Unit Price UHFNGG	UHFNSG	UHFNEAG
UHFNGG (Steel) UHFNSG (Stainless Steel) UHFNEAG (Aluminum)	48	G (Zinc Diecast) S (1.4301/ X5CrNi18-10)	86	2000	90			
	66		104		100			
	88		126		114			
	100		138		122			
	110		148		127			
	120		158		134			
	125		163		136			
	160		198		158			

When pedestal of 1.4301/X5CrNi18-10 is selected, 1,80 EUR is added.

Order Example

Part Number	-	Pedestal
UWASN110		
UHFNGG48	-	S

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	0.05	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

6 Days P.87

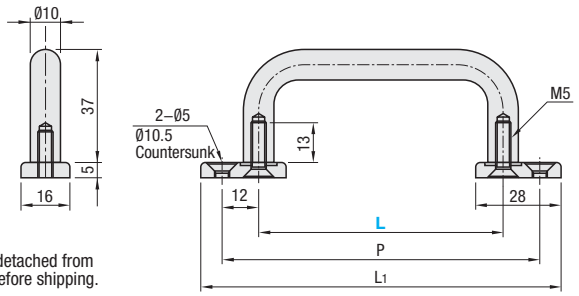
■Handles for Aluminum Frames - Plate Mounted

RoHS



The base is rotatable to be set at the optional location.

Type	M Material	S Surface Treatment	A Accessory: Pedestal UWANGF M Material	Pedestal UWANGF S Surface Treatment	Pedestal UWANSGF M Material	Pedestal UWANSGF S Surface Treatment	Nuts M Material	Screw M Material
UWANGF	1.0715/9SMn28	Chrome Plating	Zinc Diecast	Electrostatic Paint (Silver)	1.4301/ X5CrNi18-10	-	HNTTSN M Material 1.4401/ X5CrNiMo17-12-2	SHFBS M Material 1.4301/X5CrNi18-10 or equivalent
UWANSGF	1.4301/ X5CrNi18-10	Buffed Finish						Handle comes with 4 screws included.



The bases are detached from the handles before shipping.

Part Number Type	L	Compatible Extrusion Selection	P	L1	Allowable Load (N)	€ Unit Price UWANGF	€ Unit Price UWANSGF
UWANGF (Steel) / UWANSGF (Stainless Steel)	80	5 (20 Square) / 6 (30 Square) / 8 (40/45 Squares)	104	118	2000		
	100		124	138			
	110		134	148			
	120		144	158			
	125		149	163			
	160		184	198			
	200		224	238			
	250		274	288			

Order Example

Part Number	-	Compatible Extrusion Selection
UWANGF100	-	5

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	0.05	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

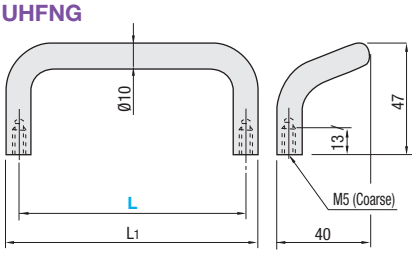
6 Days P.87

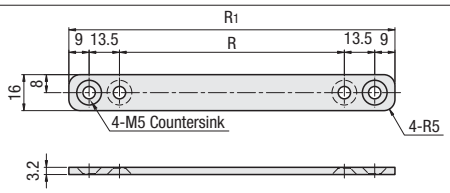
■Handles for Aluminum Frames

RoHS



UHFNG





Part Number Type	L	L1	R	R1	Reference Mass (g)	€ Unit Price
UHFNG	100	110	100	145	50	
	120	130	120	165	52.5	
	125	135	125	170	54	

The default L dimension will be 100 unless specified.

Example



Order Example

Part Number
UHFNG120

Days to Ship

6 Days 5 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	0.05	10%	18%

For orders larger than indicated quantity, please request a quotation.

Handles

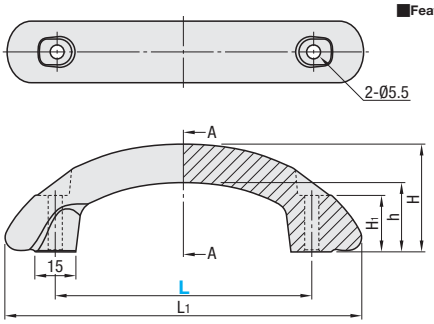
CAD Data

■Designed Handles

RoHS



UWSD



■**Features**:Products intended for aesthetics as well as easier grip design.

M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Buffed Finish

Part Number Type	L	L1	H	h	H1	Allowable Load (N)	Mass (g)	€ Unit Price
UWSD	100	139	42	27	22	500	337	
	150	190	44	29	20		434	

EX Example



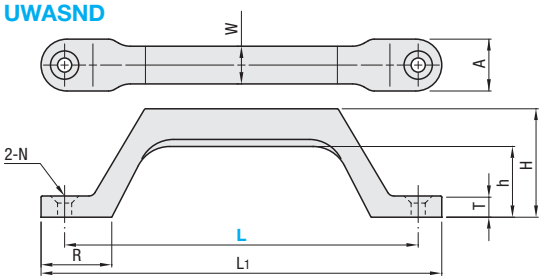
Back side

■Cast Handles

RoHS



UWASND



M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Buffed Finish

Part Number Type	L	L1	H	h	T	A	W	R	N Through	N Countersunk	Allowable Load (N)	Mass (g)	€ Unit Price
UWASND	80	96	32	20	6	18	12	20	4.5	8.5	500	97	
	100	116						23				116	
	150	170	46	30	9	22	16	30	6.5	12.5		301	
	200	220	46	30	9	22	16	30	6.5	12.5		354	

Order Example: Part Number — UWSD100, UWASND80

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	0.05	10%	18%

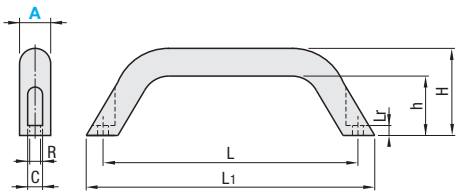
For orders larger than indicated quantity, please request a quotation.

■Aluminum Handles

RoHS



Type	M Material	S Surface Treatment
HHDF	Aluminum Alloy	Electrostatic Paint (Mat Black)
HHDFL	Aluminum Alloy	Barrel Grinding (p.1581)
HHDFA	Aluminum Alloy	Buffed Finish



Part Number Type	A	Extrusions (Series)	L	L1	H	h	R	C	Lr	Mass (g)	Screws · Nuts Screws	Quantity	Nuts	Quantity	€ Unit Price HHDF	HHDFL	HHDFA
HHDF HHDFL HHDFA	19	HFS5	90	107	41	29	5.3	9	5	64	CBM5-10	2	HNTT5-5	2			
	20	HFS6	93.5	112	44	31	6.5	10.5	5	110	CBM6-12		HNTT6-6				
	26	HFS8 HFS8-45	130	149	57	40	8.5	13.3	5	250	CBM8-15		HNTT8-8				

Order Example: Part Number — HHDF19

Days to Ship: 6 Days / 2 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	0.05	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations: Part Number - (SET · SST) — HHDF19 - SET

When-SET is specified, the product is not RoHS compliant.
Applicable to HHDF, HHDFL, HHDFA.

Alteration	Code	Spec.	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET	Applicable screws and nuts come in a set. When is specified, stainless steel screws and nuts are included.	19	1,05	1,20
	SST (Stainless Steel)		20	1,10	1,25
			26	1,20	1,30

Handles for Aluminum Frames / Handles for Plates

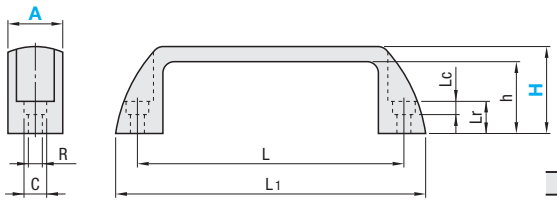
Price Reduction
Up to 49%

CAD Data

■Handles - Nylon 6 RoHS



UPCN
(Nylon 6)



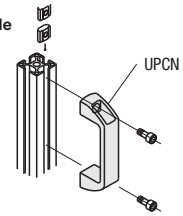
M Material
Glass Fiber Reinforced Nylon 6

Part Number Type	A	Color of Handles	H	Extrusions (Series)	h	L	L1	R	C	Lr	Lc	Allowable Load (N)	Mass (g)	€ Unit Price B(Black) Qty. 1~9	B(Black) 10~19	B(Black) 20~39	B(Black) 40~	W(White)·M(Orange)·R(Red)·G(Green) Qty. 1~9	W·M·R·G 10~19	W·M·R·G 20~39	W·M·R·G 40~
UPCN	19	B(Black) W(White) M(Orange) R(Red) G(Green)	36	HFS5	30	90	108.5	5.5	9.5	11	6	500	23								
			51		45								24								
	21		36	HFS6	30	93.5	112	6.5	10.5	13	7		25								
			51		45								28								
	26		41	HFS8 HFS8-45	34	117	139	8.5	13.3	15	9		38								
			57		50								48								
	27		45		37	132	156			16			54								
			63		55								62								
	28		52		42	152	177	6.5	10.5	13	7		66								
			50		42	179	204	8.5	13.3	17	9		68								
			71		63								86								

The default color of handle will be black unless specified. The default H dimension will be A19–H36, A21–H36, A26–H41, A27–H45 and A28–H50 unless specified.

Order Example: Part Number UPCN19 - Color of Handles B - H 51

Example



Days to Ship: 6 Days / 2 Days P.87

Alterations: Part Number UPCN21 - Color of Handles B - H 51 - (SET · SST) SET

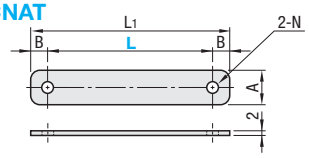
Alteration	Code	Spec.	No.	Price Adder SET	Price Adder SST
Applicable Screw Nut Set	SET	Applicable screws and nuts come in a set. When is specified, stainless steel screw and nut are included.	19	1,05	1,20
	SST (Stainless Steel)		21	1,10	1,25
			26	1,20	1,30

When-SET is specified, the product is not RoHS compliant.

■Mounting Plates for Handle RoHS



UPCNAT

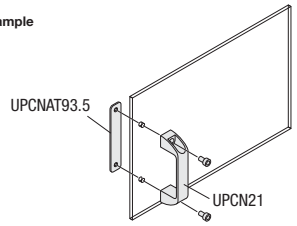


M Material: 1.4301/X5CrNi18-10

Order Example: Part Number UPCNAT117

Days to Ship: 6 Days P.87

Example

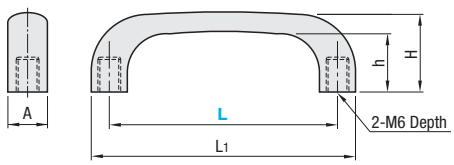


Part Number Type	L	L1	A	B	N	Handles	Reference Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~
UPCNAT	90	108.5	19	9.25	5.5	UPCN19	31		
	93.5	112	21		6.5	UPCN21	36		
	117	139	26	11		UPCN26	55		
	132	156	27	12	8.5	UPCN27	64		
	179	204	28	12.5		UPCN28	88		

■Handles for Plates RoHS



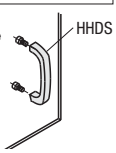
HHDS
HHDSW
HHDSA
HHDSS



Type	M Material	S Surface Treatment
HHDS	Polycarbonate (Black)	-
HHDSW	Polycarbonate (White)	-
HHDSA	EN AC-46100/G-AlSi12Cu	Baked Finish, Silver Metallic
HHDSS	1.4301/X5CrNi18-10 or equivalent	Buffed Finish

Part Number Type	L	L1	H	h	A	Mass (g) HHDS · HHDSW	Mass (g) HHDSA	Mass (g) HHDSS	€ Unit Price HHDS	€ Unit Price HHDSW	€ Unit Price HHDSA	€ Unit Price HHDSS
HHDS HHDSW HHDSA HHDSS	90	110	32	24	13	17	43	90				
	104	127	37	27.7	16	25	65	150				
	122	149	43.3	32.5	19	42	102	220				

Example



Order Example: Part Number HHDS90

Days to Ship: 6 Days / 2 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	0.05	10%	18%

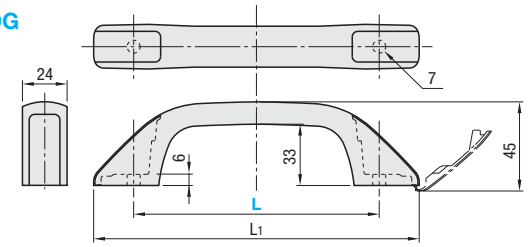
For orders larger than indicated quantity, please request a quotation.

Handles with Cap / Nylon Handles

■Resin Handles with Cap RoHS



UPCDG
(Nylon 6)

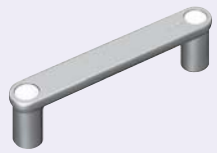


* Easier mounting is possible by the combination use with the Nuts for Handles below.

Material
Glass Fiber Reinforced Nylon 6

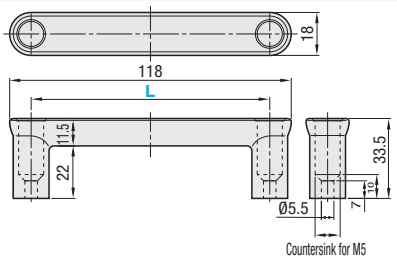
Part Number Type	L	L_1	Allowable Load (N)	Mass (g)	€ Unit Price
UPCDG	90	133	500	30	
	94	136.5		33	
	117	160		36	
	132	175		39	

■Handles with Caps RoHS



Type	Handle		Cap	
	M Material	S Surface Treatment	M Material	Color
HHDG	EN AC-46100/G-AlSi12Cu	Baked Finish	ABS	White
HHDGS	1.4301/X5CrNi18-10 or equivalent	Buffed Finish	ABS	White

* Easier mounting is possible by the combination use with the Nuts for Handles below.



Part Number Type	L	Mass (g)	Applicable Screw Screws	Applicable Screw Quantity	€ Unit Price HHDG	€ Unit Price HHDGS
HHDG HHDGS	100	62	Flathead Screw M5	2		

Order Example: Part Number UPCDG90, HHDG100

Days to Ship: 6 Days / 2 Days P.87

Price (euros)

■Volume Discount (Round down to one Cent.) P.87

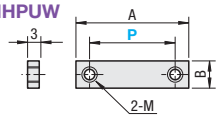
Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Nuts for Handles RoHS



HHPUW



M Material: 1.4301/X5CrNi18-10

Part Number Type	P	B	A	M	Handles	€ Unit Price Qty. 1~9	Volume Discount 10~
HHPUW	90	10	100	6	UPCDG90		
	100	12	110	5	HHDG-100		

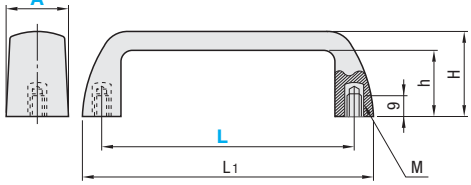
Order Example: Part Number HHPUW90

Days to Ship: 6 Days / 2 Days P.87

■Nylon Handles RoHS



UPFN



Material	
Handle	Glass Fiber Reinforced Nylon 6
Male Thread Section	Brass (Insert)

Part Number Type	A	L	Color of Handles	L_1	H	h	M (Coarse)	Allowable Load (N)	Mass (g)	€ Unit Price B(Black)	€ Unit Price W(White) · M(Orange) · R(Red)
UPFN	26	105	B(Black) W(White) M(Orange) R(Red)	121	37	29	6	500	55		
		110		133	40	32			60		
		117					8		62		

The default color of handle will be black unless specified.

Order Example: Part Number UPFN26 - L 105 - Color of Handles B

Price (euros)

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 6 Days P.87

Aluminum Hollow Handles

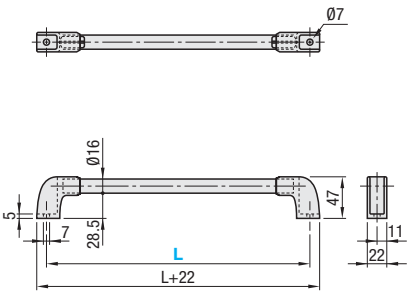
CAD Data

Small Diameter Aluminum Hollow Handles

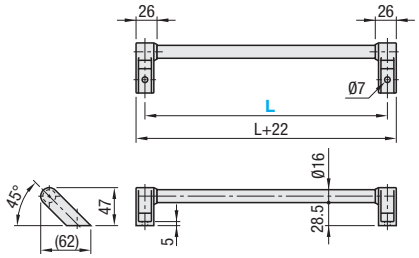


RoHS

UWAPNC
UWAPFC (L Dimension Configurable Type)



UHFAPC
UHFAPFC (L Dimension Configurable Type)



Name of Parts	Material
Hollow	EN AW-6063/AlMg0,7Si
Elbow	Polycarbonate

Part Number Type	L	Applicable Screws	€ Unit Price UWAPNC	€ Unit Price UHFAPC
UWAPNC UHFAPC	100	Socket Head Cap Screws M6		
	150			
	200			
	250			
	300			

Part Number Type	L 1mm Increment	Applicable Screws	€ Unit Price UWAPFC	€ Unit Price UHFAPFC
UWAPFC UHFAPFC	100~150	Socket Head Cap Screws M6		
	151~200			
	201~250			
	251~300			

Order Example

Part Number

UWAPNC200
UWAPFC-237

For L Dimension Configurable Type, add "-" (hyphenation) after the product name.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

Dimension Fixed Type: 6 Days P.87

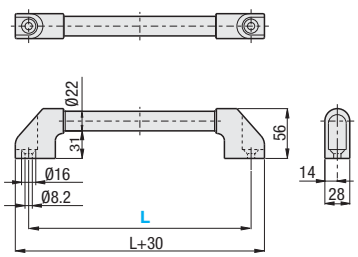
L Dimension Configurable: 8 Days

Aluminum Hollow Handles

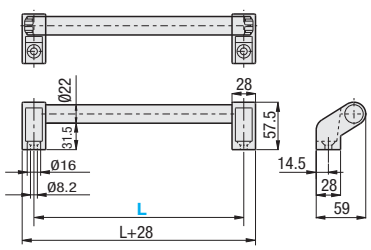


RoHS

UWAPN
UWAPF (L Dimension Configurable Type)



UHFAP
UHFAPF (L Dimension Configurable Type)



Name of Parts	Material
Hollow	EN AW-6063/AlMg0,7Si
Elbow	Glass Fiber Reinforced Nylon

Part Number Type	L	Applicable Screws	€ Unit Price UWAPN	€ Unit Price UHFAP
UWAPN UHFAP	150	Flathead Screw M8		
	200			
	250			
	300			
	400			
	500			
	600			

Part Number Type	L 1mm Increment	Applicable Screws	€ Unit Price UWAPF	€ Unit Price UHFAPF
UWAPF UHFAPF	100~150	Flathead Screw M8		
	151~200			
	201~250			
	251~300			
	301~400			
	401~500			
	501~600			

Order Example

Part Number

UWAPN150
UHFAPF-185

For L Dimension Configurable Type, add "-" (hyphenation) after the product name.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

Dimension Fixed Type: 6 Days P.87

L Dimension Configurable: 8 Days

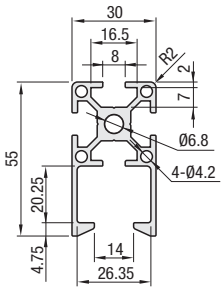
Aluminum Frames for Sliding Doors / Pulley Kits for Sliding Doors and Guides

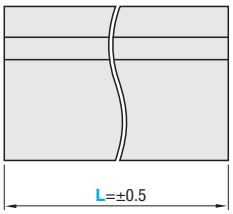
■Pulley Kits for Sliding Doors HLF (GLF)

RoHS



HFHSD6-3030





M Material: EN AC-51 400-T5 Aluminum Alloy
S Surface Treatment: Anodize

Part Number	L 0.5mm Increment	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴		€ Unit Price Less than 300mm	€ Unit Price/m 300mm or more
				ℓx	ℓy		
HFHSD6-3030	50~4000	1.26	467	5.17x10⁴	12.44x10⁴		

Alterations

Order Example: Part Number - L - (Alteration Code)
HFHSD6-3030 - 1000 - TPW

Days to Ship: 7 Days

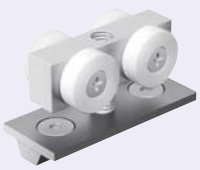
Price

When L is less than 300
The unit prices indicated in the table are regardless of the length.
ex: HFHSD6-3030-200=4,80 EUR
When L is 300 or more
Price is calculated as follows:
€ Unit Price/m x Specified Full Length =Sales Price
ex: HFHSD6-3030-1,200
16,00x1.2m=19,20 EUR
(Round down to ten Cent.)

Alteration	Tapping		
Code	LTP	RTP	TPW
Spec.	Tapping on the Left End Face Tap Shape M8-Depth 24	Tapping on the Right End Face Tap Shape M8-Depth 24	Tapping on Both Ends Tap Shape M8-Depth 24
Price Adder	1,80	1,80	3,60

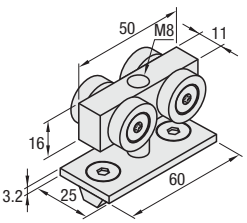
■Pulley Kits for Sliding Doors

RoHS

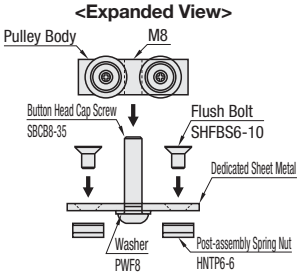


HASGD

Parts		M Material	S Surface Treatment
Pulley	Body	1.0038/S235JR	Trivalent Chromate
	Bearing	1.3505/100Cr6	
	Wheel	Polyacetal	-
Sheet Metal		1.0320/St.22	Trivalent Chromate
Button Head Cap Screw / Flathead Screw		1.4301/ X5CrNi18-10	-
Washer		1.0038/S235JR	Trivalent Chromate
Spring Nuts		1.0301/C10	



<Expanded View>



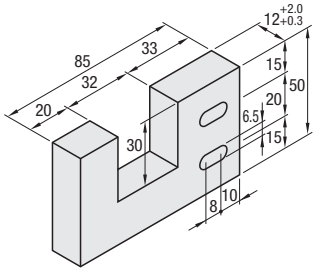
Part Number	€ Unit Price	Volume Discount
	Qty. 1~4	5~
HASGD		

■Guides for Sliding Doors

RoHS



HASGY

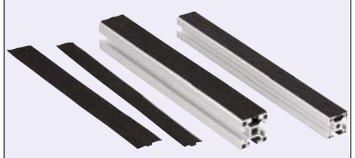


M Material: Polyacetal

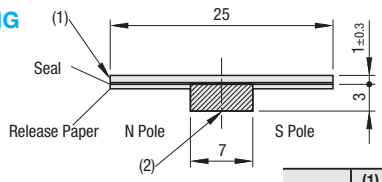
Part Number	€ Unit Price	Volume Discount
	Qty. 1~4	5~
HASGY		

■Latch Magnets with Adhesive Tapes

RoHS



HSMG



The N pole has the N mark.
For mounting, refer to the Example of Use on P.690

Type	(1) Sponge ▣Material	(2) Magnet ▣Material	Heat Resistance Temperature
HSMG	Chloroprene	Anisotropic Ferrite Magnet (Plastic Magnet)	50°C

Part Number Type	No.	Color	Length (mm)	Extrusions (Types)	Magnet Type	Attraction Force per 100mm [g]	Surface Magnetic Flux Density Gauss [G]	€ Unit Price 1~4 Qty.	Volume Discount 5~20
HSMG	6	B	1000	HFS6	Anisotropic Ferrite Magnet	75	500		

For orders larger than indicated quantity, please request a quotation.

The attraction force is a reference value checked in the room temperature (20°C). Usable as simplified magnet catches if attached on door frame.
The attraction force is a reference value gained when two HSMG attracted each other.
Size variations for 8-series are also available. P.690
Can be cut with scissors.

Order Example

Part Number	-	L
HFHSD6-3030	-	1800
HASGD		
HASGY		
HSMG6-B		

Days to Ship

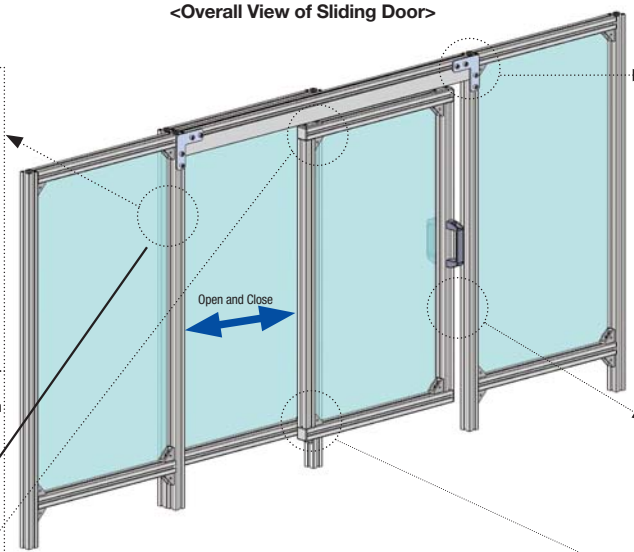
■HFHSD6-3030 **6 Days**

■HSMG **7 Days**

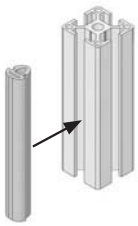
■HASGD HASGY **6 Days** P.87

Example

<Overall View of Sliding Door>



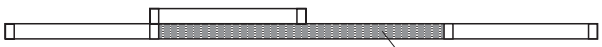
Use seal covers to absorb shocks caused by the door opening and closing. P.689



HSMG is usable as simplified magnet catches if attached on door frame.

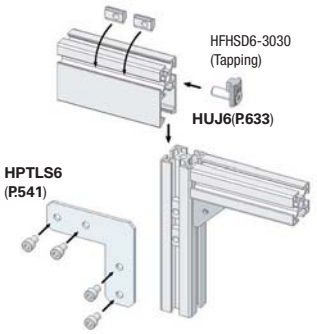


<2 dimensional View from Top>



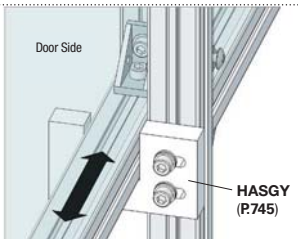
How to Install the Aluminum Frames for Sliding Door

Use Simple Joint together with Sheet Metal Plate and secure.



Use HSMG6 as necessary. Slide Locks (P.737) are also effective.

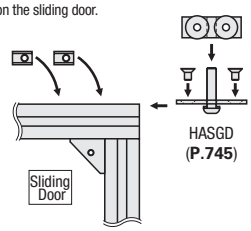
How to Mount the Guide for Sliding Doors

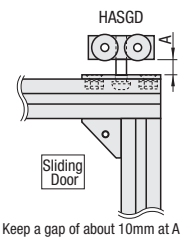


Mount the guide to the frame with screws and nuts.

How to Mount the Pulley for Sliding Doors

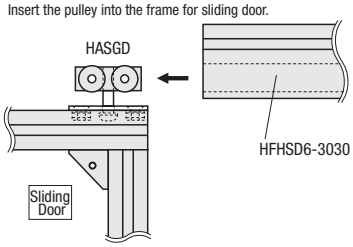
Mount the pulley on the sliding door.





Keep a gap of about 10mm at A part.

Insert the pulley into the frame for sliding door.



Tensioners for Aluminum Frames / Stainless Steel Wires

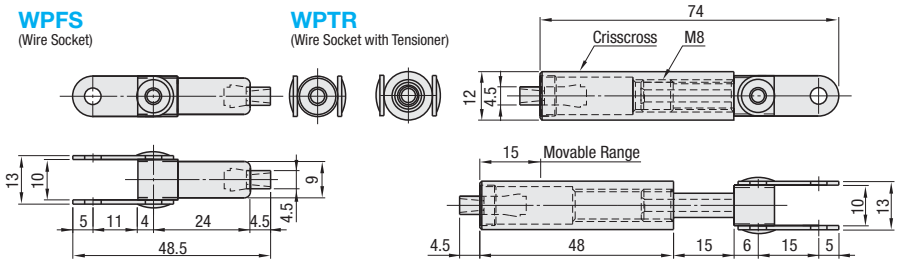
CAD Data

Accessories for Aluminum Frames Tensioner



WPFS (Wire Socket)

WPTR (Wire Socket with Tensioner)



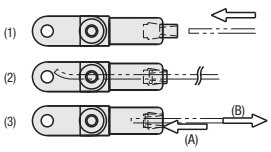
Can be mounted to HBLFSN5-C (**P.483**).

M Material: Free-Cutting Brass S Surface Treatment: Nickel Plating

Wire Sockets and Wire Sockets with Tensioner for Ø1.5 Stainless Steel Wire

Part Number Type	No.	Mass (g)	Components: Truss Screw	Quantity	Domed Cap Nut	Quantity	Unit Price
WPFS	1.5	19	M4x25	1	M4	1	
WPTR		44					

WPFS (Wire Socket)

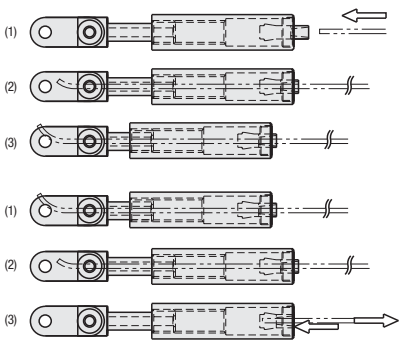


Insert wire

Insert to the end. Cannot be pulled out in this state. (Safety load 30kg, cut-off load 80kg)

By pressing the tip (A) wire can be pulled out (B). (Must remove tension in order to press wire.)

WPTR (Wire Socket with Tensioner)



Turn and extend the tensioner.
Insert the wire.

Insert to the end.
Cannot be pulled out in this state. (Safe load 30kg, Break load 80kg)

Turn the tensioner and exert tension on the wire.
Load tension within the working range of 15mm.

The state where the tension is being exerted.

Loosen by turning the tensioner.

By pressing the tip (A) wire can be pulled out (B).
(Remove tension in order to press wire.)

Inserting Wire



Insert the wire from the pin side. While doing so, insert the wire enough into the pin. The wire will then be gripped.

Removing Wire



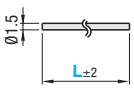
When removing the wire, pull out the wire while pressing the pin.

Stainless Steel Wires

RoHS

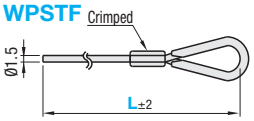


WPS
WPSF



The cut ends of the wire are terminated to prevent fraying.

WPST
WPSTF Crimped



M Material: 1.4301/X5CrNi18-10 7x7 Strands

Wire Diameter (mm)	Wire Diameter Selection Guide * 1: Allowable Load (kg)	Tensile Load Test Result * 2: Max. Load (kgf)	Displacement (mm)
1.5Ø	30	84.8~95.7	10~11 (80kgf)

* 1 Allowable load is determined as 1/3 of the maximum static load rating. Depending on usage, consider applying safety factor up to 1/5.
* 2 These are test results by the Tokyo Metropolitan Industrial Technology Research Institute. Displacement is the value measured with 110m distance between metals.

Stainless Steel Wires Selectable Length

Part Number Type	No.	Length L (m)	Mass (g)	€ Unit Price WPS	WPST
WPS	1.5	1	10		
WPST		10	100		

Stainless Steel Wires Configurable Length

Part Number Type	No.	Length L 10mm Increment	Mass g/m	€ Unit Price L300~1000	L1010~2000	L2010~3000
WPSF	1.5	300~3000	10			
WPSTF						

Order Example

Part Number	-	L (m)
WPFS1.5		
WPS1.5	-	10
WPSF1.5	-	550

Days to Ship

- Other than listed on the right: 6 Days P.87
- WPSF · WPSTF: 10 Days

Price

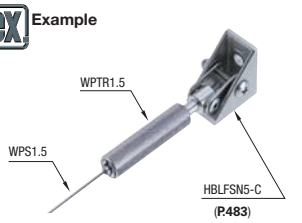
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~74	75~99	100~200
Discount Rate	€ Unit Price	0.05	10%	15%

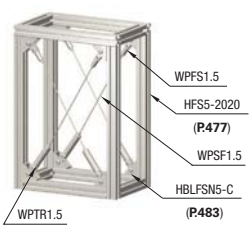
For orders larger than indicated quantity, please request a quotation.

⊗Not Applicable to WPSF · WPSTF

Example

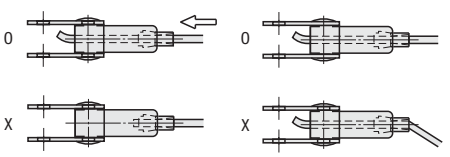


WPFS, WPTRboth can be mounted to the Aluminum Frames Bracket (**P.483**)



Insert the wire until the tip comes out from the inside.

Install so that the tension is exerted straight on the wire.

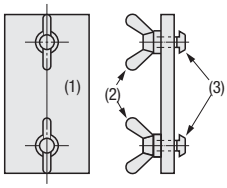


Jigs for Assembly / Drilling Jigs / Repair Pen

■Jigs for Assembly



HFKZG



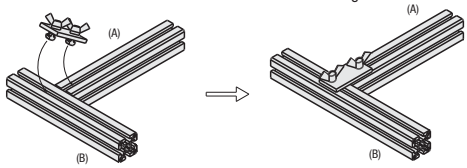
Part Number Type	No.	Extrusions (Series)	Components (1) Plate	Quantity	(2) Wing Screw	Quantity	(3) Post-Assembly Fitting Nut	Quantity	€ Unit Price Qty. 1~8	Volume Discount 9~
HFKZG	5	HFS5	HPTSS5	1	CHOB4-8	2	HNTFSN5-4	2		
	6	HFS6	HPTSS6	1	CHOB6-12	2	HNTFSN6-6	2		
	8	HFS8	HPTSS8	1	CHOB8-15	2	HNTFSN8-8	2		
	8-45	HFS8-45	HPTSS8-45	1						

Order Example — Part Number: HFKZG6

Days to Ship: 6 Days P.87

Example

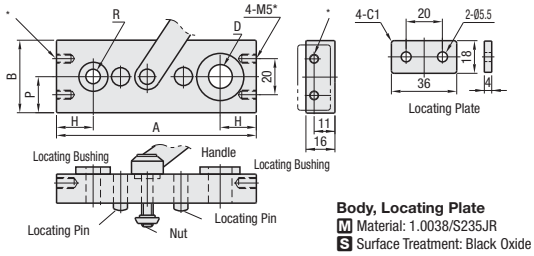
Set it over two frames. By tightening the wing screw, the plane of the frame surface of A and B is made. Then A and B are connected with angle brackets.



■Drilling Jigs -Blind Joint D Hole · Wrench Hole Machining-



HFSJG



*No hole for HFSJG5.

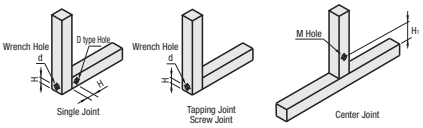
Body, Locating Plate
M Material: 1.0038/S235JR
S Surface Treatment: Black Oxide

Part Number Type	No.	A	B	P	H	R	D	Extrusions (Series)	Components Clamp Lever	Quantity	Nuts	Quantity	Screws	Quantity	Locating Plate	€ Unit Price
HFSJG	5	100	25	15	15	7.3	7.1	HFS5	CLDM5-20-Y	1	HNTTSN5-5	1	CHOB5-8	1	1 Pc.	
	6	100	30	15	15	8	11.1	HFS6	CLDM6-20-M		HNTFSN6-6			2		
	8	110	40	20	20	8	13.1	HFS8	CLDM8-25-B		HNTFSN8-8					
	8-45	120	45	22.5	22.5	8	15.1	HFS8-45	CLDM8-25-S		HNTFSN8-8					

Order Example — Part Number: HFSJG6

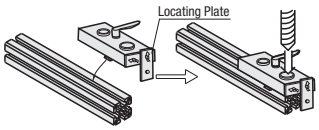
Days to Ship: 8 Days

Hole Type	Hole Name
Hole for Joint Nut of Single Joint	D Type Hole
The Hole for the Joint Guide / Joint Hollow of Center Joint, Post-Assembly Double Joint.	M type Hole
Wrench Hole for Tightening Screw of Joint Plate of Single Joint	Wrench Hole



Example

1) Attach the Locating Plate to one of the holes on the drilling jig.
2) Slide jig into the frame channel up to the Locating Plate.
3) Drill hole using the positioning jig bushing.



Applicable Frame Series	H mm	H_1 mm	D Type Hole mm	M type Hole mm	d (Wrench Hole) mm
HFS5	10	10	-	7.1	7.3
HFS6	15	15	11.1	11.1	8
HFS8	20	20	13.1	13.1	
HFS8-45	22.5	20	15.1	13.1	

■Black Anodize Spot Repair Pen RoHS



Part Number	Volume (ml)	Type	Features	Color	Usage	Operating Temp. Range (°C)	How to Use Dry Condition	Main Components	Unit Price Qty. 1~9	Volume Discount 10~
		Pen	A felt-tipped pen that can quickly repair flaws on black anodized items. Repairs become less noticeable as the color is similar to that of black anodized aluminum	Mat Black	Flaw repairs of black anodizing on aluminum frames. Markings on aluminum items.	5~35	Shake well before use, and directly apply on the surface to repair.	Acrylic Resin		

Order Example — Part Number

Days to Ship: 6 Days P.87

■Characteristic Values of ANCPE

Item		Values
Drying Characteristics	Dry to Touch	10 minutes
	Cured Dry	50 minutes
Pencil Hardness (JIS K5400)		F
Gasoline Resistance (Soaking in Gasoline 2 Hours)		Partial Softening
Alcohol Resistance (25°C, 24 Hours)		Standard

Not Available

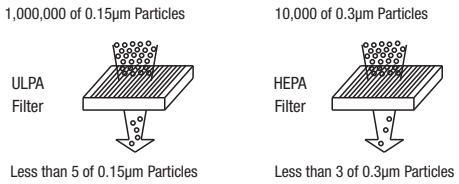
HEPA · ULPA Filter Units
-Overview-

■Features of HEPA and ULPA Filter Units

- Capable of serving as HEPA filter of ISO certified class 5 to 9 or ULPA filter of class 3 to 6 in general industrial clean room equipment.
- 100V and 200V power specifications are available.
- Air outlet cleanness is ISO certified HEPA class 5 or ULPA class 3.
- Available with air volume ranging from 1, 3, 5, 10, 15, and 25m³/min for HEPA, and 2.5, 4, 7, 13, and 20m³/min for ULPA.
- Pre-filter provided as a standard equipment to catch coarse particles prolongs service life of HEPA, ULPA filters.
- Operating status of the filter can be visually checked from outside through LED at the center of the filter bottom surface. (Except Air Volume 1 Series)

■Standards of HEPA · ULPA

- The Japanese Industrial Standards specify filters capable of 99.97% collection of 0.3μm particles or better at rated flow rate with an initial pressure loss of less than 245Pa as HEPA (High Efficiency Particulate Air) filters (named high performance filter).
- Under the same standards, filters capable of 99.9995% collection of 0.15μm particles or better at rated flow rate with an initial pressure loss of less than 245 Pa are called ULPA (Ultra Low Penetration Air) filters (named ultra-high performance filters).



■HEPA · ULPA Filter Selection

- Use the followings as a guide to HEPA filter selection. (Classes in US Federal Standards are retained)
  Class 100: Unit with quantity of air volume enough for generating laminar air flow
  Class 1000: Unit with quantity of air volume enough for 300 cycles of air circulation
  Class 10000: Unit with quantity of air volume enough for 60 cycles of air circulation
  Class 100000: Unit with quantity of air volume enough for 30 cycles of air circulation
- Design with laminar air flow when selecting ULPA filters.
- The definition of cleanness class in terms of number of ventilation cycles is given as reference only. We recommend using of a particle counter (listed on HEPAC ...) for measurements.

$$\text{No. of Ventilation Cycles (Per Hour)} = \frac{\text{Air Volume (m}^3\text{/min) x 60min}}{\text{Space Volume (m}^3\text{)}}$$

■Standards for Cleanness Performance

Cleanness is defined by the number of standard sized particles per unit volume. Note that the standard particle size and standard volume are not the same on different standards. The target range for MISUMI HEPA/UPLA filter is shown in the following table. 0.1μm/ft³ is used as a standard in parts of semiconductor industry.

■JIS B 9920

Particle Size (μm)	Cleanness Class Upper Limit Concentration (pieces/m³)							
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
0.1	10^1	10^2	10^3	10^4	10^5	(10^6)	(10^7)	(10^8)
0.2	2	24	236	2.360	23.600	-	-	-
0.3	1	10	101	1.010	10.100	101.000	1.010.000	10.100.000
0.5	(0.35)	(3.5)	35	350	3.500	35.000	350.000	3.500.000
5.0	-	-	-	-	29	293	2.900	29.000
Cleanness Class Range of Particle Size	0.1~0.3		0.1~0.5		0.1~5.0		0.5	

■ISO 14644-1

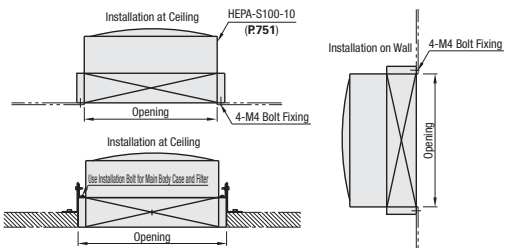
ISO Class	Maximum Allowable Particle Concentration by Different Particle Sizes (Pieces/m³)					
	0.1μm	0.2μm	0.3μm	0.5μm	1μm	5μm
1	10	2				
2	100	24	10	4		
3	1,000	237	102	35	8	
4	10,000	2,370	1,020	352	83	
5	100,000	23,700	10,200	3,520	832	29
6	1,000,000	237,000	102,000	35,200	8,320	293
7				352,000	83,200	2,930
8				3,520,000	832,000	29,300
9				35,200,000	8,320,000	293,000

ULPA Filter ULPA, HEPA Filter

Main Classification Standard for Cleaning Capacity

	US Fed. Standards 209 D	US Fed. Standards 209 E	JIS B 9920	ISO 14644-1	Semiconductor Industry
Standard Particle Size	0.5μm or More		0.1μm or More		
Unit Volume	ft³	m³			ft³
Class			1	ISO 1	
					1
			2	ISO 2	
		M1			10
	1	M1.5	3	ISO 3	
		M2			100
	10	M2.5	4	ISO 4	
		M3			1,000
	100	M3.5	5	ISO 5	
		M4			10,000
	1,000	M4.5	6	ISO 6	
		M5			100,000
	10,000	M5.5	7	ISO 7	
		M6			
	100,000	M6.5	8	ISO 8	
		M7			
				ISO 9	

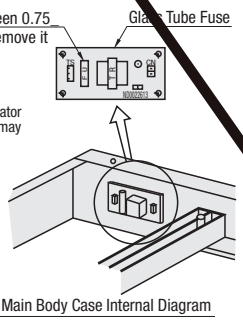
■Mounting Example



■Functions

- Abnormality Detection Function
Circuit protector switch is used. When a current overload is detected, the switch turns "Off" immediately, and the equipment stops. At recovery stage, confirm that the safety is assured and then turn the switch on.

- Operations Indicating Function
When the switch is turned on, the operation indicating high-brightness LED turns on.
In case when the indication light is not desired, open the main filter and remove the fuse from the indicating light power source panel that is located at the side of the main fixture case. (Refer to the figure below)
(?)There is no indicator light for Air Volume 1 Series.



*** Cautions**
- Do not push on the indicator light strongly. The filter may be damaged.

■Maintenance · Inspection

- Exterior
- Wipe the surface with a soft cloth. (For clean room installation, use low dust emission cloth.)
- Use warm water or neutral detergent for hard stains. (For clean room installation, use purified or DI water.)
- After using the neutral detergent, wipe it thoroughly using a cloth with clean water.

Cautions!!
Do not use the following.
Solvent such as paint thinner, acid, alkaline or hot water.

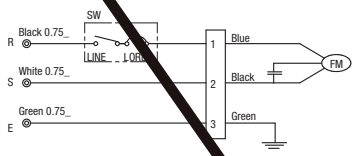
- Main Filter (HEPACF P.752)
When dust accumulates in the main filter, air passages become blocked and air speed and air volume are reduced. Normal service life is defined as when the passing air volume/speed are reduced to 1/2 of the initial value. Main filter replacement periods can be confirmed by using a switch unit with a clogged filter indicator (HEPAIC – listed on MISUMI web). When not using this switch, the guideline for the main filter replacement periods are: 1 year in general room environments, and 5 years in ISO Class 7 (Class 10,000) clean rooms, with continuous operation.

- Pre-filter
Clean the pre-filter on regular basis.

Not Available

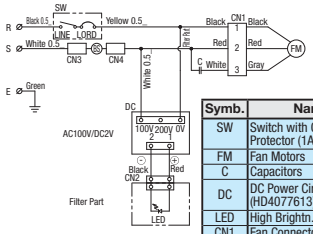
■Connection Diagram

Air Volume 1 Series AC100V,1Ø,50/60HZ



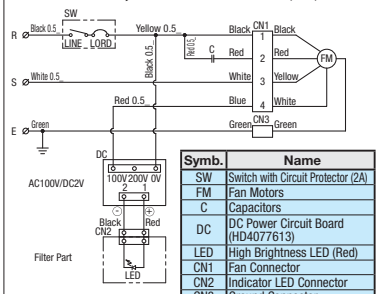
Symbols	Name
SW	Switch with Circuit Protector (1A)
FM	Fan Motors
C	Capacitors
CN1	Fan Connector

Air Volume 3 Series AC100V,1Ø,50/60HZ



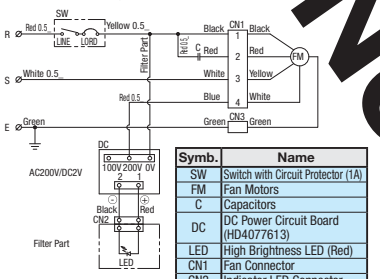
Symb.	Name
SW	Switch with Circuit Protector (1A)
FM	Fan Motors
C	Capacitors
DC	DC Power Circuit Board (HD4077613)
LED	High Brightn. LED (Red)
CN1	Fan Connector
CN2	Indicator LED Connector
CN3, 4	Bimetal Thermostat Connector
BS	Bimetal Thermostat (90°C)

Air Volume 5, 10 Series AC100V,1Ø,50/60HZ



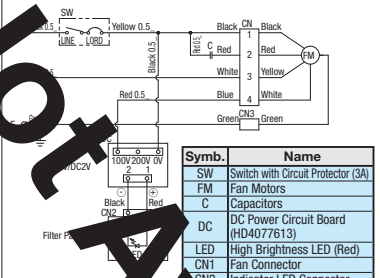
Symb.	Name
SW	Switch with Circuit Protector (2A)
FM	Fan Motors
C	Capacitors
DC	DC Power Circuit Board (HD4077613)
LED	High Brightness LED (Red)
CN1	Fan Connector
CN2	Indicator LED Connector
CN3	Ground Connector

Air Volume 5, 10 Series AC200V,1Ø,50/60HZ



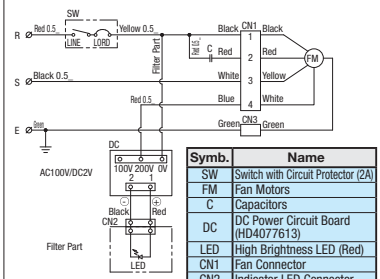
Symb.	Name
SW	Switch with Circuit Protector (1A)
FM	Fan Motors
C	Capacitors
DC	DC Power Circuit Board (HD4077613)
LED	High Brightness LED (Red)
CN1	Fan Connector
CN2	Indicator LED Connector
CN3	Ground Connector

Air Volume 15 Series AC100V,1Ø,50/60HZ



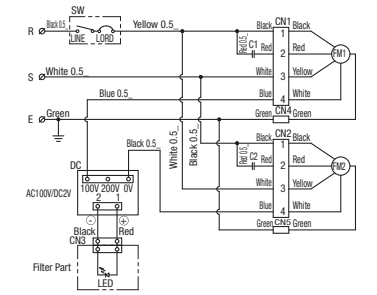
Symb.	Name
SW	Switch with Circuit Protector (3A)
FM	Fan Motors
C	Capacitors
DC	DC Power Circuit Board (HD4077613)
LED	High Brightness LED (Red)
CN1	Fan Connector
CN2	Indicator LED Connector
CN3	Ground Connector

Air Volume 15 Series AC200V,1Ø,50/60HZ

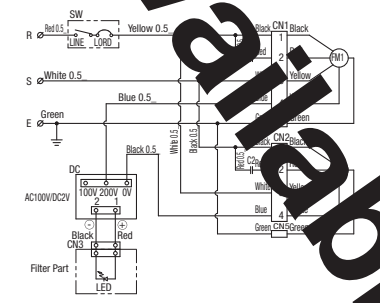


Symb.	Name
SW	Switch with Circuit Protector (2A)
FM	Fan Motors
C	Capacitors
DC	DC Power Circuit Board (HD4077613)
LED	High Brightness LED (Red)
CN1	Fan Connector
CN2	Indicator LED Connector
CN3	Ground Connector

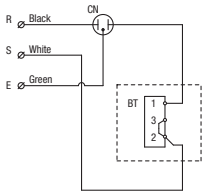
Air Volume 25 Series AC100V,1Ø,50/60HZ



Air Volume 25 Series AC200V,1Ø,50/60HZ



Air Volume Adjustment Controller AC100V,1Ø,50/60HZ



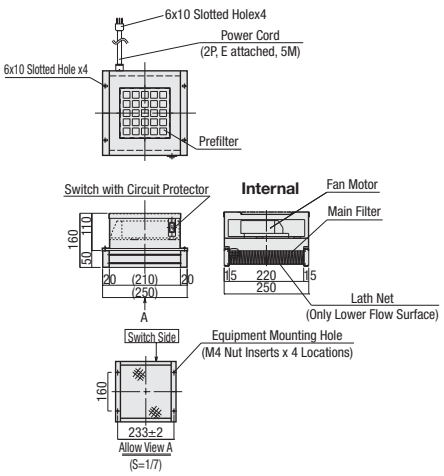
Symbols	Name
BT	Varitap
CN	Outlet

■Air Volume 25 Series Symbol - Name

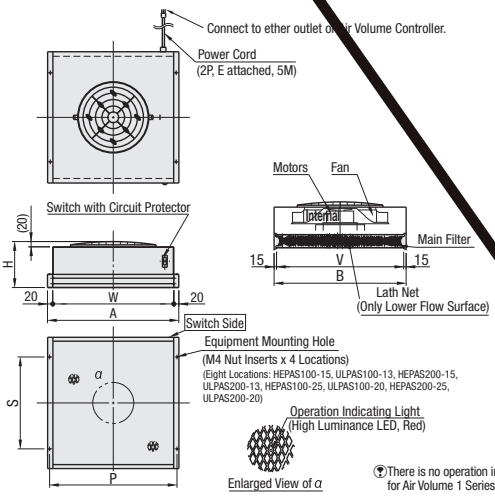
SW	Switch with Circuit Protector (3A)	LED	High Brightness LED (Red)
FM1, 2	Fan Motors	CN1, 2	Fan Connector
C1, 2	Capacitors	CN3	Indicator LED Connector
DC	DC Power Circuit Board (HD4077613)	CN4, 5	Ground Connector

■Name of Each Part

<Air Volume 1 Series>



<Air Volume 3~ Series>



There is no operation indicator light for Air Volume 1 Series.

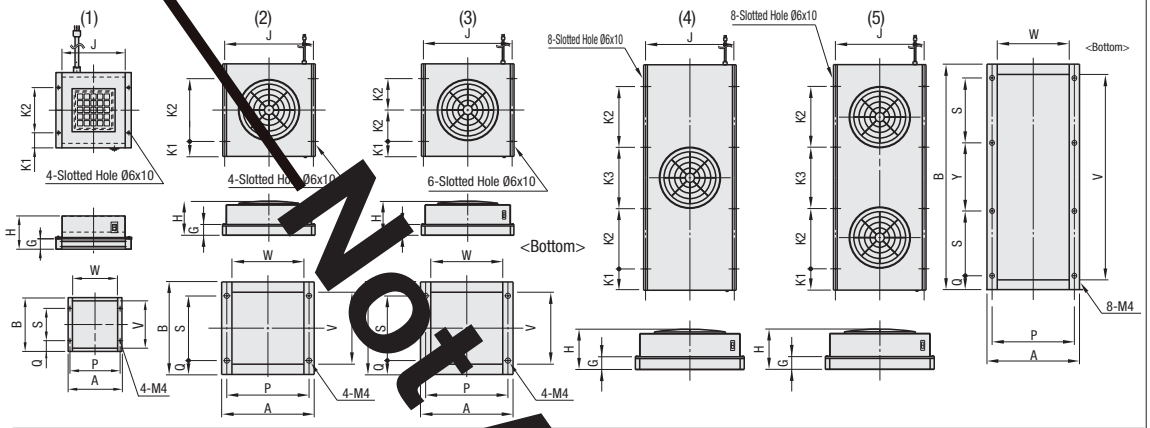
Not Available

Filter Units / Peripherals

Filter · Filter

RoHS





No.	Air Volume m³/min		External Dimensions A	B	Cover Height H	G	Unit Mounting Pitch K1	K2	K3	Bottom Blower Outlet Size W	V	Bottom Side Mounting Pitch No. of Female Thread Holes	P	Q	S	Y
(1)	1	-	250	250	160	50	4	160	-	210	220	4	233	45	160	-
(2)	3	2.5	400	400	165	50	4	240	-	360	370	4	383	80	240	-
	5	4	500	500	185		4	240	-	460	470	4	483	75	350	-
(3)	10	7	610	610			6	320	-	570	580	8	593	80	450	-
(4)	15	13		1220	200	65	8	593	80		1190				380	300
(5)	25	20			215											

Part Number Type	Single-phase Power Supply (V)	Air Volume m³/min	€ Unit Price Qty. 1~4 Air Volume	1	3	5	10	15	25	Volume Discount 5~9pcs. Air Volume	1	3	5	10	15	25
(HEPA Filter)		1 3 5 10 15 25														

Part Number Type	Single-phase Power Supply (V)	Air Volume m³/min	€ Unit Price Qty. 1~4 Air Volume	2.5	4	7	13	20	Volume Discount 5~9pcs. Air Volume	2.5	4	7	13	20
(ULPA Filter)		2.5 4 7 13 20												

*200V type is not available for HEPA filter air volume 1,3, and ULPA filter air volume 2.5.

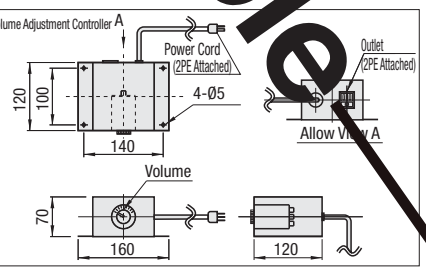
■With Air Volume Adjustment Filters



(included with HEPAS100–5)

(included with HEPAS100–10)

(Air Volume Adjustment Controller)



Part Number Type	Single-phase Power Supply (V)	Air Volume Range	Included Filter Unit	Air Volume m³/min (Controller Volume) (10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)	€ Unit Price 1~4 Qty.	Volume Discount 5~9
		5-1		5	4.2	3.9	3.3	2.9	1.6	1.0	0.5	0.5 or Less~			
		10-1		10	9.3	7.7	6.1	3.9	2.3	1.1	1 or Less~				

Refer to the figure below.

Part Number	Applicable Filter	€ Unit Price 1~4 Qty.	Volume Discount 5~9
(Air Volume Controller Unit)			

Air volume is the average value. Adjust according to the environment.

Part Number													
Dust Collection Efficiency		: 99.99% or more at 0.3μm particles : 99.999% or more at 0.1μm~0.2μm particles											
Main Filter													
Air Volume (m3/min)		1 (0.8)	3 (3.5)	2.5 (3.0)	5 (5.0)	4 (4.0)	10 (10)	7 (7)	15 (15)	13 (13)	20 (20)	20 (20)	
Air Velocity (m/s)		0.36 (0.29)	0.38 (0.44)	0.31 (0.38)	0.39 (0.39)	0.31 (0.31)	0.51 (0.51)	0.35 (0.35)	0.37 (0.37)	0.32 (0.32)	0.61 (0.61)	0.4 (0.49)	
Mass (kg)		4.0	6.5	6.5	11.5	11.5	14.5	14.5	22.0	22.0	25.0	25	
Noise (dBA)		56 (56)	53 (56)	54 (53)	55 (56)	53 (56)	56 (57)	56 (57)	56 (57)	56 (57)	59 (59)	59 (59)	
Power Supply	100V Type	AC100V, 1Ø, 50/60Hz Power Cord with Earthing Plug 5m Included											
	200V Type	-	-		AC200V, 1Ø, 50/60Hz Terminal Block Connection								
Power Consumption (W)	100V Type	35 (40)	28 (36)	27 (36)	43 (46)	43 (46)	98 (114)	98 (113)	141 (157)	141 (158)	190 (230)	190 (230)	
	200V Type	-	-	-	51 (53)	50 (52)	100 (118)	103 (117)	141 (158)	140 (156)	190 (230)	190 (230)	
Accessory		Pre-filter											
		Gasket for blow hole: EPDM Sponge											

( ) is for 60Hz AC. Noise is measured at the point of 1m from the filter in an anechoic room.

Not Available

Not Available

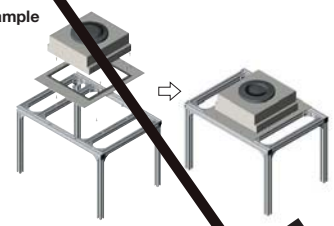
CAD Data

Order Example | Part Number | - | Air Volume (Air Volume Range)

Days to Ship: 10 Days

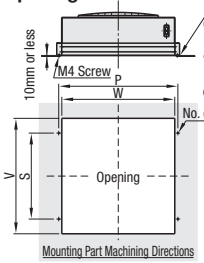
For orders larger than indicated quantity, please request a quotation.

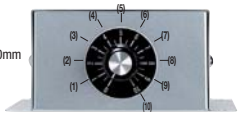
Example



Prepare mounting brackets which have openings as shown at right for mounting to the Aluminum Frames Units.

Opening Dimensions

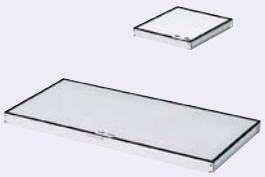


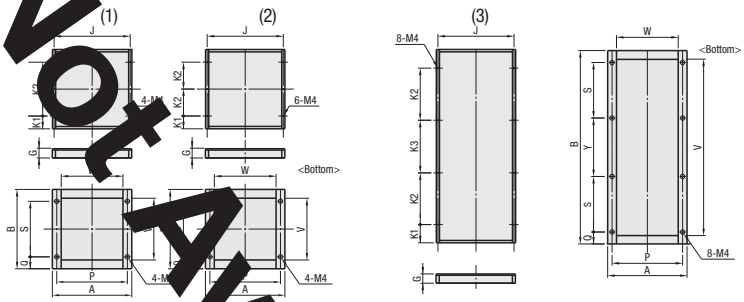


HEPAFS and HEPAD have a 10-level Air Volume Adjusting Knob. For details of each air volume setting, refer to the Specification Table.

Replacement Filters

RoHS





No.	Air Volume m³/min	External Dimensions A	External Dimensions B	Height G	Upper Cover Mounting Pitch: No. of Cover Mounting Screws	J	K1	K3	Bottom Blower Outlet Size W	Bottom Blower Outlet Size V	Bottom Side Mounting Pitch: Number of taps	P	Q	S	Y
(1)	1	250	250	50	4	233	45	-	210	220	4	233	45	160	-
	3	400	400			383	80	240	360	370		383	80	240	-
	5	500	500			483	75	350	460	470		483	75	350	-
(2)	10	610	610		6	593	80	450	570	580		593	80	450	-
(3)	15		1220	65	8			300		1190	8			380	300
	25														

No gasket included.

the mounting pitch on the bottom, refer to the drawing for opening dimensions.

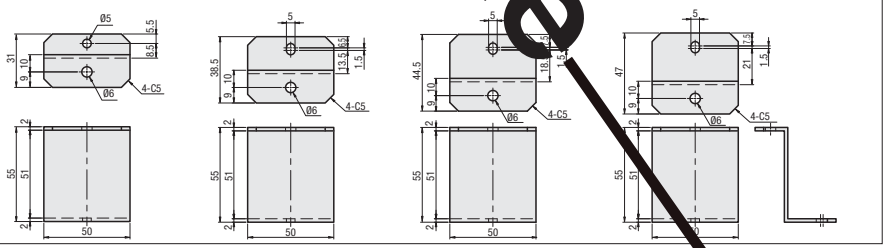
Part Number / Type	Air Volume m³/min	€ Unit Price Qty. 1~4: Air Volume 1	3	5	10	15	25	Volume Discount 5~9pcs.: Air Volume 1	3	5	10	15	25
(For HEPA)													

Mounting Brackets for Filter Units

RoHS



Material: 1.4301/X5CrNi18-10



Part Number Type	No.	Extrusions (Series)	Screw / Nut: Screws	Screw / Nut: Nuts	€ Unit Price 1~4 Qty.	Volume Discount 5~
		HFS5	SCB5-8	HNTTSN5-5		
		HFS6	SCB5-10	HNTTSN6-5		
		HFS8	SCB5-12	HNTTSN8-5		
		HFS8-45				

Use the included screws to attach the filter side.

For orders larger than indicated quantity, please request a quotation.

Order Example | Part Number | - | Air Volume

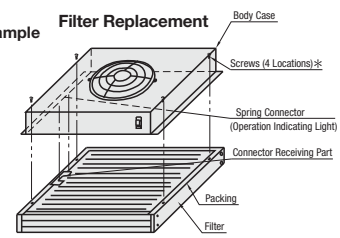
Days to Ship

■Replacement Filters: 10 Days

■Mounting Brackets for Filter Units: 6 Days

Example

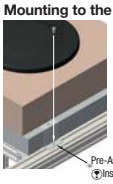
Filter Replacement



* and have 6 Connector Receiving Parts, while and have 8 Connector Receiving Parts.

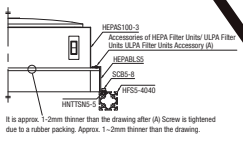
- Remove screws (4 locations) with a screwdriver and replace the filter.
- Position the connector for indicator light.

Mounting to the Aluminum Frames Units when HEPABLS is in use.



Pre-Assembly Fitting Nut HNTTSN

Insert it into the slot before assembling the extrusions.



Semi-HEPA Filter Unit for Equipment (Clean Exhaust Unit)
-Overview-

Not Available

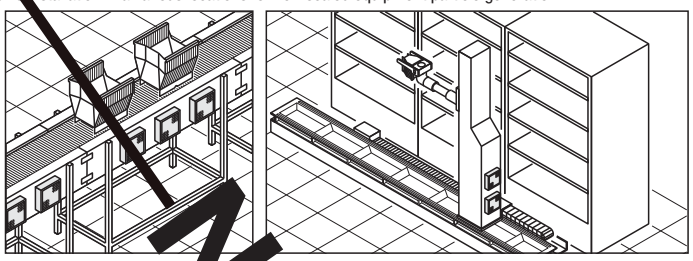
■Clean Exhaust Units

The unit reduces contamination effectively by actively exhausting particles when installed on particle generating motion mechanisms of various clean room equipment.

■Features

- A combination of a small axial flow fan and a low-loss Semi-HEPA filter has better than 95% efficiency for 0.3μm size particle collection.
- Small size allows installation in a various locations for non-sealed equipment particle generation.

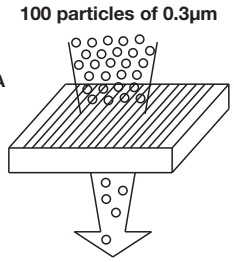
Example



By installing to particle generating work transfer equipment and robots, directly exhausting to clean room without localized ducts is possible.
Replacing heat exhaust fans on control panels with Clean Exhaust Units is also an effective clean room countermeasure.

■Semi-HEPA Standards

Original standards where the filter is capable of collecting 95% of 0.3μm size particles at rated air volume is called the Semi-HEPA Filter.



■About Cleanness

Cleans the exhaust air of 0.3μm size particles to less than [illegible] of the source.
Cleanness is defined by the number of standard sized particles per unit volume, however; installing Clean Exhaust Units keeps the cleanness against the particle generation sources under 20x or less of Particle Concentrations. Note that the standard particle size and standard volume are not the same on different standards. The target range for MISUMI Clean Exhaust Units is shown in the blue cells in the following table. 0.1μm/ft³ is used as a standard in parts of semiconductor industry.

■JIS B 9920

Particle Size (μm)	Cleanness Class Upper Limit Concentration (pieces/m³)							
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
0.1	10^1	10^2	10^3	10^4	10^5	(10^6)		(10^8)
0.2	2	24	236	2,360	23,600	-	-	
0.3	1	10	101	1,010	10,100	101,000	1,010,0	
0.5	(0.35)	(3.5)	35	350	3,500	35,000	350,00	3,5
5.0	-	-	-	-	29	290	2,900	
Cleanness Class Range of Particle Size	0.1~0.3		0.1~0.5		0.1~5.0	0.3~5.0		

■ISO 14644-1

ISO Class	Maximum Allowable Particle Concentration by Different Particle Sizes (Pieces/m³)					
	0.1μm	0.2μm	0.3μm	0.5μm	1μm	5μm
1	10	2				
2	100	24	10	4		
3	1,000	237	102	35	8	
4	10,000	2,370	1,020	352	83	
5	100,000	23,700	10,200	3,520	832	29
6	1,000,000	237,000	102,000	35,200	8,320	293
7				352,000	83,200	2,930
8				3,520,000	832,000	29,300
9				35,200,000	8,320,000	293,000

Clean Exhaust Units

Main Classification Standard for Cleaning Capacity

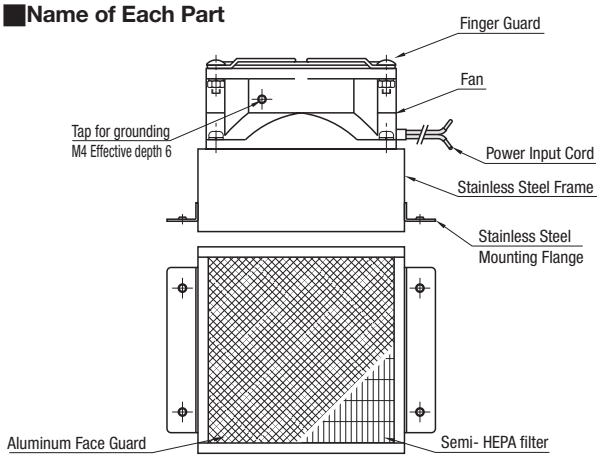
	US Federal Standards 209 D	US Federal Standards 209 E	JIS B 9920	ISO 14644-1	Semiconductor Industry
Standard Particle Size	0.5μm or More		0.1μm or More		
Unit Volume	ft³	m³			ft³
			1	ISO 1	
			2	ISO 2	1
		M1			
	1	M1.5	3	ISO 3	10
		M2			
	10	M2.5	4	ISO 4	100
		M3			1,000
Display	100	M3.5	5	ISO 5	
		M4			10,000
	000	M4.5	6	ISO 6	
		M5			100,000
	10,000	M5.5	7	ISO 7	
		M6			
	000	M6.5	8	ISO 8	
		M7			
				ISO 9	

■Maintenance · Inspection

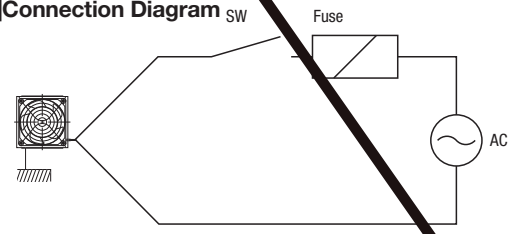
Clean Exhaust Unit consists of a semi-HEPA filter and a fan, and are both consumable components Replacements in approximately 3~5 yrs. are required.

- Semi-HEPA Filter
  Service life of a filter is when the air volume/speed is reduced to 1/2 due to clogging.
  The life may be reached in less than 3 yrs. in some usage conditions.
- Fan
  Stop the fan immediately if abnormal rotations or noises are evident. The service life may have been reached.

■Name of Each Part



■Connection Diagram



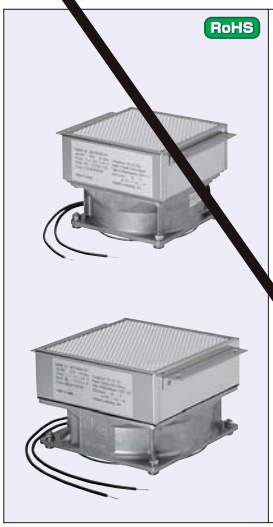
- Protect with a fuse to prevent from high voltage burnouts.
- Make a ground (earth) connection using a tap provided on the fan housing.

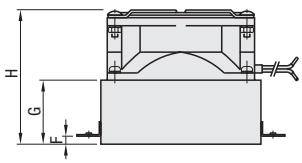
■Usage Environment

- Ambient Temp: -10~60°C
- Ambient Humidity: Less than 90% (No condensation)
- No direct sunlight
- No continuous vibrations or shocks
- No particles other than airborne particles

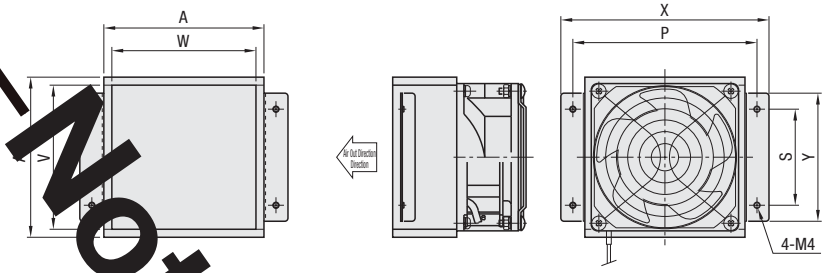
Semi-HEPA Filter Unit for Equipment (Clean Exhaust Unit)

CAD Data





Leads: Heat Resistant PVC 0.75mm² (30 cord./0.18 dia.)
Length: 300±30
See Connection Diagram on left page for connections.



Part Number		Air Volume m³/min	Exhaust Air Speed (m/s)	External Dimensions / Cover Height				Mounting Flange		Bottom Side Mounting Pitch			Bottom Blower Outlet Size		Mass (kg)	Noise (dBA)	€ Unit Price	Volume Discount
Type	Power Supply Single Phase (V)			A	H	G	F	X	Y	No. of Female Thread Holes	P	S	W	V			1~4 Qty.	5~9
(Semi-HEPA Filter)		0.20	0.41	100	84	40		130	80	4	115	60	90	90	0.7	31 (38)		
		0.28	0.38	120					100		135	80	110	110	0.8	44 (48)		

Noise level is measured at 1m from the exhaust in an anechoic chamber. Values in ( ) are for [illegible]

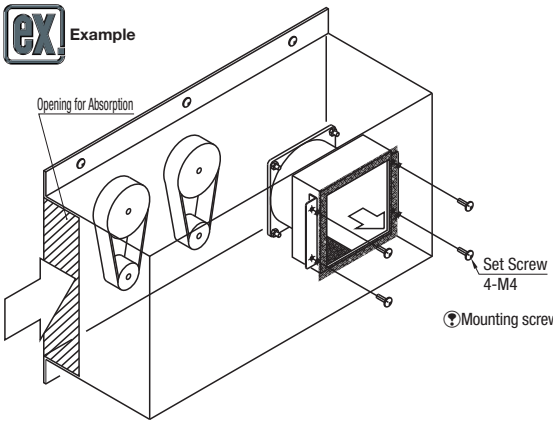
For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number - Air Volume
- 0.20

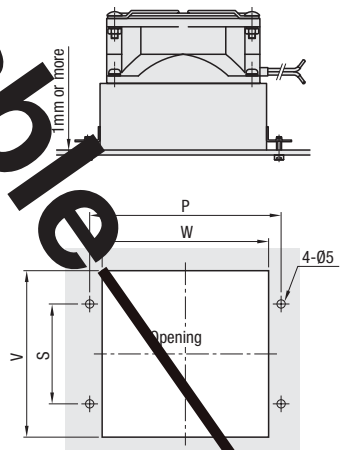
Days to Ship [illegible] Days

Example



Mounting screws are not included.

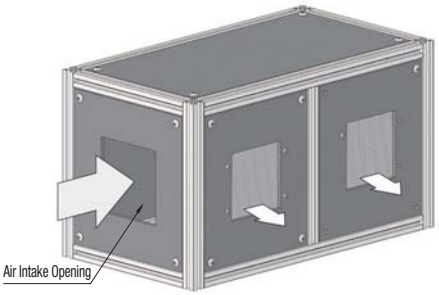
[illegible] Opening Dimensions



Mounting Part Machining Directions

- Clean room contamination can be reduced by installing the unit on covers surrounding particle generation motion mechanisms.
- Secure adequate air paths around the unit when designing to avoid undue resistance on intake and exhaust air flow.

An export permit application to the Ministry of Economy, Trade and Industry required when exporting this product.



- A case to cover dust source can be constructed with aluminum frame extrusions.

Air Intake Opening Dimensions

Secure adequate air flow using the following calculations.

$$\text{Air Intake Opening Area (m}^2\text{)} = \frac{\text{Clean Exhaust Unit Air Volume (m}^3\text{/min)} \times \text{Unit Qty.}}{\text{Intake Air Speed (m/s)} \times 60\text{s}}$$

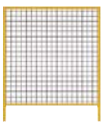
Set intake air speed to more than 0.3m/s in order to prevent dusts from being expelled from the intake opening.

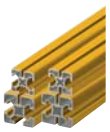
Not Available

Aluminum Frames Units - Assembly & Shipping Service

Aluminum Frames Units - Assembly & Shipping Service

Addition

Product Name	Safety Mesh Fence Units	Extrusion for Safety Fence
Page	757,758	759

Addition





Small Parts for Safety Mesh Fence Units	Door Units	Alum. Extrusion Components For Doors
760	761	762

Addition





Folding Door Units	Magentic Catches for Folding Doors	Sliders for Folding Door
763	764	764

Addition




Sliding Door Units	Alum. Extrusions for Slide Doors, Slide Rails, Slide Spacers, Mounting Plates
765	766

Addition

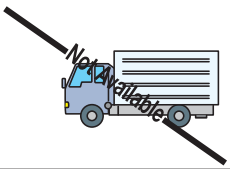



Addition





Aluminum Frames Standard Units	Components of Aluminum Frames Standard Units	Temporary Assembly Service
767	769~774	775





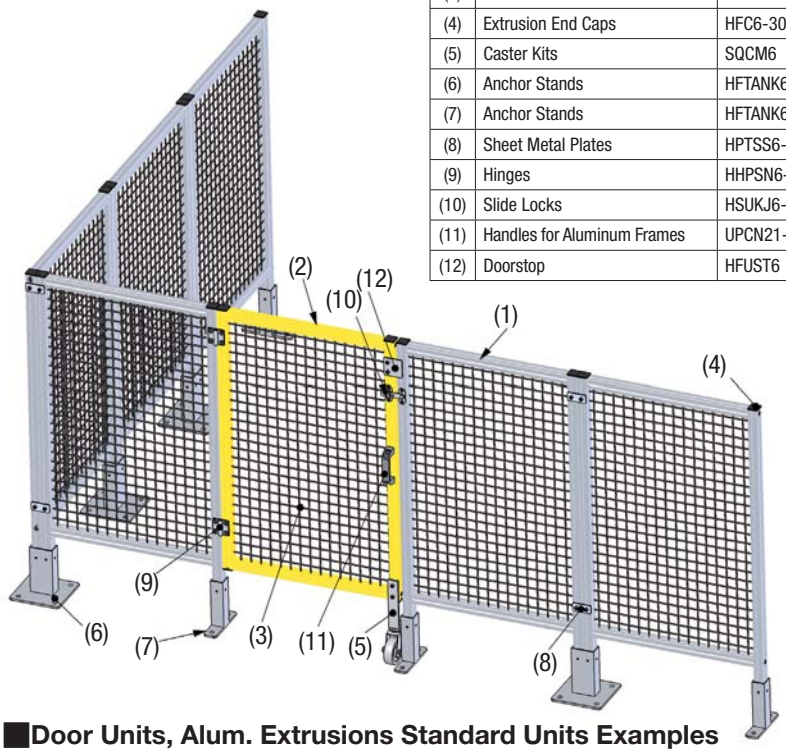


Assembling and Shipping Services	Application Form for Assembling and Shipping Service	Design Support Software for Aluminum Extrusion Shapes
777	781	783,784

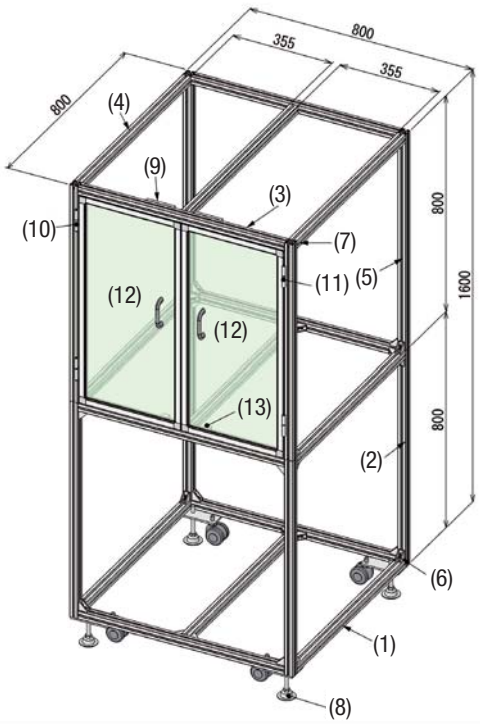
Example of Components: Safety Mesh Fence Extrusions

No.	Name	Part Number	Quantity	Page
(1)	Safety Mesh Fence Units	HFUA6-Fence Net-W dim.- D dim.-H dim.	6	**757**
(2)	Safety Mesh Fence Units (Yellow)	HFFSY6-3030-L dim.	4	**759**
(3)	Fence Nets	FENP30-A dim.-B dim.	1	**851**
(4)	Extrusion End Caps	HFC6-3030-B	16	**551**
(5)	Caster Kits	SQCM6	1	**715**
(6)	Anchor Stands	HFTANK6-3060-SET	4	**718**
(7)	Anchor Stands	HFTANK6-3030-AC-SET	4	**718**
(8)	Sheet Metal Plates	HPTSS6-SET	8	**541**
(9)	Hinges	HHPSN6-SET	2	**719**
(10)	Slide Locks	HSUKJ6-SET	1	**737**
(11)	Handles for Aluminum Frames	UPCN21-B-SET	1	**742**
(12)	Doorstop	HFUST6	1	**760**

* For frame alterations, see **P.645~658**



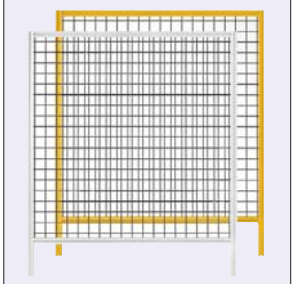
Door Units, Alum. Extrusions Standard Units Examples



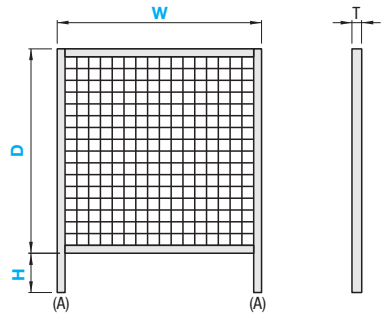
No.	Name	Part Number	Quantity	Page
(1)	Aluminum Extrusion for 30 Square	HFS6-3030-740	10	**511**
(2)	Aluminum Extrusion for 30 Square	HFS6-3030-800	4	**511**
(3)	Aluminum Extrusion for 30 Square	HFS6-3030-740-LDH-AH370-RDH	2	**511**
(4)	Aluminum Extrusion for 30 Square	HFS6-3030-740-LDH-RDH	3	**511**
(5)	Aluminum Extrusion for 30 Square	HFS6-3030-800-LCP	4	**511**
(6)	Reversal Bracket with Tab	HBLFSN6-SET	34	**523**
(7)	Single Joint Kit	HSJNS6	10	**635**
(8)	Adjuster Pad & Caster Kits	HAJCHP6	4	**705**
(9)	Magnetic Catch	HMER6-5	2	**731**
(10)	Flag Hinge for Aluminum Frames - Mixed Series	HHPFDLN6-SET	2	**726**
(11)	Flag Hinge for Aluminum Frames - Mixed Series	HHPFDRN6-SET	2	**726**
(12)	Door Units	HTUA6 - Panel - W Dims. - H Dims.	2	**761**
(13)	Magnetic Catch	HMEN6-5	2	**729**

* For frame alterations, see **P.645~658**

Safety Mesh Fence Units



HFUA(Standard Type)
HFUAY(Yellow Painted Extrusion Type)



Customer assembly required. Details on Fence Nets, see P.851 For (A) part, refer to Alteration below.

Standard Type

Part Number Type	Shape	No.	Fence Nets Wire Ø3.2 Panel (t=3) Selection	W (Width) 1mm increments	D (Height) 1mm increments	H (Leg Height) Selection	T	Components: Fence Nets (Part Number)	Extrusion (Part Number)	Fixing Parts (Part Number)	Fixing Parts Quantity	€ Unit Price: Fence Nets30B(Black, Pitch 30mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Fence Nets30S (Silver, Pitch 30mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Fence Nets50B (Black, Pitch 50mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Fence Nets50S (Silver, Pitch 50mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Anti-static PVCST3(Clear) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180
HFUA		6	30B (Pitch 30mm, Black) 30S (Pitch 30mm, Silver) 50B (Pitch 50mm, Black) 50S (Pitch 50mm, Silver) ST3 Anti-static PVC Clear	500 ~ 1000	500 ~ 1030	0 ~ 150	30	Black (FENP) Silver (FENM)	HFFS6-3030	SCB8-40	4					
		8		500 ~ 1000	500 ~ 1030		40		HFFS8-4040	SCB12-60	4					

Yellow Painted Extrusion Type

Part Number Type	Shape	No.	Fence Nets Wire Ø3.2 Panel (t=3) Selection	W (Width) 1mm increments	D (Height) 1mm increments	H (Leg Height) Selection	T	Components: Fence Nets (Part Number)	Extrusion (Part Number)	Fixing Parts (Part Number)	Fixing Parts Quantity	€ Unit Price: Fence Nets30B(Black, Pitch 30mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Fence Nets30S (Silver, Pitch 30mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Fence Nets50B (Black, Pitch 50mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Fence Nets50S (Silver, Pitch 50mm) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180	Anti-static PVCST3(Clear) W+D+H 1000~1299 / 1300~1599 / 1600~1899 / 1900~2180
HFUAY (Yellow Painted Extrusion Type)		6	30B (Pitch 30mm, Black) 30S (Pitch 30mm, Silver) 50B (Pitch 50mm, Black) 50S (Pitch 50mm, Silver) ST3 Anti-static PVC Clear	500 ~ 1000	500 ~ 1030	0 ~ 150	30	Black (FENP) Silver (FENM)	HFFSY6-3030	SCB8-40	4					
		8		500 ~ 1000	500 ~ 1030		40		HFFSY8-4040	SCB12-60	4					

Order Example

Part Number	-	Fence Nets	-	W	-	D	-	H
HFUA6	-	30B	-	W700	-	D800	-	H150

Days to Ship 10 Days

Alterations

Part Number	-	Fence Nets	-	W	-	D	-	H	-	(Alteration Code)
HFUA6	-	30B	-	W700	-	D800	-	H150	-	UTP

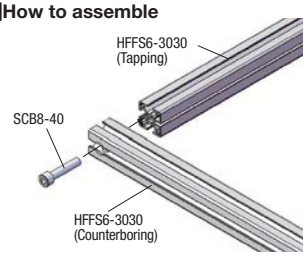
Alteration	Code	Spec.	Price Adder
Tapping on the Bottom End Face	UTP	Adds hole tapping alterations on the (A) of the drawing. HFUA6, HFUAY→M8 Depth 24 HFUA8, HFUAY8→M12 Depth 36	3,60

Example

<Features of Safety Mesh Fence>

Slot profile is the same as that of aluminum extrusion HFS series except the dedicated slot for the fence mesh.
All other accessories for the HFS Series (nuts, extrusion caps, etc.) can be used.

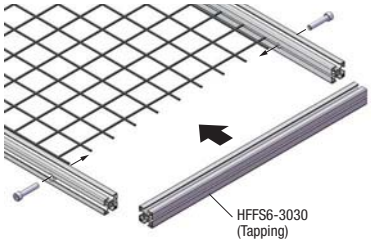
How to assemble



Step (1)
Connect frame extrusions with counterbored holes and end tapped holes using hex socket cap screws.
* Use hex socket cap screws (SCB12-60) when connecting HFFS8-4040 extrusions.

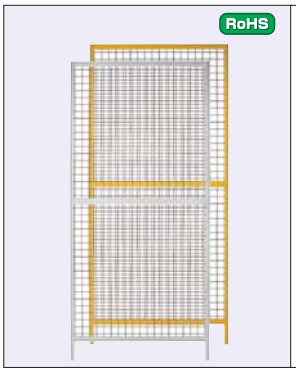


Step (2)
Insert a mesh fence into the dedicated slot for fence mesh.
The slots are sometimes slightly tight.

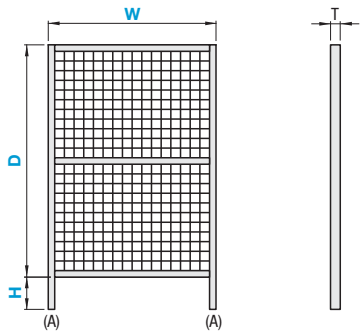


Step (3)
Connect the extrusions in the same manner as he Step (1), and the Mesh Fence is complete.

CAD Data



HFUB (Standard Type)
HFUBY (Yellow Painted Extrusion Type)



Customer assembly required. Details on Fence Nets, see P.851 For (A) part, refer to Alteration below.

Standard Type

Part Number Type	Shape No.	Fence Nets Wire Ø3.2 Panel (t=3) Selection	W (Width) 1mm increments	D (Height) 1mm increments	H (Leg Height) Selection	T	Components: Fence Nets (Part Number)	Components: Extrusion (Part Number)	Components: Fixing Parts (Part Number)	Components: Fixing Parts Quantity	€ Unit Price: Fence Nets30B(Black, Pitch 30mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Fence Nets30S (Silver, Pitch 30mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Fence Nets50B (Black, Pitch 50mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Fence Nets50S (Silver, Pitch 50mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Anti-static PVCST3(Clear) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150
HFUB	6	30B (Pitch 30mm, Black) 30S (Pitch 30mm, Silver) 50B (Pitch 50mm, Black) 50S (Pitch 50mm, Silver) ST3 Anti-static PVC Clear	500 ~ 1000	1500 ~ 2000	0 ~ 150	30	Black (FENP) Silver (FENM)	HFFS6-3030 HFFH6-3030	SCB8-40	6																		
	8		500 ~ 1000	1500 ~ 2000		40		HFFS8-4040 HFFH8-4040	SCB12-60	6																		

Yellow Painted Extrusion Type

Part Number Type	Shape No.	Fence Nets Wire Ø3.2 Panel (t=3) Selection	W (Width) 1mm increments	D (Height) 1mm increments	H (Leg Height) Selection	T	Components: Fence Nets (Part Number)	Components: Extrusion (Part Number)	Components: Fixing Parts (Part Number)	Components: Fixing Parts Quantity	€ Unit Price: Fence Nets30B(Black, Pitch 30mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Fence Nets30S (Silver, Pitch 30mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Fence Nets50B (Black, Pitch 50mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Fence Nets50S (Silver, Pitch 50mm) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150	Anti-static PVCST3(Clear) W+D+H 2000~2299	2300~2599	2600~2899	2900~3150
HFUBY (Yellow Painted Extrusion Type)	6	30B (Pitch 30mm, Black) 30S (Pitch 30mm, Silver) 50B (Pitch 50mm, Black) 50S (Pitch 50mm, Silver) ST3 Anti-static PVC Clear	500 ~ 1000	1500 ~ 2000	0 ~ 150	30	Black (FENP) Silver (FENM)	HFFSY6-3030 HFFHY6-3030	SCB8-40	6																		
	8		500 ~ 1000	1500 ~ 2000		40		HFFSY8-4040 HFFHY8-4040	SCB12-60	6																		

Order Example

Part Number	Fence Nets	W	D	H
HFUBY8	50B	W800	D1800	H150

Alterations

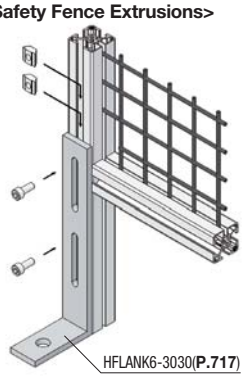
Part Number	Fence Nets	W	D	H	(Alteration Code)
HFUBY8	50S	W800	D1800	H150	UTP

Days to Ship 10 Days

Alteration	Code	Spec.	Price Adder
Tapping on the Bottom End Face	UTP	Adds hole tapping alterations on the (A) of the drawing. HFUB6, HFUBY→M8 Depth 24 HFUB8, HFUBY8→M12 Depth 36	3,60

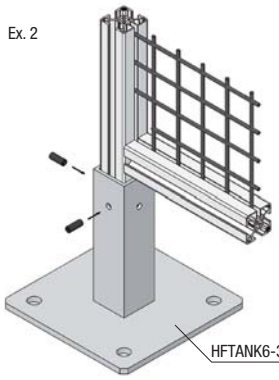
Example <How to Fix Safety Fence Extrusions>

Ex. 1



HFLANK6-3030(P.717)

Ex. 2



HFTANK6-3030(P.718)

Extrusion for Safety Fence

CAD Data

The paint color for the Yellow Type is D22-80V (Japan Paint Ind. Assoc.) ref. Mussel 2.5YR6/14.

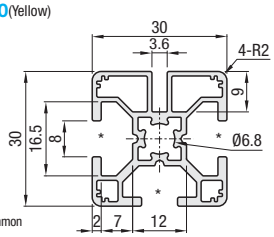
■Extrusion for Safety Fence



RoHS

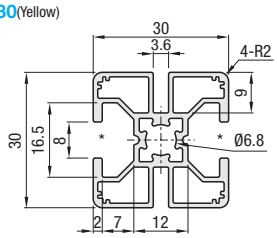
Type	M Material	S Surface Treatment
HFFS HFFH	EN AW-6063/ AlMg0,7Si	Clear Anodize
HFFSY HFFHY		Baked finish (Yellow)

HFFS6-3030
HFFSY6-3030(Yellow)



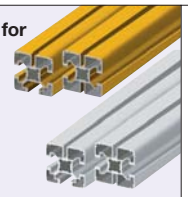
*marked shots are common with the HFS Sevies

HFFH6-3030
HFFHY6-3030(Yellow)



Part Number	L 0.5mm Increments (Tolerance ±0.5)	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	Volume Discount/m 300mm or More
HFFS6-3030	50~4000	0.72	268	1.59x104	1.56x104		
HFFSY6-3030(Yellow)							
HFFH6-3030		0.71	264	1.57x104	1.47x104		
HFFHY6-3030(Yellow)							

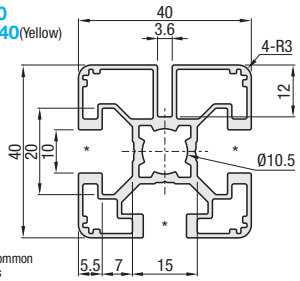
■Extrusion for Safety Fence



RoHS

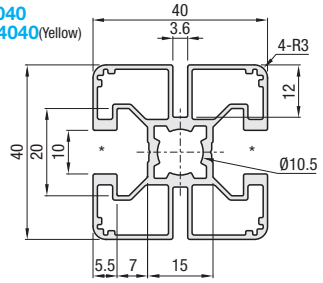
Type	M Material	S Surface Treatment
HFFS HFFH	EN AW-6063/ AlMg0,7Si	Clear Anodize
HFFSY HFFHY		Baked finish (Yellow)

HFFS8-4040
HFFSY8-4040(Yellow)



* marked slots are common with the HFS Series

HFFH8-4040
HFFHY8-4040(Yellow)



Part Number	L 0.5mm Increments (Tolerance ±0.5)	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	Volume Discount/m 300mm or More
HFFS8-4040	50~4000	1.09	405	2.97x104	3.09x104		
HFFSY8-4040(Yellow)							
HFFH8-4040		1.04	387	2.9x104	2.92x104		
HFFHY8-4040(Yellow)							

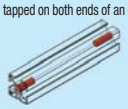
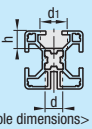
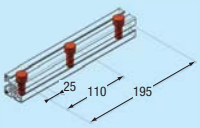
Order Example Part Number - L
HFFS6-3030 - 800

Days to Ship 6 Days

When L is less than 300
Use the unit prices in the table regardless of length.
ex: HFFS6-3030-180=1,90 EUR
When L is 300 or more
Price is calculated as follows:
€ Unit Price / m x Specified Length=Price
ex:HFFS6-3030-800 6,50 x 0.8m=5,20 EUR
(Round down to ten Cent)

Alterations Part Number - L - (Alteration Code)
HFFS6-3030 - 1000 - LTP-XA15-XB900

- Tapping alteration 7 Days
- Counterbored hole alteration 8 Days

Alterations Code		Tapping on the Left End Face LTP	Tapping on Both Ends TPW	Counterbore Hole Machining on the Specified Position XA XB XC XD XE
Spec.		Hole tapped on left end of an extrusion  <Tap Shape> HFFS6-3030, HFFH6-3030 HFFSY6-3030, HFFHY6-3030 →M8 Depth 24 HFFS8-4040, HFFH8-4040 HFFSY8-4040, HFFHY8-4040 →M12 Depth 36	Holes tapped on both ends of an extrusion  <Tap Shape> HFFS6-3030, HFFH6-3030 HFFSY6-3030, HFFHY6-3030 →M8 Depth 24 HFFS8-4040, HFFH8-4040 HFFSY8-4040, HFFHY8-4040 →M12 Depth 36	Machines counterbore holes on the specified position. (Distance from the left end) Can be machined counterbore holes up to 10 places. (0.5mm Increment) Dimensions and directions of the counterbore holes are shown in the drawing below.  Order example (1) HFFS6-3030-230-XA15-XB100-XC185  <Details of counterbored hole dimensions> Extrusion / HFFS6-3030 HFFSY6-3030 / HFFS8-4040 HFFSY8-4040 d: 9 / 13 d1: 14 / 19 h: 9 / 12.5
Price Adder	HFF_6 HFF_Y6	1,80	3,60	2,50 (per place)
	HFF_8 HFF_Y8	2,00	4,00	

Example

<Features of Safety Mesh Fence>

Slots other than slots designed for fence nets are the same slot as aluminum extrusion HFS series.
All other accessories for the HFS Series (nuts, extrusion caps, etc.) can be used.

■How to assemble



Step (1)
Connect frame extrusions with counterbored holes and end tapped holes using hex socket cap screws.
* Use hex socket cap screws (SCB12-60) when connecting HFFS8-4040 extrusions.

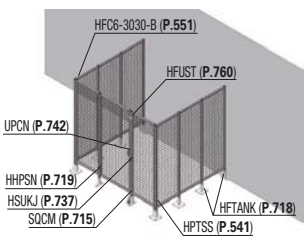


Step (2)
Insert a fence net into a dedicated slot.
The slots are sometimes slightly tight.



Step (3)
Connect the extrusions in the same manner as he Step (1), and the Mesh Fence is complete.

■How to fix Safety Mesh Fence Units



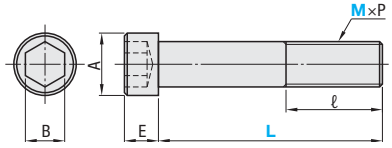
Small Parts for Safety Mesh Fence

RoHS



M Material: 1.4567/X3CrNiCu18-9-4
JIS B 1176
* Strength Class A2-70

SCB (Stainless Steel)



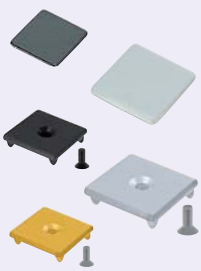
* A2-70 (SCB)
- It indicates that the minimum value of nominal tensile strength is 700N/mm² {71kgf/mm²}.
- The steel class is A2 (Austenitic Stainless Steel)

Part Number Type	M-L	MxP	ℓ	A	E	B	€ Unit Price 1~9 pcs	Volume Discount 10~29	30~99	100~
SCB	8-40	8x1.25	28	13	8	6				
	12-60	12x1.75	36	18	12	10				

Order Example: Part Number SCB8-40

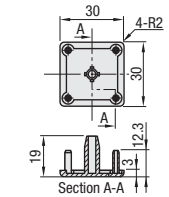
Days to Ship: 6 Days P.87

RoHS

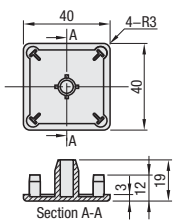


M Material: Polyamide
(Black, Lt. Gray, Yellow)

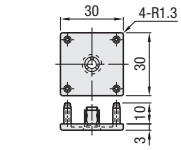
HFC6-3030



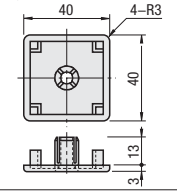
HFC8-4040



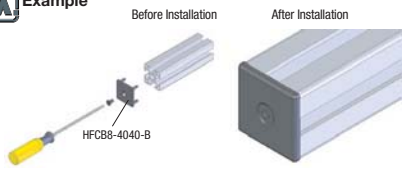
HFCB6-3030
(Bolt Fixing Type)



HFCB8-4040
(Bolt Fixing Type)



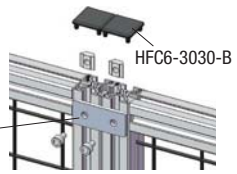
Example



Tapping on the frame is not required.

Connecting adjacent frames (30 SQ. type)

- Install extrusion caps as needed.



Part Number Type	No.	Color	€ Unit Price 1~14pcs.	Volume Discount 15~19	20~	Applicable Extrusion
HFC6	3030	B (Black)				HFF_6-3030 HFF_Y6-3030
HFC8	4040	S (Light Gray)				HFF_8-4040 HFF_Y8-4040
HFCB6	3030	B (Black)				HFF_6-3030 HFF_Y6-3030
HFCB8	4040	S (Light Gray) Y (Yellow)				HFF_8-4040 HFF_Y8-4040

Order Example: Part Number HFCB6-3030 - Color B

Days to Ship: 6 Days P.87

Flathead countersink screw is included for Screw Mount Type.
3030 Type (Blk: HFBMB4-12, Lt. Gray - Yellow: SHFBS4-12)
4040 Type (Blk: HFBMB5-12, Lt. Gray - Yellow: SHFBS5-15)

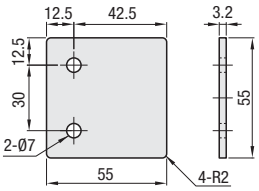
Doorstop (for hinged doors)

RoHS

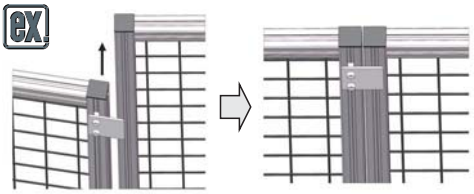


M Material: 1.0320/St.22
S Surface Treatment: Trivalent Chromate

HFUST6
HFUST8



Required nuts and screws are specific to the extrusion size.



Part Number Type	No.	Applicable Extrusion (Series)	Accessory Screws	Quantity	Nuts	Quantity	€ Unit Price 1~4pcs.	Volume Discount 5~
HFUST	6	HFF_6-3030 HFF_Y6-3030	SCB6-10	2	HNTT6-6	2		
	8	HFF_8-4040 HFF_Y8-4040	SCB6-15	2	HNTT8-6	2		

Order Example: Part Number HFUST6

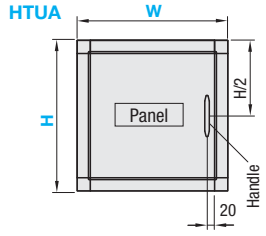
Days to Ship: 6 Days P.87

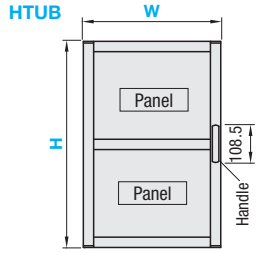
Door Units / Extrusion Components for Doors

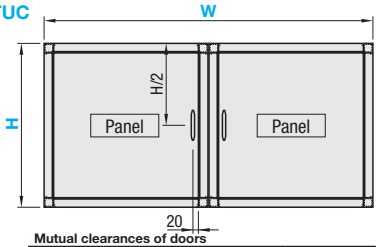
RoHS











This product requires assembly.
When HTUB is selected, the minimum notching are applied on the panels in order to avoid interferences with connecting components.

Mutual clearances of doors

	500≤W≤659	660≤W≤1399	1400≤W
Clearances	6	5	4

Part Number		Panel (Select a desired material and thickness from the codes below)			W (Width) 1mm Increments	H (Height) 1mm Increments	Components						
							Frame*	Fixing Parts		Handle		Panel Holder	
Type	No.						Part Number	Part Number	Quantity	Part Number	Quantity	Part Number	Quantity
HTUA	5	Acrylic (Clear)	AC(Thickness 5mm)	AC3(Thickness 3mm)	250~1000 W≤900 when AC3	250~1000 H≤900 when AC3	HFTF5-2020	HBLTC5	4	HHDS90 (screws for Fixing)	1	(Thickness 5mm) HFSSK5-Length (Thickness 3mm) HFSSK3-Length	4
		Polycarbonate (Clear)	PC(Thickness 5mm)	PC3(Thickness 3mm)									
		PET (Clear)	PY(Thickness 5mm)	PY3(Thickness 3mm)									
	6	Anti-static PVC (Clear)	ST(Thickness 5mm)	ST3(Thickness 3mm)			HFTF6-3030	HBLTC6					
		No panel	NN										
HTUB	6	Acrylic (Clear)	AC(Thickness 5mm)	AC3(Thickness 3mm)	500~1000 W≤900 when AC3	1000~2000 H≤1850 when AC3	HFS6-3030	HBLBCA6 HCJ6	4 2	UPCN21-B-SST	1	(Thickness 5mm) HSCP3H-Length (Thickness 3mm) HSCP5N-Length	4
		Polycarbonate (Clear)	PC(Thickness 5mm)	PC3(Thickness 3mm)									
		PET (Clear)	PY(Thickness 5mm)	PY3(Thickness 3mm)									
	8	Anti-static PVC (Clear)	ST(Thickness 5mm)	ST3(Thickness 3mm)			HFS8-4040	HBLBCA8 HCJ8	4 2	UPCN26-B-SST		(Thickness 5mm) HSCP5H-Length (Thickness 3mm) HSCP7H-Length	
		No panel	NN										
HTUC	5	Acrylic (Clear)	AC(Thickness 5mm)	AC3(Thickness 3mm)	500~2000 W≤1800 when AC3	250~1000 H≤900 when AC3	HFTF5-2020	HBLTC5	8	HHDS90 (screws for Fixing)	2	(Thickness 5mm) HFSSK5-Length (Thickness 3mm) HFSSK3-Length	8
		Polycarbonate (Clear)	PC(Thickness 5mm)	PC3(Thickness 3mm)									
		PET (Clear)	PY(Thickness 5mm)	PY3(Thickness 3mm)									
	6	Anti-static PVC (Clear)	ST(Thickness 5mm)	ST3(Thickness 3mm)			HFTF6-3030	HBLTC6					
		No panel	NN										

* Aluminum frames will have hole machining required for connecting.

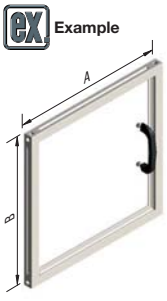
Price

Price of this item will be the price shown in the table with the material multiplier. (Round down to one Cent)
(Example) For HTUA6-PY-700-700: 110,00x0.9=107,90 EUR

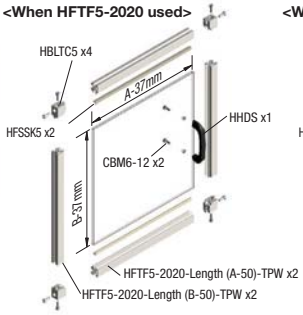
Part Number		W (mm)	€ H/Height							
			250 ~499	500 ~749	750 ~1000	1000 ~1249	1250 ~1499	1500 ~1749	1750 ~2000
HTUA	5	250~499							
		500~749							
		750~1000							
	6	250~499							
		500~749							
		750~1000							
HTUB	6	500~749							
		750~1000							
	8	500~749							
		750~1000							
HTUC	5	500~999							
		1000~1499							
		1500~2000							
	6	500~999							
		1000~1499							
		1500~2000							

Panel			Material Rate
Thickness 5mm	AC	Acrylic (Clear)	x1.0
	PC	Polycarbonate (Clear)	x1.3
	PY	PET (Clear)	x0.9
	ST	Anti-static PVC (Clear)	x1.3
Thickness 3mm	AC3	Acrylic (Clear)	x0.9
	PC3	Polycarbonate (Clear)	x1.1
	PY3	PET (Clear)	x0.9
	ST3	Anti-static PVC (Clear)	x1.1
No panel	NN	No panel	x0.5

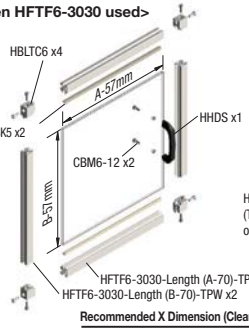
Example



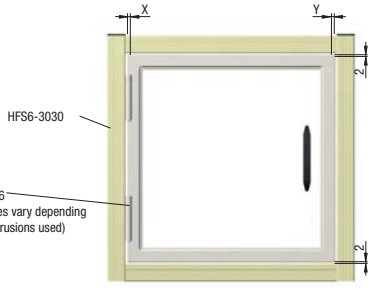
<When HFTF5-2020 used>



<When HFTF6-3030 used>



■Clearances of HTUA/HTUC doors and the outer frame



* Mount the support spacers along the circumference.
* The door extrusions will need tapping.
Caster kit for door extrusions P.715

Recommended X Dimension (Clearance on Hinge Side)

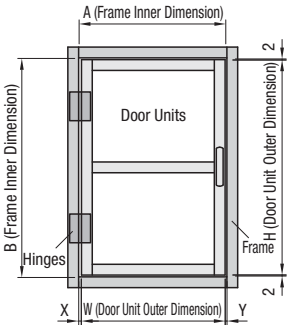
	Extrusions	
	HFS5-2020 HFS6-3030	HFS8-4040 HFS6-4545
X	3.5	4.5

Recommended Y Dimension (Clearance on Handle Side)

	A (Door Width)		
	200≤W<330	330≤W<700	700≤W
Y	3	2.5	2

* For HTUC (double-leafed doors), the clearance between the doors will be (Y x 2).

Clearance of HTUB door and the outer frame



Door Units Type	No.	Hinges to be used	Outer frame 30 Square (HFS6) W	H	X	Y When 250≤W<450	Y When 450≤W	40 Square (HFS8) W	H	X	Y 250≤W<450 When	Y 450≤W When	45 Square. (HFS8-45) W	H	X	Y When 250≤W<450	Y When 450≤W
HTUB	6	Hinges	A-Y-2	B-4	2	3	2	A-Y-2	B-4	2	3	2	A-Y-2	B-4	1.5	3	2
		Flag Hinges	A-Y-3.5	B-4	3.5	3	2	A-Y-4.5	B-4	4.5	3	2	A-Y-4.5	B-4	4.5	3	2

Door Units Type	No.	Hinges to be used	Outer frame 40 Square. (HFS8), 45 Square. (HFS8-45) W	H	X	Y 200≤W<400 When	Y 400≤W<700 When	Y 700≤W<1000 When	Y 1000≤W When
HTUB	8	Hinges	A-Y-2	B-4	2	5	4	3	2
		Flag Hinges	A-Y-4.5	B-4	4.5	5	4	3	2

Order Example Part Number: HTUA6 - Panel: AC - W: 600 - H: 500

Days to Ship 10 Days

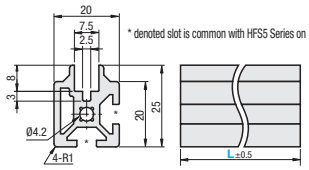
Alterations Part Number: HTUB6 - Panel: PC - W: 900 - H: 1800 - (Alteration Code: TN)

Alterations	Code	Spec.	Price Adder
Handles are not included ⓟApplicable to HTUB only	TN	Shipped without a standard handle included. (Please use a customer provided handle)	-6,80

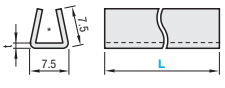
RoHS



HFTF5-2020 (Door Extrusion)
Panel Thickness 3~5mm

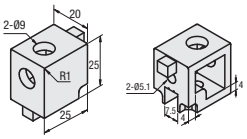


HFSSK (Support Spacer)

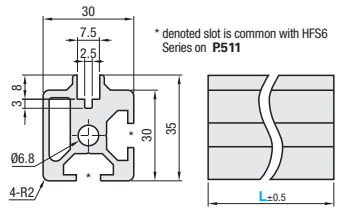


*Insert a panel in this slot.

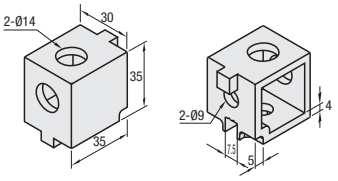
HBLTC5
(For door extrusions Corner Bracket)



HFTF6-3030 (Door Extrusion)
Panel Thickness 3~5mm



HBLTC6
(For door extrusions Corner Bracket)



Type	Material	Surface Treatment
HFTF5-2020 HFTF6-3030	EN AC-51 400/AlMgSi0,7	Clear Anodize
HBLTC	EN AC-46100/G-AlSi12Cu	-
HFSSK5	EVA Temp. Resistance: -20~60C°	-

Door Extrusion

Part Number	L 0.5mm Increments	Mass kg/m	Sectional Area mm²	Applicable Panel Thickness	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	Volume Discount/m 300mm or More
HFTF5-2020	50~4000	0.60	222	3~5	1.01x10⁴	0.87x10⁴		
HFTF6-3030		1.28	474		4.49x10⁴	3.83x10⁴		

When L is less than 300, prices will be as shown in the table, regardless of the actual lengths.
ex:HFTF5-2020-180=2,10 EUR
When L is 300 or over, apply the price calculation below.
€ Unit Price/mxStandard Full Length Price=Price
ex:HFTF5-2020-500
7,10 x 0.5m=3,50 EUR (Round down to ten Cent)

Support Spacer

Part Number Type	No.	L Selection	Applicable panel Plate thickness	t	L1000 € Unit Price 1~9 pcs	L1000 Volume Discount 10~50	L2000 € Unit Price 1~9 pcs	L2000 Volume Discount 10~50
HFSSK *	3	1000 2000	3	2				
	5		5	1				

ⓟ* HFTF5-2020, HFTF6-3030 common ⓟFor orders larger than indicated quantity, please request a quotation.

Corner Bracket for Door Extrusion

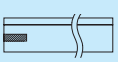
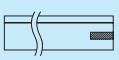
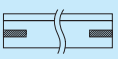
Part Number Type	No.	Mass (g)	Accessory Screws	Accessory Quantity	€ Unit Price 1~99 pcs.	Volume Discount 100~
HBLTC	5	45	SCBE5-15	2		2,49
	6	49	SCBE8-25			3,70

Order Example Part Number: HFTF5-2020 - L: 450; HFSSK5 - 1000; HBLTC5

*The door extrusions need tapping.

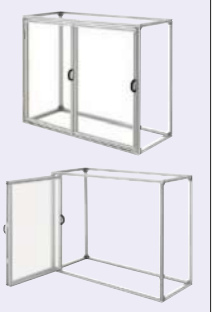
Days to Ship
- HFTF5-2020, HFTF6-3030: 6 Days P.88
- HFSSK: 7 Days P.88
- HBLTC: 6 Days P.87

Alterations Part Number: HFTF5-2020 - L: 800 - (Alteration Code: TPW) — 7 Days

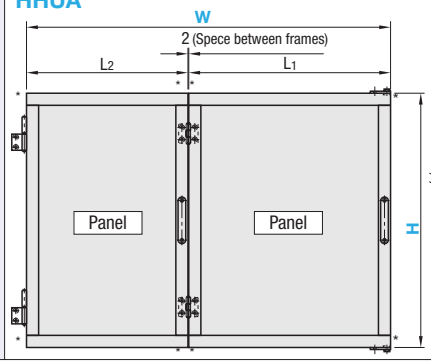
Alterations	Tapping ⓟApplicable to HFTF5-2020, HFTF6-3030		
Code	LTP	RTP	TPW
Spec. (Type / Tap Shape: HFTF5-2020 M5-Depth15; HFTF6-3030 M8-Depth24)	Tapping on the left end face 	Tapping on the right end face 	Tapping on both ends 
Price Adder	1,80	1,80	3,60

Folding Door Units / Magnetic Catches / Sliders

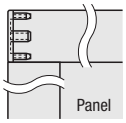
■Folding Door Units RoHS



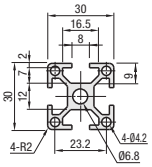
HHUA



<Enlarged * section>
Please attach the included extrusion end caps at eight cut surfaces.

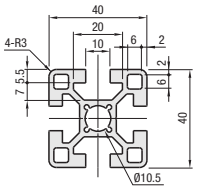


<Extrusion when HHUA6 selected>



HFS6-3030

<Extrusion when HHUA8 selected>



HFS8-4040

- Customer assembly required.
- Only the folding door part is sold.
- The drawing is for a left opening door. Doors opening toward the right have hinges (for fixing) on the right side. And $L_2 > L_1$.
- Minimum notching is given to a panel to avoid interference with fastener parts.

Part Number			Panel (Select a desired material and thickness from the codes below)		W (Width) 1mm increments	H (Height) 1mm increments	L1	L2	Components															
									Frame*		Fixing Parts		Panel Clamps		Sliders for Folding Doors		Handle		Hinges (for middle)		Hinges (for fixing)		Extrusion End Caps	
Type	No.	Open/Close Direction							Part Number			Quantity	Part Number	Quantity	Part Number	Quantity	Part Number	Quantity	Part Number	Quantity	Part Number	Quantity	Part Number	Quantity
HHUA	6	L (Left)	Acrylic (Clear)	AC (Thickness 5mm) AC3 (Thickness 3mm)	500~1500	500~1000	L2+28	W/2-15	HFS6-3030		HCJ6	8	(Thickness 5mm) HSCP3H-B (Thickness 3mm) HSCP5HN-B	8	HFAFSH6	2	HHDF20-SST	2	HHPSN6-SST	2	HHPFLN6-SST	2	HFC6-3030-S	8
		R (Right)	Polycarbonate (Clear)	PC (Thickness 5mm) PC3 (Thickness 3mm)			W/2-15	L1+28													HHPFRN6-SST			
			PET (Clear)	PY (Thickness 5mm) PY3 (Thickness 3mm)																				
	8	L (Left)	Anti-static PVC (Clear)	ST (Thickness 5mm) ST3 (Thickness 3mm)			L2+46	W/2-24	HFS8-4040		HCJ8	8	(Thickness 5mm) HSCP5H-B (Thickness 3mm) HSCP7H-B	8	HFAFSH8	2	HHDF26-SST	2	HHPSN8-SST	2	HHPFLN8-SST	2	HFC8-4040-S	8
		R (Right)	No panel	NN			W/2-24	L1+46													HHPFRN8-SST			

Order Example

Part Number	-	Panel	-	W	-	H
HHUA6L	-	PC	-	1000	-	800

Days to Ship 10 Days

Price

The price of this product is the price shown in the table multiplied by each material rate. (Round down to ten Cent.)
(Example) For HHUA6L-PY-800-900: 292,00 EURx0.9=262,80 EUR

Panel			Material Rate
Thickness 5mm	AC	Acrylic (Clear)	x1.0
	PC	Polycarbonate (Clear)	x1.2
	PY	PET (Clear)	x0.9
	ST	Anti-static PVC (Clear)	x1.3
Thickness 3mm	AC3	Acrylic (Clear)	x0.9
	PC3	Polycarbonate (Clear)	x1.0
	PY3	PET (Clear)	x0.9
	ST3	Anti-static PVC (Clear)	x1.1
No panel	NN	No panel	x0.6

Part Number		W (mm)	€ H/Height 500~749	€ H/Height 750~1000
HHUA	6L 6R	500~749		
		750~999		
		1000~1249		
		1250~1500		
	8L 8R	500~749		
		750~999		
		1000~1249		
		1250~1500		

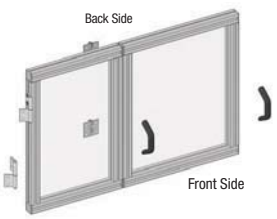
Example ■Example of folding door assembly (For left opening door)



- Corners are screw-joint connected.
- About Screw-Joint connections P.628



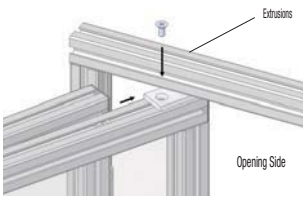
-Inset a panel and fix it with a panel clamp. (Connection with bracket is possible)



-Combine 2 panels. Attach hinges to the reverse side, flag hinges to the left side and handle on the front face.



-Connect the outer extrusion and the folding door, and mount a slider on the upper and lower slot of the outer extrusion.

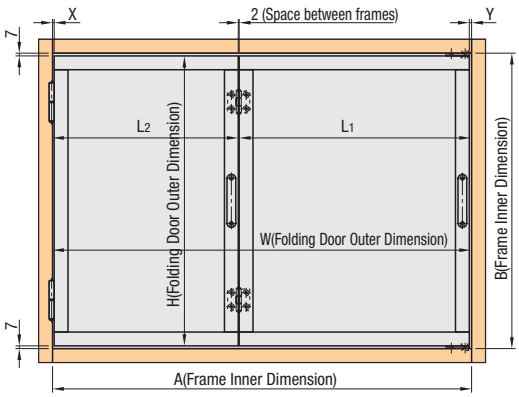


-Keep it fully open and fix the folding door body to the folding door slider.



Smoothness of the door depends on the tolerance of aluminum extrusions and accuracy of assembly. Be sure to finely adjust the position of sliders.

■Clearance between HHUA and outer frame



■Details of Each Component

Part Number	Product Name	Page
HFS6-3030	30 SQ. Alum. Extrusions	P.511
HFS8-4040	40 SQ. Alum. Extrusions	P.553
HCJ	Screw Joints	P.628
HSCP3H-B,HSCP5H-B	Panel Clamps	P.685
HFAFSH	Sliders for Folding Doors	P.764
HHDF	Handle	P.741
HHPSN	Hinges	P.719
HHPFFLN (HHPFRN)	Aluminum Flag Hinges	P.726
HFC6-3030-S,HFC8-4040-S	Extrusion End Caps	P.551

■Imparting Folding Door



Folding Door Units		Outer Frame											
		30 Square (HFS6)						40 Square (HFS8)					
Type	No.	W Dimension	H Dimension	X Dimension	Y Dimension When 500≤W<700	Y Dimension When 700≤W<1000	Y Dimension When 1000≤W<1500	W Dimension	H Dimension	X Dimension	Y Dimension When 500≤W<700	Y Dimension When 700≤W<1000	Y Dimension When 1000≤W<1500
HHUA	6	A-Y-X	B-14	3.5	7.5	6.5	5.5	-	-	-	-	-	-
	8	-	-	-	-	-	-	A-Y-X	B-14	4.5	11.5	9.5	7.5

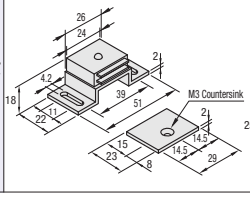
■Magentic Catches for Folding Doors RoHS



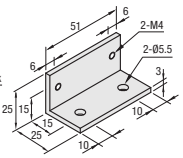
M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Dark Brown Painting

HMENF6-6 (30 Square 30 Square for folding door)
HMENF8-8 (40 Square 40 Square for folding door)

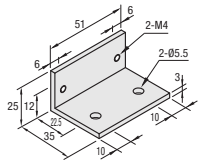
Magnet Body



MG6-6 Plate

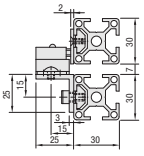


MG8-8 Plate

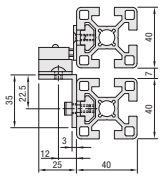


Example

HMENF6-6



HMENF8-8



Part Number		Applicable Extrusion		Magnet	Components												€ Unit Price	Volume Discount
					Magnet Side							Door Side (Extrusion Side)						
Type	No.	Extrusions	Folding Doors	Retaining Force N{kgf}	Mounting Plate	For Magnet Fitting: Attachment Screws	Quantity	Screws	Quantity	Nuts	Quantity	For Extrusion Mounting: Rush Screw	Quantity	Nuts	Quantity		1~4pcs.	5~50
HMENF	6-6	30 Square	30 Square	29.4 {3}	MG6-6	Truss Screw M4-5	2	SCB5-10	2	HNTT6-5	2	M3-8	1	HNTT6-3	1			
	8-8	40 Square	40 Square		MG8-8	Truss Screw M4-5	2	SCB5-12	2	HNTT8-5	2	M3-8	1	HNTM8-3	1			

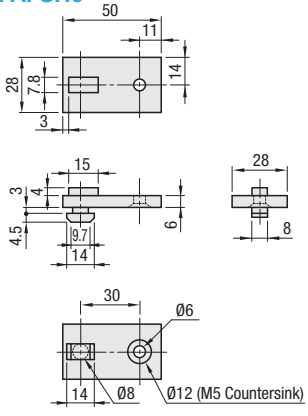
Order Example: Part Number HMENF6-6

Days to Ship: 8 Days

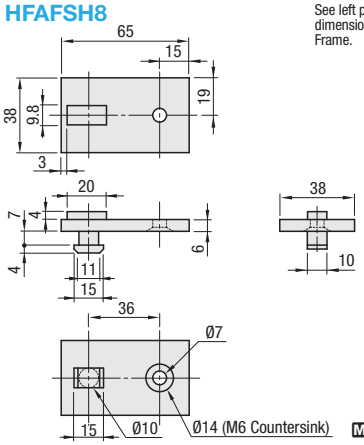
■Sliders for Folding Door RoHS



HFAFSH6



HFAFSH8



See left page for recommended dimensions of mounting to Outer Frame.

M Material: Polyacetal (White)

Part Number		Applicable Extrusions (Series)		Included Screws and Nuts				€ Unit Price	Volume Discount	
Type	No.	Folding door side extrusion	Outer frame	Screws	Quantity	Nuts	Quantity	1~49pc.	50~99	100~
HFAFSH	6	HFS6	HFS6	SHFBS5-12	1	SHNTP6-5	1			
	8	HFS8*	HFS8*	SHFBS6-15	1	SHNTP8-6	1			

*Cannot be used for HFS8-45, HFS8-50, HFS8-60

Order Example: Part Number HFAFSH6

Days to Ship: 6 Days P.87

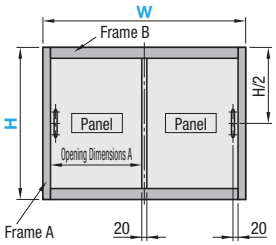
Sliding Door Units

CAD Data



RoHS

HRUA



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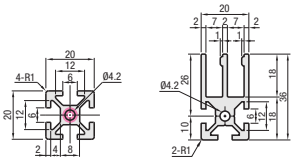
<Extrusions when HRUA5 selected>



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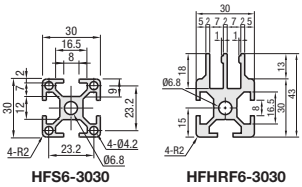
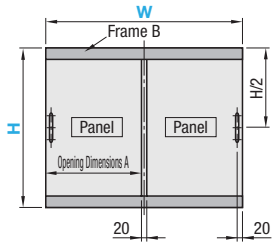


This product requires assembly.

HRUB



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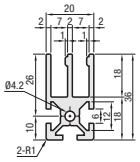

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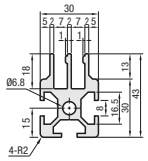


This product requires assembly.

Part Number		Panel (Select a desired material and thickness from the codes below)		W (Width) 1mm increments	H (Height) 1mm increments	A Opening Dimensions	Components							
							Frame A	Frame B	Fixing Parts		Slide Spacers		Handle	
Type	No.						Part Number	Part Number	Part Number	Quantity	Part Number	Quantity	Part Number	Quantity
HRUA	5	Acrylic (Clear)	AC(Thickness 5mm)	500~2000	300~900	W/2-56.5	HFS5-2020	HFHRF5-2020	SCB5-25	4	HRLSP	2	HHDS90 (screws for Fixing)	2
	6	Polycarbonate (Clear)	PC(Thickness 5mm)			W/2-66.5	HFS6-3030	HFHRF6-3030	SCB8-40					
HRUB (No Side Extrusion)	5	PET (Clear)	PY(Thickness 5mm)	500~1900	300~900	W/2-36.5	-	HFHRF5-2020	-	-	HRLSP	2	HHDS90 (screws for Fixing)	2
	6	Anti-static PVC (Clear)	ST(Thickness 5mm)					HFHRF6-3030						

Order Example: Part Number - Panel - W - H
HRUA6 - AC - 1200 - 750

Days to Ship: 10 Days

Price

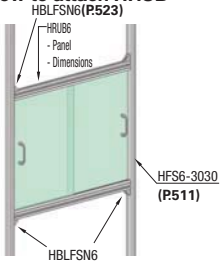
Price of this item will be the price shown in the table with the material multiplier. (Round down to one Cent)
(Example) For HRUA6-PY-1600-850: 242,80 EURx0.9=218,50 EUR

Part Number		W (mm)	€ H/Height (mm) 300~599	€ H/Height (mm) 600~900
HRUA	5	500~999		
		1000~1499		
		1500~2000		
	6	500~999		
		1000~1499		
		1500~2000		
HRUB	5	500~999		
		1000~1499		
		1500~2000		
	6	500~999		
		1000~1499		
		1500~2000		

Panel			Material Rate
Thickness 5mm	AC	Acrylic (Clear)	x1.0
	PC	Polycarbonate (Clear)	x1.3
	PY	PET (Clear)	x0.9
	ST	Anti-static PVC (Clear)	x1.3

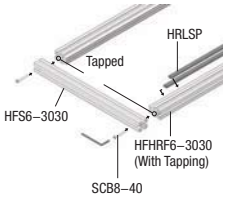
Example

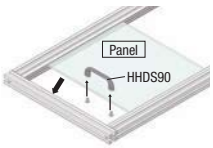
Example - how to attach HRUB

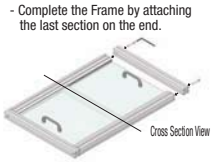


Example - how to assemble HRUA6

- Connect frames on one side and insert a slide space into the groove
- Mount a Handle on the panel. Insert the Panel into the grooves of slide spacers.
- Complete the Frame by attaching the last section on the end.







<Cross Section View>

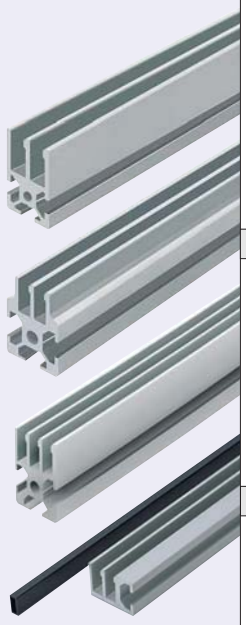


Sliding Door Alum. Extrusions / Slide Rails / Slide Spacers / Mounting Plates
-Aluminum Type-

CAD Data

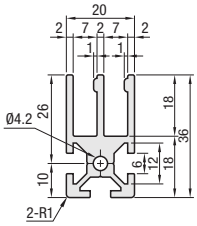
RoHS

Model Number Not compliant with RoHS

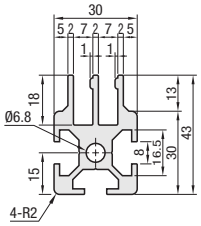


Aluminum Frames for Sliding Door

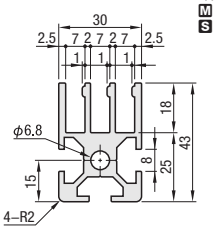
HFHRF5-2020



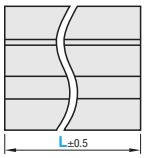
HFHRF6-3030



HFHRT6-3030

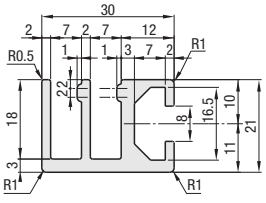


Applicable to panels of 5mm thickness
M Material: EN AC-51400-T5/AlMgSi0,7
S Surface Treatment: Anodize

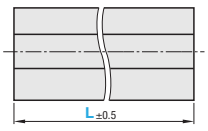


Slide Rails

HRLFL

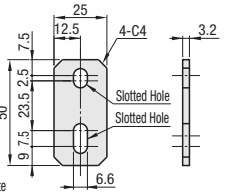


Applicable to panels of 5mm thickness
M Material: EN AC-51400-T5/AlMgSi0,7
S Surface Treatment: Anodize



Attachment Plates

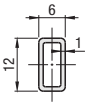
HRLPL6 (Connect a slide rail and a support extrusion)
HRLPL8



M Material: 1.0330/DC01
S Surface Treatment:
JIS STKM Bright Chromate

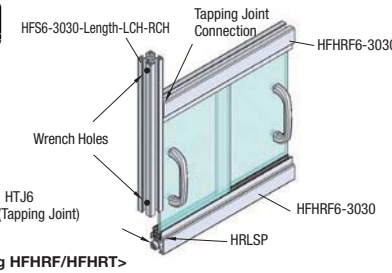
Slide Spacers

HRLSP (To be inserted into Slide Rail's two bottom rows or three bottom rows)

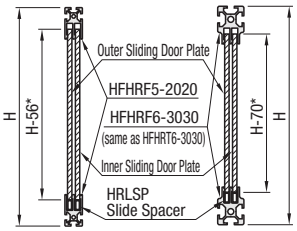


Type	M Material	Heat Resistant Temperature
HRLSP	Polyethylene (Black)	-45~80C°

ex

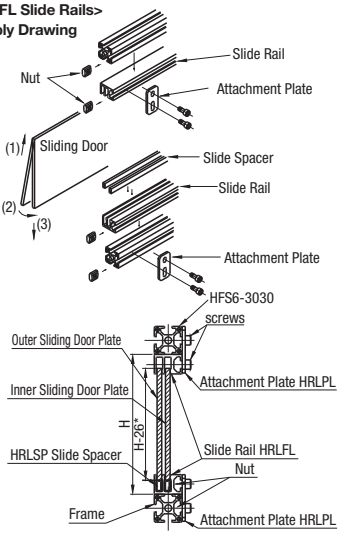


<Using HFHRF/HFHRT>



HFHRF5	*When H dimension is less than 318, design with H-60.
HFHRF6, HFHRT6	*When H dimension is less than 325, design with H-74.

<Using HRLFL Slide Rails>
- Assembly Drawing



When H dimension is less than 300, design with H-30.

Aluminum Frames for Sliding Door

Part Number	L 0.5mm Increments	Mass kg/m	Sectional Area mm²	Cross Sectional Moment of Inertia mm⁴ ℓx	ℓy	€ Unit Price Less than 300mm	Volume Discount /m 300mm or More
HFHRF5-2020	50~4000	0.83	308	3.16x104	1.25x104		
HFHRF6-3030		1.43	528	7.18x104	4.13x104		
HFHRT6-3030		1.43	529	8.11x104	4.62x104		

Slide Rails

Part Number	L 1mm Increments	Applicable Extrusion (Series)	Mass kg/m	Sectional Area mm²	€ Unit Price/m
HRLFL	50~3000	HFS6 HFS8 HFS8-45	0.716	265	

Slide Spacers

Part Number	Length mm	€ Unit Price 1~4pcs.	Volume Discount Qty. 5~
HRLSP	2000		

Part Number	Length mm	€ Unit Price (set of 30 pcs.)
HRLSP-SET (set of 30 pcs.)	2000	

Attachment Plates

Part Number Type	No.	Applicable Extrusion (Series)	Accessories Screws	Quantity	Nuts	Quantity	€ Unit Price 1~4pcs.	€ Unit Price Qty. 5~
HRLPL	6	HFS6	CBM6-10	2	HNTT6-6	2		
	8	HFS8 HFS8-45	CBM6-10	1	HNTT6-6	1		
			CBM6-15*	1	HNTT8-6*	1		

*Extrusion side mounting with Screws and Nuts

Days to Ship
- HFHRF, HFHRT, HRLFL: 6 Days
- HRLSP (-SET): 7 Days
- HRLPL: 6 Days P.88

Express A 5,00 EUR/ piece
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Order Example

Part Number	-	L
HFHRF6-3030	-	1200
HRLFL	-	300
HRLSP		
HRLPL6		

Alterations

Part Number	-	L	-	(Alteration Code)
HFHRF6-3030	-	1500	-	TPW

7 Days Applicable to HFHRF and HFHRT only

Alterations Code	Tapping LTP	RTP	TPW
Spec.	Tapping on the left end face Tap Shape HFHRF5→M5-Depth 15 HFHRF6, HFHRT6→ M8-Depth 24	Tapping on the right end face Tap Shape HFHRF5→M5-Depth 15 HFHRF6, HFHRT6→ M8-Depth 24	Tapping on both ends Tap Shape HFHRF5→M5-Depth 15 HFHRF6, HFHRT6→ M8-Depth 24
Price Adder	1,80	1,80	3,60

Aluminum Frames Standard Units

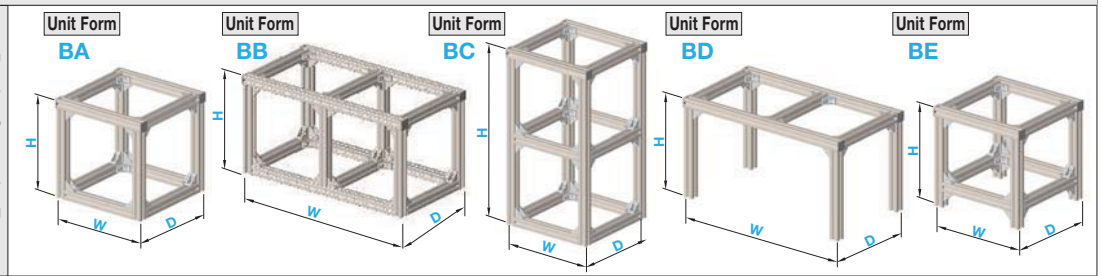


"Aluminum Frames Standard Units" is a system of ordering a complete set of components for a Extrusion Unit by customers providing only the extrusion type, width (W), depth (D), and height (H) information. Customers can build desired extrusion units just by assembling. For the components, see **P.773**
Customer assembly required. If pre-assembly is required, see **P.775**

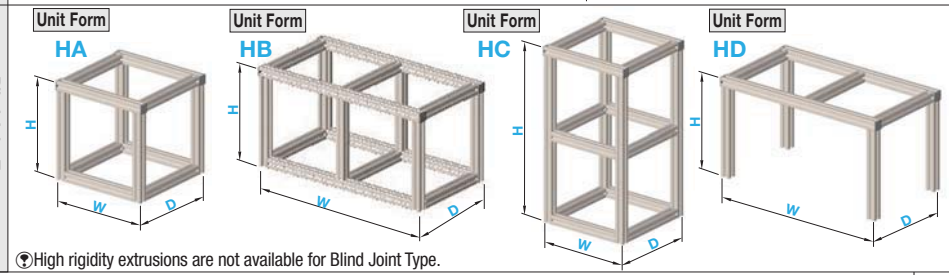
Standard Units Using 4-Side Slotted Extrusions(HFS, GFS)

Selectable Unit Shape

Bracket Connection Type



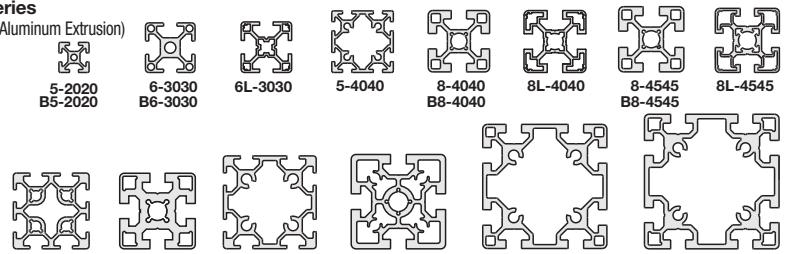
Blind Joint Type



High rigidity extrusions are not available for Blind Joint Type.

Selectable Extrusion Shape

HFS Series
(Standard Aluminum Extrusion)



*B indicates black anodized extrusion.

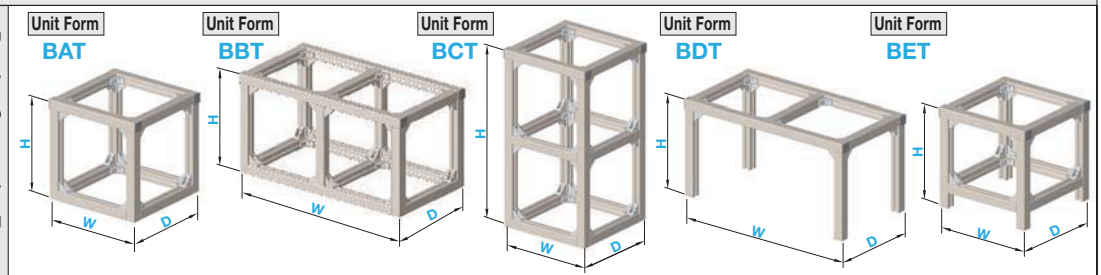
GFS Series
(High Rigidity Aluminum Extrusion)



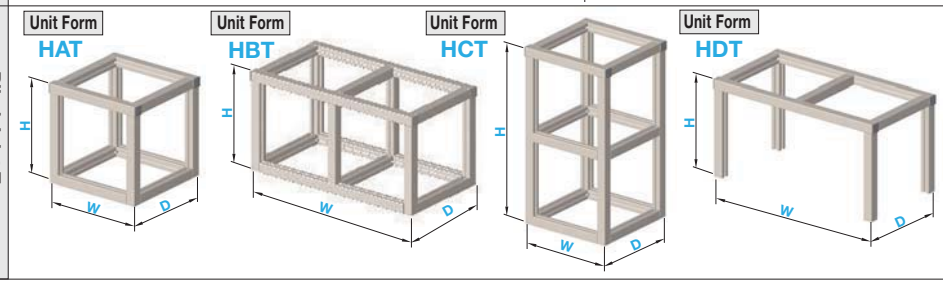
Standard Unit Using 2- Side Slotted Extrusions (HFST)

Selectable Unit Shape

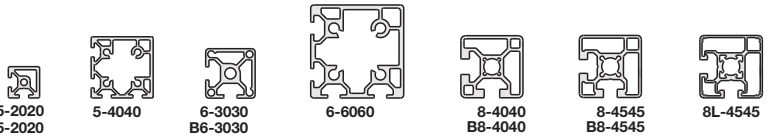
Bracket Connection Type



Blind Joint Type

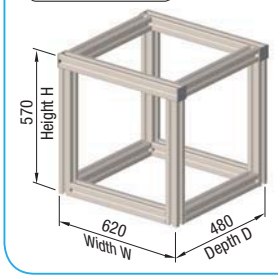


Selectable Extrusion Shape



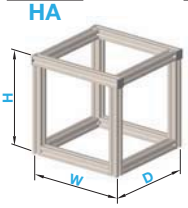
3-Side Slotted extrusions (HFSF) are used for the bottom and middle sections.
*B indicates black anodized extrusion.

How to Order



When an "HA" configuration unit W620mm, D480mm, and H570mm with HFS6-3030 extrusions is wanted

HAU	HA	6-3030-	W620-	D480-	H570
Aluminum Frames Standard Units	Unit Form	Extrusion Type	Width	Depth	Height





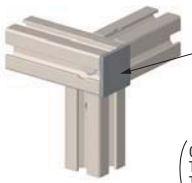
■The extrusions used can be changed to the new EFS Series. The EFS Series extrusions are equally rigid to the HFS Series yet lighter and more economical. Further cost reduction can be achieved with the new EFS Series extrusions.

- The extrusions denoted with a suffix (E) for the "Extrusion Type" column in the specification tables is changed from the HFS Series to the new EFS Series by placing an E on the end of the P/N. Deduct 3% from the unit prices using the HFS extrusions. (Deductions do not apply to "Alterations". For prices, see the price lists.) **P.771, 772**
- A various "Alteration Options" are provided for the Standard Unit system for customer convenience. (See→**P.769**)

■Alterations

Pre-Assembly Fitting Spring Nut	Change to Post Assembly Insertion Nuts and Stopper Set	Post-Assembly Insertion Spring Nut	Cover Mounting Hole	Tapping
SN	AN	BN	C	TP
Changes Pre-assembly Insertion Nuts (HNTT) to Pre-assembly Spring Nuts (HNTU) .	Change Pre-assembly Insertion Nuts (HNTT) to Post Assembly Insertion Nuts and Stopper Set (HNTAT)	Changes Pre-assembly Insertion Nuts (HNTT) to Post-assembly Insertion Spring Nuts (HNTP) .	Adds tap holes on the bracket for cover mounting.	Adds tapping on the bottom surface of the upright extrusions in four corners.

- For the component details comprising the unit, see **P.773**
- Customer assembly required. If pre-assembly is required, see **P.775**
- Extrusions in the middle position of BB, BC, BD and HB, HC, HD unit forms can be moved after assembly, so it is not necessary to specify the position.
- Extrusions in the middle position of HB, HC or HD unit forms are connected with Pre-Assembly Double Joints.
- For the load capacity, see **P.671**
- The types starting with G are High Rigidity Aluminum Frames.
- The types starting with B are black anodized extrusions.
- For Casters and Adjuster Pads (not specifiable in the unit construction scheme), see **P.770**



- Extrusion end cap protrudes from the extrusion ends by the cap thickness.

(Common to Bracket Type and Single Joint Type)

Order Example Part Number - W - D - H
HAUHC8-4040 - W800 - D500 - H600

Price P.771~772

Days to Ship 8 Days

Alterations P.769

Unit	Part Number			W	D	H
	Type	Unit Form	Extrusion Type	1mm increments	1mm increments	1mm increments
Standard Unit with 4 Side Slots	HAU	BA BB BC BD BE	5-2020	300~1000	300~1000	300~1000
			5-4040	300~1200	300~1200	300~1200
			6-3030(E) 6L-3030	300~1200	300~1200	300~1200
			8-4040(E) 8L-4040 G8-4040 8-4545(E) 8L-4545 G8-4545 6-5050 8-5050	300~1800	300~1800	300~1800
			6-6060 8-6060	500~1800	500~1800	500~1800
			8-8080(E) 8-9090(E)	500~2000	500~2000	500~2000
		HA HB HC HD	6-3030(E) 6L-3030	300~1200	300~1200	300~1200
			8-4040(E) 8L-4040 8-4545(E) 8L-4545	300~1800	300~1800	300~1800
Standard Unit with 2 Side Slots		BAT BBT BCT BDT BET	5-2020	300~1000	300~1000	300~1000
			5-4040	300~1200	300~1200	300~1200
			6-3030(E)	300~1200	300~1200	300~1200
			8-4040(E) 8-4545(E) 8L-4545	300~1800	300~1800	300~1800
			6-6060	500~1800	500~1800	500~1800
		HAT HBT HCT HDT	6-3030(E)	300~1200	300~1200	300~1200
			8-4040(E) 8-4545(E) 8L-4545	300~1800	300~1800	300~1800

* Extrusions with (E) suffix can be changed from HFS Series to the EFS Series, by adding an (E) on the end.
(Example) HAUBA6-3030E-W800-D500-H600

Unit	Part Number			W	D	H
	Type	Unit Form	Extrusion Type	1mm increments	1mm increments	1mm increments
Black Anodize Extrusions Standard Unit with 4 Side Slots	HAU	BA BB BC BD BE	B5-2020	300~1000	300~1000	300~1000
			B6-3030(E)	300~1200	300~1200	300~1200
			B8-4040(E) B8-4545(E)	300~1800	300~1800	300~1800
		HA HB HC HD	B6-3030(E)	300~1200	300~1200	300~1200
			B8-4040(E)B8-4545(E)	300~1800	300~1800	300~1800
Black Anodize Extrusions Standard Unit with 2 Side Slots	HAU	BAT BBT BCT BDT BET	B5-2020	300~1000	300~1000	300~1000
			B6-3030(E)	300~1200	300~1200	300~1200
			B8-4040(E) B8-4545(E)	300~1800	300~1800	300~1800

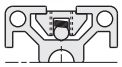
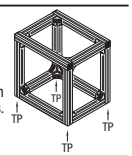
* Extrusions with (E) suffix can be changed from HFS Series to the EFS Series, by adding an (E) on the end.
(Example) HAUBA6-3030E-W800-D500-H600

- G8-4040 is a Standard Unit using GFS8-4040 extrusions.
- G8-4545 is a Standard Unit using GFS8-4545 extrusions.
- 6L-3030 is a Standard Unit using HFSL6-3030 extrusions.
- 8L-4040 is a Standard Unit using HFSL8-4040 extrusions.
- 8L-4545 is a Standard Unit using HFSL8-4545 extrusions.
- B5-2020 is a Standard Unit using HFSB5-2020.
- Black anodized units are not available for 2 Side Slot Type and Blind Joint Type.

Alterations for Aluminum Extrusion Standard Units

-(Applicable also to the Temporary Assembly Service on P.775)-

■Alterations (T)Nut type change is available for Bracket Connection Type only. (T)The "Alteration" can be specified also when the extrusion is changed from HFS to EFS (See **P.768**)

Pre-Assembly Fitting Spring Nut	Change to Post Assembly Insertion Nuts and Stopper Set	Post-Assembly Insertion Spring Nut	Mounting Holes for Cover	Standard Unit Extrusions Tapping Alteration
SN	**AN**	**BN**	**C**	**TP**
Changes Pre-assembly Insertion Nuts (HNTT) to Pre-assembly Spring Nuts (HNTU) . Built-in spring prevents slips. Move easily in the groove when pressed slightly by hand. 	Change Pre-assembly Insertion Nuts (HNTT) to Post Assembly Insertion Nuts and Stopper Set (HNTAT) The Nuts and Stoppers can be used after the frame is assembled. 	Changes Pre-assembly Insertion Nuts (HNTT) to Post-assembly Insertion Spring Nuts (HNTP) .  * Will no fall if the extrusion is held vertically.	Adds tap holes on the bracket for cover mounting. (Both Sides M5 Depth 15mm)  (T)Only applicable to Bracket Connection Type (Mounting Screws **P.684**HCBM) (T)Not applicable to black anodize.	Adds tapping on the bottom surface of the upright extrusions in four corners. 

■Bracket Connection Type

Unit Form	Selection Extrusion	Price Adder SN	AN	BN	C	TP
BA	5-2020 B5-2020	6,70	5,20	5,70	8,00 20 pcs. out of 24 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040	13,40	10,50	11,50		28,80 M5x12, 16pcs.
	6-3030 B6-3030 6L-3030	7,20	5,70	6,20		7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040 G8-4040	7,60				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545 G8-4545					16,00 M12x18*, 4pcs.
	6-5050	14,40	11,50	12,40		28,80 M8x24, 16pcs.
	8-5050	15,30				16,00 M12x18*, 4pcs.
	6-6060	14,40				28,80 M8x24, 16pcs.
	8-6060	15,30				16,00 M12x18*, 4pcs.
	8-8080					32,00 M8x24, 16pcs.
	8-9090					
BB	5-2020 B5-2020	12,30	9,60	10,50	12,80 32 pcs. out of 44 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040	24,60	19,30	21,10		28,80 M5x12, 16pcs.
	6-3030 B6-3030 6L-3030	13,20	10,50	11,40		7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040 G8-4040	14,00				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545 G8-4545					16,00 M12x18*, 4pcs.
	6-5050	26,40	21,10	22,80		28,80 M8x24, 16pcs.
	8-5050	28,10				16,00 M12x18*, 4pcs.
	6-6060	26,40				28,80 M8x24, 16pcs.
	8-6060	28,10				16,00 M12x18*, 4pcs.
	8-8080					32,00 M8x24, 16pcs.
	8-9090					
BC	5-2020 B5-2020	12,30	9,60	10,50	14,40 36 pcs. out of 44 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040	24,60	19,30	21,10		28,80 M5x12, 16pcs.
	6-3030 B6-3030 6L-3030	13,20	10,50	11,40		7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040 G8-4040	14,00				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545 G8-4545					16,00 M12x18*, 4pcs.
	6-5050	26,40	21,10	22,80		28,80 M8x24, 16pcs.
	8-5050	28,10				16,00 M12x18*, 4pcs.
	6-6060	26,40				28,80 M8x24, 16pcs.
	8-6060	28,10				16,00 M12x18*, 4pcs.
	8-8080					32,00 M8x24, 16pcs.
	8-9090					
BD	5-2020 B5-2020	4,40	3,50	3,80	6,40 16 pcs.	7,20 M5x15, 4pcs.
	5-4040	8,90	7,00	7,60		28,80 M5x12, 16pcs.
	6-3030 B6-3030 6L-3030	4,80	3,80	4,10		7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040 G8-4040	5,10				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545 G8-4545					16,00 M12x18*, 4pcs.
	6-5050	9,60	7,60	8,30		28,80 M8x24, 16pcs.
	8-5050	10,20				16,00 M12x18*, 4pcs.
	6-6060	9,60				28,80 M8x24, 16pcs.
	8-6060	10,20				16,00 M12x18*, 4pcs.
	8-8080					32,00 M8x24, 16pcs.
	8-9090					
BE	5-2020 B5-2020	8,90	7,00	7,60	8,00 20 pcs. out of 32 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040	17,90	14,00	15,30		28,80 M5x12, 16pcs.
	6-3030 B6-3030 6L-3030	9,60	7,60	8,30		7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040 G8-4040	10,20				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545 G8-4545					16,00 M12x18*, 4pcs.
	6-5050	19,20	15,30	16,60		28,80 M8x24, 16pcs.
	8-5050	20,40				16,00 M12x18*, 4pcs.
	6-6060	19,20				28,80 M8x24, 16pcs.
	8-6060	20,40				16,00 M12x18*, 4pcs.
	8-8080					32,00 M8x24, 16pcs.
	8-9090					

Unit Form	Selection Extrusion	Price Adder SN	AN	BN	C	TP
BAT	5-2020 B5-2020	6,70	5,20	5,70	8,00 20 pcs. out of 24 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040	13,40	10,50	11,50		28,80 M5x15, 16pcs.
	6-3030 B6-3030	7,20	5,70	6,20		7,20 M8x24, 4pcs.
	8-4040 B8-4040	7,60				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545					16,00 M12x18*, 4pcs.
	6-6060	14,40	11,50	12,40		28,80 M8x24, 16pcs.
BBT	5-2020 B5-2020	12,30	9,60	10,50	12,80 32 pcs. out of 44 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040	24,60	19,30	21,10		28,80 M5x15, 16pcs.
	6-3030 B6-3030	13,20	10,50	11,40		7,20 M8x24, 4pcs.
	8-4040 B8-4040	14,00				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545					16,00 M12x18*, 4pcs.
	6-6060	26,40	21,10	22,80		28,80 M8x24, 16pcs.
BCT	5-2020 B5-2020	12,30	9,60	10,50	14,40 36 pcs. out of 44 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040	24,60	19,30	21,10		28,80 M5x15, 16pcs.
	6-3030 B6-3030	13,20	10,50	11,40		7,20 M8x24, 4pcs.
	8-4040 B8-4040	14,00				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545					16,00 M12x18*, 4pcs.
	6-6060	26,40	21,10	22,80		28,80 M8x24, 16pcs.
BDT	5-2020 B5-2020	4,40	3,50	3,80	6,40 16 pcs.	7,20 M5x15, 4pcs.
	5-4040	8,90	7,00	7,60		28,80 M5x15, 16pcs.
	6-3030 B6-3030	4,80	3,80	4,10		7,20 M8x24, 4pcs.
	8-4040 B8-4040	5,10				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545					16,00 M12x18*, 4pcs.
	6-6060	9,60	7,60	8,30		28,80 M8x24, 16pcs.
BET	5-2020 B5-2020	8,90	7,00	7,60	8,00 20 pcs. out of 32 pcs. (Except the Brackets on bottom)	7,20 M5x15, 4pcs.
	5-4040					28,80 M5x15, 16pcs.
	6-3030 B6-3030	9,60	7,60	8,30		7,20 M8x24, 4pcs.
	8-4040 B8-4040	10,20				8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545					16,00 M12x18*, 4pcs.
	6-6060	9,60				28,80 M8x24, 16pcs.

■Blind Joint Type

Unit Form	Extrusion Type	Price Adder TP
HA	6-3030 B6-3030 6L-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545	16,00 M12x18*, 4pcs.
HB	6-3030 B6-3030 6L-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545	16,00 M12x18*, 4pcs.
HC	6-3030 B6-3030 6L-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545	16,00 M12x18*, 4pcs.
HD	6-3030 B6-3030 6L-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040 8L-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545 8L-4545	16,00 M12x18*, 4pcs.

Unit Form	Extrusion Type	Price Adder TP
HAT	6-3030 B6-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545	16,00 M12x18*, 4pcs.
	8L-4545	
HBT	6-3030 B6-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545	16,00 M12x18*, 4pcs.
	8L-4545	
HCT	6-3030 B6-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545	16,00 M12x18*, 4pcs.
	8L-4545	
HDT	6-3030 B6-3030	7,20 M8x24, 4pcs.
	8-4040 B8-4040	8,00 M12x36, 4pcs.
	8-4545 B8-4545	16,00 M12x18*, 4pcs.
	8L-4545	

* Heli-Coils Inserted

Days to Ship **8 Days**

Alterations

Part Number	-	W	-	D	-	H	-	(SN, AN, BN, TP)
HAUBA6-3030	-	W1000	-	D800	-	H700	-	C-TP
HAUHC6-3030	-	W1000	-	D800	-	H700	-	SN

Aluminum Frames Standard Units

-Caster and Adjuster Pad combinations for Standard Units-

Part Number			Ex. (1) Caster direct mounting		Ex. (2) Mounting directly to Corner Angles		Ex. (3) Caster mounted on Foot Base				Ex. (4) Plate Type Caster Unit		Ex. (5) Plate type Adjuster Pad Unit		Ex. (6) Plate type Adjuster Pad + Caster Unit			Ex. (7) Integrated Caster & Adjuster Pad	
Type	Unit Form	Extrusion Type	Casters Ex.		Casters Ex.		Foot Bases			Casters Ex.	Caster Unit		Adjustment Pad Unit		Plate with Adjustment Pad + Caster Unit			Caster & Adjustment Pad Assembly	
			Part Number	Allowable Load (kgf)	Part Number	Allowable Load (kgf)	Part Number	Applicable screws	Qty.	Part Number	Part Number	Allowable Load (kgf)	Part Number	Allowable Load (kgf)	Part Number	Caster Allowable Load (kgf)	Adjustment Pad Allowable Load (kgf)	Part Number	Allowable Load (kgf)
HAU	BA BB BC BD BE	5-2020	-		HSMC50 HSMCS50	50	-			-	HCHPS5	100	HAJPS5	500	HAJCHP5	100	500	HCFT5-60	60
		B5-2020																	
		5-4040			HSMC75 HSMCS75	60	HLF5-4040	CBM5-15	4	HCHAS12-150		150			HAJCHP5-4040				
		6-3030	HCHAS8-100	100	HSMC65 HSMCS65	50	-			-	HCHPS6	150	HAJPS6	500	HAJCHP6	150	500	HCFT6-130	130
		B6-3030																	
		6L-3030																	
		8-4040	HCHAS12-150	150	HSMC75 HSMCS75	60	-			-	HCHPS8	170	HAJPS8	1700	HAJCHP8	170	1700	HCFT8-130	130
		B8-4040																	
		8L-4040																	
		G8-4040																	
		8-4545																	
		B8-4545																	
		8L-4545																	
		G8-4545																	
		6-5050	-		-		HLF6-5050	CBM8-20	4	HCHAS16-170	HCHPS6	150	HAJPS5050		HAJCHP6-5050	150		HCFT6-250	250
		8-5050	HCHAS12-150	150			-			-	HCHPS8	170	HAJPS8		HAJCHP8	170		-	
		6-6060	-				HLF6-6060	CBM8-20	4	HCHAS16-170	HCHPS6	150	HAJPS6060		HAJCHP6060	150		HCFT6-250	250
		8-6060	HCHAS12-150	150	HSMC75 HSMCS75	60	-			-	-		-		-			-	
		8-8080	-		-		HLF8-8080	CBM8-20	4	HCHAS16-170	HCHPS8	170	HAJPS8080	4000	HAJCHP8080	170	4000	HCFT8-350	350
		8-9090					HLF8-9090						HAJPS9090		HAJCHP9090				
	BAT BBT BCT BDT BET	5-2020	-		HSMC50 HSMCS50	50	-			-	HCHPS5	100	HAJPS5	500	HAJCHP5	100	500	HCFT5-60	60
		B5-2020																	
		5-4040			HSMC75 HSMCS75	60	HLF5-4040	CBM5-15	4	HCHAS12-150		150			HAJCHP5-4040				
		6-3030	HCHAS8-100	100	HSMC65 HSMCS65	50	-			-	HCHPS6	150	HAJPS6	500	HAJCHP6	150	500	HCFT6-130	130
		B6-3030																	
		8-4040	HCHAS12-150	150	HSMC75 HSMCS75	60	-			-	HCHPS8	170	HAJPS8	1700	HAJCHP8	170	1700	HCFT8-130	130
		B8-4040																	
		8-4545																	
		B8-4545																	
		8L-4545																	
		6-6060	-		-		HLF6-6060	CBM8-20	4	HCHAS16-170	HCHPS6	150	HAJPS6060		HAJCHP6060	150		HCFT6-250	250
	HA HB HC HD	6-3030	HCHAS8-100	100	HSMC65 HSMCS65	50	-			-	HCHPS6	150	HAJPS6	500	HAJCHP6	150	500	HCFT6-130	130
		B6-3030																	
		6L-3030																	
		8-4040	HCHAS12-150	150	HSMC75 HSMCS75	60	-			-	HCHPS8	170	HAJPS8	1700	HAJCHP8	170	1700	HCFT8-130	130
		B8-4040																	
		8L-4040																	
		8-4545																	
		B8-4545																	
		8L-4545																	
	HAT HBT HCT HDT	6-3030	HCHAS8-100	100	HSMC65 HSMCS65	50	-			-	HCHPS6	150	HAJPS6	500	HAJCHP6	150	500	HCFT6-130	130
		8-4040	HCHAS12-150	150	HSMC75 HSMCS75	60					HCHPS8	170	HAJPS8	1700	HAJCHP8	170	1700	HCFT8-130	130
		8-4545																	
		8L-4545																	
Cautions on Installation			For mounting examples (1) and (3), tapping alteration TP must be specified. Attachment of the extrusion unit is not available for - marked part. The allowable load of caster is per piece.								Can be mounded without any alterations.								

Example (1) Caster direct mounting
(2) Corner angle mounting

Example (3) Caster mounted on Foot Base
Tapping option specified on a model number
HAUBA6-3030-W500-D500-H500-TP

Example (2), (4), (5), (6), (7)
Can be mounded without any alterations.

When the unit configurations are BD, HD, BDT, and HDT, the only applicable caster mounting methods are Examples (1) and (3) only, and the examples (2), (4), (5), (6), and (7) cannot be used.

Example (1) Direct mounting to an extrusion



P.709

Example (2) Mounting with Corner Angle Casters



P.711

Example (3) Mounting with Foot Base



P.707

Example (4) Mounting with Plate Type Casters



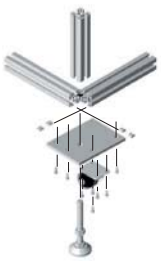
P.705

Example (5) Adjuster Pads Plate mounting



P.705

Example (6) Adjuster Pads + Caster plate mounting



P.705

Example (7) Integrated Caster mounting



P.704

Aluminum Extrusion Frame Standard Units Price

Price [How to see the price list] For HAU BA 6-3030-W1000-D800-H700 unit, see the Unit Config. column to find BA, see the Extrusion Type column and find 6-3030 row and look to the right. Total the W, D and H dimensions (1000+800+700=2500) and look down the column containing 2500 to find the cross point with the 6-3030 row. The cross point value 139,00 EUR is the unit price. This price includes all the components necessary (brackets, screws, Pre-assembly Nuts, etc.). For details, see **P.773**

■4 Side Slot Type

Part Number			€ (W+D+H)														
Type	Unit Config.	Extrusion Type	900 ~ 1249	1250 ~ 1599	1600 ~ 1949	1950 ~ 2299	2300 ~ 2649	2650 ~ 2999	3000 ~ 3349	3350 ~ 3699	3700 ~ 4049	4050 ~ 4399	4400 ~ 4749	4750 ~ 5099	5100 ~ 5449	5450 ~ 5799	5800 ~ 6000
HAU	BA	5-2020															
		5-4040															
		6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		G8-4040															
		8-4545(E)															
		8L-4545															
		G8-4545															
		6-5050															
		8-5050															
		6-6060															
		8-6060															
		8-8080(E)															
		8-9090(E)															
	BB	5-2020															
		5-4040															
		6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		G8-4040															
		8-4545(E)															
		8L-4545															
		G8-4545															
		6-5050															
		8-5050															
		6-6060															
		8-6060															
		8-8080(E)															
		8-9090(E)															
	BC	5-2020															
		5-4040															
		6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		G8-4040															
		8-4545(E)															
		8L-4545															
		G8-4545															
		6-5050															
		8-5050															
		6-6060															
		8-6060															
		8-8080(E)															
		8-9090(E)															
	BD	5-2020															
		5-4040															
		6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		G8-4040															
		8-4545(E)															
		8L-4545															
		G8-4545															
		6-5050															
		8-5050															
		6-6060															
		8-6060															
		8-8080(E)															
		8-9090(E)															
	BE	5-2020															
		5-4040															
		6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		G8-4040															
		8-4545(E)															
		8L-4545															
		G8-4545															
		6-5050															
		8-5050															
		6-6060															
		8-6060															
		8-8080(E)															
		8-9090(E)															
	HA	6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		8-4545(E)															
		8L-4545															
	HB	6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		8-4545(E)															
		8L-4545															
	HC	6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		8-4545(E)															
		8L-4545															
	HD	6-3030(E)															
		6L-3030															
		8-4040(E)															
		8L-4040															
		8-4545(E)															
		8L-4545															

The extrusions denoted with a suffix (E) for the "Extrusion Type" column in the specification tables can be changed from the HFS Series to the new EFS Series (See **P.768**). Deduct 3% from HFS extrusion prices.

■2 Side Slot Type

Part Number			€ (W+D+H)												
Type	Unit Config.	Extrusion Type	900 ~ 1249	1250 ~ 1599	1600 ~ 1949	1950 ~ 2299	2300 ~ 2649	2650 ~ 2999	3000 ~ 3349	3350 ~ 3699	3700 ~ 4049	4050 ~ 4399	4400 ~ 4749	4750 ~ 5099	5100 ~ 5400
HAU	BAT	5-2020													
		5-4040													
		6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
		6-6060													
	BBT	5-2020													
		5-4040													
		6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
		6-6060													
	BCT	5-2020													
		5-4040													
		6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
		6-6060													
	BDT	5-2020													
		5-4040													
		6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
		6-6060													
	BET	5-2020													
		5-4040													
		6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
		6-6060													
	HAT	6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
	HBT	6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
	HCT	6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													
	HDT	6-3030(E)													
		8-4040(E)													
		8-4545(E)													
		8L-4545													

■Black Anodized Extrusions 4 Side Slot Type

Part Number			€ (W+D+H)												
Type	Unit Config.	Extrusion Type	900 ~ 1249	1250 ~ 1599	1600 ~ 1949	1950 ~ 2299	2300 ~ 2649	2650 ~ 2999	3000 ~ 3349	3350 ~ 3699	3700 ~ 4049	4050 ~ 4399	4400 ~ 4749	4750 ~ 5099	5100 ~ 5400
HAU	BA	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BB	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BC	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BD	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BE	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	HA	B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	HB	B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	HC	B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	HD	B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													

■Black Anodized Extrusions 2 Side Slot Type

Part Number			€ (W+D+H)												
Type	Unit Config.	Extrusion Type	900 ~ 1249	1250 ~ 1599	1600 ~ 1949	1950 ~ 2299	2300 ~ 2649	2650 ~ 2999	3000 ~ 3349	3350 ~ 3699	3700 ~ 4049	4050 ~ 4399	4400 ~ 4749	4750 ~ 5099	5100 ~ 5400
HAU	BAT	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BBT	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BCT	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BDT	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													
	BET	B5-2020													
		B6-3030(E)													
		B8-4040(E)													
		B8-4545(E)													

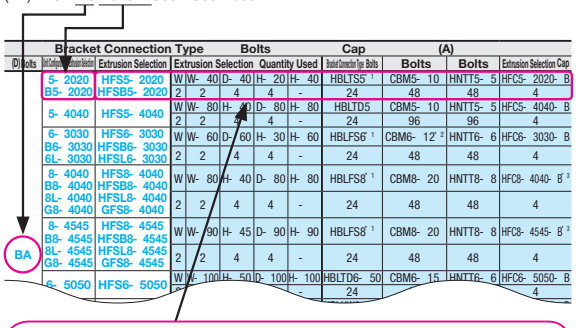
The extrusions denoted with a suffix (E) for the "Extrusion Type" column in the specification tables can be changed from the HFS Series to the new EFS Series (See **P.768**). Deduct 3% from HFS extrusion prices.

Components of Aluminum Frames Standard Units

[How to see the table]

Find the extrusion type from the selected unit Config. in the table.
Quantities of applicable extrusions and parts are shown in the columns to the right.

(Ex.) HAU BA 5-2020-W800-D500-H600



Extrusion Components Used

HFS5-2020: (W) 800mm 2pcs, (W-40) 760mm 2pcs., (D-40) 460mm 4pcs.
(H-20) 580mm 4pcs.
HBLTS5: 24pcs., CBM5-10: 48pcs., HNTT5-5: 48pcs., HFC5-2020-B: 4pcs.

Extrusion type can be changed from HFS to EFS Series. See **P.768** • When the extrusion type change from HFS to EFS is specified, the table column "Extrusions Used" will also change from HFS to EFS.

When alterations "SN", "AN", and "BN" are specified, the standard bracket connection type Pre-Assembly Insertion Nuts (HNTT) will be changed to: "SN"=Pre-Assembly Insertion Spring Nuts (HNTU), "AN"=Post Assembly Insertion Nuts & Stoppers Set (HNTAT), "BN"=Post Assembly Insertion Spring Nuts (HNTP), respectively. See "Alterations" on **P.769**

*1 When Black Anodized extrusions are selected, the HBL_S brackets will change to HBLTSB.
*2 When Black Anodized extrusions are selected, the CBM6-12 screws are changed to CBM6-15.
*3 When High Rigidity extrusion type is specified, the HFC Extrusion Caps will be changed to HFCD (SHFBS12-20 included) caps along with a required alteration. For alteration details, see P. **P.658**

-4-Sides Slotted Type-

Unit Config.	Extrusion Type	Extrusion Used	Bracket Connection Type: Number of Extrusions				Bracket	Screws	Nuts	Extrusion End Caps
BA	5-2020 B5-2020	HFS5-2020 HFSB5-2020	W W-40	D-40	H-20	H-40	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
			2 2	4	4	-	24	48	48	4
	5-4040	HFS5-4040	W W-80	H-40	D-80	H-80	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
			2 2	4	4	-	24	96	96	4
	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
			2 2	4	4	-	24	48	48	4
	8-4040 B8-4040 8L-4040 G8-4040	HFS8-4040 HFSB8-4040 HFSL8-4040 GFS8-4040	W W-80	H-40	D-80	H-80	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B*3
			2 2	4	4	-	24	48	48	4
	8-4545 B8-4545 8L-4545 G8-4545	HFS8-4545 HFSB8-4545 HFSL8-4545 GFS8-4545	W W-90	H-45	D-90	H-90	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4545-B*3
			2 2	4	4	-	24	48	48	4
	6-5050	HFS6-5050	W W-100	H-50	D-100	H-100	HBLTD6-50	CBM6-15	HNTT6-6	HFC6-5050-B
			2 2	4	4	-	24	96	96	4
	8-5050	HFS8-5050	W W-100	D-100	H-50	H-100	HBLUW8-50	CBM8-15 CBM8-25	HNTT8-8	HFC8-5050-B
			2 2	4	4	-	24	48 each	96	4
	6-6060	HFS6-6060	W W-120	D-120	H-60	H-120	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
			2 2	4	4	-	24	96	96	4
	8-6060	HFS8-6060	W W-120	D-120	H-60	H-120	HBLUW8-60	CBM8-15 CBM8-25	HNTT8-8	HFC6-6060-B
			2 2	4	4	-	24	48 each	96	4
	8-8080	HFS8-8080	W W-160	H-80	D-160	H-160	HBLUD8	CBM8-25	HNTT8-8	HFC8-8080-B
			2 2	4	4	-	24	96	96	4
	8-9090	HFS8-9090	W W-180	D-180	H-90	H-180	HBLUD8-45	CBM8-25	HNTT8-8	HFC8-9090-B
			2 2	4	4	-	24	96	96	4
BB	5-2020 B5-2020	HFS5-2020 HFSB5-2020	W W-40	D-40	H-20	H-40	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
			2 2	6	4	2	44	88	88	4
	5-4040	HFS5-4040	W W-80	H-40	D-80	H-80	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
			2 2	4	6	2	44	176	176	4
	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
			2 2	6	4	2	44	88	88	4
	8-4040 B8-4040 8L-4040 G8-4040	HFS8-4040 HFSB8-4040 HFSL8-4040 GFS8-4040	W W-80	H-40	D-80	H-80	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B*3
			2 2	4	6	2	44	88	88	4
	8-4545 B8-4545 8L-4545 G8-4545	HFS8-4545 HFSB8-4545 HFSL8-4545 GFS8-4545	W W-90	H-45	D-90	H-90	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4545-B*3
			2 2	4	6	2	44	88	88	4
	6-5050	HFS6-5050	W W-100	H-50	D-100	H-100	HBLTD6-50	CBM6-15	HNTT6-6	HFC6-5050-B
			2 2	4	6	2	44	176	176	4
	8-5050	HFS8-5050	W W-100	D-100	H-50	H-100	HBLUW8-50	CBM8-15 CBM8-25	HNTT8-8	HFC8-5050-B
			2 2	6	4	2	44	88 each	176	4
	6-6060	HFS6-6060	W W-120	D-120	H-60	H-120	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
			2 2	6	4	2	44	176	176	4
	8-6060	HFS8-6060	W W-120	D-120	H-60	H-120	HBLUW8-60	CBM8-15 CBM8-25	HNTT8-8	HFC6-6060-B
			2 2	6	4	2	44	88 each	176	4
	8-8080	HFS8-8080	W W-160	H-80	D-160	H-160	HBLUD8	CBM8-25	HNTT8-8	HFC8-8080-B
			2 2	6	4	2	44	176	176	4
	8-9090	HFS8-9090	W W-180	D-180	H-90	H-180	HBLUD8-45	CBM8-25	HNTT8-8	HFC8-9090-B
			2 2	6	4	2	44	176	176	4

Unit Config.	Extrusion Type	Extrusion Used	Bracket Connection Type: Number of Extrusions				Bracket	Screws	Nuts	Extrusion End Caps
BC	5-2020 B5-2020	HFS5-2020 HFSB5-2020	W W-40	D-40	H-20	H-40	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
			2 4	6	4	-	44	88	88	4
	5-4040	HFS5-4040	W W-80	H-40	D-80	H-80	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
			2 4	4	6	-	44	176	176	4
	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
			2 4	6	4	-	44	88	88	4
	8-4040 B8-4040 8L-4040 G8-4040	HFS8-4040 HFSB8-4040 HFSL8-4040 GFS8-4040	W W-80	H-40	D-80	H-80	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B*3
			2 4	4	6	-	44	88	88	4
	8-4545 B8-4545 8L-4545 G8-4545	HFS8-4545 HFSB8-4545 HFSL8-4545 GFS8-4545	W W-90	H-45	D-90	H-90	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4545-B*3
			2 4	4	6	-	44	88	88	4
	6-5050	HFS6-5050	W W-100	H-50	D-100	H-100	HBLTD6-50	CBM6-15	HNTT6-6	HFC6-5050-B
			2 4	4	6	-	44	176	176	4
	8-5050	HFS8-5050	W W-100	D-100	H-50	H-100	HBLUW8-50	CBM8-15 CBM8-25	HNTT8-8	HFC8-5050-B
			2 4	6	4	-	44	88 each	176	4
	6-6060	HFS6-6060	W W-120	D-120	H-60	H-120	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
			2 4	6	4	-	44	176	176	4
	8-6060	HFS8-6060	W W-120	D-120	H-60	H-120	HBLUW8-60	CBM8-15 CBM8-25	HNTT8-8	HFC6-6060-B
			2 4	6	4	-	44	88 each	176	4
	8-8080	HFS8-8080	W W-160	H-80	D-160	H-160	HBLUD8	CBM8-25	HNTT8-8	HFC8-8080-B
			2 4	4	6	-	44	176	176	4
	8-9090	HFS8-9090	W W-180	D-180	H-90	H-180	HBLUD8-45	CBM8-25	HNTT8-8	HFC8-9090-B
			2 4	6	4	-	44	176	176	4
BD	5-2020 B5-2020	HFS5-2020 HFSB5-2020	W W-40	D-40	H-20	H-40	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
			2 -	3	4	-	16	32	32	4
	5-4040	HFS5-4040	W W-80	H-40	D-80	H-80	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
			2 -	4	3	-	16	64	64	4
	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
			2 -	3	4	-	16	32	32	4
	8-4040 B8-4040 8L-4040 G8-4040	HFS8-4040 HFSB8-4040 HFSL8-4040 GFS8-4040	W W-80	H-40	D-80	H-80	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B*3
			2 -	4	3	-	16	32	32	4
	8-4545 B8-4545 8L-4545 G8-4545	HFS8-4545 HFSB8-4545 HFSL8-4545 GFS8-4545	W W-90	H-45	D-90	H-90	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4545-B*3
			2 -	4	3	-	16	32	32	4
	6-5050	HFS6-5050	W W-100	H-50	D-100	H-100	HBLTD6-50	CBM6-15	HNTT6-6	HFC6-5050-B
			2 -	4	3	-	16	64	64	4
	8-5050	HFS8-5050	W W-100	D-100	H-50	H-100	HBLUW8-50	CBM8-15 CBM8-25	HNTT8-8	HFC8-5050-B
			2 -	3	4	-	16	32 each	64	4
	6-6060	HFS6-6060	W W-120	D-120	H-60	H-120	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
			2 -	3	4	-	16	64	64	4
	8-6060	HFS8-6060	W W-120	D-120	H-60	H-120	HBLUW8-60	CBM8-15 CBM8-25	HNTT8-8	HFC6-6060-B
			2 -	3	4	-	16	32 each	64	4
	8-8080	HFS8-8080	W W-160	H-80	D-160	H-160	HBLUD8	CBM8-25	HNTT8-8	HFC8-8080-B
			2 -	4	3	-	16	64	64	4
	8-9090	HFS8-9090	W W-180	D-180	H-90	H-180	HBLUD8-45	CBM8-25	HNTT8-8	HFC8-9090-B
			2 -	4	3	-	16	64	64	4
BE	5-2020 B5-2020	HFS5-2020 HFSB5-2020	W W-40	D-40	H-20	H-40	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
			2 2	4	4	-	32	64	64	4
	5-4040	HFS5-4040	W W-80	H-40	D-80	H-80	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
			2 2	4	4	-	32	128	128	4
	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
			2 2	4	4	-	32	64	64	4
	8-4040 B8-4040 8L-4040 G8-4040	HFS8-4040 HFSB8-4040 HFSL8-4040 GFS8-4040	W W-80	H-40	D-80	H-80	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B*3
			2 2	4	4	-	32	64	64	4
	8-4545 B8-4545 8L-4545 G8-4545	HFS8-4545 HFSB8-4545 HFSL8-4545 GFS8-4545	W W-90	H-45	D-90	H-90	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4545-B*3
			2 2	4	4	-	32	64	64	4
	6-5050	HFS6-5050	W W-100	H-50	D-100	H-100	HBLTD6-50	CBM6-15	HNTT6-6	HFC6-5050-B
			2 2	4	4	-	32	128	128	4
	8-5050	HFS8-5050	W W-100	D-100	H-50	H-100	HBLUW8-50	CBM8-15 CBM8-25	HNTT8-8	HFC8-5050-B
			2 2	4	4	-	32	64 each	128	4
	6-6060	HFS6-6060	W W-120	D-120	H-60	H-120	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
			2 2	4	4	-	32	128	128	4
	8-6060	HFS8-6060	W W-120	D-120	H-60	H-120	HBLUW8-60	CBM8-15 CBM8-25	HNTT8-8	HFC6-6060-B
			2 2	4	4	-	32	64 each	128	4
	8-8080	HFS8-8080	W W-160	H-80	D-160	H-160	HBLUD8	CBM8-25	HNTT8-8	HFC8-8080-B
			2 2	4	4	-	32	128	128	4
	8-9090	HFS8-9090	W W-180	D-180	H-90	H-180	HBLUD8-45	CBM8-25	HNTT8-8	HFC8-9090-B
			2 2	4	4	-	32	128	128	4

Blind Joint Type

Unit Form	Extrusion Type	Extrusion Used	Number of Extrusions				Joint Parts		Extrusion End Caps	Machining
HA	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HSJ6	HDJSN6	HFC6-3030-B	No. of Holes
			2 2	4	4	-	16	-	4	32
	8-4040 B8-4040 8L-4040	HFS8-4040 HFSB8-4040 HFSL8-4040	W W-80	H-40	D-80	H-80	HSJ8	HDJSN8	HFC8-4040-B	No. of Holes
			2 2	4	4	-	16	-	4	32
	8-4545 B8-4545 8L-4545	HFS8-4545 HFSB8-4545 HFSL8-4545	W W-90	H-45	D-90	H-90	HSJ8-45	HDJSN8-45	HFC8-4545-B	No. of Holes
			2 2	4	4	-	16	-	4	32
HB	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HSJ6	HDJSN6	HFC6-3030-B	No. of Holes
			2 2	6	4	2	16	8	4	40
	8-4040 B8-4040 8L-4040	HFS8-4040 HFSB8-4040 HFSL8-4040	W W-80	H-40	D-80	H-80	HSJ8	HDJSN8	HFC8-4040-B	No. of Holes
			2 2	4	6	2	16	8	4	40
	8-4545 B8-4545 8L-4545	HFS8-4545 HFSB8-4545 HFSL8-4545	W W-90	H-45	D-90	H-90	HSJ8-45	HDJSN8-45	HFC8-4545-B	No. of Holes
			2 2	4	6	2	16	8	4	40
HC	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HSJ6	HDJSN6	HFC6-3030-B	No. of Holes
			2 4	6	4	-	16	8	4	40
	8-4040 B8-4040 8L-4040	HFS8-4040 HFSB8-4040 HFSL8-4040	W W-80	H-40	D-80	H-80	HSJ8	HDJSN8	HFC8-4040-B	No. of Holes
			2 4	4	6	-	16	8	4	40
	8-4545 B8-4545 8L-4545	HFS8-4545 HFSB8-4545 HFSL8-4545	W W-90	H-45	D-90	H-90	HSJ8-45	HDJSN8-45	HFC8-4545-B	No. of Holes
			2 4	4	6	-	16	8	4	40
HD	6-3030 B6-3030 6L-3030	HFS6-3030 HFSB6-3030 HFSL6-3030	W W-60	D-60	H-30	H-60	HSJ6	HDJSN6	HFC6-3030-B	No. of Holes
			2 -	3	4	-	8	2	4	18
	8-4040 B8-4040 8L-4040	HFS8-4040 HFSB8-4040 HFSL8-4040	W W-80	H-40	D-80	H-80	HSJ8	HDJSN8	HFC8-4040-B	No. of Holes
			2 -	4	3	-	8	2	4	18
	8-4545 B8-4545 8L-4545	HFS8-4545 HFSB8-4545 HFSL8-4545	W W-90	H-45	D-90	H-90	HSJ8-45	HDJSN8-45	HFC8-4545-B	No. of Holes
			2 -	4	3	-	8	2	4	18

-2-Sides Slotted Type-

Bracket Connection Type									
Unit Config.	Extrusion Type	Extrusion Used	Number of Extrusions			Bracket	Screws	Nuts	Extrusion End Caps
BAT	5-2020 B5-2020	HFST5-2020 HFSTB5-2020	W 2	D-40 2	H-20 4	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
		HFSF5-2020 HFSFB5-2020	D-40 2	H-40 -	W-40 2	24	48	48	4
	5-4040	HFST5-4040	W 2	D-80 2	H-40 4	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
		HFSF5-4040	D-80 2	H-80 -	W-80 2	24	96	96	4
	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
		HFSF6-3030 HFSFB6-3030	D-60 2	H-60 -	W-60 2	24	48	48	4
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4040 HFSFB8-4040	D-80 2	H-80 -	W-80 2	24	48	48	4
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4545 HFSFB8-4545	D-80 2	H-80 -	W-80 2	24	48	48	4
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HBLFS8	CBM8-20	HNTT8-8	HFC8-4545-B
		HFSLF8-4545	D-90 2	H-90 -	W-90 2	24	48	48	4
	6-6060	HFST6-6060	W 2	D-120 2	H-60 4	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
		HFSF6-6060	D-120 2	H-120 -	W-120 2	24	96	96	4
BBT	5-2020 B5-2020	HFST5-2020 HFSTB5-2020	W 2	D-40 2	H-20 4	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
		HFSF5-2020 HFSFB5-2020	D-40 4	H-40 2	W-40 2	44	88	88	4
	5-4040	HFST5-4040	W 2	D-80 2	H-40 4	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
		HFSF5-4040	D-80 4	H-80 2	W-80 2	44	176	176	4
	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
		HFSF6-3030 HFSFB6-3030	D-60 4	H-60 2	W-60 2	44	88	88	4
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4040 HFSFB8-4040	D-80 4	H-80 2	W-80 2	44	88	88	4
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4545 HFSFB8-4545	D-80 4	H-80 2	W-80 2	44	88	88	4
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HBLFS8	CBM8-20	HNTT8-8	HFC8-4545-B
		HFSLF8-4545	D-90 4	H-90 2	W-90 2	44	88	88	4
	6-6060	HFST6-6060	W 2	D-120 2	H-60 4	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
		HFSF6-6060	D-120 4	H-120 2	W-120 2	44	176	176	4
BCT	5-2020 B5-2020	HFST5-2020 HFSTB5-2020	W 2	D-40 2	H-20 4	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
		HFSF5-2020 HFSFB5-2020	D-40 4	H-40 -	W-40 4	44	88	88	4
	5-4040	HFST5-4040	W 2	D-80 2	H-40 4	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
		HFSF5-4040	D-80 4	H-80 -	W-80 4	44	176	176	4
	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
		HFSF6-3030 HFSFB6-3030	D-60 4	H-60 -	W-60 4	44	88	88	4
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4040 HFSFB8-4040	D-80 4	H-80 -	W-80 4	44	88	88	4
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4545 HFSFB8-4545	D-80 4	H-80 -	W-80 4	44	88	88	4
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HBLFS8	CBM8-20	HNTT8-8	HFC8-4545-B
		HFSLF8-4545	D-90 4	H-90 -	W-90 4	44	88	88	4
	6-6060	HFST6-6060	W 2	D-120 4	H-60 4	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
		HFSF6-6060	D-120 4	H-120 -	W-120 4	44	176	176	4
BDT	5-2020 B5-2020	HFST5-2020 HFSTB5-2020	W 2	D-40 2	H-20 4	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
		HFSF5-2020 HFSFB5-2020	D-40 1	H-40 -	W-40 -	16	32	32	4
	5-4040	HFST5-4040	W 2	D-80 2	H-40 4	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
		HFSF5-4040	D-80 1	H-80 -	W-80 -	16	64	64	4
	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
		HFSF6-3030 HFSFB6-3030	D-60 1	H-60 -	W-60 -	16	32	32	4
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4040 HFSFB8-4040	D-80 1	H-80 -	W-80 -	16	32	32	4
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4545 HFSFB8-4545	D-80 1	H-80 -	W-80 -	16	32	32	4
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HBLFS8	CBM8-20	HNTT8-8	HFC8-4545-B
		HFSLF8-4545	D-90 1	H-90 -	W-90 -	16	32	32	4
	6-6060	HFST6-6060	W 2	D-120 2	H-60 4	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
		HFSF6-6060	D-120 1	H-120 -	W-120 -	16	64	64	4

Bracket Connection Type									
Unit Config.	Extrusion Type	Extrusion Used	Number of Extrusions			Bracket	Screws	Nuts	Extrusion End Caps
BET	5-2020 B5-2020	HFST5-2020 HFSTB5-2020	W 2	D-40 2	H-20 4	HBLTS5*1	CBM5-10	HNTT5-5	HFC5-2020-B
		HFSF5-2020 HFSFB5-2020	D-40 2	H-40 -	W-40 2	32	64	64	4
	5-4040	HFST5-4040	W 2	D-80 2	H-40 4	HBLTD5	CBM5-10	HNTT5-5	HFC5-4040-B
		HFSF5-4040	D-80 2	H-80 -	W-80 2	32	64	64	4
	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HBLFS6*1	CBM6-12*2	HNTT6-6	HFC6-3030-B
		HFSF6-3030 HFSFB6-3030	D-60 2	H-60 -	W-60 2	32	64	64	4
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4040 HFSFB8-4040	D-80 2	H-80 -	W-80 2	32	64	64	4
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HBLFS8*1	CBM8-20	HNTT8-8	HFC8-4040-B
		HFSF8-4545 HFSFB8-4545	D-80 2	H-80 -	W-80 2	32	64	64	4
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HBLFS8	CBM8-20	HNTT8-8	HFC8-4545-B
		HFSLF8-4545	D-90 2	H-90 -	W-90 2	32	64	64	4
	6-6060	HFST6-6060	W 2	D-120 2	H-60 4	HBLTD6	CBM6-15	HNTT6-6	HFC6-6060-B
		HFSF6-6060	D-120 2	H-120 -	W-120 2	32	64	64	4

Blind Joint Type										
Unit Form	Extrusion Type	Extrusion Used	Number of Extrusions			Joint Parts		Extrusion End Caps	Machining	
HAT	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HSJD6		HFC6-3030-B	No. of Holes	
		HFSF6-3030 HFSFB6-3030	D-60 2	H-60 -	W-60 2	16		4	32	
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HSJD8		HFC8-4040-B	No. of Holes	
		HFSF8-4040 HFSFB8-4040	D-80 2	H-80 -	W-80 2	16		4	32	
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HSJD8		HFC8-4040-B	No. of Holes	
		HFSF8-4545 HFSFB8-4545	D-80 2	H-80 -	W-80 2	16		4	32	
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HSJD8-45		HFC8-4545-B	No. of Holes	
		HFSLF8-4545	D-90 2	H-90 -	W-90 2	16		4	32	
HBT	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HSJD6	HDJSN6	HFC6-3030-B	No. of Holes	
		HFSF6-3030 HFSFB6-3030	D-60 4	H-60 2	W-60 2	16	8	4	40	
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HSJD8	HDJSN8	HFC8-4040-B	No. of Holes	
		HFSF8-4040 HFSFB8-4040	D-80 4	H-80 2	W-80 2	16	8	4	40	
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HSJD8	HDJSN8	HFC8-4040-B	No. of Holes	
		HFSF8-4545 HFSFB8-4545	D-80 4	H-80 2	W-80 2	16	8	4	40	
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HSJD8-45	HDJSN8-45	HFC8-4545-B	No. of Holes	
		HFSLF8-4545	D-90 4	H-90 2	W-90 2	16	8	4	40	
HCT	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HSJD6	HDJSN6	HFC6-3030-B	No. of Holes	
		HFSF6-3030 HFSFB6-3030	D-60 4	H-60 -	W-60 4	16	8	4	40	
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HSJD8	HDJSN8	HFC8-4040-B	No. of Holes	
		HFSF8-4040 HFSFB8-4040	D-80 4	H-80 -	W-80 4	16	8	4	40	
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HSJD8	HDJSN8	HFC8-4040-B	No. of Holes	
		HFSF8-4545 HFSFB8-4545	D-80 4	H-80 -	W-80 4	16	8	4	40	
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HSJD8-45	HDJSN8-45	HFC8-4545-B	No. of Holes	
		HFSLF8-4545	D-90 4	H-90 -	W-90 4	16	8	4	40	
HDT	6-3030 B6-3030	HFST6-3030 HFSTB6-3030	W 2	D-60 2	H-30 4	HSJD6	HDJSN6	HFC6-3030-B	No. of Holes	
		HFSF6-3030 HFSFB6-3030	D-60 1	H-60 -	W-60 -	8	2	4	18	
	8-4040 B8-4040	HFST8-4040 HFSTB8-4040	W 2	D-80 2	H-40 4	HSJD8	HDJSN8	HFC8-4040-B	No. of Holes	
		HFSF8-4040 HFSFB8-4040	D-80 1	H-80 -	W-80 -	8	2	4	18	
	8-4545 B8-4545	HFST8-4545 HFSTB8-4545	W 2	D-80 2	H-40 4	HSJD8	HDJSN8	HFC8-4040-B	No. of Holes	
		HFSF8-4545 HFSFB8-4545	D-80 1	H-80 -	W-80 -	8	2	4	18	
	8L-4545	HFSLT8-4545	W 2	D-90 2	H-45 4	HSJD8-45	HDJSN8-45	HFC8-4545-B	No. of Holes	
		HFSLF8-4545	D-90 1	H-90 -	W-90 -	8	2	4	18	

■Unit Diagram

BA	BB	BC	BD	BE
				

HA	HB	HC	HD
			

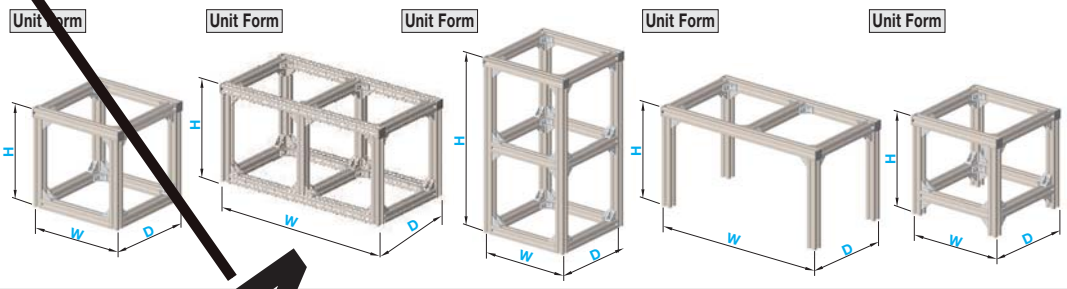
Temporary Assembly Service for Aluminum Frames

■We provide temporarily-assembled standard aluminum extrusion standard units (P.767,768)

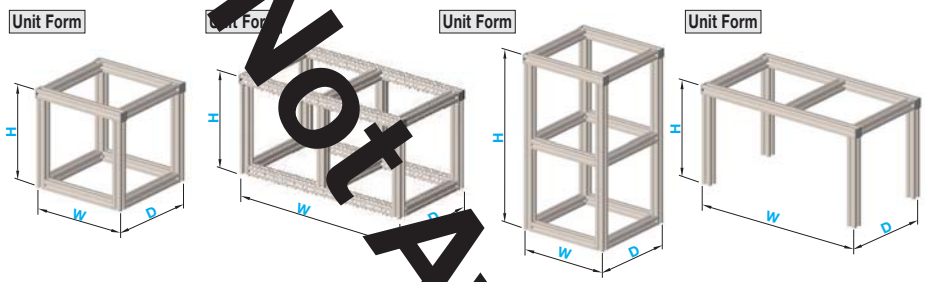
Standard Unit Using 4-Side Slotted Extrusions

Selectable Unit Shape

Bracket Connection Type

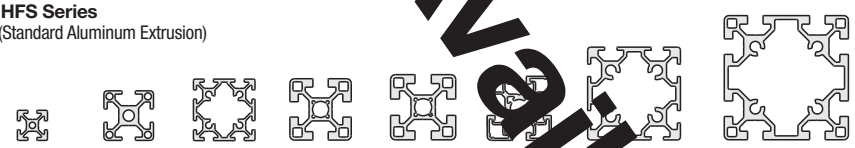


Blind Joint Type



Selectable Extrusion Shape

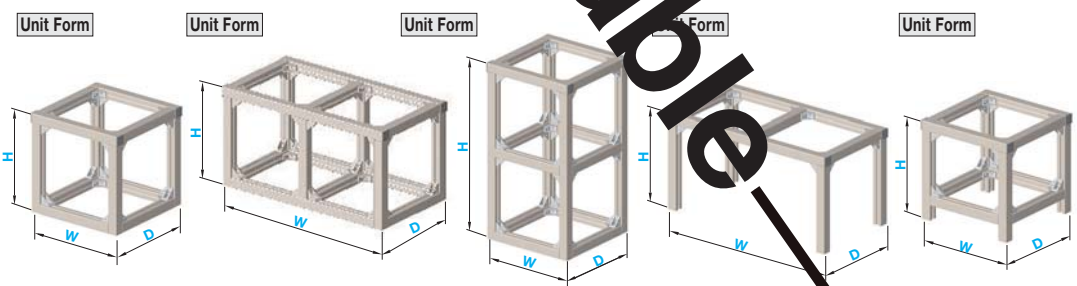
■**HFS Series**
(Standard Aluminum Extrusion)



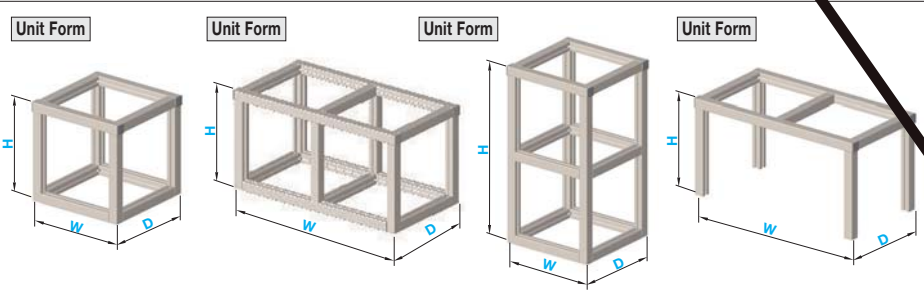
Standard Unit Using 2-Side Slotted Extrusions (HFST)

Selectable Unit Shape

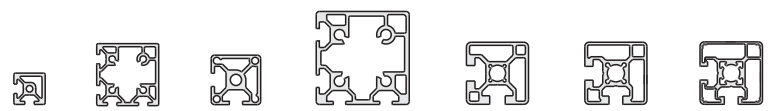
Bracket Connection Type



Blind Joint Type



Selectable Extrusion Shape



※3-Side Slotted extrusions (HFST) are used for the bottom and middle sections.

Not Available

■Dimensions of Temporary Assembly for 4-Side Slotted Extrusions (HFS)

Part Number			W 1mm Increment	D 1mm Increment	H 1mm Increment
Type	Unit Shape	Extrusion Type HFS			
		5-2020	300~1000	300~1000	300~1000
		5-4040	500~1200	500~1200	500~1200
		6-3030	300~1200	300~1200	300~1200
		8-4040	500~1200	500~1200	500~1200
		8-4545			
		8L-4545			
		6-6060	500~1000	500~1000	500~1000
		8-8080	500~700	500~700	500~700
		6-3030	300~1200	300~1200	300~1200
		8-4040	500~1200	500~1200	500~1200
		8-4545			
		8L-4545			

■Dimensions of Temporary Assembly for 2-Side Slotted Extrusions (HFST)

Part Number			W 1mm Increment	D 1mm Increment	H 1mm Increment
Type	Unit Shape	Extrusion Type HFST			
		5-2020	300~1000	300~1000	300~1000
		5-4040	500~1200	500~1200	500~1200
		6-3030	300~1200	300~1200	300~1200
		8-4040	500~1200	500~1200	500~1200
		8-4545			
		8L-4545			
		6-6060	500~1000	500~1000	500~1000
		6-3030	300~1200	300~1200	300~1200
		8-4040	500~1200	500~1200	500~1200
		8-4545			
		8L-4545			

- Available frame sizes for the Temporary Assembly Service are as shown in the table above.
  Please note that there are some differences in the modifiable sizes compared to the Standard Units on P.767,768
- Orders are accepted for the sizes within the range of W, D, H in the above table and also within the price range below.

Order Example Part Number - W - D - H
K-HAUBA6-3030 - W900 - D800 - H1200

Days to Ship 10 Days (The screws are temporarily tightened at the time of shipment. Fully tighten the screws when the product arrives.)

Price

■Temporary Assembly Service Pricing

(Example) K-HAU BA 6-3030-W900-D800-H1200

First, see the BA row of "Unit Shape" and find 6-3030 extrusion type and look to the right.
Next, select the column according to the total W+D+H value 2500. The temporary assembly price at the intersecting point is 291,90 EUR

Alterations P.769

■4-Sides Slotted Extrusions

Part Number			€ (W+D+H)							
Type	Unit Shape	Extrusion Type HFS	900 ~ 1249	1250 ~ 1599	1600 ~ 1949	1950 ~ 2299	2300 ~ 2649	2650 ~ 2999	3000 ~ 3349	3350 ~ 3600
		5-2020								✕
		5-4040	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							
		6-6060	✕			✕	✕	✕	✕	✕
		8-8080	✕			✕	✕	✕	✕	✕
		5-2020								✕
		5-4040	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							✕
		8L-4545	✕							✕
		5-2020								✕
		5-4040	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							✕
		8L-4545	✕							✕
		5-2020								✕
		5-4040	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							
		6-6060	✕				✕	✕	✕	✕
		8-8080	✕			✕	✕	✕	✕	✕
		5-2020								✕
		5-4040	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							
		6-6060	✕			✕	✕	✕	✕	✕
		8-8080	✕			✕	✕	✕	✕	✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							
		6-3030								
		8-4040	✕							
		8-4545	✕							✕
		8L-4545	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							✕
		8L-4545	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							

■2-Sides Slotted Extrusions

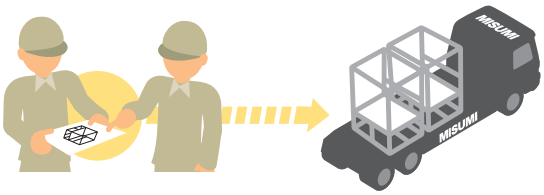
Part Number			€ (W+D+H)							
Type	Unit Shape	Extrusion Type HFST	900 ~ 1249	1250 ~ 1599	1600 ~ 1949	1950 ~ 2299	2300 ~ 2649	2650 ~ 2999	3000 ~ 3349	3350 ~ 3600
		5-2020								✕
		5-4040	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							
		6-6060	✕			✕	✕	✕	✕	✕
		5-2020								✕
		5-4040	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							
		6-6060	✕			✕	✕	✕	✕	✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							
		6-3030								
		8-4040	✕							
		8-4545	✕							✕
		8L-4545	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							✕
		8L-4545	✕							✕
		6-3030								
		8-4040	✕							
		8-4545	✕							
		8L-4545	✕							

Not Available

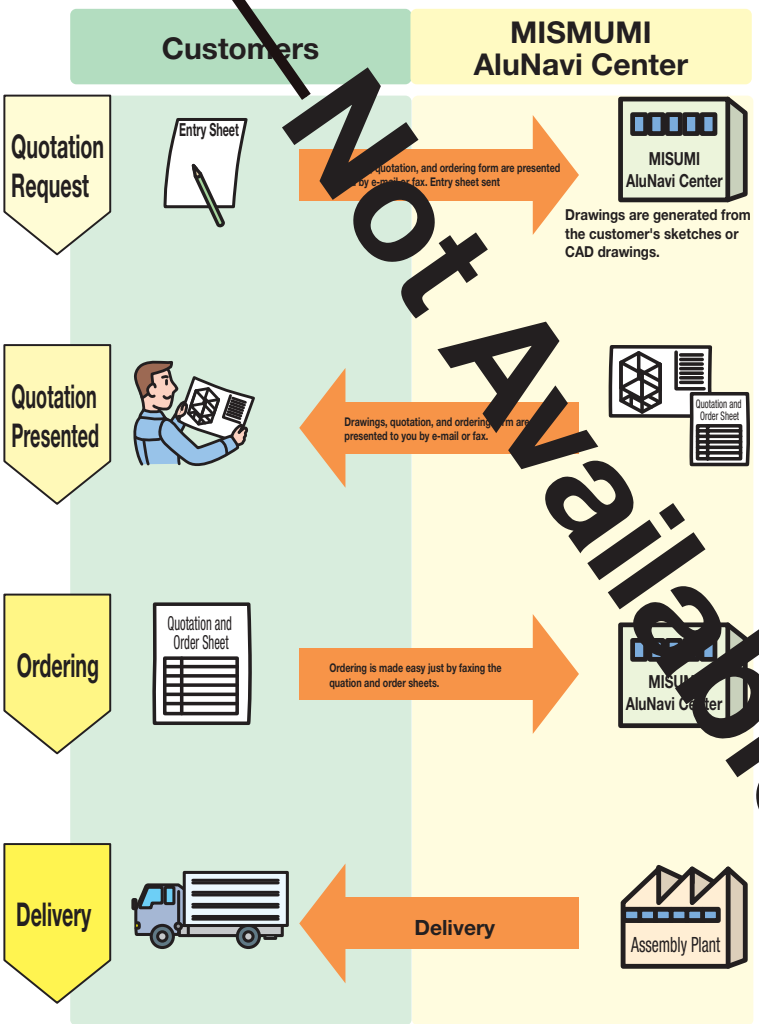
Assembly and Shipping Service (AluNavi Assembly & Shipping Service) 1

(P.777~P.782)

Aluminum Extrusion Frame Units are designed, assembled and shipped based on customer supplied sketches and CAD drawings.
Customers not familiar with the Aluminum Extrusion products can easily make use of the system. Please utilize our system to save your assembly time resources.



[Assembly & Shipping Service Flow



Please enter the required information on an Assembly & Shipping Service Entry Sheet, and fax or e-mail to MISUMI AluNavi Center. Please attach any CAD data etc. when sending your entry sheet.
The AluNavi Center contacts the customer upon reception of the entry sheet.
An Excel data formatted entry sheet can be downloaded from: http://jp.misumi-ec.com/mech/product/al/

MISUMI's AluNavi Center creates and presents the drawings (**P.779**) and a Quotation/Order Combination Sheet (**P.780**).

Any changes on materials, etc. can be faxed or e-mailed to
us for revised Quotation/Order Combination Sheets.
(Corrections may require some time)

Please read "Notes on Delivery" and "Post order changes and cancellations" on the right page.
If the drawings we presented are acceptable, please place your order by faxing a Quotation/Order Combination Sheet with your approval signature to MISUMI AluNavi Center.

- When placing your order in your own formats, the Quotation/Order Combination Sheet will need to be attached.
- Please note that the assembly service orders are not accepted through our Web Order System (WOS).
- For details, see the Quotation/Order Combination Sheet entry example on **P.780**.

Delivered from the assembly plant.
Please provide an adequate unloading facility as the product delivery is Freight-On-Board basis.

Price
Materials Charge: As quoted
Assembly Charge: 34,00 EURxHours
Freight Charge: As quoted
(Includes packing materials and labor)

Days to Ship
As quoted
(Delivery date is unconfirmed until the Bill Of Materials is finalized)

Not Available

For inquiries - - -MISUMI AluNavi Center(MISUMI Aluminum Extrusion Design Navigation Center)
Open hours: Weekdays (Mon.~Fri.) 9:00~17:00 * Excluding: Holidays, Obon, and year end/beginning
TEL : 03-3647-5462 FAX : 03-3647-5469 E-mail : p-alumi@misumi.co.jp

Not Available

Design Drawings

Design drawing generation service is provided free-of-charge as a part of the Assembly & Shipping Service, and not available for components only purchases
MISUMI may not be able to fulfill customer requests in some cases.
In such cases, MISUMI would contact the customer to notify the circumstances.

-Except for the Resin Panels, the only other components available to be combined with the extrusion frame assembly service are listed on **P.477~776**
⊗We cannot accommodate custom made components, other manufacturer's products, or customer supplied parts into the designs.
-We may need to contact the customers for inquiries on dimensions, specifications delivery location information by phone or e-mail.
-Please contact MISUMI AluNavi Center if CAD data are desired. The data format for electronically provided drawings is PDF.

Drawings/Quotations Submission General Timelines

The table shown on the right assumes no design changes during a quotation process. **The timelines on the right may be influenced by seasonal/in-house workload fluctuations. Please allow ample time on the customer end when requesting for quotations.**

Production and delivery times are communicated to the customer by noting on the Quotation/Order Combination Sheets.

Number of Extrusions	2D CAD Drawing+Quotation	3D CAD Drawing+Quotation
~10	Approx. 4 days	Approx. 4 days
~30	Approx. 5 days	Approx. 5 days
~50	Approx. 6 days	Approx. 7 days
~100	Approx. 7 days	Approx. 8 days
101~	10 days or more	

* Not including Sat., Sun., and other holidays.

Notes on Delivery

[Delivery format]

-Product delivery is Freight-On-Board basis. (Customers to unload the products)
On-site assembly service at destinations is not available.
-For unusually large items, delivery may have to be made in sections. The customers would be responsible for the final assembly.
-Packing reinforcements for the freight may be needed depending on the size of the product. Customers would be contacted with the details if needed.
-Unless otherwise specified by the customer, the lowest cost freight method would be selected including mixed freights.
If charter freights are to be used, please notify us as needed.
-Time specified deliveries are available only with chartered freights.
-If Mondays and "the day after holiday" delivery is desired, please check with us for possible Sat./Sun./Holiday freight loading charges.

[After the delivery]

-Fasteners are not fully tightened at the time of shipment. Please fully tighten all the screws after the delivery.
Fasteners may be loosened by vibrations during the shipment.

Post order changes and cancellations

Please note that changes made on materials, destinations, delivery dates, etc., and cancellations after the initial order was placed are subject to customer billing at actual costs incurred.
*The billed amounts would vary based on the nature of changes ordered since materials, assembly labor, and freight resources are finalized after the order is received.
*Delivery date postponement requested by the customer after the order is placed may incur a storage charge.

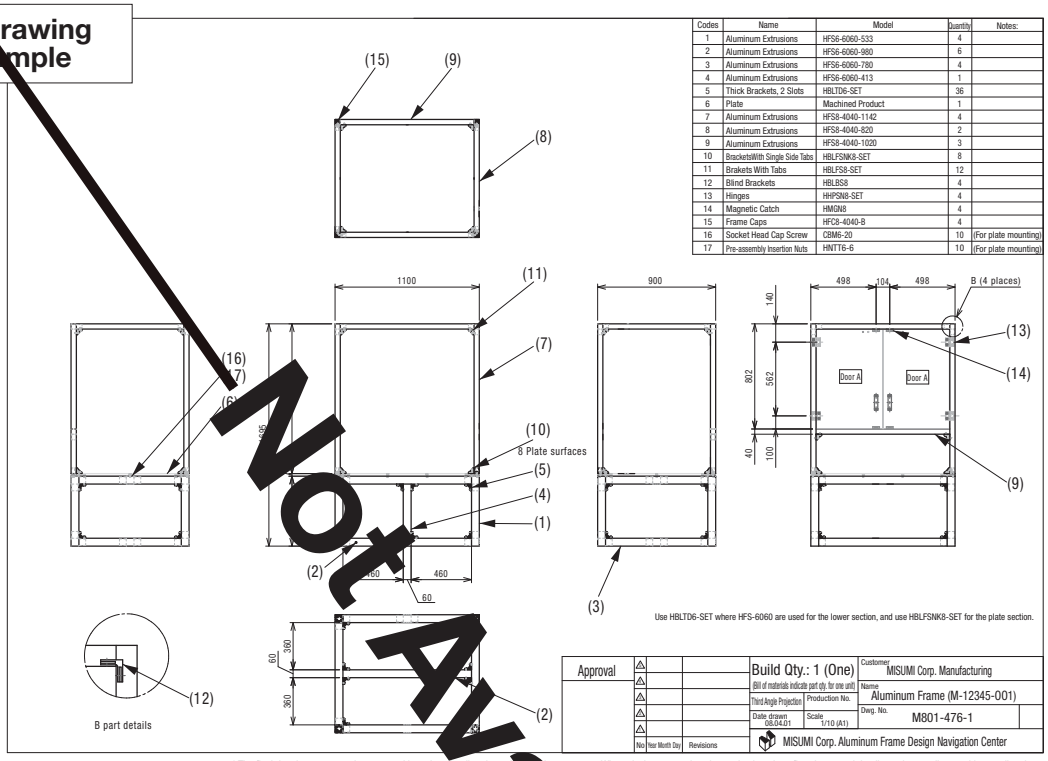
Placing repeated orders

When placing an order for a repeated item, please specify the drawing number of the past item to request for a delivery time quotation.
*Please note that the delivery time for the new order may not be the same as the previous order as delivery times vary depending on current production queue.

* Material prices and assembly charges are subject to revisions.

Assembly and Shipping Service (AluNavi Assembly & Shipping Service) 2 (P.777~P.782)

2D Drawing Example



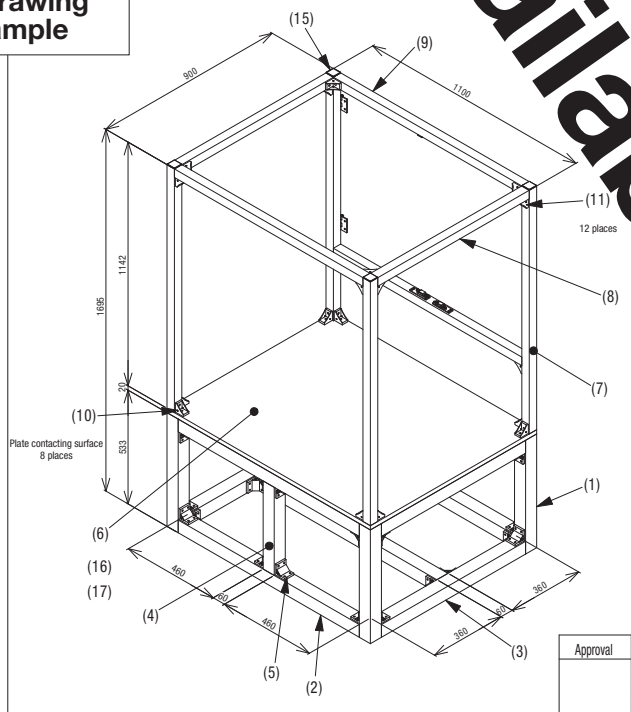
Codes	Name	Model	Quantity	Notes:
1	Aluminum Extrusions	HFS6-6060-533	4	
2	Aluminum Extrusions	HFS6-6060-980	6	
3	Aluminum Extrusions	HFS6-6060-780	4	
4	Aluminum Extrusions	HFS6-6060-413	1	
5	Thick Brackets, 2 Slots	HBLTD6-SET	36	
6	Plate	Machined Product	1	
7	Aluminum Extrusions	HFS8-4040-1142	4	
8	Aluminum Extrusions	HFS8-4040-820	2	
9	Aluminum Extrusions	HFS8-4040-1020	3	
10	BracketsWith Single Side Tabs	HBLFSNK8-SET	8	
11	Brakets With Tabs	HBLFS8-SET	12	
12	Blind Brackets	HBLBS8	4	
13	Hinges	HHPSN8-SET	4	
14	Magnetic Catch	HMGN8	4	
15	Frame Caps	HFC8-4040-B	4	
16	Socket Head Cap Screw	CBM6-20	10	(For plate mounting)
17	Pre-assembly Insertion Nuts	HNTT6-6	10	(For plate mounting)

Use HBLTD6-SET where HFS-6060 are used for the lower section, and use HBLFSNK8-SET for the plate section.

Approval			Build Qty.: 1 (One)	Customer: MISUMI Corp. Manufacturing
			(Bill of materials indicate part qty. for one unit)	Name: Aluminum Frame (M-12345-001)
			Third Angle Projection / Production No.	Dwg. No.: M801-476-1
			Date drawn: 08.04.01 / Scale: 1/10 (A1)	MISUMI Corp. Aluminum Frame Design Navigation Center
			No. / Year Month Day / Revisions	

* The final drawings presented are created based on the directions given by the customer. When placing your order, please check and confirm the quoted details are in compliance with your directions.

3D Drawing Example



Codes	Product Name	Model	Quantity
1	Aluminum Extrusions	HFS6-6060-533	4
2	Aluminum Extrusions	HFS6-6060-980	6
3	Aluminum Extrusions	HFS6-6060-780	4
4	Aluminum Extrusions	HFS6-6060-413	1
5	Thick Brackets, 2 Slots	HBLTD6-SET	36
6	Plate	Machined Product	1
7	Aluminum Extrusions	HFS8-4040-1142	4
8	Aluminum Extrusions	HFS8-4040-820	2
9	Aluminum Extrusions	HFS8-4040-1020	3
10	BracketsWith Single Side Tabs	HBLFSNK8-SET	8
	Brakets With Tabs	HBLFS8-SET	12
	Blind Brackets	HBLBS8	4
13	Hinges	HHPSN8-SET	4
14	Magnetic Catch	HMGN8	4
	Frame Caps	HFC8-4040-B	4
16	Socket Head Cap Screw	CBM6-20	10
	Pre-assembly Insertion Nuts	HNTT6-6	10

Approval			Build Qty.: 1 (One)	Customer: MISUMI Corp. Manufacturing
			(Bill of materials indicate part qty. for one unit)	Name: Aluminum Frame (M-12345-001)
			Third Angle Projection / Production No.	Dwg. No.: M801-476-1
			Date drawn: 08.04.01 / Scale: 1/10 (A1)	MISUMI Corp. Aluminum Frame Design Navigation Center
			No. / Year Month Day / Revisions	

* The final drawings presented are created based on the directions given by the customer. When placing your order, please check and confirm the quoted details are in compliance with your directions.

* When any Panel Components are associated, detailed drawings of all the panels will accompany the 2D and 3D drawing sets.
Plate products and machining alterations are not available.

Not Available

Quotation/Order Combination Sheet entry example


アルナビ 組立出荷

アルナビ組立出荷 見積書 兼 発注書

送信日 月 日 | 送信枚数 1/1

123XXX お客様コードNo.

〇〇株式会社 様 TEL 045-XXX-XXXX FAX 045-XXX-XXXX

ご発注 部課名 お名前

ご納入 部課名 お名前

直送先コードNo. 直送先 会社名 TEL FAX

直送先 住所 〒

ご納入 部課名 お名前

合計金額 ¥ (内訳下記)	¥109,666	
御見積台数	1	台分

M507-002

ご希望納品日

ご注文番号

ご承認印

出荷日: ご注文後(実働) 10 日目発送 又は 納品日: - までに ご注文頂いた場合 - 納品

納品形態: 車上渡し ミスミ工場にて組立て後、トラックにて上記納品先住所に出荷します。
※ トラックからの荷下ろしは、お客様にて行うものとなります。
※ 納品物の大きさによっては、運送上の理由から面・ユニットごとに 納品となることがあります。

特記事項・その他

費用内訳

項	名称／内容	上段: ご注文番号 下段: 型式	数量	単価	小計
1	部材費 (一式分:別紙の通り)	@ALNA-PARTS-123XXX-M507-002	1	77,866	77,866
2	組立費 (時間*3400円)	@ALNA-ASS-123XXX-M507-002	7	3,400	23,800
3	運送費 (混載便)	@ALNA-DEL-123XXX-M507-002	1	8,000	8,000

【ご留意事項】
●価格改定時には合計金額が変更となる可能性がございます。ご了承願います。
●ご発注後の組立て部材、納品先、納品日、その他変更がある場合は、実費にて請求させて頂く場合がありますので、予めご了承ください。※ご注文後に、運送便、作業員、部材の手配が行われる為、変更内容によりご請求させて頂く金額は異なります。

見積発行元 株式会社ミスミ アルナビセンター | TEL :03-3647-5462 FAX :03-3647-5469 E-mail :p-alumi@misumi.co.jp | ご提出日 2009/4/1

【ご発注を2009/5/1以降に予定されているお客様へ】
●本案件の納期・部材確保のため、よろしければご発注予定をお聞かせください。
□発注予定(月 日頃) □発注見送り □その他 (理由:)
●「発注見送り」をご選択いただいたお客様はご参考までに理由をお聞かせください。※複数回答可
□見積提出が遅い □納期が間に合わない □価格が高い (部材費 組立費 運送費)
□設計変更 □他社へ発注 □部材のみ購入、自社にて組付
□案件が中止となった □その他 (理由:)

ご注文時はミスミアルナビセンターまでFAXしてください。 FAX 03-3647-5469

The second page and thereafter are detailed bill of materials.
(Unnecessary to include in your order)

A Quotation/Order Combination Sheet will be submitted to the customer from MISUMI.
Please check and confirm the drawing, delivery time, and the price.

When placing your order, please enter the required information and an approval signature in the RED box shown n the left, and fax the sheet to MISUMI.
Fax only the 1st page of the Quotation/Order Combination Sheet. (The 2nd page and after are detailed B.O.M.)

- When placing your order in your own formats, the Quotation/Order Combination Sheet will need to be attached.
- Please note that the assembly service orders are not accepted through our Web Order System (WOS).

- Name of the person ordering
- Name of the person delivered to

- Delivery address
  (Not needed if same as the customer code)

- For specified delivery date, check for the actual number of working days.

- Customer's order number
- Customer's approval signature

- Freight charge will vary depending on the destination and transportation method.

Quotation Example

- Example of delivering a unit shown on the left to Yokohama city, Kanagawa Pref.

(1) Materials Cost	778,66 EUR
(2) Assembly Charges	238,00 EUR (34,00 EURx7 Hours)
(3) Freight Charge	778,66 EUR (Includes packing materials and labor)

Total(Tax not included) 778,66 EUR

-If your anticipated order placement date is 30 days or more from our quotation date, please kindly inform us of the expected order date for us to better manage our material and labor resources.

Please fax your order to MISUMI AluNavi Center using a Quotation/Order Combination Sheet. Your orders are accepted upon receipt of your approved Quotation/Order Combination Sheet.

Not Available

Assembly & Shipping Service Entry Sheet

Customer Code No.	Company Name	Section	Name	Date
		Section Dept.	Mr./Ms.	/ ( )
Phone Number	**Fax Number**	**E-mail**		

Destination Info.

Name of the person to contact for technical details.

* No entry required if "deliver to" address is the same as the address registered with the Customer Code above.

Direct shipping code/number	Deliver to: Company Name	Customer Contact Name	Delivery Address
* Leave blank if code not available.		Section Dept. Mr./Ms.	
Phone Number	**Fax Number**	**Zip Code**	

Select your desired drawing format and a drawing/quotation return communication method from below.

Drawing Format	Characteristics	Checked
2D	Characteristics	_
3D	Easier to understand during assembly.	_

Quotation Return Method	Checked
FAX	_
E-mail	_

Build Quantity	Requested Delivery Date
Units	/ ( )

Please select desired materials from below. If no selection is entered, we will design with components most economical for the application.

Frame Size	
mm SQ. * Model No. OK	
Extrusion Type	
4-Sides Slotted	_
1-sides Flat	_
2-sides Flat	_
Extrusion End Caps	
Black	_
Gray	_
Level w/extrusions	_
Screws/Nuts Material	
Steel	_
Stainless Steel	_
Nut Type	
Pre-assy. Insert	_
Pre-assy.-Insert, Spring	_
Post-assy.-Insert, Spring	_
Post-assy.-Insert, Stopper	_
Post-assy.-Insert Locknut	_
Connection Type	
Reversal Bracket with Tab	_
Post-assy.-Insert, Simple Brkt.	_
Thick Brkt.	_
Blind Brkt.	_
Post-assy.-Insert, Dbbl. Joint	_
Single Joint	_
Screw Joints	_
Other ( )	
Footings	
Caster	_
Adjustment Pad	_
Casters - Integrated Adjusters	_
Anchors	_
Door Type	
Panel doors	_
Frame Doors	_
Sliding doors	_
Folding Doors	_
Panel Mounting Method	
Direct frame mount	_
Bracket mount	_
Extrusion slot mount	_
Other ( )	
Panel Type	
PVC (anti-static)	_
Acrylic	_
Acrylic (anti-static)	_
Polycarbonate	_
Polycarbonate (anti-static)	_
PET	_
Laminated Alum. Boards	_
Other ( ) * Enter desired thickness	

Customer sketches/other

Not Available

* If electronic data or printed drawings are on hand, please attach and forward to us.
* Enter the name of you CAD platform. ➡ ( )
* Enter any required elements not listed on the left.

Customer Equipment DWG. Number

* For noting the customer drawing number of design drawings.

Please send to below after entering your data. Thank you for your cooperation.
MISUMI AluNavi Center [MISUMI Corp. Aluminum Extrusion Products Navigation Center]

■TEL:03-3647-5462

FAX 03-3647-5469 **E-mail p-alumi@misumi.co.jp**

Information

Dedicated Aluminum Extrusion products web site is now on line at: http://jp.misumi-ec.com/mech/product/al/

Assembly & Shipping Service RFQ entry sheet is available for downloading at the web address shown above.

<Entry Sheet (left page) Example>

Customer Code No.	Company Name	Section	Name	Date
123xxx	MISUMI Automation Corp.	Design Section Dept.	OO Mr./Ms.	4/1(Wed.)
Phone Number	**Fax Number**	**E-mail**		
03-xxxx-xxxx	03-xxxx-xxxx	OO@xxx.co.jp		

Destination Info.

Name of the person to contact for technical details.

* No entry required if "deliver to" address is the same as the address registered with the Customer Code above.

Direct shipping code/number	Deliver to: Company Name	Customer Contact Name	Delivery Address
* Leave blank if code not available,		Section Dept. Mr./Ms.	Same as above
Phone Number	**Fax Number**	**Zip Code**	

Select your desired drawing format and quotation return communication method from below.

Drawing Format	Characteristics	Checked
2D	Drawings returned quickly.	√
3D	Easier to understand during assembly.	_

Quotation Return Method	Checked
FAX	_
E-mail	√

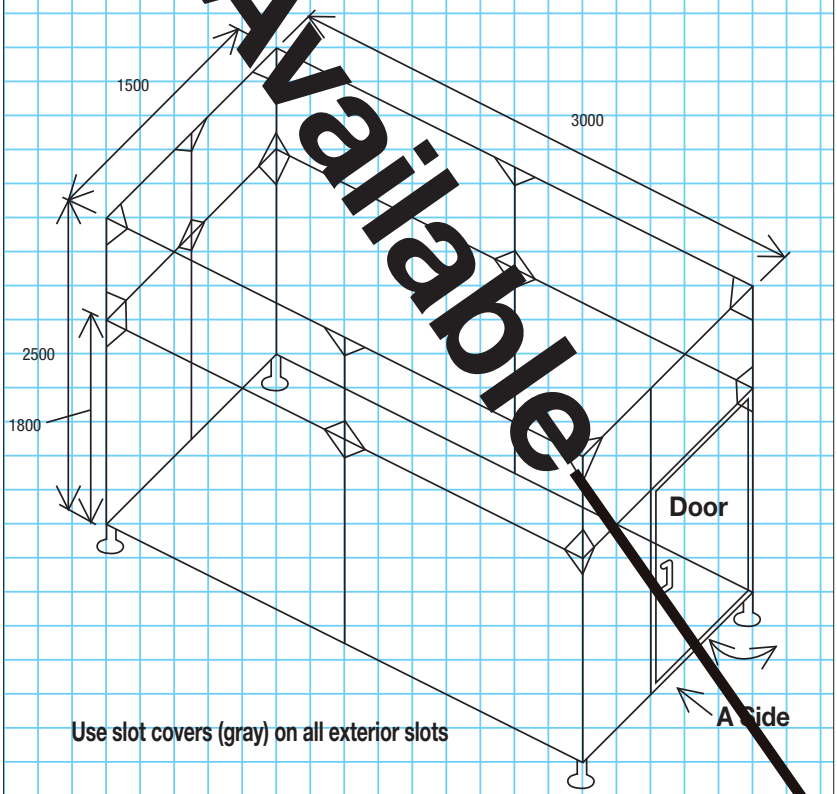
Build Quantity	Requested Delivery Date
1 Units	/ ( )

Please select desired materials from below. If no selection is entered, we will design with components most economical for the application.

Frame Size	
40mm SQ. * Model No. OK	
Extrusion Type	
4-Sides Slotted	√
1-sides Flat	_
2-sides Flat	_
Extrusion End Caps	
Black	√
Gray	_
Level w/extrusions	_
Screws/Nuts Material	
Steel	√
Stainless Steel	_
Nut Type	
Pre-assy. Insert	_
Pre-assy.-Insert, Spring	_
Post-assy.-Insert, Spring	√
Post-assy.-Insert, Stopper	_
Other ( )	_
Connection Type	
Reversal Bracket with Tab	_
Post-assy.-Insert, Simple Brkt.	√
Thick Brkt.	_
Blind Brkt.	_
Post-assy.-Insert, Dbl. Joint	_
Single Joint	_
Screw Joints	_
Other ( )	
Footings	
Caster	_
Adjustment Pad	√
Casters - Integrated Adjusters	_
Anchors	_
Door Type	
Panel doors	_
Frame Doors	√
Sliding doors	_
Folding Doors	_
Panel Mounting Method	
Direct frame mount	_
Bracket mount	√
Extrusion slot mount	_
Other ( )	
Panel Type	
PVC (anti-static)	_
Acrylic	_
Acrylic (anti-static)	_
Polycarbonate	_
Polycarbonate (anti-static)	_
PET	√
Laminated Alum. Boards	_
Other (5mm) * Enter desired thickness	

Customer sketches/other

- A door (1500mm H, 900mm W, right opening) on surface A
- Panel spacers (black) in extrusion/panel spaces



* If electronic data or printed drawings are on hand, please attach and forward to us.
* Enter the name of you CAD platform. ➡( )
* Enter any required elements not listed on the left.

Customer Equipment DWG. Number

MISUMI-01

* For noting the customer drawing number on design drawings.

Please send to below after entering your data. Thank you for your cooperation.

MISUMI AluNavi Center [MISUMI Corp. Aluminum Extrusion Products Navigation Center]

■TEL:03-3647-5462

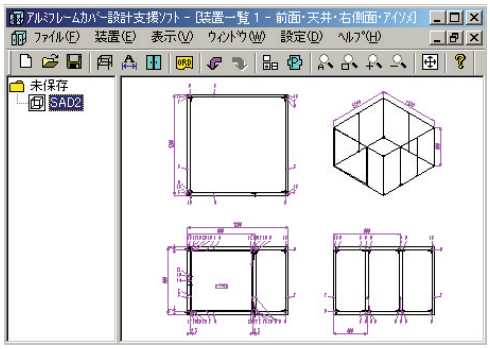
FAX 03-3647-5469 **E-mail p-alumi@misumi.co.jp**

Not Available

Standard Aluminum Frames Design Support (Software)

Design Support Software V2.70 (Free)

■Software Overview



Designing is easy

- Analyzes beam deflections by calculating the loads.
- Many practical shapes are provided.
- All the materials will be converted into part numbers and quantities.

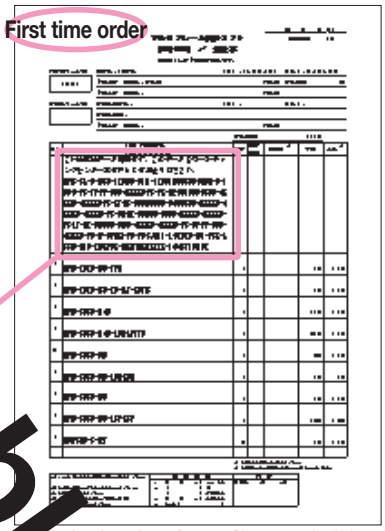
Only the prominent cataloged products are selectable from the software.

- The software calculates door dimensions and panel notches.

30% OFF from your first software generated order

For your 1st time order, please notate "First Order" on the software generated order sheet.
MISUMI will take 30% OFF from your order generated with the software for the 1st time (only).
Please end the order to the Marketing Center. P.1807

If the design you generated includes any Panels, MISUMI needs the characteristic information from the order sheet generated by the software in order to manufacture them. Please attach the software generated order sheet even when ordering in your own formats or by using our WOS (Web Order System). We cannot assure to meet your requested delivery date if the software generated order sheet is not attached.



The price shown is a reference. Please note that Volume [illegible] is not reflected.

■How to obtain the software

Download the software from the following web page.
http://jp.misumi-ec.com/cad/
Your questions are answered via e-mail and phone.
E-mail: p-alumi@misumi.co.jp
Phone: 03-3647-7173

■Environment

Runs on Windows98, 2000, Me, NT, and XP platforms. (Not compatible with Windows95)

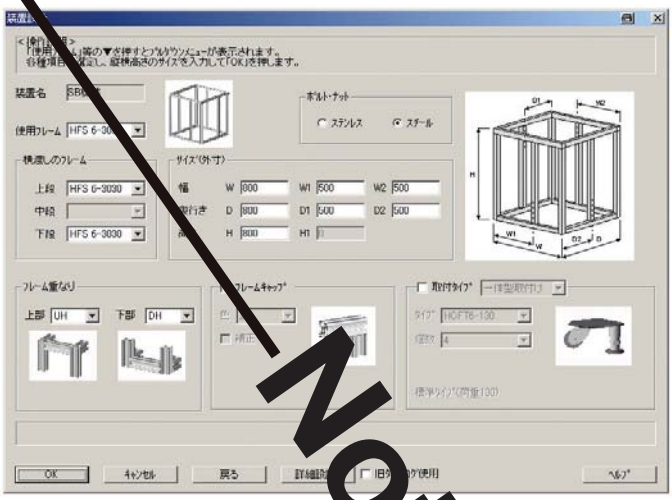
(Windows is a registered trademark of Microsoft Corporation)

■Staring the software

After unzipping, install and start "Misumi-alumi soft".

Not Available

■Introducing the Design Support Software



■Example shape selectable in the software



Many other shapes can be specified.

(1) Choose a desired configuration from Basic Configurations group.
(2) Specify: Frame Type, Size (outer dims.), and extra connection configurations.



(3) By designing via Detailed Design screens, doors and panel types can be specified.
(4) 6 drawings are generated.
(5) A bill of materials containing catalog codes, quantities, and prices is displayed as an order she
The prices displayed by the software are reference prices.
Volume discounts are not reflected on the prices.

■How to order materials

Please enter your company name and customer code on the printed order sheet and send to our Marketing Cent

P.1807

Please send your R.F.Q. (P.781) to our AluNavi Center (P.777) by filling out the entry sheet.

- Catalog codes for panels used for Alum. Extrusion products

The Design Support Software generates drawings for the panels along with the extrusion frame structural drawings.
Following catalog codes are generated for the panels with notch information and mounting hole dimensions.

		HFPAL	T	A	B	Notching data
Order Example	Design Support Software	Panel code	Thickness	Width	Height	
	Part Number		-	A	- B	- Notching data
				- 200	- 320	- OOO

Days to Ship: 8 Days

€ Unit Price

Price including the notches will be entered into the order sheet.

Not Available

Factory Frames / Hollow Frames

Factory Frames/ Hollow Frames

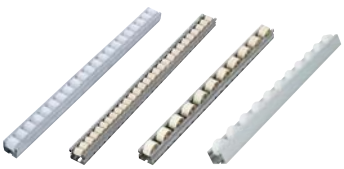
NEW Addition





Product Name	Factory Frames · Joints · Accessory Parts	Door Parts for Factory Frames
Page	788~792	793







Handles	Wheel-Conveyor Assembly · Factory Frame-Dedicated Connecting Parts	Adjustment Pads for Factory Frames Table-Top Bases
793	794	795





Casters for Factory Frames	Hollow Frames	Curved Hollow Frames
796	799	799





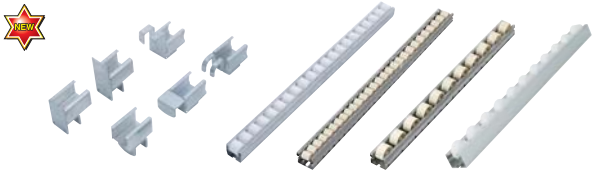






Aluminum Hollow Frames	Metal Joints	Adhesives	Plastic Joints	Plastic Joints
800	802	803	804	805





Plastic Joints	Connecting Parts
806	807







Skid Hollows · Connecting Parts	Lifting Table Units	Accessory Parts
808	808	809







Adjusting Bolts	Casters for Hollow Frames
810	811



Caster Attachment Parts
812



Stainless Steel Hollow Frames · Joints · Accessory Parts
813-814



Factory Frame Standard Units - Work Table
816



Hollow Frame Standard Units - Hand Truck
817



Hollow Frame Standard Units - Partition
818



Hollow Cutters
819



Spare Cutter Blades
819



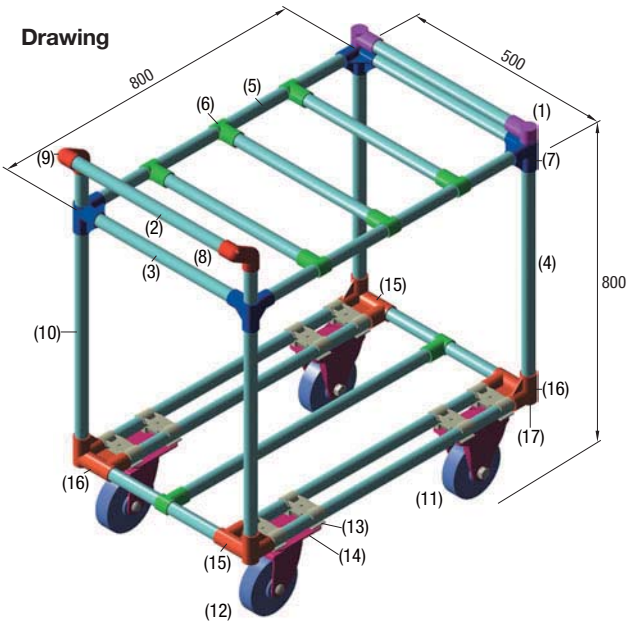
Deburring Tools
819



Spare Cutter Blades
819

Application Example - Hand Truck

Drawing



Components List

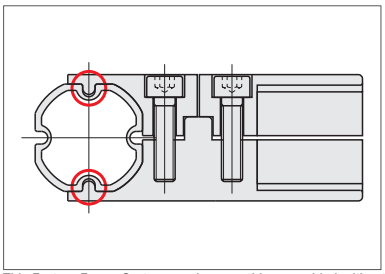
Number	Part Number	Symbol	Pc.
(1)	PJ003-Color	Plastic Joints	2
(2)	PFS28-Color-467	Hollow Frame	1
(3)	PFS28-Color-427	Hollow Frame	8
(4)	PFS28-Color-653	Hollow Frame	2
(5)	PFS28-Color-727	Hollow Frame	7
(6)	PJ204C-Color	Plastic Joints	8
(7)	PJ103-Color	Plastic Joints	4
(8)	PJ601R-Color	Plastic Joints	1
(9)	PJ601L-Color	Plastic Joints	1
(10)	PFS28-Color-731	Hollow Frame	2
(11)	PHCHK130	Casters	2
(12)	PHCHK130	Casters (with Stopper)	2
(13)	JBS001	Caster Attachment	8
(14)	JBS002	Caster Attachment	8
(15)	PJ603R-Color	Plastic Joints	2
(16)	PJ603L-Color	Plastic Joints	2
(17)	PJ503-Color	Plastic Joints	4

Color W (White)
S (Gray)

Features of Factory Frame System

■Features of Factory Frame System

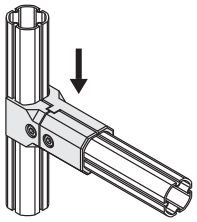
Compared with the conventional hollow frames, Aluminum hollow frames have the advantages as follows;
- Improved squareness at assembly.
- Allows fine adjustment after assembly.



This Factory Frame System can be smoothly assembled without bothered by the frame twisting, just by setting the frame dents in the joint tabs.

■Allowable Load

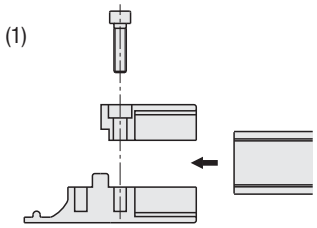
- Allowable Load of Metal Joints

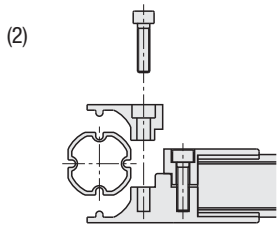


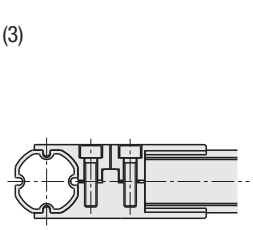
Load that doesn't cause joints misalignment
Max. Load= Approx. 80kg

Please note the maximum load is the value of the static load, and impact load may be lower than this value.

-Deflection Amount of Factory Frames
Please refer to Allowable Load of Aluminum Frames on →**P.671**







Do not use electric tools whose torque cannot be controlled such as impact drivers. Reference Tightening Torque: 6.8N/m

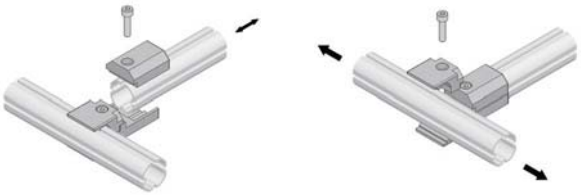
Frames can be assembled by tightening the screws for each frame by turns.
There is no need to fix several frames at a time, which enables easy assembly.

- **Conventional Frame Joint**



When a screw is loosened, both frames move.

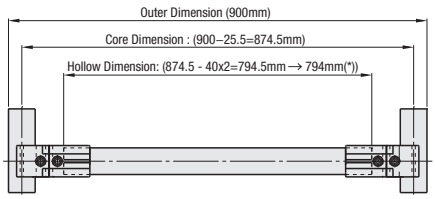
- **Factory Frame System**



Separate adjustment is possible for each frame.

On conventional Frames and Joints, both frames loosened when loosening a screw to move frames. On the contrary, the Factory Frames System can loosen only the frame which needs to be moved. This feature enables frames to be arranged or adjusted after assembling.
No need to hold several frames at a time when assembling.

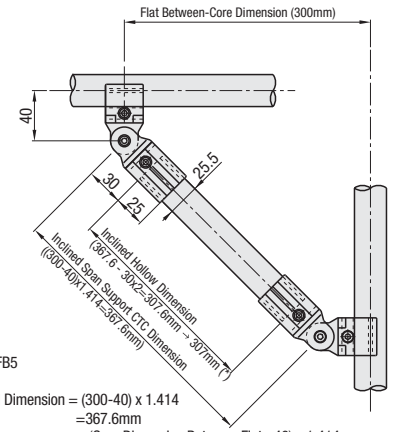
■How to Calculate Hollow Dimension



*When the dimension has the digits after decimal point, round it down to the nearest 1.

When using FFB1

Core Dimension=900-25.5=874.5mm
=Outer Diameter-Factory Frame Diameter
Hollow Dimension=874.5-40x2=794.5mm
=Core Dimension-length from the center to the tip of the hollow x 2
If the hollow dimension has the digit after decimal point, round it down to the nearest 1.
→Eventual Hollow Length=794mm

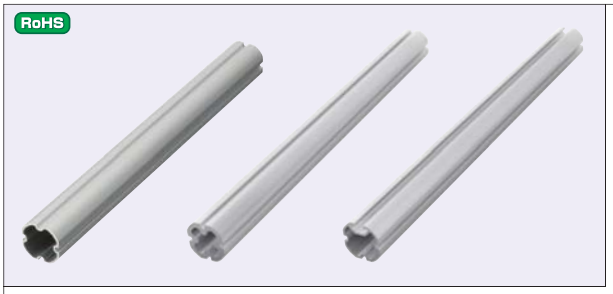


When using FFB5

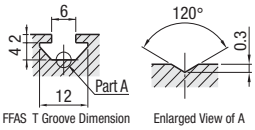
Actual Inclined Dimension = (300-40) x 1.414
=367.6mm
= (Core Dimension Between Flats-40) x 1.414
Inclined Hollow Dimension (367.6-30x2=307.6mm
= The actual Inclined Dimension the Distance from the Fulcrum to the Hollow End x2
*If the hollow dimension has the digit after decimal point, round it down to the nearest 1.
→Eventual Hollow Length=307mm

Factory Frames

CAD Data



Type		M Material	S Surface Treatment
L Dimension Configurable	3000mm Set of 6 pcs.		
FFA	FFATS	EN AC-51400/ AlMgSi0,7-T5	Anodizing
FFAU	FFAUTS		
FFAS	FFASTS		

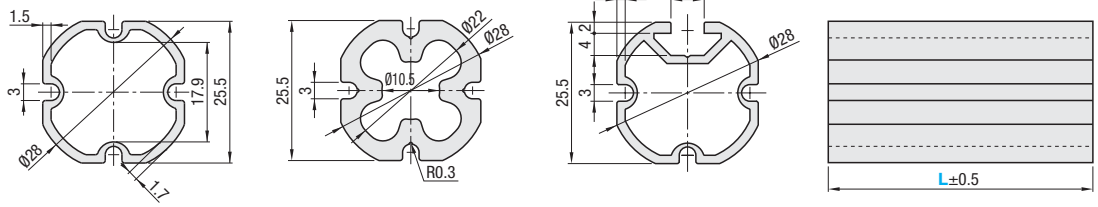


FFAS T Groove Dimension　Enlarged View of A

< Standard Type >
FFA(L Dimension Configurable)
FFATS(Base Material 3000mm 6 pcs. / set)

< High Rigidity Type >
FFAU(L Dimension Configurable)
FFAUTS(Base Material 3000mm 6 pcs. / set)

< Groove Type >
FFAS(L Dimension Configurable)
FFASTS(Base Material 3000mm 6 pcs. / set)



Select nuts for grooves from **P.500~508**

L Dimension Configurable

Part Number Type	Part Number No.	L 1mm Increment	Mass kg/m	Sectional Area mm²	Geometrical Moment of Inertia mm⁴ ℓx	Geometrical Moment of Inertia mm⁴ ℓy	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or More
FFA	28	60~4000	0.37	137.2	$1.07x10^4$	$1.07x10^4$		
FFAU			0.82	303.1	$1.86x10^4$	$1.86x10^4$		
FFAS			0.42	155.6	$1.11x10^4$	$1.12x10^4$		

3000mm 6 pcs. / set

Part Number Type	Part Number No.	(mm)	Mass kg/pc.	€ Unit Price 6 pcs./ set
FFATS	28	3000 (Set of 6 pcs.)	1.11	
FFAUTS			2.46	
FFASTS			1.26	

⊗For Factory Frames, the following items cannot be used: Cutters and Deburring Tools on page **P.819** and adhesives on page **P.803**

Order Example

Part Number	-	L
FFA28 FFATS28	-	1800

Days to Ship: **6 Days**

Price

When L is less than 300, the unit price is as indicated in the table, regardless of the length.
ex: FFA28-280=1,40 EUR
When L is 300 or more, total prices are calculated as follows.
€ Unit Price / m x Specified Full Length = Sales Price
ex: FFA28-720
370x0.72=1,40 EUR (Round down to ten Cent.)

Alterations　Days to Ship: 7 Days

Alterations Code	Alterations	Tapping on Ends LTP	RTP	TPW
Spec.		The illustration below shows the basic frame position.		
Applicable Frames	Tap Shape	LTP: Left End	RTP: Right End	TPW: Both Ends
FFAU FFAUTS	M12 Depth 36	2,00	2,00	4,00

Example



Joints for Factory Frames

RoHS

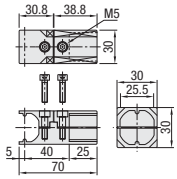


Part Number	Material
FFB1 · FFB2	EN AC-46100/G-AlSi12Cu
FFB3~FFB5	EN AC-46100/G-AlSi12Cu

Reference Tightening Torque: 6.8N/m

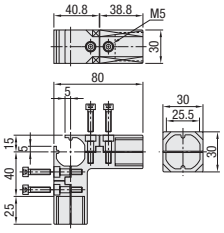
The shape of FFB3~FFB5 may be partially altered for product improvements.

FFB1



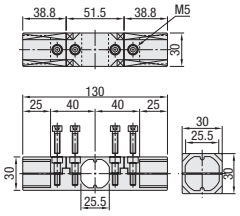


FFB2



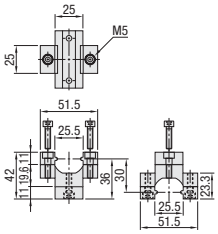


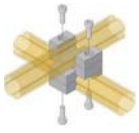
FFB3



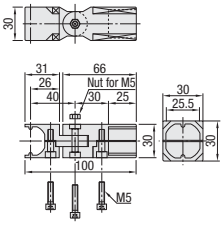


FFB4





FFB5





Part Number		Mass	Included Bolts and Nuts		€ Unit Price
Type	No.	(g)	Size	Qty.	
FFB	1	88	M5-20	2	
	2	168		4	
	3	172			
	4	92	M5-15		
	5	145	M5-20	2	
			M5-25	1	
			Nut for M5		

RoHS

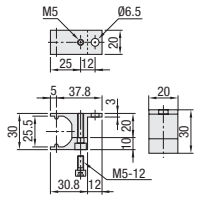


Part Number	Material
FFB6~FFB10	EN AC-46100/G-AlSi12Cu

Reference Tightening Torque: 6.8N/m

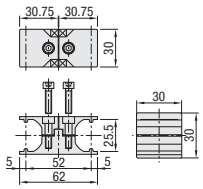
The shape may be partially altered for product improvements.

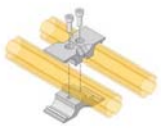
FFB6



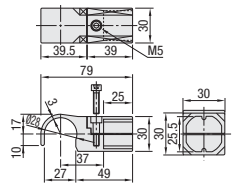


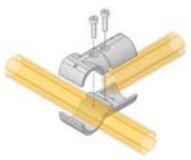
FFB7



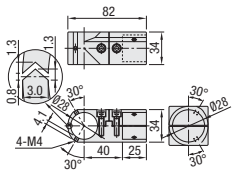


FFB8



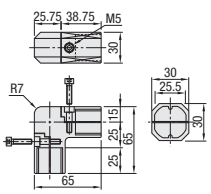


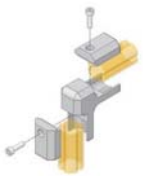
FFB9





FFB10





Part Number		Mass	Included Bolts and Nuts		€ Unit Price
Type	No.	(g)	Size	Qty.	
FFB	6	35	M5-12	1	
	7	80	M5-20	2	
	8	84		1	
	9	110		2	
	10	145			

Alterations

Part Number - (SET · C)

FFB9 - SET

Alteration	Code	Spec.	Price Adder
Set Screw	SET	4 set screws (M4-6) come with FFB9 as a set. Applicable to FFB9 only.	2,12
Mounting Hole alteration for Cover	C	Adds a tap for FFB10 for cover mounting. Applicable to FFB10 only.	1,00

CAD Data

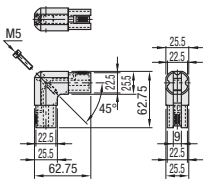
RoHS



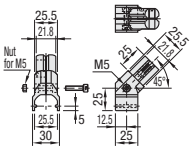
Part Number	Material
FFB11~FFB15	EN AC-46100/G-AlSi12Cu

Reference Tightening Torque: 6.8N/m

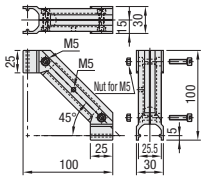
FFB11



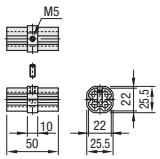
FFB12



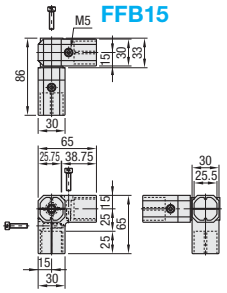
FFB13



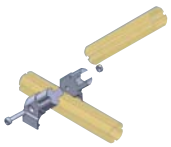
FFB14

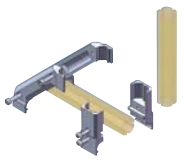


FFB15













Part Number		Mass	Included Bolts and Nuts		€ Unit Price
Type	No.	(g)	Size	Qty.	
FFB	11	250	M5-20	1	
	12	88	M5-20	1	
			Nut for M5	1	
	13	88	M5-20	2	
			Nut for M5		
	14	35	M5 Set Screw	1	
	15	140	M5-20	3	
			M8-35	1	

Order Example

Part Number
FFB1

Days to Ship

6 Days P.87

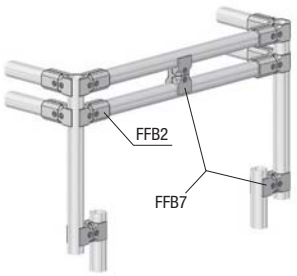
Price

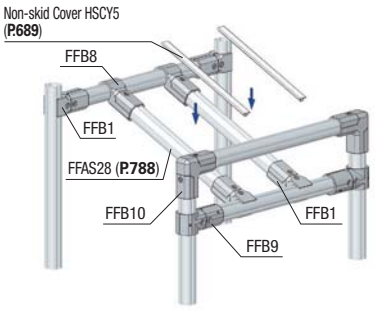
Volume Discount
(Round down to one Cent.) P.87

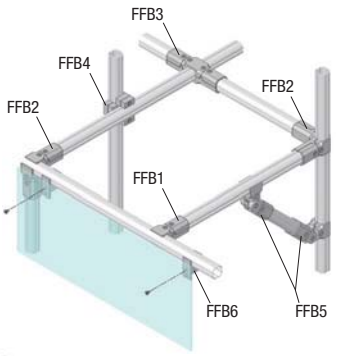
Quantity	1~100	101~200
Rate	€ Unit Price	5%

Please request a quotation for orders larger than indicated quantity.

Example











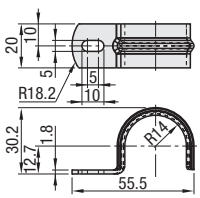
Accessories for Factory Frames

RoHS

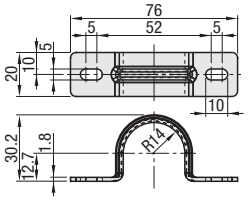


Part Number	M Material	S Surface Treatment
FFS101 FFS102	1.0330/DC01	Trivalent Chromate
FFS103	Polyethylene	-
FFS107	Polypropylene	

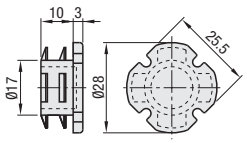
■Saddles with One Fixing
FFS101 (Set of 4)



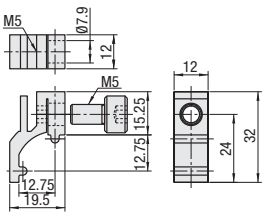
■Saddles with Two Fixings
FFS102 (Set of 4)



■Inner Cap
FFS103 (Set of 4)(Applicable Frame: FFA28)



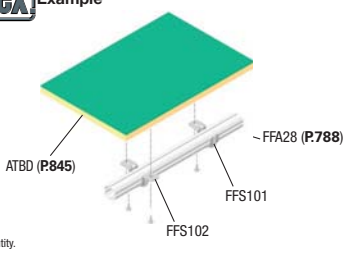
■Panel Holder
FFS107



Part Number	Mass (g/pc.)	Pcs. per Pkg.	€ Unit Price
FFS101	19	4	
FFS102	24	4	
FFS103	4	4	
FFS107	8	1	

Please confirm order quantity when ordering per package.

Example



Order Example — Part Number: FFS101

Days to Ship — 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~49	50~199
Rate	€ Unit Price	10%	20%

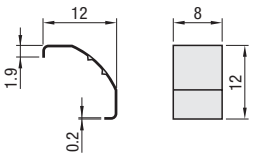
Please request a quotation for orders larger than indicated quantity.

RoHS



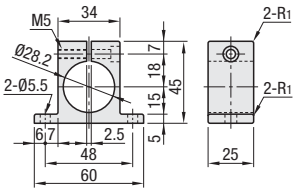
Part Number	M Material	S Surface Treatment
FFS104	1.4301/X5CrNi18-10	-
FFS105	EN AW-6063/AlMg0,7Si	Clear Anodize
FFS106	1.0038/S235JR	Chrome Plating

■Conductive Plate
FFS104 (Set of 50)



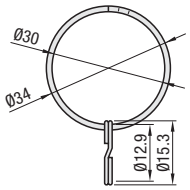
By inserting in between the Frame tube and the joint, it scratches the anodized surface to gain electrical conduction. (Refer to the application example below.)

■Clamp for Factory Frame
FFS105



A Accessory: Hexagon Socket Head Cap Screw M5-22 x 1

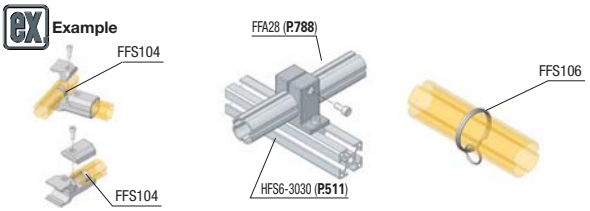
■Ring Slider
FFS106 (Set of 10)



Part Number	Mass (g/pc.)	Pcs. per Pkg.	€ Unit Price
FFS104	1	50	
FFS105	70	1	
FFS106	14	10	

Please confirm order quantity when ordering per package.

Example



Order Example — Part Number: FFS104

Days to Ship — 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~49	50~199
Rate	€ Unit Price	10%	20%

Please request a quotation for orders larger than indicated quantity.

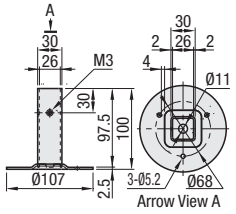
RoHS





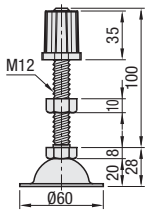
Part Number	M Material	S Surface Treatment
FFS201	1.0330/DC01	Trivalent Chromate
FFS202-12	Adjustment Pad: 1.0038/S235JR or equivalent	
	Insert Nuts: 1.1191/C45E	
FFS203-8	Body: Polyethylene	-
	Nut: 1.0038/S235JR	Trivalent Chromate

■Hollow Stands
FFS201

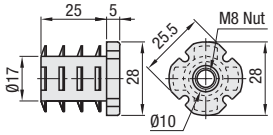


Screw is not included.

■Adjustment Bolt set
FFS202~12 (Applicable Frame: FFA28)



■Insert Nut M8
FFS203~8 (Applicable Frame: FFA28)



Part Number	Mass (g)	€ Unit Price
FFS201	320	
FFS202-12	264	
FFS203-8	15	

Order Example: Part Number FFS202-12

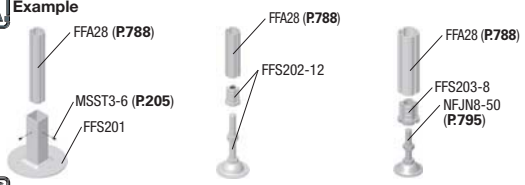
Days to Ship: 6 Days P.87

Alterations: Part Number FFS201 - (SET) SET

Applicable to FFS201 only.

Alteration	Code	Spec.	Price Adder
Set Screw	SET	2 set screws (M3-6) come with FFS201 as a set.	1,00

Example



Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49	50~199
Rate	€ Unit Price	10%	20%

Please request a quotation for orders larger than indicated quantity.

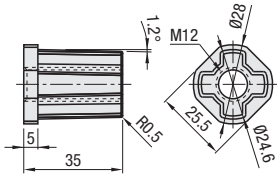
RoHS



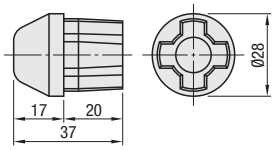



Part Number	M Material	S Surface Treatment
FFS203-12	1.1191/C45E	-
FFS204	Chloroprene Rubber	
FFS205	EN AC-46100/G-AlSi12Cu	

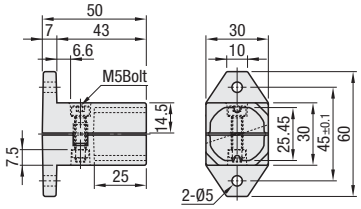
■Insert Nut M12
FFS203~12 (Applicable Frame: FFA28)



■Rubber Foot
FFS204 (Applicable Frame: FFA28)



■Clamp for Factory Frame
FFS205



A Accessory: Hexagon Socket Head Cap Screw M5-20 x 1 Nut for M5 x 1

Part Number	Mass (g)	€ Unit Price
FFS203-12	80	
FFS204	18	
FFS205	80	

Order Example: Part Number FFS203-12

Days to Ship: 6 Days P.87

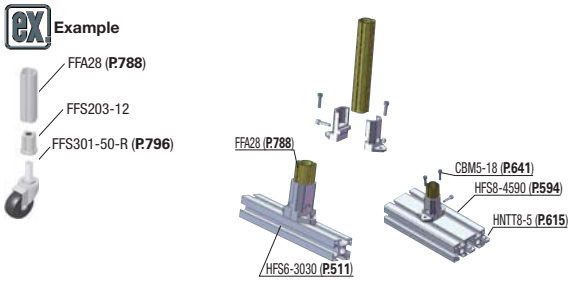
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49	50~199
Rate	€ Unit Price	10%	20%

Please request a quotation for orders larger than indicated quantity.

Example

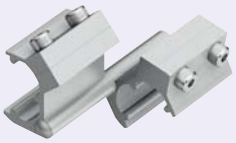


Door Parts for Factory Frames

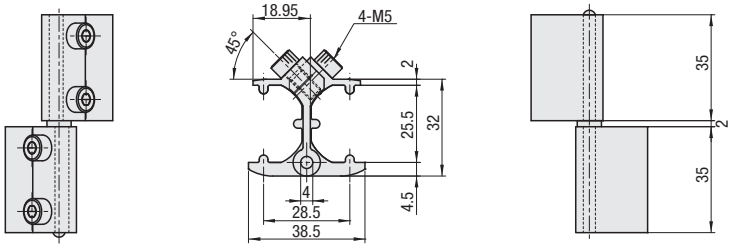
CAD Data

■Hinges for Factory Frames

RoHS



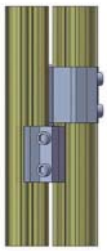
FFH



Part Number	M Material	S Surface Treatment
FFH	EN AW-6063/AlMg0,7Si	Clear Anodize

Part Number Type	Part Number No.	Allowable Load (N)	Mass (g)	Included Screws		€ Unit Price 1~9 pcs.	Volume Discount 10~
FFH	1	98	22	M5-12	4		

ex. Example



Order Example — Part Number: FFH1

Days to Ship: 6 Days P.87

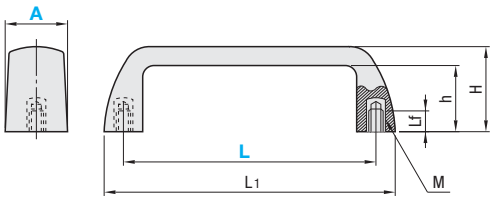
■Handles

RoHS



UPFN

(Nylon 6)



	M Material
Handle	Glass Fiber Reinforced Nylon 6
Male Thread Section	Brass (Insers)

Part Number Type	Part Number A	L	Handle Colors	L1	H	h	M (Coarse Thread)	Lf	Allowable Load (N)	Mass (g)	€ Unit Price B(Black)	€ Unit Price W(White) · M(Orange) · R(Red)
UPFN	26	105	B (Black) W (White) M (Orange) R (Red)	121	37	29	6	9	500	55		
		110		133	40	32				60		
		117					8			62		

The default handle color will be black unless otherwise specified.

Order Example — Part Number: UPFN26 - L: 105 - Handle Colors: B

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

Please request a quotation for orders larger than indicated quantity.

Days to Ship: 6 Days P.87

Wheel-Conveyor Assembly · Connecting Parts

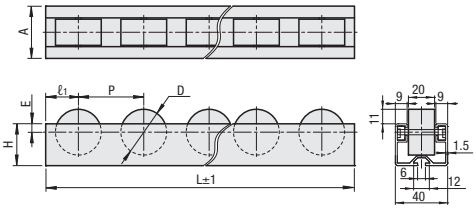
CAD Data

■Wheel-Conveyor Assembly

RoHS



FFSSPH(Economy Type)



Part Number	M Material	S Surface Treatment
FFSSPH	Edge: EN AC-51 400 SS-T5	Clear Anodize
	Wheel: Polyacetal	-
	Shaft: JIS SWRM	-

Part Number	L Nominal Length	A	H	E	P	D	ℓ1	Wheel (Qty.)	Mass (Kg)	Allowable Load (per wheel)	Connecting Parts	€ Unit Price 1~49 pcs.	Volume Discount 50~
FFSSPH (Economy Type)	1000	40	32	5	50	35	25	19	1.84	10	JBS50_		14,70
	1500							29	2.76				21,30
	3000							59	5.52				25,60

Order Example: Part Number FFSSPH - L 3000

Days to Ship: 6 Days

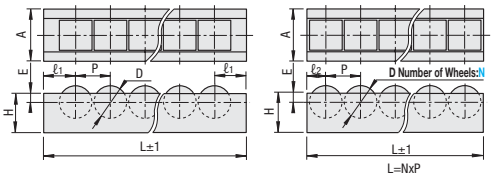
■Wheel-Conveyor Assembly

RoHS

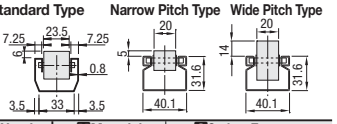


■L Dimension Selectable
PFSSPH(Standard)
PFSUPH(Wide Pitch)
PFSPPH(Narrow Pitch)

■Specify Quantity of Wheels
PFSSPHF(Standard)
PFSUPHF(Wide Pitch)
PFSPPHF(Narrow Pitch)



Standard Type / Narrow Pitch Type / Wide Pitch Type



Part Number	M Material	S Surface Treatment
PFSSPH_	Edge: 1.0330/DC01	Non-chrome Hot Dip Galvanizing
	Wheel: Polyacetal	-
	Shafts: Polyacetal	-
PFSPPH_ PFSUPH_	Edge: 1.0330/DC01	Non-chrome Hot Dip Galvanizing
	Wheel: Polypropylene	-

■L Dimension Selectable

Part Number	L Nominal Length	Actual length L (mm)	A	H	E	P	D	ℓ1	Wheel (Qty.)	Mass (Kg)	Allowable Load (per wheel)	Connecting Parts	€ Unit Price Qty. 1~49	Volume Discount 50~
PFSSPH (Standard)	2000	1992	40	30	6.5	27	25	24	73	2.12	5kg	JBS50_		
	2400	2397							88	2.56				
	3000	2991							110	3.20				
PFSPPH (Narrow Pitch)	2000	2000	40.1	31.6	4	20	18	10	99	2.50	7kg	JBS50_A		
	2500	2500							124	3.13				
	3000	3000							149	3.75				
PFSUPH (Wide Pitch)	2000	2000	40.1	31.6	4	50	36	25	39	2.36	10kg			
	2500	2500							49	2.95				
	3000	3000							59	3.54				

Order Example: Part Number PFSSPH - L 2400 - N; PFSSPHF - 50

Days to Ship: •L Dimension Selectable 8 Days

•Specify Quantity of Wheels 10 Days

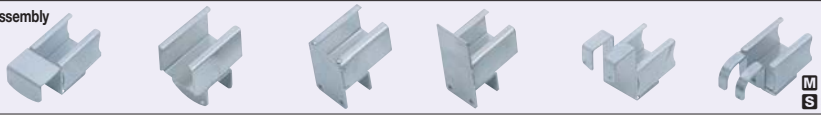
■Specify Quantity of Wheels

Part Number	Wheel Qty. N	A	H	E	P	D	ℓ2	Mass (kg/m)	Allowable Load (per wheel)	Connecting Parts	€ Unit Price wheel 1pc.	Cutting Charge
PFSSPHF	5~110	40	30	6.5	27	25	13.5	1.1	5kg	JBS50_		
PFSPPHF	5~149	40.1	31.6	4	20	18	10	1.25	7kg	JBS50_A		
PFSUPHF	5~59	40.1	31.6	4	50	36	25	1.18	10kg			

Price Ex. When PFSSPHF-30, 0,48 EUR x 30 pcs. +4,00 EUR = 18,40 EUR (Round down to ten Cent.)

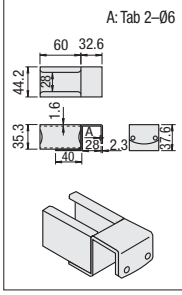
■Wheel-Conveyor Assembly Mounting Parts

RoHS

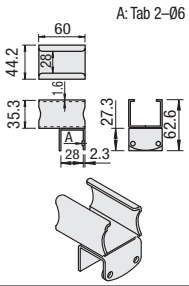


M Material: 1.0330/DC01
S Surface Treatment: Trivalent Chromate

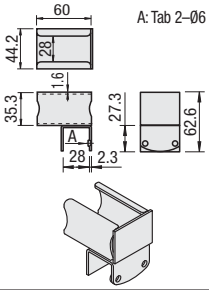
Front Support JBS501 · JBS501A



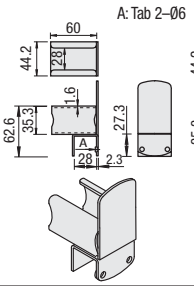
Middle Support JBS504 · JBS504A



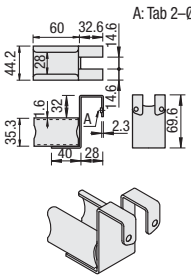
Bottom Support JBS505 · JBS505A



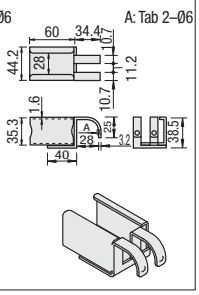
Bottom Support JBS506 · JBS506A



2-Way Drop* JBS507 · JBS507A



2-Way Front Support* JBS508 · JBS508A



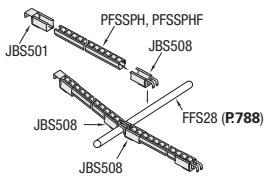
Part Number	Mass (g)	€ Unit Price Qty. 1~49	Volume Discount 50~99
JBS501 JBS501A	180		
JBS504 JBS504A	146		
JBS505 JBS505A	168		
JBS506 JBS506A	192		
JBS507 JBS507A	184		
JBS508 JBS508A	164		

Please request a quotation for orders larger than indicated quantity.

Order Example: Part Number JBS501

Days to Ship: 8 Days

*The 2-way type can be mounted onto a hollow in between linear wheel assemblies as shown right.



Adjustment Pads for Factory Frames / TABLE-Top Bases

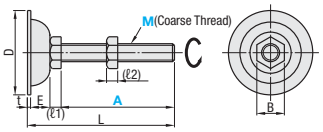
CAD Data

When mounting, **P.792** select "FFS203-8 (for M8)", "FFS203-12 (for M12)".

■Adjustment Pads RoHS



NFJN
NFJNS (Stainless Steel)



Type	Material	Surface Treatment
NFJN	1.0038/S235JR	Trivalent Chromate
NFJNS	1.4301/X5CrNi18-10	Electrolityc Polishing

M	D	(ℓ1)	(ℓ2)	E	B	t
8	38	5.5	6.5	11	13	1.6
12	60	8	10	18	19	2.0

Screw shafts can turn independently of the base, and tilt by 3~5º.

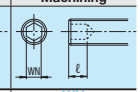
Part Number Type	M-A	L	Allowable Vertical Load (kN) NFJN · NFJNS	Mass (g)	€ Unit Price NFJN	NFJNS
NFJN NFJNS (Stainless Steel)	8 - 50	68,10	3.9	50		
	8 - 100			65		
	12 - 75	103	4.9	166		
	12 - 100	128		184		
	12 - 125	153		200		
	12 - 150	178		219		

Alterations

Part Number - (WC · WK · SC · WN)
NFJN8-50 - WC

8 Days

Applicable to 1.0038/S235JR only. No plating on alteration applied sections.

Alterations	Square Chamfering	Hexagonal Chamfering	Wrench Flat	Hex Wrench Socket Machining
				
Code	WC	WK	SC	WN
Spec.	Ordering Code WC Applicable to M≥10 M: 10, 12, 16, 20 / WC: 6, 8, 10, 12 / ℓ: 10, 10, 12, 13.5	Ordering Code WK Applicable to M≥10 M: 10, 12, 16, 20 / WK: 6, 8, 10, 13 / ℓ: 10	Ordering Code SC Applicable to M≥10 M: 10, 12, 16, 20 / W: 8, 10, 13, 17 / ℓ1: 8, 10, 10, 20	Ordering Code WN Applicable to 20≥M≥10 M: 10, 12, 16, 20 / WN: 4, 5, 5, 8 / ℓ: 5, 6, 8
Price Adder	5,00	5,00	5,00	5,00

Order Example: Part Number NFJN12 - A 100

Days to Ship: 2 Days P.87

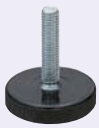
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

Please request a quotation for orders larger than indicated quantity.

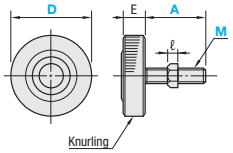
■Table-Top Bases RoHS



Screws and pads are one-piece molded.

Type	Material Main Body	Material Bolts	Surface Treatment
NFB	PP Resin	1.0038/S235JR	Trivalent Chromate

NFB



Part Number Type	D	M Coarse	A	ℓ	E	Allowable Load (kN)	€ Unit Price
NFB	30	8	21 26 31 36	6.5	8	1.8	
	40				9.5	2.0	

Days to Ship: 6 Days P.87

Order Example: Part Number NFB30 - M 8 - A 31

Price

■Volume Discount (Round down to one Cent.) P.87

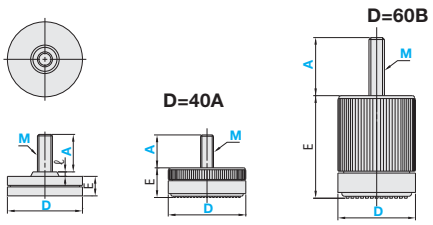
Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

Please request a quotation for orders larger than indicated quantity.

■Table-Top Bases RoHS



KFB (Separate Type) **KFBR** (Knurled Type)



Type	Material Main Body	Material Bottom	Material Bolts	Surface Treatment Bolts
KFB	ABS Resin	-	JIS SWRM	Trivalent Chromate
KFBR	Polyamide	Polyurethane		

Part Number Type	D	M (Coarse)	A	ℓ	E	Allowable Load (kN)	Mass (g)	€ Unit Price
KFB	40	8	25	2	11	0.28	24	
	60	12		3	15		30	
KFBR	40A	8	24	-	23	0.58	35	
	60B	8	32		54	0.78	71	

Order Example: Part Number KFB40 - M 8 - A 25

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~49	50~99	100~199
Rate	€ Unit Price	5%	10%

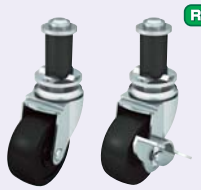
Please request a quotation for orders larger than indicated quantity.

Casters for Factory Frames

-Screwed-on Type · Insertion Type-

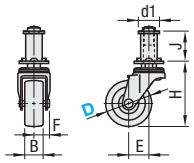
CAD Data

When mounting, **P.792** select "FFS203-8 (for M8)", "FFS203-12 (for M12)".

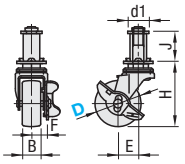


RoHS

FFHCHF



FFHCHFS (With Stopper)



Part Number Type	D	Wheel Material Element, Color	d1	B	H	J	E	Wrench Width mm	Mass (Kg)	€ Unit Price R(Synthetic Rubber)	€ Unit Price T(Conductive Rubber)
FFHCHF	50	R (Synthetic Rubber · Black *1)	24	20	70	36	22	14	0.20		
	75			25	100	38	28	21	0.51		
	100				132	60	31		0.68		
FFHCHFS (with Stopper)	50	T (Conductive Rubber · Black)		20	70	36	22	14	0.20		
	75			25	100	38	28	21	0.51		
	100				132	60	31		0.68		

Order Example: Part Number - Wheel Material → FFHCHF50 - R

Days to Ship: 8 Days

■Double Wheels Swivel Type

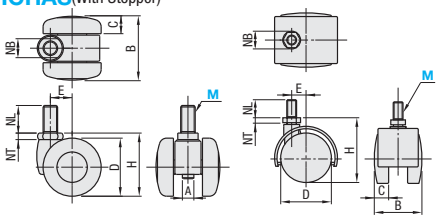
RoHS



Type	Main Body M Material	Main Body S Surface Treatment	Wheel M Material (Color)
HCHA	Nylon	-	Nylon
HCHAS			

HCHA
HCHAS (With Stopper)

The shape of HCHA 8-20, 8-30, 12-20, 12-30, HCHAS 8-20, 8-30, 12-20, 12-30



Part Number Type	M (Coarse Thread)	Allowable Load W (kgf)	Allowable Load W (N)	D	H	A	B	C	E	NB	NT	NL	HCHA € Unit Price 1~9 pcs.	HCHA Volume Discount 10~	HCHAS € Unit Price 1~9 pcs.	HCHAS Volume Discount 10~
HCHA HCHAS (With Stopper)	8	20*	196	42	54	-	40	14	12	12	4	15				
		30*	294	52	64		47	14.5	16		5					
		40	396	40	43.5	7	44	12	15	14	4.5	12				
		60	594	50	57.5	8	49	14	17	17	6	14				
		100	990	60	68.5											
	12	20*	196	42	54	-	40	14	12	19	5	15				
		30*	294	52	64		47	14.5	16							
		60	594	50	57.5	8	49	14	17	17	6	14				
		100	990	60	68.5											
		150	1485		69	10	59	17.5		22	8	22				

Order Example: Part Number - W → HCHA12 - 100

Days to Ship:
- HCHAS: 6 Days P.88
- HCHA: 8 Days

For * marked types, install and tighten the NB part with a wrench.

■Swivel, Screwed-on Casters

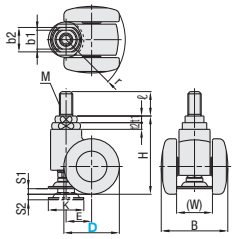
RoHS



Type	Main Body M Material	Wheel M Material	Adjuster M Material	Adjuster S Surface Treatment
CMPAN	Nylon	Nylon	1.0038/S235JR	Trivalent Chromate

(1) Tighten t1 nut to lock the main body thread.
(2) The t2 nut can be used to adjust the height of the pad.

CMPAN



Part Number Type	D	Wheel Material	H	B	(W)	S1	S2	K	Mounting Screws Part M (Coarse)	ℓ	Adj. Nut Size t1	t2	b1	b2	E	(r)	Allowable Load (N)	Mass (g)	€ Unit Price
CMPAN	50	N (Nylon)	76	62	34	10	5	32	12	22	4	4	17	23	23	54	1000	240	
	60		81	69	37											61		250	

Order Example: Part Number - Wheel Material → CMPAN50 - N

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

■Screwed-on Casters

RoHS

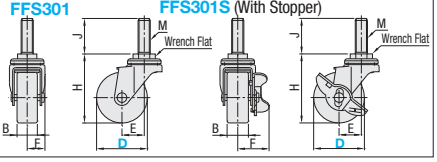


Type	Main Body M Material	Main Body S Surface Treatment	Wheel M Material	Main Body Bearing
FFS301 FFS301S	1.0320/St.22	Trivalent Chromate	Synthetic Rubber	Provided

*Tighten with a Wrench for Hollow Inserts (PFSP21).
P.811

FFS301

FFS301S (With Stopper)



Part Number Type	D	Wheel Material Component	Color	M	B	F	H	J	E	Wrench Width mm	Mass g	Allowable Load N	€ Unit Price
FFS301	50	R (Synthetic Rubber)	Black	12	20	17.5	68	35	22	19	165	300	
	75		Gray		25	25.5	97		28	21	430	600	
FFS301S (with Stopper)	50		Black	12	20	30.9	68	35	22	19	190	300	
	75		Gray		25	43.3	97		28	21	485	600	

Order Example: Part Number - Wheel Material → FFS301-75 - R; FFS301S-50 - R

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~50	51~299
Rate	€ Unit Price	10%

Please request a quotation for orders larger than indicated quantity.

Features of Hollow Frame Systems

Features of Hollow Frame Systems

MISUMI Hollow Frame System is designed to combine various shapes and sizes of hollows and joints freely and economically. We provide the system for industrial equipment that serves for streamlining of logistics and space-saving.

Joint Mechanism

There are two joining methods, metal joints and plastic joints for hollow frame systems. (Aluminum extruded hollow is applicable to metal and joints only. For Stainless Steel Hollows, please use the special metal joints.)

Metal Joints (P.802)	Plastic Joints (P.804~)
	
Features	**Features**
- Rigid - Quick jointing by screw-together assembly - Can be disassembled freely	- Economical and light weight - Needs 24 hours to bond joints and hollows by adhesives. - Once joined, cannot be disassembled.

Material Specifications

•Hollow

(1)Aluminum extruded hollow
(EN AC51400-T5, EN AW-6061-T6 Thickness 1.7mm)
(2)Hot Zinc Plating Steel Hollow
(Cold rolled steel plate 1.0330/DC01 Thickness 0.7mm)
Plastic Coating Thickness 1mm (Refer to P.799)
*Hereafter described as "Resin Coating Hollow"
(3)Stainless Steel Hollow (1.4016/X6(8)Cr17 Thickness 1.0mm)

•Metal Joint
(1)Stainless Steel (1.4301/X5CrNi18-10) Thickness 2.3mm
(2)SAPH Thickness 2.6mm Cathodic electrodeposition coating (Refer to P.802)

•Plastic Joints
AAS Resin (P.804~P.806)

Chemical Resistance (Hollows, Plastic Films, Plastic Joints)

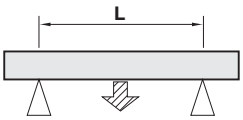
Strong resistance to inorganic acids, alkalis, salts and apolar oils.
The plastic coating may dissolve or swell when it contacts organic solvents such as ketone, ester, aromatics, hydrocarbon chlorinates.

Appearance after 7 days of immersion at room temperature

Chemicals	Appearance
Distilled Water	No change
10% Acetic Acid	No change
10% Hydrochloric Acid	No change
3% Sulfuric Acid	No change
10% Sodium Hydroxide	No change
Ethanol	No change
n-Heptane	No change
Regular Gasoline	Expansion and Whitening
Machine Oil	No change
Toluene	Dissolution
Methylethylketone	Dissolution

Allowable Load on Hollows

Test with product supported at both ends and concentrated load cast on the center. Use with lighter load than these test values.

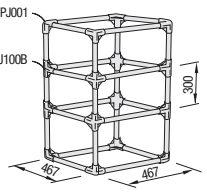


L Dimension (mm)	Resin Coating Hollow Allowable Load (N) (kgf)		Stainless Steel Hollow Allowable Load (N) (kgf)	
450	1372	140	1509	154
900	686	70	755	77
1000	568	58	625	64
1100	519	53	571	58
1300	431	44	474	48
1500	382	39	420	43
1800	313	32	345	35

Compression Strength of Hollows

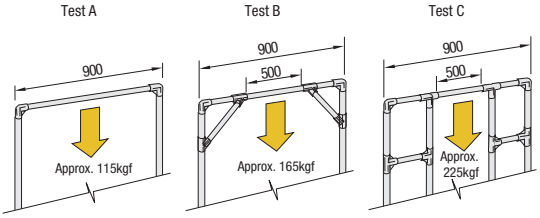
The structure below is assembled with resin coating pipes and plastic joints. When tested with uniformly-distributed load applied on upper and lower parallel plates supported by 4 posts.

Max. Compression Strength=Approx. 220 kgf



Comparison of Structure Strength

Strength comparison with concentrated load on the center

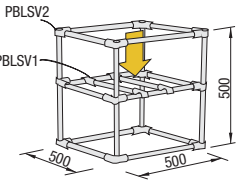


Joint strength by metal joints

Load value that may cause joint misalignment when the load is applied on the center shelf of the structure.

(1)When resin coating hollows and metal joints are used.
Max. Load= Approx. 220kgf

(2)When stainless steel hollows and metal joints for stainless steel hollows are used.
Max. Load= Approx. 160kgf

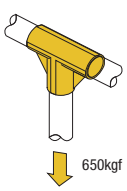


Please note the maximum load is the value of the static load, and impact load may be lower than this value.

Adhesive strength by plastic joints

The right-hand figure shows adhesive tension strength 24 hours after PJ201B is bonded to a pipe (by adhesive).
Then measured the Tension Strength.
(Aluminum extruded hollow and stainless steel hollow cannot be bonded.)

Adhesive Strength=Approx. 650 kgf



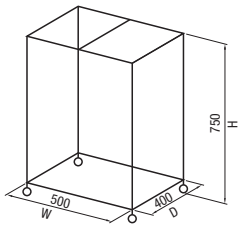
Selection Steps for Hollow Frame

1. Selection Steps (Ex.) To assemble a "Cart" with hollow frames and plastic joints (excluding top plates).

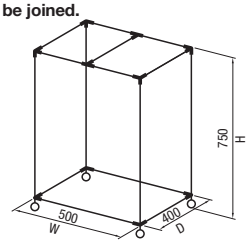
Step (1) Rough sketch of cart shape

- Determine the dimensions for width(W), depth(D) and height(H), and whether the casters are used or not.

Ex. Width 500, Depth 400, Height 750 and 4 Casters



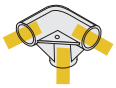
Step (2) Mark positions for hollows to be joined.



Step (3) Select joint parts.

Refer to "Selection of Plastic Joints" on **P.803.**

PJ001 (P.804)



PJ201C (P.804)



1 Direction Through

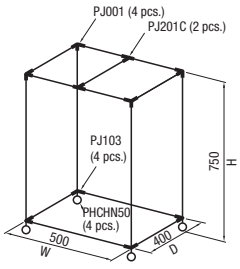
PJ103 (P.804)



1 Direction Through

PHCHN50 (P.804)





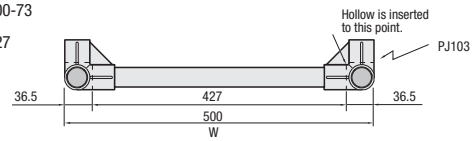
Step (4) Calculate pipe length. (P.820)

- Hollow length in W direction (Hollow length between two PJ001s or PJ103s)

=W-36.5x2

=500-73

=427



- Hollow length in D direction

(Hollow length between PJ001s or PJ103s or PJ201Cs.)

=D-36.5x2

=400-73

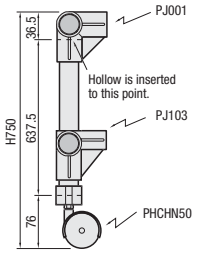
=327

- Hollow length in H direction

(Hollow length between PJ001s or PJ103s and caster height is subtracted.)

=H-76-36.5

=750-112.5=637.5≒637



Step (5) Select color.

Select color for pipes and plastic joints. (Ex.) S (Dark Gray)

2. Make selected parts list.

The above hollow frame cart is assembled with the following parts. Please place an order with the Part Number below.

Part Number	Pc.	Part Number	Pc.
PFS28-S-427	4	**PJ201C-S**	2
PFS28-S-327	5	**PJ103-S**	4
PFS28-S-637	4	**PHCHN50**	4
PJ001-S	4	(**PFBONDN1000**	1)

If no adhesive is available at hand (**P.803**)

3. Notes for Assembly

(1) Temporary Assembly

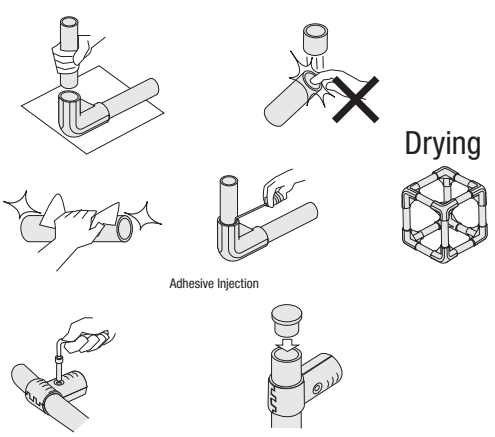
(1) During the temporary assembly, insert hollows completely.
(2) Please be careful not to cut your hands by sharp ends of the cut hollows.

(2) Plastic Joints

(1) Adhesive should be applied on Joints and Hollows after the temporary assembly, since they can't be disjoined once bonded.
(2) Clean the bond surface before applying adhesive.
(3) Apply adhesive on a flat table.
(4) Apply adhesive twice to make sure it is completed.
(5) Liquid adhesive should be injected evenly not spill over.
(6) Do not move the Joints and Hollows for 24 hours after adhesive application.

(3) Metal Joints

(1) Metal joints may become damaged if clamped insufficiently.
(2) Tighten the screws with a hexagonal wrench.
(3) Attach PJ503 (inner cap) on the hollow ends with adhesive.



Hollow Frames / Curved Hollow Frames

CAD Data

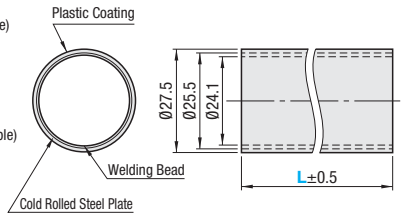
RoHS

Hollow Frames



Standard
PFS (L Dimension Configurable)
PFSKS (Base Material, 5 pcs./pack)

Antistatic
PFST (L Dimension Configurable)
PFSTKS (Base Material, 5 pcs./pack)



Type	Steel Hollow		Plastic Coating
	M Material	S Surface Treatment	M Material
PFS · PFSKS	1.0330/DC01 (Thickness 0.7mm)	Hot Zinc Plating + Chromate-Free Antirust Treatment	AAS Coating
PFST · PFSTKS			Conductive ABS Coating

L Dimension Configurable

Part Number Type	No.	Color	L 1mm Increment	Mass kg/m	€ Unit Price/m
PFS (Standard)	28	W (White) V (Ivory) S (Dark Gray) Y (Yellow)	60~3000	0.53	
PFST (Antistatic)		B (Black) TV (Ivory) TS (Blue Gray)			

Price (Ex.) When PFS28-W-1250, 3,40 EUR x 1.25m=4,20 EUR (Round down to one Cent.)

4020mm Base Material, 5 pcs./set

5 pcs./set

Part Number Type	No.	Color	L Length (mm)	Mass kg	€ Unit Price 1~19 set (s)	Volume Discount 20~59
PFSKS (Standard) (5 pcs./set)	28	W (White) V (Ivory) S (Dark Gray) Y (Yellow)	4020 (5 pcs./set)	10.6		
PFSTKS (Antistatic) (5 pcs./set)		B (Black) TV (Ivory) TS (Blue Gray)				

±5mm tolerance for base material with length 4020mm.

Please request a quotation for orders larger than indicated quantity.

Order Example

Part Number	-	Color	-	L
PFS28	-	W	-	1250
PFSKS28	-	S		

Days to Ship: **8 Days**

Surface Resistivity of Antistatic Type

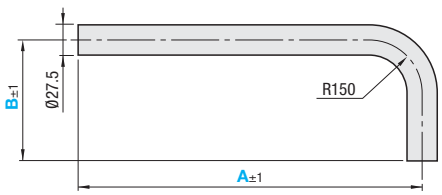
Type	No.	Color	Surface Resistivity
PFST	28	B	10^4~$10^5\Omega$
		TV TS	10^7~$10^8\Omega$

RoHS

Curved Hollow Frames



PFSMG
(Standard)



Type	M Material	
PFSMG	Hot Zinc Plating Steel Hollow	1.0330/DC01 Thickness 0.7mm
	Plastic Coating	AAS, ABS Coating

Part Number Type	No.	Color	A 1mm Increment	€ Unit Price B 1mm Increment							
				200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PFSMG	28	W (White) V (Ivory) S (Dark Gray)	200~300								
			301~400								
			401~500								
			501~600								
			601~700								
			701~800								
			801~900								
			901~1000								

Order Example

Part Number	-	Color	-	A	-	B
PFSMG28	-	W	-	A300	-	B800

Days to Ship: **10 Days**

Aluminum Hollow Frames

CAD Data

RoHS

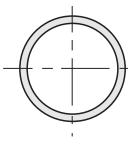
Aluminum Hollow Frames

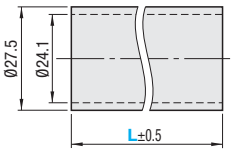


Standard

PFAS (L Dimension Configurable)

PFASKS (Base Material, 5 pcs./pack)

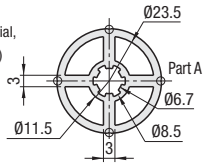


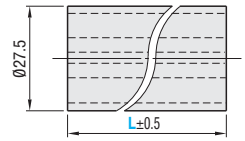


Reinforced

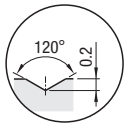
PFAUS (L Dimension Configurable)

PFAUKS (Base Material, 5 pcs./pack)





A Section (4 Places)



The aluminum frame cannot be used with the plastic joints bonded.

Type	Material
PFAS · PFASKS	EN AW-6061/EN AW-AlMG1SiCu-T6
PFAUS · PFAUKS	EN AC-51400/AlMgSi0,7-T5

L Dimension Configurable

Part Number Type	Part Number No.	Surface Treatment	L 1mm Increment	Mass kg/m	Sectional Area mm²	Geometrical Moment of Inertia mm⁴ ℓx	Geometrical Moment of Inertia mm⁴ ℓy	€ Unit Price Less than 300mm No Treatment	€ Unit Price Less than 300mm Anodizing	€ Unit Price/m 300mm or More No Treatment	€ Unit Price/m 300mm or More Anodizing
PFAS	28	N (No Treatment) A (Anodize)	60~4000	0.372	137.8	1.151x10⁴	1.151x10⁴				
PFAUS				0.786	285	1.655x10⁴	1.655x10⁴				

4020mm Base Material, 5 pcs./set

Part Number Type	Part Number No.	Surface Treatment	L Length (mm)	Mass kg/pc.	€ Unit Price 5 pcs./set No Treatment 1~19 set (s)	€ Unit Price 5 pcs./set Anodizing 1~19 set (s)
PFASKS	28	N (No Treatment) A (Anodize)	4020 (5 pcs./set)	1.50		
PFAUKS				3.15		

Please request a quotation for orders larger than indicated quantity.

Order Example

Part Number	-	Surface Treatment	-	L
PFAS28 PFASKS28	-	N A	-	1250

Days to Ship 6 Days

Example



Price

When L is less than 300
The table indicates unit prices regardless of the length.
ex: PFAS28–N–280=1,60 EUR

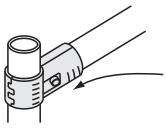
When L is 300 or more
Price is calculated as follows:
€ Unit Price / m x Specified Full Length = Sales Price
ex: PFAS28–N–450
1,60 EURx0.45=5,40 EUR
(Round down to one Cent.)

Alterations

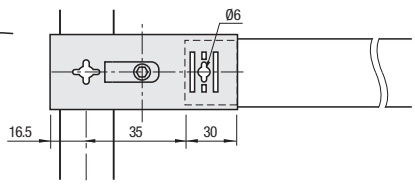
Part Number	-	Surface Treatment	-	L	-	(Alteration Code)
PFAUS28	-	N	-	800	-	LTP

7 Days

Alteration Code	Tapping LTP	Tapping RTP	Tapping TPW
Spec.	Available for only **PFAUS** Tapping to the Ø6.7 hole **LTP** : Tapping on the Left End Face **RTP** : Tapping on the Right End Face **TPW** : Tapping on Both Ends Ex. LTP M8 Depth 24		
Price Adder	1,80	1,80	3,60



Enlarged View

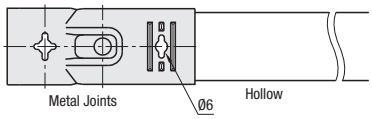


For cutters for Hollow Frames and Aluminum Hollow Frames, see P.819 (This cutter cannot cut reinforced aluminum hollow frames.)

Metal Joints Selection

■Metal Joints

(1) A screw hole has been provided to allow the metal joint to be firmly connected to a hollow.

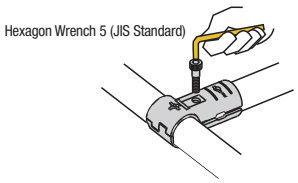


(2) Material and coating is selectable according to the purpose of use.

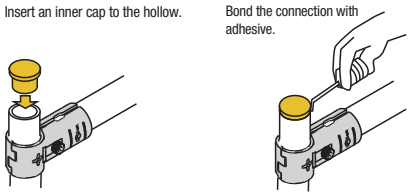
Part Number	Material	Plating
PBLSN, PBLS	SAPH	Cathodic Electrodeposition Coating
PBLSNC		Nickel Plating
PBLSNS	1.4301/X5CrNi18-10	-

■How to Use Metal Joints

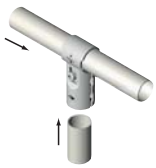
(1) Use a hexagon wrench 5 (JIS standard) for tightening.



(2) When using Metal / Joints, bond an inner cap (PJ503) to the end of hollow with adhesives.
(No inner cap is required for aluminum hollows.)



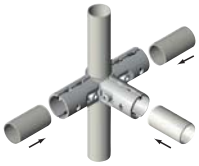
■Metal · Joint Connecting Configurations



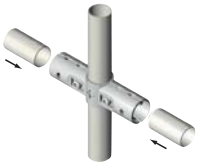
PBLSN1
Orthogonal Joints



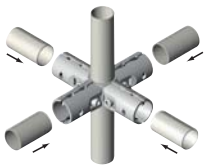
PBLSN2
4 Direction Orthogonal joints



PBLSN3
5 Direction Joints



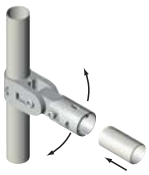
PBLSN4
4 Direction Parallel Joints



PBLSN5
6 Direction Joints



PBLSN6
Cross Type Joints



PBLSN7
Free Joints



PBLSN701
Plate Joints



PBLS8
Hinge Type Parallel Joints
(With Flanged Collar)



PBLS9
Double Orthogonal Joints



PBLS10
Hinge Type Parallel Joints
(With Flanged Collar)



PBLSN11
Double Parallel Joints

Metal Joints

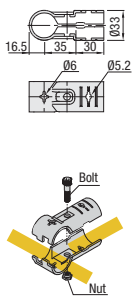
CAD Data

RoHS

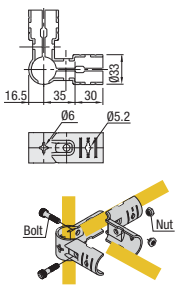


Type	Material	Plate Thickness	Surface Treatment
PBLSN_	SAPH	2.6mm	Cathodic Electrodeposition Coating
PBLSNC_			Nickel Plating
PBLSNS_	1.4301/X5CrNi18-10		-

PBLSN1 PBLSNC1 PBLSNS1



PBLSN2 PBLSNC2 PBLSNS2



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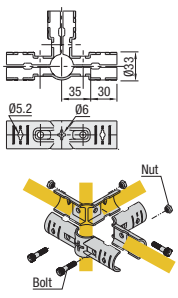

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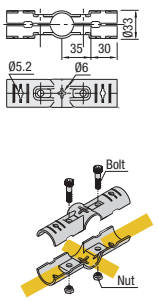
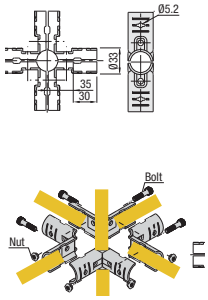
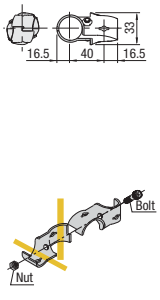


PBLSN5 PBLSNC5



PBLSN6



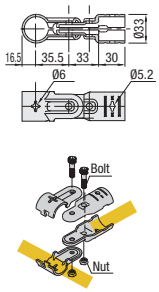
Part Number Type	No.	Mass (g)	Components (Except Bracket) Bolts	Qty.	Nuts	Qty.	€ Unit Price PBLSN · PBLSNC	PBLSNS
PBLSN (Cathodic Electrodeposition Coating)	1	160	M6-25	1	M6	1		
	2	250		2		2		
PBLSNC (Nickel Plating)	3	325		3		3		
	4	250		2		2		
PBLSNS (Stainless Steel)	5	400		4		4		
PBLSN (Cathodic Electrodeposition Coating)	6	150		1		1		

RoHS

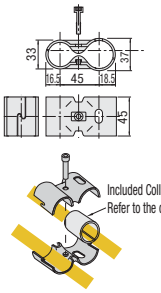


Type	Material	Plate Thickness	Surface Treatment
PBLS_ PBLSN_	SAPH	2.6mm	Cathodic Electrodeposition Coating

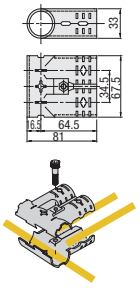
PBLSN7



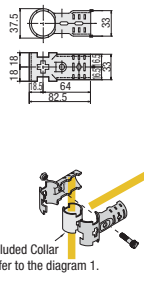
PBLS8



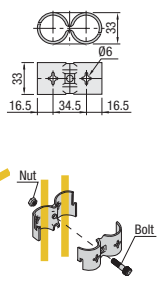
PBLS9



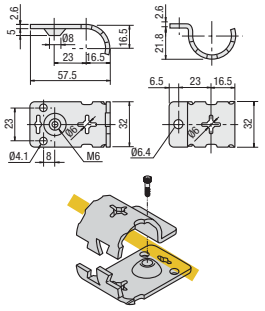
PBLS10



PBLSN11



PBLSN701



※No nut used. The main body is tapped.

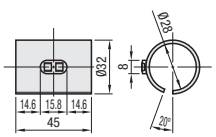
※A nut is welded to the body.

Part Number Type	No.	Mass (g)	Components (Except Bracket) Bolts	Qty.	Nuts	Qty.	Others	€ Unit Price PBLSN · PBLS
PBLSN (Cathodic Electrodeposition Coating)	7	260	M6-25	2	M6	2	-	
	701	80	M6-10	1		0		
PBLS (Cathodic Electrodeposition Coating)	8*	200	M6-25	1		0	Included Collar	
	9*	289					-	
	10	186				1	Included Collar	
PBLSN	11	165					-	

* No nuts included for PBLS8 and PBLS9 since there is a tap on the metal bracket.

※Use of PBLS8 and PBLS10: insert the hollow through the included collar, slide the pipe and the metal joint, then rotate it.

Fig.1 included Collar Size



M Material: Polyethylene (White)

Order Example — Part Number: PBLSN1

Days to Ship — 6 Days P.87

Price

Volume Discount (※Round down to one Cent.) P.87

Quantity	1~50	51~100
Rate	€ Unit Price	5%

※Please request a quotation for orders larger than indicated quantity.

Plastic Joints Selection · Adhesives

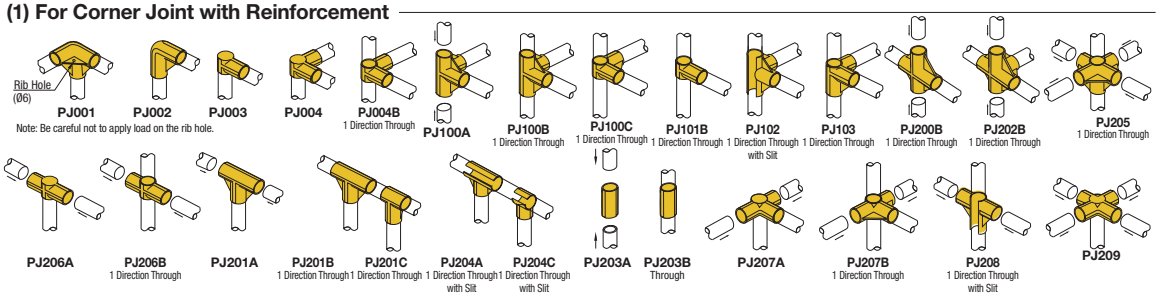
Plastic joints must be connected using adhesives. Therefore do not use in sections that require disassembly.

(1) Comparison by Strength When higher strength is required, select the appropriate joint based on the following chart.



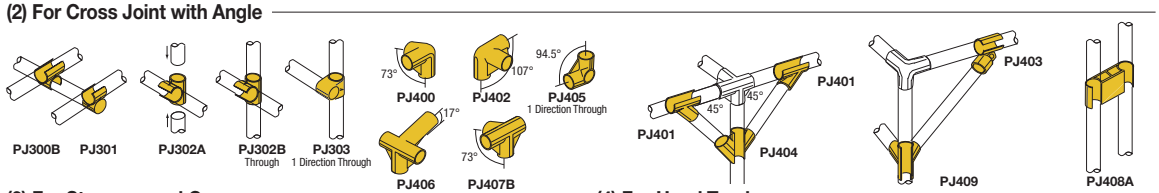
(2) Comparison by Applications Plastic joint can be selected to the shapes of pipes to join.

(1) For Corner Joint with Reinforcement



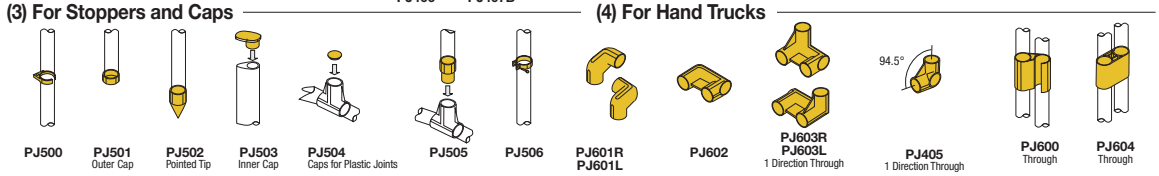
Note: 6 directional joint assembly is difficult. (Ex.PJ205) It is recommended to use PJ200B and PJ302B first and install side hollow later.

(2) For Cross Joint with Angle

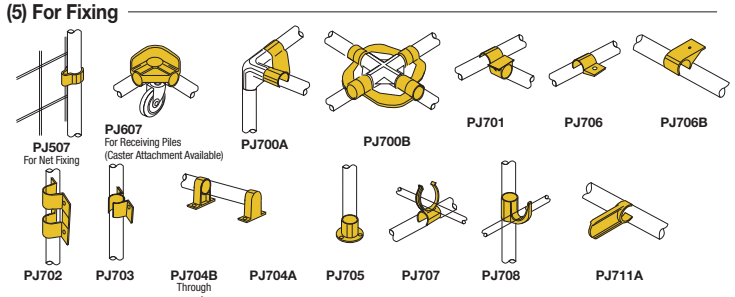


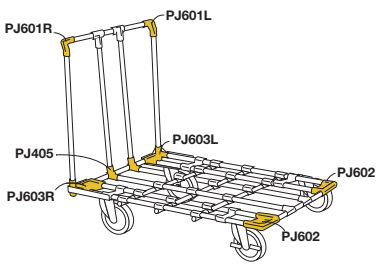
(3) For Stoppers and Caps

(4) For Hand Trucks



(5) For Fixing





Adhesives

RoHS

Not hazardous according to Japanese Fire Defense Law.







	Ⓜ(Component)
Adhesives	Organic Solvent Naphthenic Hydrocarbon Isoparaffinic Hydrocarbon Methylene Chloride
Syringe	Polyethylene

Part Number Type	No.	Volume mℓ	Accessories	€ Unit Price
	300	300	Syringe 1 Pc.	
	1000	1000	Syringe 2 Pcs.	

Order Example — Part Number

Days to Ship — 8 Days

How to Use

- Wipe dust, moisture and oil from the joining surface in advance.
- Proper pouring amount of adhesive is approximately 0.3~0.8mℓ for one joint.
- Pour evenly on the joining surface.
- Ensure that it does not spill out since it dissolves plastic joints and pipes.
- Do not move for at least 10~15 minutes after liquid adhesive is injected. (Adhesive strength will be approximately 80% after 24 hours at normal temperature.)
- Once joined, it cannot be removed.
- Not available for Aluminum Extruded Hollows, Skid Hollows and Stainless Steel Hollow.

Notes on handling liquid adhesive

Warning

1. It is harmful to human health. Do not swallow or inhale directly.
2. Keep away from fire.
3. Wash off with water immediately in contact with eye.
4. Do not let the adhesive come in contact with skin directly. Wash with soap and warm water immediately if came in contact with skin.
5. Sufficient room ventilation is needed.
6. Because it may dissolve plastics, be sure that it does not contact eyeglasses, plastics, or clothes.
7. Do not point the syringe injection tube toward people. It is dangerous if the liquid splatters.
8. Close the cap tightly after use, because the quick-dry solvent is used.
9. Do not mix with other solvents such as thinner.
10. Store in cool and dry room.
11. Contents may gel when in temperature change. In this case, open the cap slowly.

Not Available

Plastic Joints

-PJ001~209-

CAD Data

RoHS PJ001~PJ100C



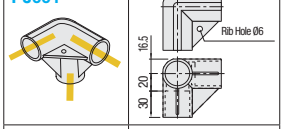
RoHS PJ101B~PJ202B



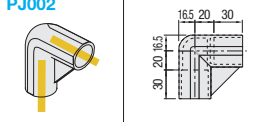
RoHS PJ203A~PJ209



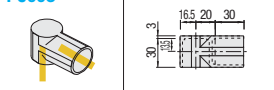
PJ001



PJ002



PJ003



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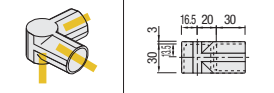

PJ004B

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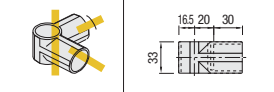
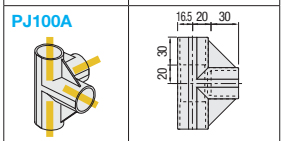


PJ100A



PJ100B

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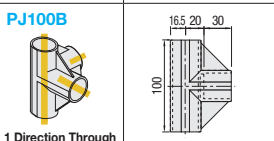

PJ100C

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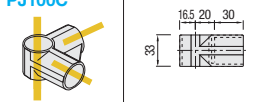

PJ101B

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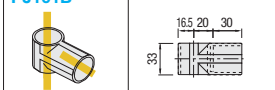
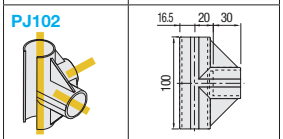


PJ102



PJ103

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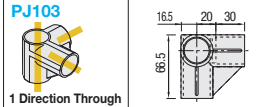

PJ200B

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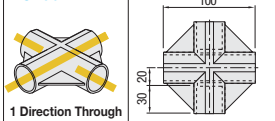
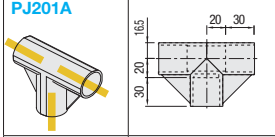


PJ201A



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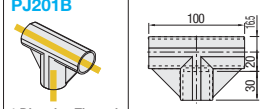

PJ201C

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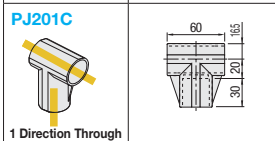

PJ202B

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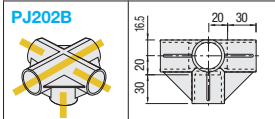
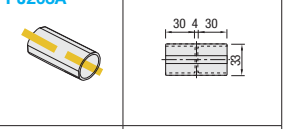
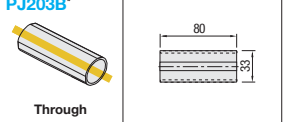


PJ203A



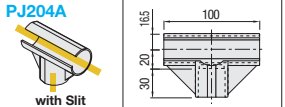
PJ203B*

Through



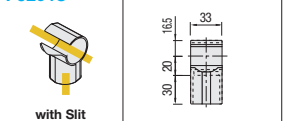
PJ204A

with Slit



PJ204C

with Slit



PJ205

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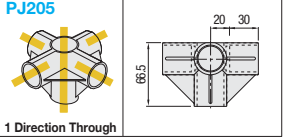
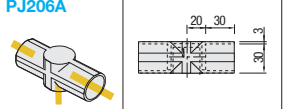


PJ206A



PJ206B

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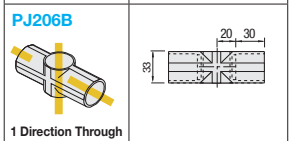
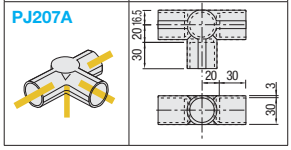
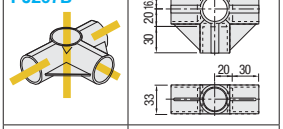


PJ207A

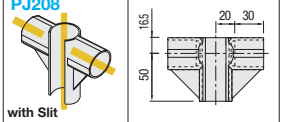


PJ207B

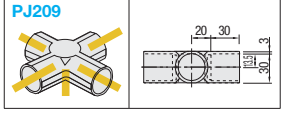


PJ208

with Slit

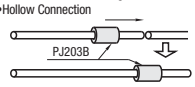


PJ209



* PJ203B is used in the following case.

•Hollow Connection



(Do not use in places where force may be applied.)

Part Number	Color	Mass (g)	€ Unit Price Qty. 1~19	Volume Discount 20~49	50~99	100~299
PJ001	W (White) S (Gray)	46				
PJ002		33				
PJ003		25				
PJ004		37				
PJ004B		37				
PJ100A		58				
PJ100B		57				
PJ100C		33				

Please request a quotation for orders larger than indicated quantity.

Part Number	Color	Mass (g)	€ Unit Price Qty. 1~19	Volume Discount 20~49	50~99	100~299
PJ101B	W (White) S (Gray)	21				
PJ102		28				
PJ103		37				
PJ200B		55				
PJ201A		48				
PJ201B		44				
PJ201C		32				
PJ202B		74				

Please request a quotation for orders larger than indicated quantity.

Part Number	Color	Mass (g)	€ Unit Price Qty. 1~19	Volume Discount 20~49	50~99	100~299
PJ203A	W (White) S (Gray)	27				
PJ203B		23				
PJ204A		37				
PJ204C		19				
PJ205		73				
PJ206A		35				
PJ206B		33				
PJ207A		47				
PJ207B		44				
PJ208		40				
PJ209		58				

Please request a quotation for orders larger than indicated quantity.

Order Example: Part Number PJ001 - Color S

Days to Ship: 8 Days

Plastic Joints

-PJ300B~PJ507-

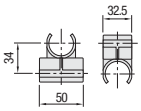
CAD Data

RoHS PJ300B~PJ401



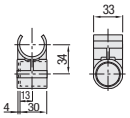
PJ300B





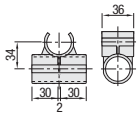
PJ301





PJ302A

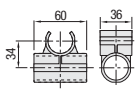




PJ302B



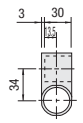
1 Direction Through



PJ303



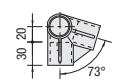
1 Direction Through



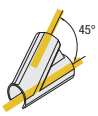
PJ400

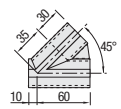


1 Direction Through



PJ401





Part Number	Color	Mass (g)	€ Unit Price	Volume Discount		
			Qty. 1~19	20~49	50~99	100~199
PJ300B	W (White) S (Gray)	18				
PJ301		18				
PJ302A		30				
PJ302B		29				
PJ303		29				
PJ400	S	45				
PJ401	W · S	30				

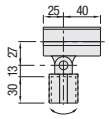
Please request a quotation for orders larger than indicated quantity.

RoHS PJ403~PJ500

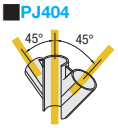


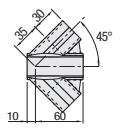
PJ403





PJ404

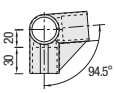




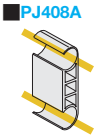
PJ405

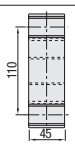


1 Direction Through



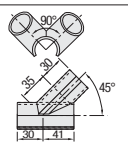
PJ408A





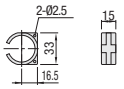
PJ409





PJ500





Part Number	Color	Mass (g)	€ Unit Price	Volume Discount		
			Qty. 1~19	20~49	50~99	100~199
PJ403	W · S	30				
PJ404		45				
PJ405	S	32				
PJ408A	W · S	43				
PJ409		47				
PJ500		4.5				

Please request a quotation for orders larger than indicated quantity.

RoHS PJ501~PJ507



PJ501



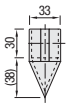
Outer Cap



PJ502



Pointed Tip Caps



PJ503



Inner Cap



PJ504



Caps for Plastic Joints



PJ505





PJ506 (Set of 2)



PJ507

Part Number	Color	Mass (g)	€ Unit Price	Volume Discount		
			Qty. 1~19	20~49	50~99	100~199
PJ501	W (White) S (Gray)	8				
PJ502		15				
PJ503		3				
PJ504		3				
PJ505		19				
PJ506*		6				
PJ507		6				

*PJ506 is in set of 2 pieces.
Please request a quotation for orders larger than indicated quantity.

Order Example

Part Number	-	Color
PJ301	-	S

Days to Ship: 8 Days

Plastic Joints

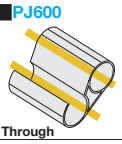
-PJ600~PJ708-

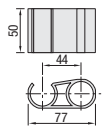
CAD Data

RoHS PJ600~PJ607



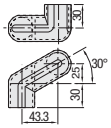
PJ600





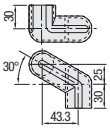
PJ601L



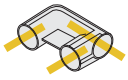


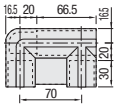
PJ601R



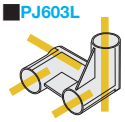


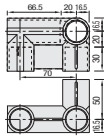
PJ602





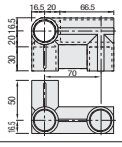
PJ603L



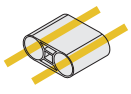


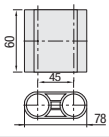
PJ603R





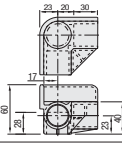
PJ604





PJ607

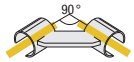


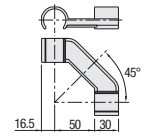


RoHS PJ700A~PJ705

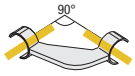


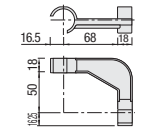
PJ700A





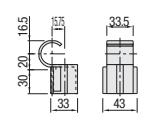
PJ700B



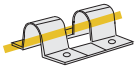


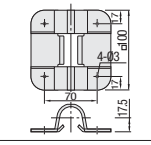
PJ701





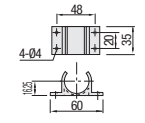
PJ702





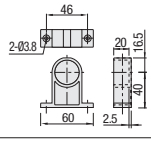
PJ703





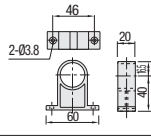
PJ704A





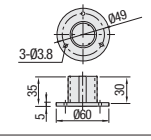
PJ704B





PJ705



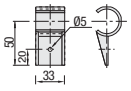


RoHS PJ706~PJ708

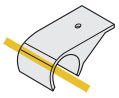


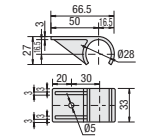
PJ706





PJ706B





PJ707



PJ708

* PJ203B is used in the following case.
·Hollow Connection

(Do not use in places where force may be applied.)

Part Number	Color	Mass (g)	€ Unit Price	Volume Discount		
			Qty. 1~19	20~49	50~99	100~199
PJ600	W (White) S (Gray)	32				
PJ601L		39				
PJ601R		39				
PJ602		58				
PJ603L		65				
PJ603R		65				
PJ604		49				
PJ607		64				

Please request a quotation for orders larger than indicated quantity.

Part Number	Color	Mass (g)	€ Unit Price	Volume Discount		
			Qty. 1~19	20~49	50~99	100~199
PJ700A	W (White) S (Gray)	21				
PJ700B		19				
PJ701		23				
PJ702		32				
PJ703		14				
PJ704A		19				
PJ704B		17				
PJ705		21				

Please request a quotation for orders larger than indicated quantity.

Part Number	Color	Mass (g)	€ Unit Price	Volume Discount		
			Qty. 1~19	20~49	50~99	100~199
PJ706	W / S	13				
PJ706B*	W	12				
PJ707	W / S	18				
PJ708		26				

*PJ706B is available for W (White) only.
Please request a quotation for orders larger than indicated quantity.

Order Example

Part Number	-	Color
PJ600	-	S

Days to Ship: 8 Days

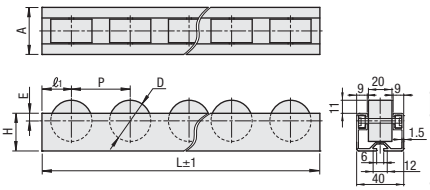
Wheel-Conveyor Assembly · Connecting Parts

CAD Data

■Wheel-Conveyor Assembly

RoHS





Part Number	Material	Surface Treatment
FFSSPH	Edge: EN AC-51400/AlMgSi0,7-T5	Clear Anodize
	Wheel: Polyacetal	-
	Shaft: JIS SWRM	-

Part Number	L Nominal Length	A	H	E	P	D	ℓ1	Wheel (Qty.)	Mass (Kg)	Allowable Load (per wheel)	Connecting Parts	€ Unit Price 1~49 pcs.	Volume Discount 50~
FFSSPH (Economy Type)	1000	40	32	5	50	35	25	19	1.84	10	JBS50_		
	1500							29	2.76				
	3000							59	5.52				

Order Example

Part Number	-	L
FFSSPH	-	3000

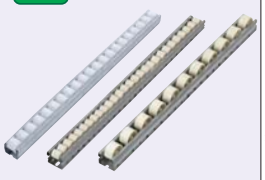
Days to Ship

•L Dimension Selectable

6 Days

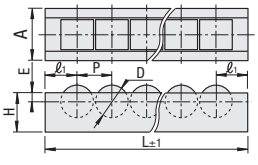
■Wheel-Conveyor Assembly

RoHS



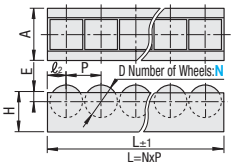
■L Dimension Selectable

PFSSPH (Standard)
PFSPPH (Narrow Pitch)
PFSUPH (Wide Pitch)

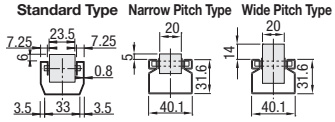


■Specify Quantity of Wheels

PFSSPHF (Standard)
PFSPPHF (Narrow Pitch)
PFSUPHF (Wide Pitch)



Standard Type · Narrow Pitch Type · Wide Pitch Type



Part Number	Material	Surface Treatment
PFSSPH_	Edge: 1.0330/DC01	Non-chrome Hot Dip Galvanizing
	Wheel: Polyacetal	-
	Shafts: Polyacetal	-
PFSPPH_ PFSUPH_	Edge: 1.0320/St.22	Non-chrome Hot Dip Galvanizing
	Wheel: Polypropylene	-
	Shafts: 1.0038/S235JR	Trivalent Chromate

■L Dimension Selectable

Part Number	L Nominal Length	Actual length L (mm)	A	H	E	P	D	ℓ1	Wheel (Qty.)	Mass (Kg)	Allowable Load (per wheel)	Connecting Parts	€ Unit Price Qty. 1~49	Volume Discount 50~
PFSSPH (Standard)	2000	1992	40	30	6.5	27	25	24	73	2.12	5kg	JBS50_		
	2400	2397							88	2.56				
	3000	2991							110	3.20				
PFSPPH (Narrow Pitch)	2000	2000	40.1	31.6	4	20	18	10	99	2.50	7kg	JBS50_A		
	2500	2500							124	3.13				
	3000	3000							149	3.75				
PFSUPH (Wide Pitch)	2000	2000	40.1	31.6	4	50	36	25	39	2.36	10kg			
	2500	2500							49	2.95				
	3000	3000							59	3.54				

Order Example

Part Number	-	L	-	N
PFSSPH	-	2400		
PFSPPHF			-	50

■Specify Quantity of Wheels

Part Number	Wheel Qty. N	A	H	E	P	D	ℓ2	Mass (kg/m)	Allowable Load (per wheel)	Connecting Parts	€ Unit Price wheel 1pc.	Cutting Charge
PFSSPHF	5~110	40	30	6.5	27	25	13.5	1.1	5kg	JBS50_		
PFSPPHF	5~149	40.1	31.6	4	20	18	10	1.25	7kg	JBS50_A		
PFSUPHF	5~59	40.1	31.6	4	50	36	25	1.18	10kg			

Days to Ship

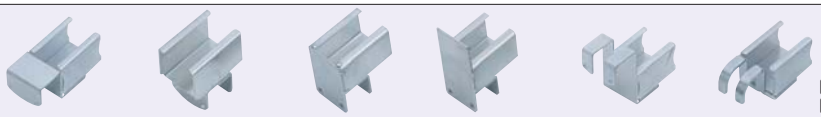
•L Dimension Selectable **8 Days**

•Specify Quantity of Wheels **10 Days**

Price Ex. When PFSSPHF-30, 0,48 EUR x 30 pcs. +4,00 EUR = 18,40 EUR (Round down to ten Cent.)

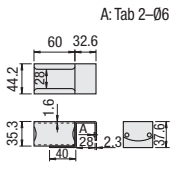
RoHS

■Wheel-Conveyor Assembly Connecting Parts

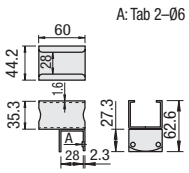


Material: 1.0330/DC01
Surface Treatment: Trivalent Chromate

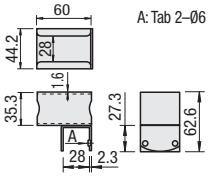
Front Support
JBS501 · JBS501A



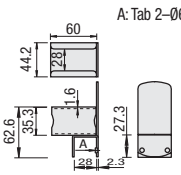
Middle Support
JBS504 · JBS504A



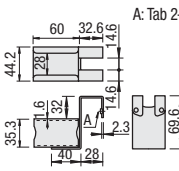
Bottom Support
JBS505 · JBS505A



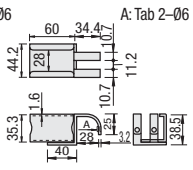
Bottom Support
JBS506 · JBS506A



2-Way Drop*
JBS507 · JBS507A



2-Way Front Support*
JBS508 · JBS508A





*The 2-way type can be mounted onto a pipe in between linear wheel assemblies as shown below.

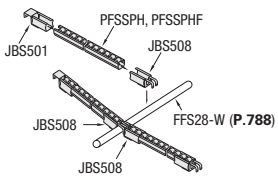
Part Number	Mass (g)	€ Unit Price Qty. 1~49	Volume Discount 50~99
JBS501 JBS501A	180		
JBS504 JBS504A	146		
JBS505 JBS505A	168		
JBS506 JBS506A	192		
JBS507 JBS507A	184		
JBS508 JBS508A	164		

Order Example

Part Number: JBS501

Days to Ship: **8 Days**

Please request a quotation for orders larger than indicated quantity.



Skid Hollows · Connecting Parts / Lifting Table Units

CAD Data

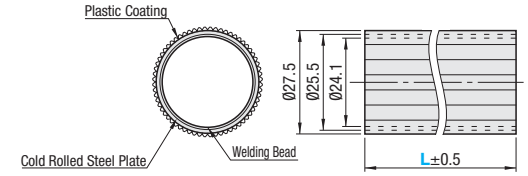
■Skid Hollows

RoHS



PFSL (L Dimension Configurable)

Adhesives cannot be used.



Type	Steel Hollow		Plastic Coating
	M Material	S Surface Treatment	M Material
PFSL	1.0330/DC01 (Thickness 0.7mm)	Hot Zinc Plating + Chromate-Free Antirust Treatment	Olefinic Resin

■L Dimension Configurable

Part Number Type	Part Number No.	Color	L 1mm Increment	Mass (kg/m)	€ Unit Price/m
PFSL	28	F (Ivory)	150~3000	0.53	

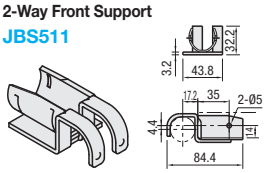
Price (Ex.) When PFSL28-F-1250, 4,80 EUR x 1.25m = 6,00 EUR (Round down to ten Cent.)

■Skid Hollows Connecting Parts

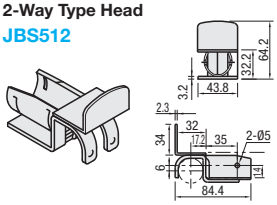
RoHS



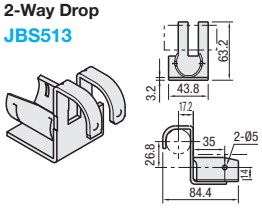
2-Way Front Support
JBS511



2-Way Type Head
JBS512



2-Way Drop
JBS513



M Material: 1.0330/DC01 S Surface Treatment: Trivalent Chromate Plating

Part Number	Mass (g)	€ Unit Price Qty. 1~49	Volume Discount 50~99
JBS511	120		
JBS512	168		
JBS513	158		

Please request a quotation for orders larger than indicated quantity.

Order Example: Part Number PFSL28 - Color F - L 1250 (JBS511)

Days to Ship: 8 Days

■Skid Hollows

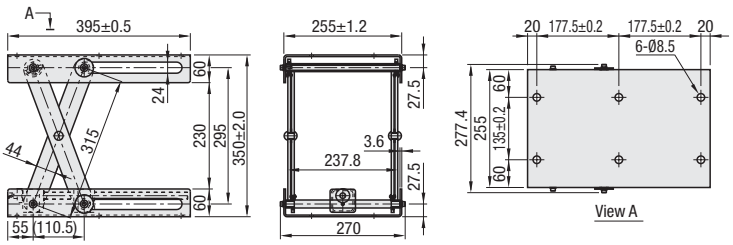
Chute can be assembled with skid pipes at lower cost than wheel-conveyors. Skid pipes are pipes with grooves on surface. Plastic containers slide on Skid Hollows easily.

■Lifting Table Units

RoHS

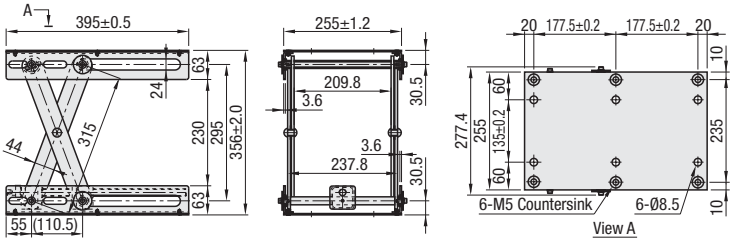


PFJB802 (Body / Standard Type)

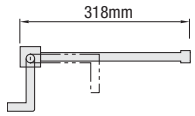


PFJB803
(Body, Panel Detachable Type)

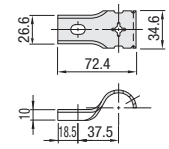
*Both upper and lower aluminum panels (T=3mm) can be detachable. The loads below are the values when the panels are attached.



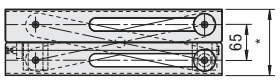
PFJB802H (Special Handle)



PFJB305 (Special Saddle)



*PFJB802: 120mm±2.0mm
PFJB803: 126mm±2.0mm



Part Number	M Material	S Surface Treatment
PFJB802	1.0320/St.22 (3.6mm)	Trivalent Chromate
PFJB803	Body: 1.0320/St.22 (3.6mm) Panel: EN AW-5052/AlMg2,5 (3mm)	Body: Trivalent Chromate Panel: Anodize
PFJB802H / PFJB305	1.0320/St.22	Trivalent Chromate

Part Number	Static Load (Kg)	Dynamic Load (Kg)	Mass	€ Unit Price Qty. 1~19	Volume Discount 20~99
PFJB802(Body, Standard)	100	80	12.5kg		
PFJB803(Body, Panel Detachable Type)	60	50	10.3kg		
PFJB802H(Handle)	-	-	444g		
PFJB305(Saddle)	-	-	53g		

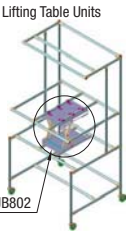
Please request a quotation for orders larger than indicated quantity.

Order Example: Part Number PFJB802

Days to Ship: 8 Days

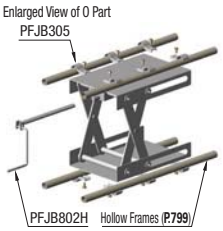
Example

Lifting Table Units



Usable when adjusting rack height of working platform.

Enlarged View of 0 Part



Accessory Parts

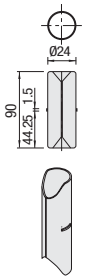
CAD Data

RoHS

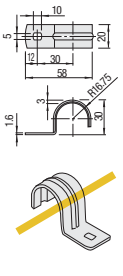


Part Number	Material	Surface Treatment
JBS201	1.4305/X10CrNiS18-9	-
JBS301	1.0330/DC01	Trivalent Chromate
FFS102	1.0330/DC01	Trivalent Chromate
JBS306	1.0320/St.22	Trivalent Chromate
JBS402	Chloroprene Rubber	-
JBS403	Sthylene-butadiene Rubber	-

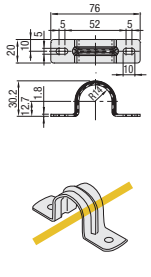
Hollow Joining Fitting
JBS201



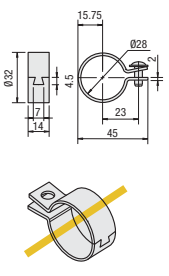
Saddles with One Fixing
JBS301(Set of 4)



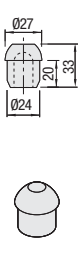
Saddles with Two Fixings
FFS102(Set of 4)



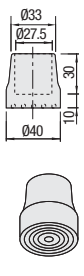
JBS306



Inner Rubber Cap
JBS402



Outer Rubber Cap
JBS403



Part Number	Mass (g)	€ Unit Price
JBS201	59	
JBS301*	19	
FFS102*	24	
JBS306	28	
JBS402	15	
JBS403	31	

*JBS301, FFS102 is in set of 4 pieces.

Order Example — Part Number: JBS301

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~50	51~299
Rate	€ Unit Price	5%

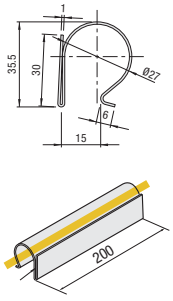
Please request a quotation for orders larger than indicated quantity.

RoHS

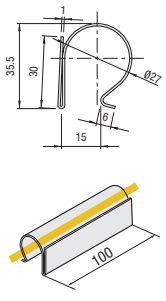


Part Number	Material	Surface Treatment
JBS601	Polyester	-
JBS601S		
JBS611		
JBS612		
FFS106	1.0038/S235JR	Chrome Plating

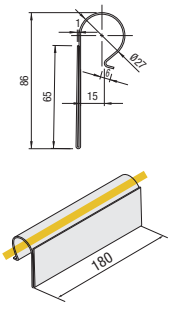
Name Holder
JBS601



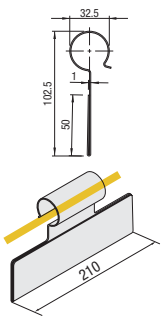
Name Holder
JBS601S



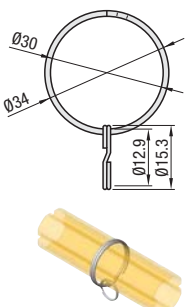
Name Holder
JBS611



Name Holder
JBS612



Ring Slider
FFS106(Set of 10)

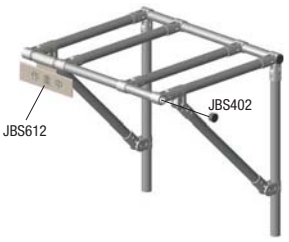


Part Number	Mass (g/pc.)	€ Unit Price
JBS601	34	
JBS601S	16	
JBS611	49	
JBS612	41	
FFS106	14	

Order Example — Part Number: JBS601

Days to Ship: 8 Days

Example



Price

Volume Discount (Round down to one Cent.) P.87

FFS106

Quantity	1~19	20~49	50~199
Rate	€ Unit Price	10%	20%

Others

Quantity	1~50	51~299
Rate	€ Unit Price	5%

Please request a quotation for orders larger than indicated quantity.

Adjusting Bolts

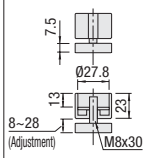
CAD Data

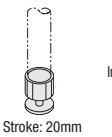
RoHS



Part Number	M Material	S Surface Treatment
JBS202	1.0330/DC01	Trivalent Chromate
JBS401	Polypropylene	-
JBS404 JBS405 JBS406	1.0330/DC01	Trivalent Chromate
JBS407	Plastic Styrene-Butadiene Rubber	-
JBS408	Plastic	-

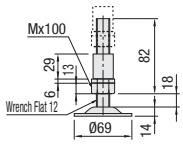
Adjuster
JBS401

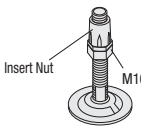




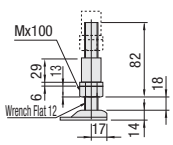
Stroke: 20mm

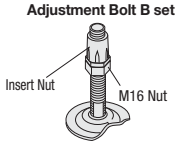
Adjustment Bolt A set
JBS404



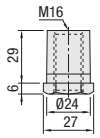


Adjustment Bolt B set
JBS405



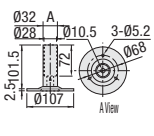


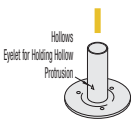
Insert Nuts
JBS406



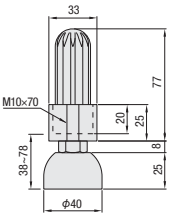


Hollow Stand S
JBS202





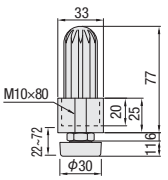
Inner Stand
JBS407



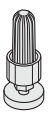
Adjustment Range : 40mm



Inner Stand
JBS408



Adjustment Range : 50mm



Part Number	Color	Mass (g)	€ Unit Price
JBS202	-	302	
JBS401	W · S	35	
JBS404	-	330	
JBS405	-	305	
JBS406	-	75	
JBS407	-	126	
JBS408	W (White)	92	

Order Example: Part Number - Color
JBS202
JBS401 - W

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~50	51~199
Rate	€ Unit Price	5%

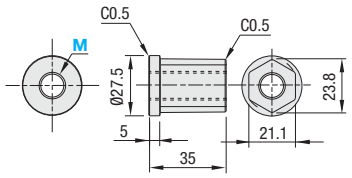
Please request a quotation for orders larger than indicated quantity.

Insert Nut -Stainless Steel-

RoHS

PFINS





Tapered part from tip to head (1.2°) allows insertion into inner diameters of pipe frames.

M Material: Stainless Steel

Part Number		Mass (g)	€ Unit Price
Type	M		
PFINS	8	89	
	10	85	
	12	82	

The insert nut can also be used with the standard adjustment pads. (P.979)

Order Example: Part Number
PFINS10

Days to Ship: PFINS 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~50	51~199
Rate	€ Unit Price	5%

Please request a quotation for orders larger than indicated quantity.

Casters for Hollow Frames

CAD Data

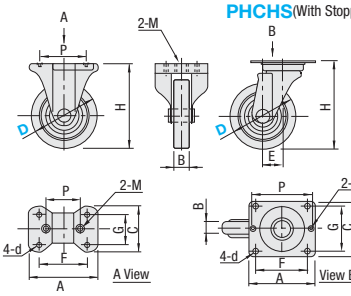
RoHS



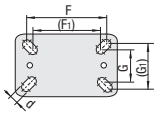
■Fixed Type
PHCHK

■Swivel Type
PHCH
PHCHS(With Stopper)

*PHCHK100
PHCH100
PHCHS100



Mounting hole dimensions F and G vary according to slotted holes.



The following parts are included with the Fixed Type and Swivel Type.

M8x40 Hexagon Bolts	x2
Spring Washers	x2
M8 Nuts	x2

Type	Main Body		Wheel	Bearing
	M Material	S Surface Treatment	M Material	
PHCHK PHCH PHCHS	1.0320/St.22	Trivalent Chromate	Synthetic Rubber	Provided

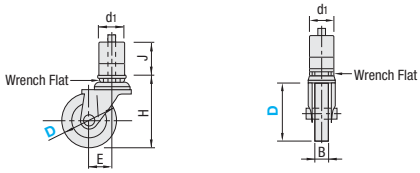
Rotation	Part Number Type	D	P	M	B	H	A	C	F (F1)	d	E	G (G1)	Wheel Color	Allowable Load N{kgf}		Mass kg (Stopper) Not Provided	Mass kg (Stopper) Provided	€ Unit Price No Stopper	€ Unit Price With Stopper
Fixed Type	PHCHK	*100	75	8	32	130	110	70	90 (80)	10.5	-	50 (45)	Black	1177	{120}	0.83	-		
		130	107		38	177	138	90	100	11		56		1765	{180}	1.6			
		150			42	198								1961	{200}	1.9			
Swivel Type	PHCH PHCHS (with Stopper)	*100	75	8	32	130	90	90	71 (68)	10.5	30	71 (68)		1177	{120}	1.06	1.16		
		130	107		38	177	120	105	90	11	40	80		1765	{180}	2.0	2.16		
		150			42	198					45			1961	{200}	2.34	2.54		

RoHS



■Hollow Insert Type*
PHCHF
PHCHFS(With Stopper)

■Plastic Joint Insert Type
PHCHPJ



Tighten with a Wrench for Hollow Inserts (PFSP).

Type	Main Body		Wheel	Bearing
	M Material	S Surface Treatment	M Material	
PHCHF PHCHFS	1.0320/St.22	Trivalent Chromate	Refer to the following.	Provided

Part Number Type	D	Wheel Material Element · Color	d1	B	H	J	E	Wrench Width mm	Mass kg	€ Unit Price R(Synthetic Rubber)	N(Nylon)	U(Urethane)	T(Conductive Rubber)	M(MC Nylon)	C(Iron: FC20)
PHCHF	50	R(Synthetic Rubber , Black*1)	24	20	70	36	22	14	0.18						
	75	N(Nylon , White)		25	100	38	28	21	0.49						
	100	M(MC Nylon , Navy-blue)*2			132	60	31		0.66						
PHCHFS (with Stopper)	50	U(Urethane , Brown)	24	20	70	36	22	14	0.18						
	75	T(Conductive Rubber , Black)		25	100	38	28	21	0.49						
	100	C(Iron: FC20 JIS STKM Bright Chromate)*2			132	60	31		0.66						

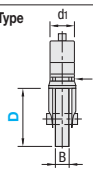
*1: The color of synthetic rubber D75 is gray.*2: Only 50 and 75 for are available for D.

D	Allowable Load N {kgf}					
	R (Synthetic Rubber)	N (Nylon)	U (Urethane)	T (Conductive Rubber)	M (MC Nylon)	C (Iron: FC20)
50	343{35}	392{40}	392{40}	343{35}	392{40}	
75	588{60}	784{80}	686{70}	588{60}	784{80}	
100		588{60}	588{60}	490{50}	-	

RoHS



■Plastic Joint Insert Type
PHCHPJ



* Tighten with the Wrenches JBS009 (**P.812**)

Type	Main Body		Wheel	Bearing
	M Material	S Surface Treatment	M Material	
PHCHPJ	1.0320/St.22	Trivalent Chromate	Synthetic Rubber	Provided

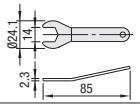
To be Inserted	Part Number Type	D	d1	B	H	J	E	Wrench Width mm	Wheel Color	Allowable Load N{kgf}		Mass kg	€ Unit Price
Plastic Joints*	PHCHPJ	50	28	20	67	28	22	17	Black	343	{35}	0.19	

RoHS

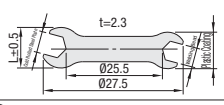


■Wrenches for Hollow Insert

PFSP14



PFSP21



M Material: 1.0330/DC01

Part Number Type	No.	Applicable Caster D	Mass (g)	€ Unit Price
PFSP	14	50	18	
	21	75 / 100	58	

Order Example

Part Number		Wheel Material
PHCHK100	-	
PHCHF50	-	R
PFSP14		

Days to Ship: **8 Days**

Price

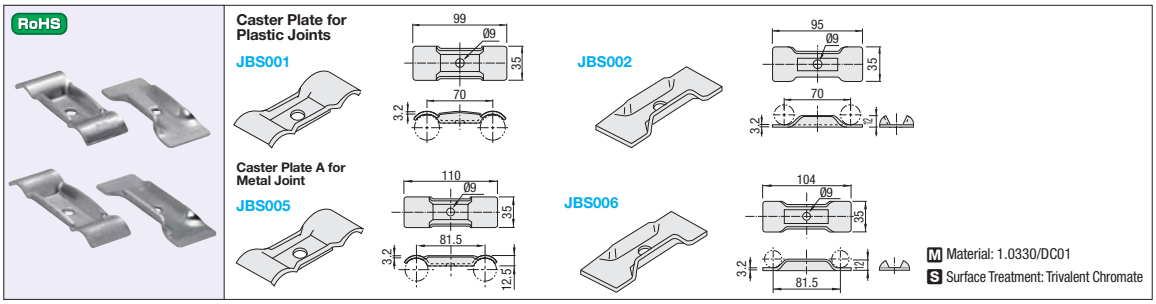
■Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~19	20~49
Rate	€ Unit Price	5%

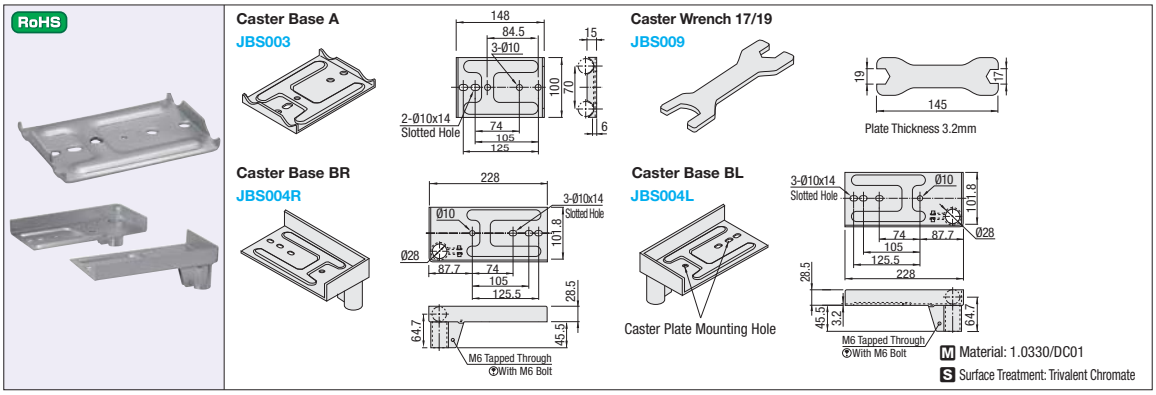
Please request a quotation for orders larger than indicated quantity.

Caster Attachment Parts

CAD Data



Part Number	Mass (g)	€ Unit Price
JBS001	90	
JBS002	80	
JBS005	90	
JBS006	80	



Part Number	Mass (g)	€ Unit Price
JBS003	380	
JBS004R	390	
JBS004L	890	
JBS009	110	

Order Example — Part Number: JBS003

Price

Days to Ship: 8 Days

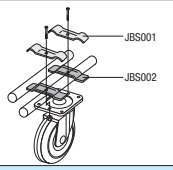
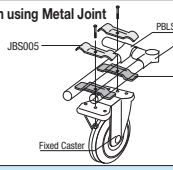
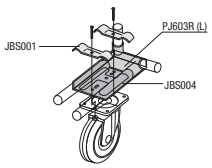
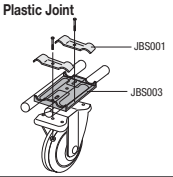
Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~99
Rate	€ Unit Price	5%

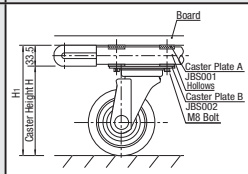
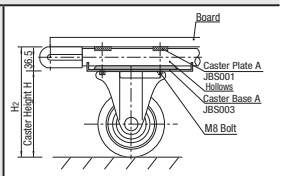
Please request a quotation for orders larger than indicated quantity.

Example

Attachment Method of Casters for Hollow Frame

	Example of Swiveling Caster (PHCH · PHCHS)	Example of Fixed Caster (PHCHK)
Caster Plate Attachment		When using Metal Joint 
Components	Swiveling Caster ..... 1 Pc. Caster Plate A (JBS001) ..... 2 Pcs. Caster Plate B (JBS002) ..... 2 Pcs. Mounting Bolts, Spring Washers and Nuts ... 2 Sets	Fixed Type Caster ..... 1 Pc. Caster Plate A (JBS005) for Metal Joint ... 2 Pcs. Caster Plate B (JBS006) for Metal Joint ... 2 Pcs. Mounting Bolts, Spring Washers and Nuts 2 Sets
Caster Base Attachment (Large load)		When using Plastic Joint 
Components	Swiveling Caster ..... 1 Pc. Caster Plate A (JBS001) ..... 2 Pcs. Caster Base B (JBS004) ..... 1 Pc. Mounting Bolts, Spring Washers and Nuts 2 Sets	Fixed Type Caster ..... 1 Pc. Caster Plate A (JBS001) ..... 2 Pcs. Caster Base A (JBS003) ..... 1 Pc. Mounting Bolts, Spring Washers and Nuts 2 Sets

Calculation of Caster Height

	Calculation
Caster Plate Attachment	 H1=33.5mm+H
Caster Base Attachment	 H2=36.5mm+H

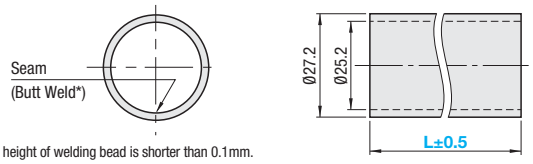
Stainless Steel Hollow Frames / Joints · Accessory Parts

RoHS

Stainless Steel Hollow Frames



PFSUS (L Dimension Configurable)



*The height of welding bead is shorter than 0.1mm.

M Material: 1.4016/X6(8)Cr17

L Dimension Configurable

Part Number Type	Part Number No.	L 1mm Increment	Mass kg/m	€ Unit Price Less than 300mm	€ Unit Price/m 300mm or More
PFSUS	28	60~2400	0.62		

Please request a quotation for orders larger than indicated quantity.

Order Example: Part Number PFSUS28 - L 1250

Price

When L is less than 300, the unit prices indicated in the table are regardless of the length.
ex: PFSUS28–280=3,70 EUR

When L is 300 or more, total prices are calculated as follows.
€ Unit Price / m x Specified Full Length = Sales Price
ex: PFSUS28–650 → 9,50 EUR x 0.65 = 6,10 EUR (Round down to ten Cent.)

Days to Ship: 8 Days

Accessory Parts for Stainless Hollow

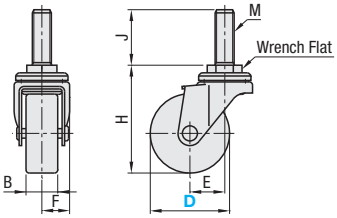
The size of the Stainless Hollow Frame is different from that of conventional Resin Coating Hollow Frame and Aluminum Extruded Hollow Frame. So some conventional accessory parts, in case they are intended to be set in inside of the hollow frames, cannot be used.
For Metal Joints, Casters, Adjustment Bolt Set, Insert Nuts and Inner Caps, use the following products.

RoHS

Casters



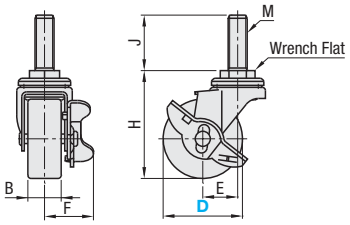
FFS301



*Tighten with a Wrench for Hollow Inserts (PFSP21). (P.811)

When mounted to the Stainless Hollow Frame, please use it combined with the Insert Nut (SPFINS12).

FFS301S (With Stopper)



Type	Main Body M Material	Main Body S Surface Treatment	Wheel M Material	Bearing Body
FFS301 FFS301S	1.0320/St.22	Trivalent Chromate	Synthetic Rubber	Provided

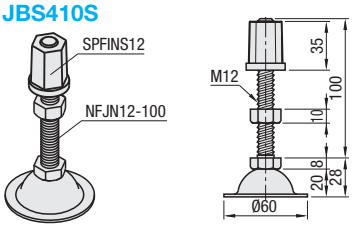
Part Number Type	Part Number D	Wheel Material Component	Wheel Material Color	M	B	F	H	J	E	Wrench Width mm	Mass kg	Allowable Load N	€ Unit Price
FFS301	50	R (Synthetic Rubber)	Black	12	20	17.5	68	35	22	19	165	300	
	75		Gray		25	25.5	97		28	21	430	600	
FFS301S (with Stopper)	50		Black	12	20	30.9	68	35	22	19	190	300	
	75		Gray		25	43.3	97		28	21	485	600	

RoHS

Adjustment Bolt set



JBS410S



Insert Nut SPFINS12 and an Adjustment Pad NFJN12-100 are ncluded as a set.

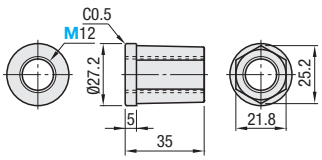
Part Number	Adjusting Bolts M Material	Adjusting Bolts S Surface Treatment	Insert Nut M Material
JBS410S	1.0038	Trivalent Chromate	Stainless Steel

Insert Nuts

RoHS



SPFINS12



Tapered part from tip to head (1.2°) allows insertion into inner diameters of pipe frames.

M Material: Stainless Steel

Part Number	Mass (g)	€ Unit Price
JBS410S	269	

Part Number Type	Part Number M	Mass (g)	€ Unit Price
SPFINS	12	85	

Order Example: Part Number FFS301-75 - Wheel Material R; FFS301S-50 - R; JBS410S; SPFINS12

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~50	51~199
Rate	€ Unit Price	5%

Please request a quotation for orders larger than indicated quantity.

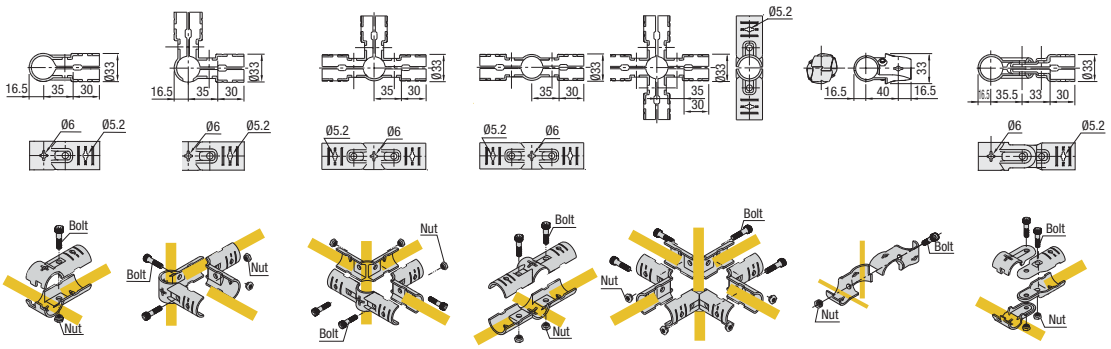
CAD Data

RoHS



Part Number	M Material	Plate Thickness	S Surface Treatment
PBLSS_	SAPH	2.6mm	Trivalent Chromate

PBLSS1 PBLSS2 PBLSS3 PBLSS4 PBLSS5 PBLSS6 PBLSS7



Part Number		Mass (g)	Included Screws		€ Unit Price
Type	No.		Size	Qty.	
PBLSS	1	160	M6-25	1	
	2	250		2	
	3	325		3	
	4	250		2	
	5	400		4	
	6	150		1	
	7	260		2	

Order Example Part Number PBLSS1

Days to Ship 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~20	21~199
Rate	€ Unit Price	5%

Please request a quotation for orders larger than indicated quantity.

Features of Joints for Stainless Hollow

The spurs that contact the pipes have been revised with improved geometry, and the retention force has been improved for use with stainless steel pipes. (For details, refer to P.797).



PBLSNI (Conventional Type) PBLSS1

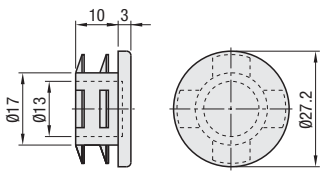
Please note that the spurs may be crushed by repeated assembly / disassembly and may reduce the gripping force.

Inner Cap

RoHS



JBS402S



M Material: Polyethylene

Part Number	Mass (g)	€ Unit Price (4 Pcs. per Package)
JBS402S	3	

4 Pcs. per Package. Check the order quantity before ordering.

Order Example Part Number JBS402S

Days to Ship 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~20	21~199
Rate	€ Unit Price	10%

Please request a quotation for orders larger than indicated quantity.

Overview of Factory Frames · Hollow Frame Standard Units

■ Overview of Standard Units (P.799~P.814)

- With this pipe frame units, the Part Number and the number of the components are fixed only by specifying the component types and each dimension.
- All the materials needed to construct a unit can be specifying just a single Type Number.
- Products other than shown in the catalog will be added periodically.

■Components List

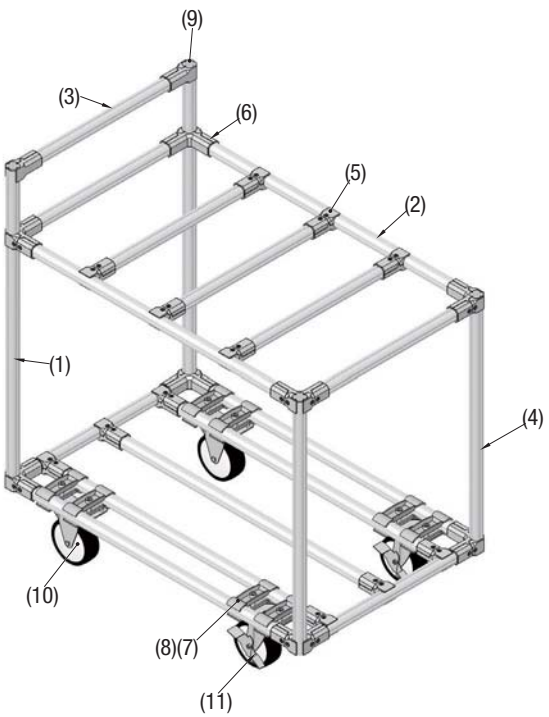
[PFUB_]

Number	Part Number	Symbol	Pc.	Page
(1)	PFS28-Color-(T-133)	Hollow Frames	2	P.799
(2)	PFS28-Color-(D-103)	Hollow Frames	7	
(3)	PFS28-Color-(W-103)	Hollow Frames	8	
(4)	PFS28-Color-(H-133)	Hollow Frames	2	
(5)	PBLSN1	Metal Joints	14	P.802
(6)	PBLSN2	Metal Joints	8	
(7)	JBS005	Caster Connecting Parts	8	P.812
(8)	JBS006	Caster Connecting Parts	8	
(9)	PJ503-W (White)	Inner Cap	4	P.805
(10)	PHCHK100	Casters	2	P.811
(11)	PHCHS100	Caster with Stopper	2	

[FFUB]

Number	Part Number	Symbol	Pc.	Page
(1)	FFA28- (T-133)	Factory Frames	2	P.799
(2)	FFA28- (D-110)	Factory Frames	7	
(3)	FFA28- (W-110)	Factory Frames	8	
(4)	FFA28- (H-133)	Factory Frames	2	
(5)	FFB1	Metal Joints	14	P.789
(6)	FFB2	Metal Joints	8	
(7)	JBS005	Caster Connecting Parts	8	P.812
(8)	JBS006	Caster Connecting Parts	8	
(9)	FFS103	Inner Cap	4	P.791
(10)	PHCHK100	Casters	2	P.811
(11)	PHCHS100	Caster with Stopper	2	

■Assembly Drawing



■For shelf panels,

This unit doesn't include top panels or shelf panels. Please order separately if necessary.

- For top panel,
  Select the product among the lineup from **P.843~P.848**

Material	Part Number	Page
Double-Sided Melamine Resin Glued Laminated Plywood	MPBHA10 · MPBHA15 · MPBHA20	P.843
Laminated Plywood	PBHA12 · PBHA16 · PBHA20	
Single-Sided Rubber Glued Laminated Plywood (Standard Type)	NTBHA10 · NTBHA14 · NTBHA20	P.845
Single-Sided Rubber Glued Laminated Plywood (Antistatic Type)	ATBHA10 · ATBHA14 · ATBHA20	
Double-Sided Melamine Resin Glued Laminated Plywood with soft edge	MPBHAR10 · MPBHAR15 · MPBHAR20	P.847
Single-Sided Rubber Glued Laminated Plywood with Soft Edge (Standard Type)	NTBHAR10 · NTBHAR14 · NTBHAR20	
Single-Sided Rubber Glued Laminated Plywood with Soft Edge (Antistatic Type)	ATBHAR10 · ATBHAR14 · ATBHAR20	
Aluminum Glued Laminated Plywood with Soft Edge	ALBHAR10 · ALBHAR15 · ALBHAR20	

Order Example

Part Number	-	A	-	B	-	Color	-	R	-	E	-	S
Select from the above table.	-	W Dimension	-	D Dimension	-	Color	-	10	-	32	-	32

For shelf mounting, use PJ706B (**P.806**) or FFB6 (**P.789**)

- For bottom shelf panel,
  Select the product among the lineup from **P.843~P.848**

Material	Part Number	Page
Double-Sided Melamine Resin Glued Laminated Plywood	MPBH10 · MPBH15 · MPBH20	P.843
Laminated Plywood	PBH12 · PBH16 · PBH20	
Single-Sided Rubber Glued Laminated Plywood (Standard Type)	NTBH10 · NTBH14 · NTBH20	P.845
Single-Sided Rubber Glued Laminated Plywood (Antistatic Type)	ATBH10 · ATBH14 · ATBH20	
Double-Sided Melamine Resin Glued Laminated Plywood with soft edge	MPBHR10 · MPBHR15 · MPBHR20	P.847
Single-Sided Rubber Glued Laminated Plywood with Soft Edge (Standard Type)	NTBHR10 · NTBHR14 · NTBHR20	
Single-Sided Rubber Glued Laminated Plywood with Soft Edge (Antistatic Type)	ATBHR10 · ATBHR14 · ATBHR20	
Aluminum Glued Laminated Plywood with Soft Edge	ALBHR10 · ALBHR15 · ALBHR20	

Order Example

Part Number	-	A	-	B	-	Color	-	E	-	S	-	X	-	Y
Select from the above table.	-	W Dimension	-	D Dimension	-	Color	-	32	-	32	-	32	-	32

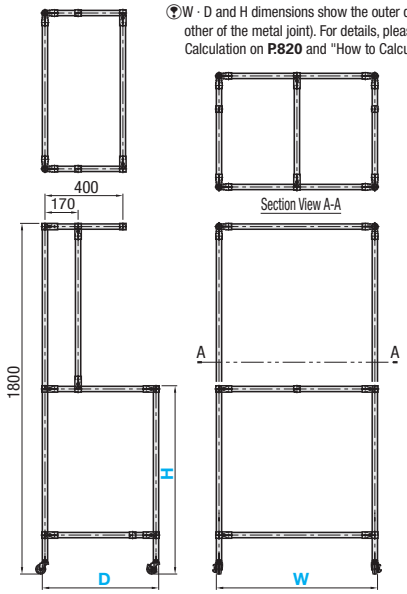
For shelf mounting, use PJ706B (**P.806**) or FFB6 (**P.789**)

Hollow Frame · Factory Frame Standard Units
-Work Bench-

RoHS



PFUA
(Hollow Frame)
FFUA
(Factory Frame)



W · D and H dimensions show the outer dimensions (from one end to the other of the metal joint). For details, please refer to Example of Metal Joint Calculation on **P.820** and "How to Calculate Hollow Dimension" on **P.787**

The unit needs to be assembled by customers.
With this hollow frame units, the number of the components is fixed only by specifying the component types and each dimension. The unit can be completed just by assembling the components.
The picture shows a standard pipe frame unit with SR2 alteration. For top and shelf panels, please order separately if necessary.
The pictured model is PFUAV.

Part Number		W	D	H
Type	Frame · Color	1mm Increment	1mm Increment	1mm Increment
PFUA (Hollow Frame)	**W** (White) **V** (Ivory) **S** (Dark Gray)	400~1200	400~1000	400~1200
FFUA (Factory Frame)				

For frame types and colors, refer to **P.788-789**

Order Example

Part Number	-	W	-	D	-	H
PFUAV	-	W1000	-	D600	-	H800
FFUA	-	W1150	-	D900	-	H850

Days to Ship: **10 Days**

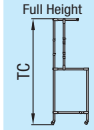
Price

Part Number		W	€ Unit Price D		
Type	Frame · Color		400~600	601~800	801~1000
PFUA (Hollow Frame)	**W** (White) **V** (Ivory) **S** (Dark Gray)	400~600			
		601~800			
		801~1000			
		1001~1200			
FFUA (Factory Frame)		400~600			
		601~800			
		801~1000			
		1001~1200			

Alterations

Part Number	-	W	-	D	-	H	- (TC · SPN · FR · SR · FFR · FSR)
PFUAS	-	W900	-	D550	-	H900	- TC2000-FR1
FFUA	-	W900	-	D550	-	H900	- TC2150-FSR2

Days to Ship: **10 Days**

Alteration	Code	Spec.	Price Adder
Full Height 	TC	Changes the full height. TC=1 mm Increment 1600≤TC≤2200 Ordering Code TC2050	TC: 1600~1799, 1801~1900, 1901~2000, 2001~2100, 2101~2200 / € Unit Price
Wrenches for mounting casters	SPN	Adds wrench for mounting casters JBS009 (**P.812**).	1,35

Alteration	Code	Spec.	Price Adder
Adds Hollow Frame Joints for flat shelves. Available for PFUA_ only	FR	Adds Hollow Frame Joints for flat shelves. Components List (1) PFS28-Color-(W-104) 2 pcs. (2) PBLSN1 4 pcs. For shelf panels, please order them separately. Ordering Code 1 board→FR1, 2 boards→FR2	W: 400~600, 601~800, 801~1000, 1001~1200 / € Unit Price / Step
Adds Hollow Frame Joints for inclined shelves. Available for PFUA_ only	SR	Adds Hollow Frame Joints for inclined shelves. Components List (1) PFS28-Color-(W-104) 3 pcs. (2) PBLSN1 6 pcs. For shelf panels, please order them separately. Ordering Code 1 board→SR1, 2 boards→SR2	W: 400~600, 601~800, 801~1000, 1001~1200 / € Unit Price / Step

Alteration	Code	Spec.	Price Adder
Adds Hollow Frame Joints for flat shelves. Available for FFUA only	FFR	Adds a Factory Frame Joint for flat shelves. Components List (1) FFA28- (W-110) 2 pcs. (2) FFB1 4 pcs. For shelf panels, please order them separately. Ordering Code 1 board→FFR1, 2 boards→FFR2	W: 400~600, 601~800, 801~1000, 1001~1200 / € Unit Price / Step
Adds Hollow Frame Joints for inclined shelves. Available for FFUA only	FSR	Adds a Factory Frame Joint for inclined shelves. Components List (1) FFA28- (W-110) 3 pcs. (2) FFB1 6 pcs. For shelf panels, please order them separately. Ordering Code 1 board→FSR1, 2 boards→FSR2	W: 400~600, 601~800, 801~1000, 1001~1200 / € Unit Price / Step

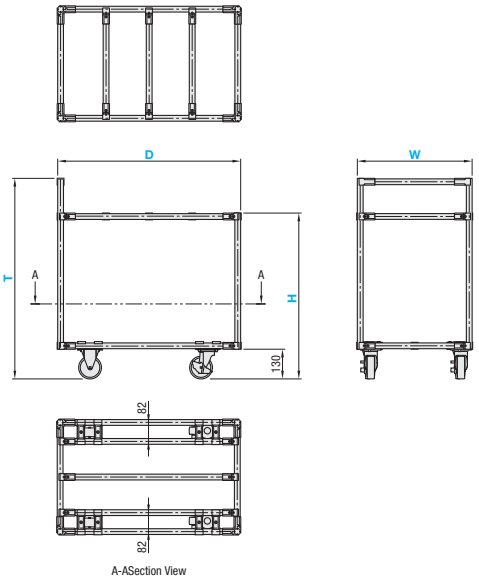
Hollow Frame · Factory Frame Standard Units
-Hand Truck-

RoHS



PFUB
(Hollow Frame)
FFUB
(Factory Frame)

※W · D · H and T dimensions show the outer dimensions (from one end to the other of the metal joint). For details, refer to Example of Metal Joint Calculation on **P.820** and "How to Calculate Hollow Dimension" on **P.787**



A-ASection View

※The unit needs to be assembled by customers.
With this pipe frame units, the number of the components is fixed only by specifying the component types and each dimension. The unit can be completed just by assembling the components.

Part Number		W	D	H	T
Type	Frame · Color	1mm Increment	1mm Increment	1mm Increment	1mm Increment
PFUB (Hollow Frame)	W (White) V (Ivory) S (Dark Gray)	400~1000	600~1200	400~1200	700~1400
FFUB (Factory Frame)					

※T ≥ H+50※Please note the cart may become unstable depending on size.
※For frame types and colors, refer to **P.788-789**

Order Example

Part Number	-	W	-	D	-	H	-	T
PFUBV	-	W600	-	D800	-	H750	-	T1000
FFUB	-	W650	-	D1000	-	H600	-	T800

Days to Ship 10 Days

Price

Part Number		W	€ Unit Price D		
Type	Frame · Color		600~800	801~1000	1001~1200
PFUB (Hollow Frame)	W (White) V (Ivory) S (Dark Gray)	400~600			
		601~800			
		801~1000			
FFUB (Factory Frame)		400~600			
		601~800			
		801~1000			

Alterations

Part Number	-	W	-	D	-	H	-	T	- (AWF · ADF)
PFUBS	-	W800	-	D1000	-	H600	-	T750	- AWF1-ADF2

10 Days

Alteration	Code	Spec.	Price Adder
Adds a pipe frame joint for upper shelves.	AWF	Adds a pipe frame joint for upper shelves. ■Components List - PFUB_ (1) PFS28-Color-(W-103) 1 pc. (2) PBLSN1 2 Pcs. - FFUB (1) FFA28- (W-110) 1 pc. (2) FFB1 2 Pcs. Ordering Code 1 pc.→AWF1 2 pcs.→AWF2	PFUB_ 8,70 EUR/pc. FFUB 7,60 EUR/pc.

Alteration	Code	Spec.	Price Adder
Adds a pipe frame joint for lower shelves.	ADF	Adds a pipe frame joint for lower shelves. ■Components List - PFUB_ (1) PFS28-Color-(D-103) 1 pc. (2) PBLSN1 2 Pcs. - FFUB (1) FFA28- (D-110) 1 pc. (2) FFB1 2 Pcs. Ordering Code 1 pc.→ADF1 2 pcs.→ADF2	PFUB_ 9,40 EUR/pc. FFUB 8,40 EUR/pc.

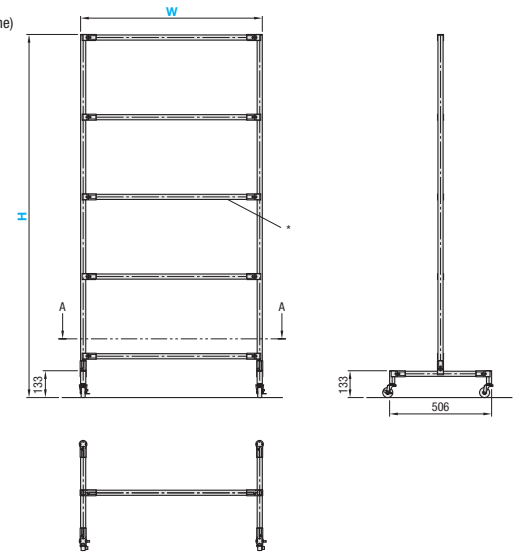
Hollow Frame · Factory Frame Standard Units
-Partition-

RoHS



PFUC
(Hollow Frame)
FFUC
(Factory Frame)

W and H dimensions show the outer dimensions (from one end to the other of the metal joint). For details, refer to Example of Metal Joint Calculation on **P.820** and "How to Calculate Hollow Dimension" on **P.787**



A-ASection View

The unit needs to be assembled by customers.
With this pipe frame units, the number of the components is fixed only by specifying the component types and each dimension. The unit can be completed just by assembling the components.

Part Number		W	H
Type	Frame · Color	1mm Increment	1mm Increment
PFUC (Hollow Frame)	**W** (White) **V** (Ivory) **S** (Dark Gray)	600~1200	600~2000
FFUC (Factory Frame)			

For frame types and colors, refer to **P.788-789**

Order Example

Part Number	-	W	-	H
PFUCV FFUC	-	W900 W1000	-	H1800 H1200

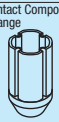
Days to Ship **10 Days**

Price

Part Number		W	€ Unit Price H			
Type	Frame / Color		600~800	801~1200	1201~1600	1601~2000
PFUC (Hollow Frame)	**W** (White) **V** (Ivory) **S** (Dark Gray)	600~800				
		801~1000				
		1001~1200				
FFUC (Factory Frame)		600~800				
		801~1000				
		1001~1200				

Alterations

Part Number	-	W	-	H	- (SPN · GA · ABM)	10 Days
PFUCS	-	W900	-	H1350	- GA-ABM2	

Alteration	Code	Spec.	Price Adder
Wrenches for mounting casters	SPN	Adds wrench for mounting casters.	1,35
Contact Component Change 	GA	Replaces casters with rubber feet. PFUC_→JBS402 (**P.809**) FFUC→FFS204 (**P.792**)	-15,00

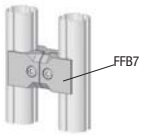
Alteration	Code	Spec.	Price Adder
Additional Horizontal Frames	ABM	Adds horizontal frames or joints. ■Components List - PFUC_ (1) PFS28-Color-(W-103) 1 pc. (2) PBLSN1 2 Pcs. - FFUC (1) FFA28- (W-106) 1 pc. (2) FFB1 2 Pcs. Ordering Code 1 pc. → ABM1 2 pcs. → ABM2	PFUC_ 9,40 EUR/pc. FFUC 8,40 EUR/pc.

Example

-For panel mounting, use FFB6 (**P.789**) or PBLSN701 (**P.802**)



-When FFB7 (**P.789**) or PBLSN11 (**P.802**) are used, partitions can be easily connected.



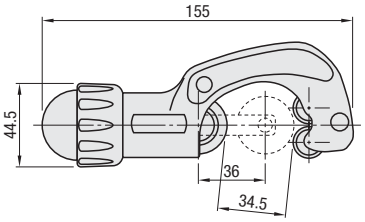
Adjust frame back and forth when a caster interferes.

Cutters, Spare Cutter Blades, Deburring Tools, Spare Deburring Blades

■Hollow Cutters

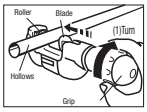


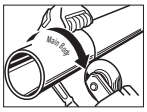
PFCAT
PFCATS

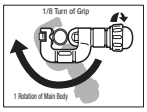


Remodeled in May 2009. Functions are the same as those of the old model.
Reinforced aluminum hollow frames and factory frames cannot be cut with this cutter.

Part Number	Applicable pipe	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~19
PFCAT	Aluminum Extruded Hollow, Resin Coating Hollow	350		
PFCATS	Stainless Steel Hollow	356		







⚠CAUTION

- If the cutter is used to cut the unspecified objects or for the unspecified purpose except cutting, which may damage the cutter or cause the accidents.
- Be sure to inspect the cutter before use. Do not use until it is repaired or replaced when it is out of order.
- Do not touch blade while cutting. Fingers may get caught between the blade and the pipe, or it may cause other accidents or injury.
- Be careful of falling while carrying or operating.
- Wipe water off when the cutter gets wet. Water entrance into bearing may cause rust and may stop moving.

■How to Use

1. Turn the grip to grasp pipe between the roller and cutter blade. Hollow end should come out at least a little more than the roller width.
2. Rotate the grip till the point where the cutter hits the pipe, then further rotate it by around 90 degrees in the direction of the arrow (1) in the figure. Then, rotate the body 360 degrees to make incision on whole the circumference.
3. Then turn the grip slowly (approx. 1/8 turn per each main body rotation) to cut gradually deeper and turn the main body to completely cut the pipe.

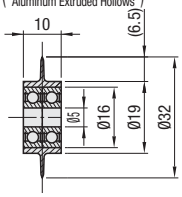
*If the cutting speed is too fast, it may cause pipe deformation, or shorten the blade's lifetime.

RoHS

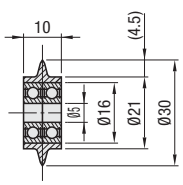
■Spare Cutter Blades



PFCATH (For Resin Coated Hollows, Aluminum Extruded Hollows)



PFCATHS (For Stainless Steel Hollow)



A Accessories: Retaining Ring of E Type 1 pc.

Part Number		Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~19
PFCATH	(For Resin Coated Hollows, Aluminum Extruded Hollows)	19		
PFCATHS	(For Stainless Steel Hollow)	25		

Please request a quotation for orders larger than indicated quantity.

How to Replace Spare Blades: Remove the retaining ring E Type of the cutter main body, then pull installation pin for replacement.

Order Example — Part Number: PFCAT, PFCATH

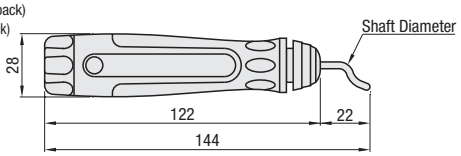
Days to Ship: 6 Days P.87

RoHS

■Deburring Tools / Spare Blades



M-NG1000-F (Deburring Tool: PFREMH-BS1010x1 pc.)
M-NG1000-S (Deburring Tool: PFREMH-BS1018x1 pc.)
PFREMH-BS1010 (Spare Blades, 10 pcs./pack)
PFREMH-BS2010 (Spare Blades, 10 pcs./pack)
PFREMH-BS1018 (Spare Blades, 10 pcs./pack)



M Material: Handle: Plastic+Rubber

■Deburring Tools

Part Number	Mass (g)	€ Unit Price Qty.1~9	Volume Discount 10~29
M-NG1000-F	31		
M-NG1000-S	31		

Please request a quotation for orders larger than indicated quantity.

■Spare Cutter Blades

Part Number Type	Part Number No.	Features	€ Unit Price* Qty.1~9	Volume Discount* 10~29
PFREMH	BS1010	For heavy steel and aluminum. One blade in clockwise direction. Black		
	BS2010	For cast, brass and plastic. Two blades in either direction. Silver		
	BS1018	For hard to cut material such as stainless steel. One blade in clockwise direction. Silver		

*One pack contains 10 pieces.

Please request a quotation for orders larger than indicated quantity.

Order Example — Part Number: M-NG1000-F, PFREMH-BS1010

• Deburring Tools: 6 Days P.87

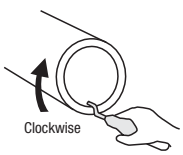
• Spare Blades: 8 Days

■How to Use

1. Hold the grip and apply the blade to the inside of the pipe.
2. Turn at least one full turn while keeping the blade in the direction of the pipe.

⚠CAUTION

- Using for purposes other than deburring after pipe frame cut may cause damages or accidents.
- Be sure to check the burr remover before use. Do not use until it is repaired or replaced when it is out of order.
- Do not touch blade section during operation. It may cause accidents or injury.
- The Part Number for the conventional product PFREM has changed to M-NG1000-F. Some modification has made handle shape, but it doesn't affect mechanical function.



How to Calculate Hollow Dimension

-Metal Joint / Plastic Joint-

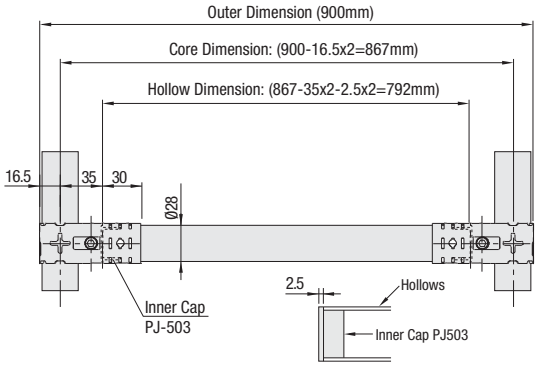
■Example of Metal Joint Calculation

When using PBLSN1

Core Dimension=900-16.5x2=867
=Outer Dimension-Metal Joint Radiusx2

Hollow Dimension=867-35x2-2.5x2=792
=Core Dimension - Length From Metal Joint Center to Hollow End

*Hollow will be shorter (2.5x2) when inner cap is attached for rust prevention.
No inner cap is required for aluminum extruded pipes.



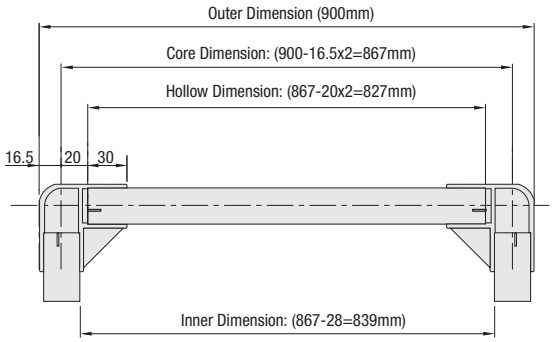
■Example of Plastic Joint Calculation

(Aluminum extruded pipes and stainless steel pipes should not be combined with plastic joints.)

When using PJ002

Core Dimension=900-16.5x2=867
=Outer Dimension-Metal Joint Radiusx2

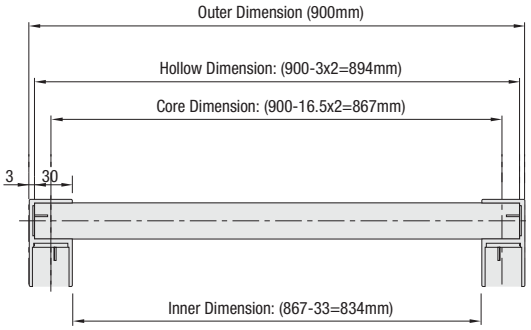
Hollow Dimension=867-20x2=827
=Core Dimension - Length from Plastic Joint Center to Hollow End



When using PJ003

Core Dimension=900-16.5x2=867
=Outer Dimension-Metal Joint Radiusx2

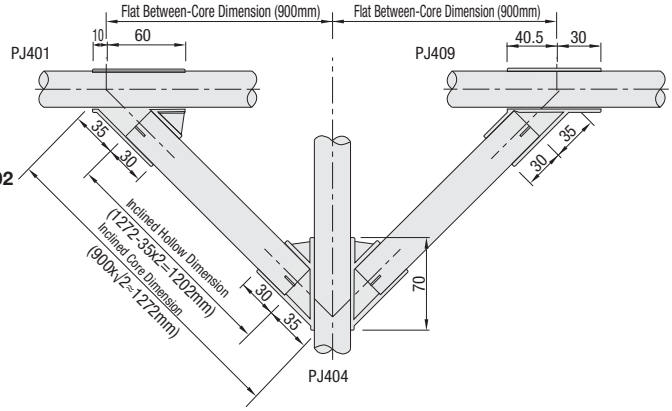
Hollow Dimension=900-3x2=894
=Outer Dimension - Length From Plastic Joint End to Hollow End



When using PJ401 , PJ404 , PJ409

Inclined Core Dimension=900x√2≈1272
=Core Dimension Between Flatsx√2

Inclined Hollow Dimension=1272-35x2=1202
=Inclined Core Dimension - Length from Plastic Joint Center to Hollow End



Cover Panels / Boards

Addition

Cover Panels/ Boards





Product Name	Aluminum Panels · Diamond Tread Plates	Stainless Steel Panels
Page	823	825



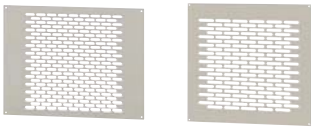
Addition



Steel Panels	Cover Panels
827	829







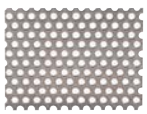
Baked Finish Steel Panels	-Keyhole-	-Ventilation Hole-
831	831	833

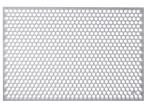


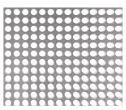
Addition

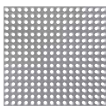


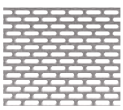
Baked Finish Steel Panels-Left Door / Right Door · Double Doors-	-Selectable Shapes-
834	835











Perforated Metals-Standard-	-Perforated Metals with Flames · Fixed Dimension-	-Round Hole Parallel · Slot Hole-
837	838	839











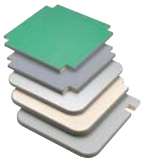
Perforated Metals-Framed-	-Standard Circular-	-Framed Circular-	-L-Shaped-	-U-Shaped-
840	841	841	842	842







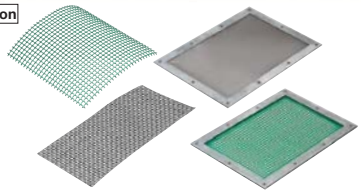
Double-Sided Melamine Resin Glued Laminated Plywoods · Particle Boards	Single-Sided Rubber Glued Laminated Plywoods-Standard · Antistatic-
843	845





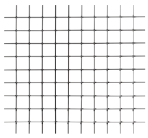


Addition

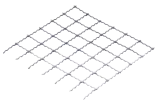


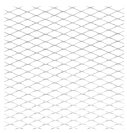
Laminated Plywoods with Edge Moldings -Soft Edged Type · Adhesive Type-	Stainless Steel Panels with Protective Sheet	Net Plates
847	849	850

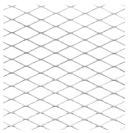
Addition











Fence Nets	Folding Nets -No Frame · Framed-
851	853

Aluminum Panels / Diamond Tread Plates





RoHS

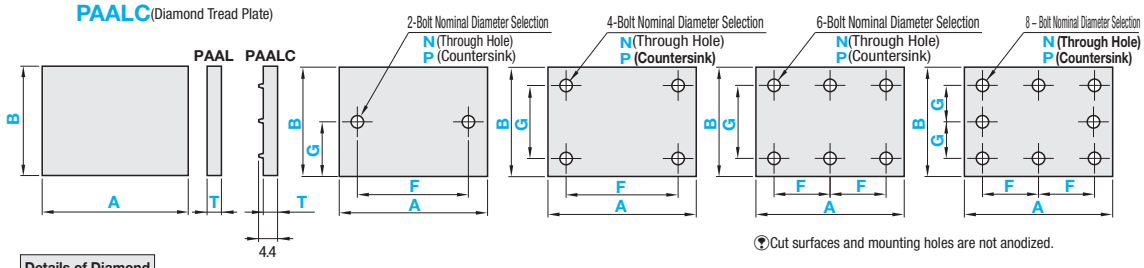
Type	Material	Surface Treatment
PAAL	EN AW-5052/ AlMg2,5	Clear Anodize
PAALC		-

Standard Type

PAAL
PAALC (Diamond Tread Plate)

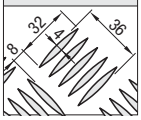
Hole Type

-2 Holes- 2H -4 Holes- 4H -6 Holes- 6H -8 Holes- 8H



Cut surfaces and mounting holes are not anodized.

Details of Diamond Tread Plates



Details of Hole Machining



Bolt Nominal Diameter	3	4	5	6	8
d	3.5	4.5	5.5	6.5	8.5
d_1	7.5	-	11.5	-	18.5
h	2	-	3	-	5

Precision Standards

- T Dimension Tolerance

T	1.0	1.5	2.0	3.0	5.0	3.2
	±0.06	±0.09	±0.09	±0.10	±0.12	±0.2

- Tolerance of A and B ±1.0

Standard Type

Part Number Type	1mm Increment A	1mm Increment B	Selection T
PAAL	50 ~ 1200	50 ~ 1000	1.0 1.5 2.0 3.0 5.0
PAALC (Diamond Tread Plate)			3.2

Hole Type

Part Number Type	Part Number Nominal	1mm Increment A	1mm Increment B	Selection T	1mm Increment F	1mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter P (Countersink)
PAAL	2H 4H 6H 8H	50 ~ 1200	50 ~ 1000	1.0	9~1191 (2H · 4H Type) 9~595 (6H · 8H Type)	5~995 (2H Type) 9~991 (4H · 6H Type) 9~495 (8H Type)	3 4 5 6 8	-
				1.5				-
				2.0				3
				3.0				5
				5.0				8
PAALC (Diamond Tread Plate)				3.2				5

Dimension F Specification Range : For 2H and 4H, $d(d_1)+5 \le F \le A-d(d_1)-5$; for 6H and 8H, $d(d_1)+5 \le F \le A/2-d(d_1)/2-2.5$.

Dimension G Specification Range : For 2H, $d(d_1)/2+2.5 \le G \le B-d(d_1)/2-2.5$; for 6H, $d(d_1)+5 \le G \le B-d(d_1)-5$; for 8H, $d(d_1)+5 \le G \le B/2-d(d_1)/2-2.5$.
(d for through hole, d_1 for countersink)

Order Example

Standard Type

Part Number - A - B - T
PAAL - 600 - 400 - 2.0

Hole Type

Part Number - A - B - T - F - G - Bolt Nominal
PAAL4H - 800 - 600 - 3.0 - F700 - G500 - N6

Days to Ship

Standard Type / Hole Type

8 Days

Express A 8,00 EUR/ piece P88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Allowable Load Standard of Diamond Tread Plate PAALC

Supported on two edges of length B.

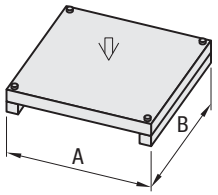


Plate Size A	Plate Size B	Load Standard N	Load Standard kgf
600	300	215	22
600	450	321	33
600	600	428	44
450	300	508	52
450	450	761	78
300	300	1713	175

Reduced Delivery Time

Price

Standard Type € Unit Price

Part Number	T	A	€ Unit Price B									
			50~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PAAL	1.0	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										
	1.5	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										
	2.0	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										
	3.0	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										
	5.0	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										
PAALC (Diamond Tread Plate)	3.2	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										

Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes	
	N(Through Hole)	P(Countersink)
2H		
4H		
6H		
8H		

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal

PAAL4H - 500 - 400 - 3.0 - F240 - G160 - N6

(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price

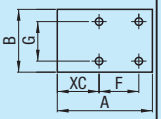
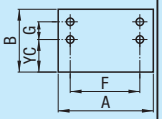
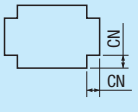
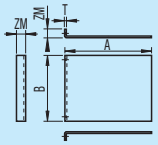
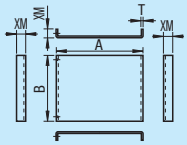
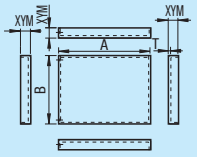
48,80 EUR + 6,00 EUR = 54,80 EUR

Alterations

Part Number - A - B - T - F - G - Bolt Nominal - (XC · YC ... etc.)

PAAL4H - 100 - 80 - 3.0 - F50 - G60 - N4 - XC10

10 Days

Alterations	Hole Position from Left	Hole Position from Bottom	Relief at Four Corners	One Side Folded	Left and Right Sides Folded	Four Sides Folded
						
Code	XC	YC	CN	ZM	XM	XYM
Spec.	XC=1 mm Increment Ⓥ5≤XC≤1186 Ⓥ(2H · 4H Type) d(d1)/2+2.5≤XC≤ A-F-d(d1)/2-2.5 Ⓥ(6H · 8H Type) d(d1)/2+2.5≤XC≤ A-2F-d(d1)/2-2.5	YC=1 mm Increment Ⓥ5≤YC≤986 Ⓥ(4H · 6H Type) d(d1)/2+2.5≤YC≤ B-G-d(d1)/2-2.5 Ⓥ(8H Type) d(d1)/2+2.5≤YC≤ B-2G-d(d1)/2-2.5 ⊗Not applicable to 2H Type	CN=1 mm Increment Machines relief at 4 corners. Ⓥ5≤CN≤50 Ordering Code CN=25 ⋯› CN25 ⊗Combination use with ZM · XM · XYM is not possible.	‹Fabrication Conditions› ZM=1mm Increment T / ZM 2.0 / 15≤ZM≤100 3.0 / 17≤ZM≤100 3.2 / 19≤ZM≤100 Ⓥ PAALC has protrusions on external side. ⊗Not applicable to T=5.0 Ⓥ ZM+A≤1200 ⊗Not compatible with CN.	‹Fabrication Conditions› XM=1mm Increment T / XM 2.0 / 15≤XM≤100 3.0 / 17≤XM≤100 3.2 / 19≤XM≤100 Ⓥ PAALC has protrusions on external side. ⊗Not applicable to T=5.0 Ⓥ XMx2+A≤1200 ⊗Not compatible with CN.	‹Fabrication Conditions› XYM=1mm Increment T / XYM 2.0 / 15≤XYM≤100 3.0 / 17≤XYM≤100 3.2 / 19≤XYM≤100 Ⓥ PAALC has protrusions on external side. ⊗Not applicable to T=5.0 Ⓥ XYMx2+A≤1200 Ⓥ XYMx2+B≤1000 ⊗Not compatible with CN.
Price Adder	4,00	4,00	3,00	10,00	20,00	40,00

Stainless Steel Panels

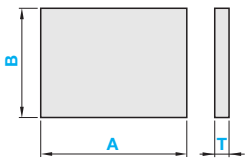
RoHS



Type	Material	Finishing
PASUS	1.4301/	One Side 400 Grind
PMSUS	X5CrNi18-10	One Side Mirror Finish (800 Grind, No Grind Trace)

Standard Type

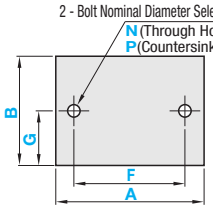
PASUS(400 Grind)
PMSUS(Mirror Finish)



Hole Type

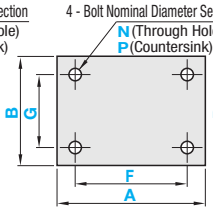
-2 Holes- **2H**

2 - Bolt Nominal Diameter Selection



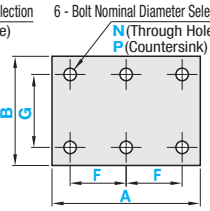
-4 Holes- **4H**

4 - Bolt Nominal Diameter Selection



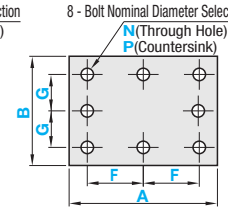
-6 Holes- **6H**

6 - Bolt Nominal Diameter Selection



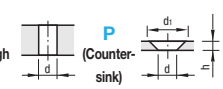
-8 Holes- **8H**

8 - Bolt Nominal Diameter Selection



A≥B
PASUS (400 Grind) has brushed marks, but the direction can not be specified.

Details of Hole Machining



Bolt Nominal Diameter	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9
d1	7.5	9.5	11.5	-	-
h	2	2.5	3	-	-

Precision Standards

-T Dimension Tolerance	T	0.8	1.0 or 1.2	1.5	2.0	2.5	3.0
		±0.09	±0.10	±0.12	±0.17	±0.20	±0.25

-Tolerance of A and B: 1000 or less±0.5, More than 1000±1.0

Standard Type

Part Number Type	1mm Increment A	1mm Increment B	Selection T
PASUS (400 Grind)	50~1200	50~1000	0.8, 1.0, 1.2, 1.5, 2.0, 2.5, 3.0
PMSUS (Mirror Finish)	50~800	50~800	1.0

Hole Type

Part Number Type	Part Number Nominal	1mm Increment A	1mm Increment B	Selection T	1mm Increment F	1mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter P (Countersink)
PASUS (400 Grind)	2H, 4H, 6H	50~1200	50~1000	0.8	9~1191(2H · 4H Type) 9~595(6H · 8H Type)	5~995(2H Type) 9~991(4H · 6H Type) 9~495(8H Type)	3	-
				1.0				-
				1.2			4	-
				1.5				-
				2.0			5	3
				2.5				4
				3.0				5
PMSUS (Mirror Finish)	8H	50~800	50~800	1.0	9~791(2H · 4H Type) 9~395(6H · 8H Type)	5~795(2H Type) 9~791(4H · 6H Type) 9~395(8H Type)	6, 8	-

Dimension F Specification Range : For 2H and 4H, d(d1)+5≤F≤A-d(d1)-5; for 6H and 8H, d(d1)+5≤F≤A/2-d(d1)/2-2.5.
Dimension G Specification Range : For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5, For 4H and 6H, d(d1)+5≤G≤B-d(d1)-5; for 8H, d(d1)+5≤G≤B/2-d(d1)/2-2.5.
(d for through hole, d1 for countersink)

Order Example

Standard Type

Part Number	A	B	T
PASUS	600	400	0.8

Hole Type

Part Number	A	B	T	F	G	Bolt Nominal
PASUS4H	800	600	2.0	F700	G500	N6

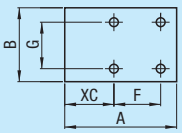
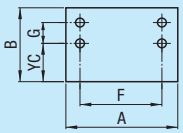
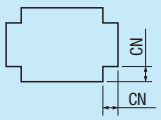
Alterations

Part Number	A	B	T	F	G	Bolt Nominal	(XC · YC · CN)
PASUS4H	800	80	1.0	F50	G60	N4	XC10

Days to Ship

PASUS
8 Days
Express A 8,00 EUR/ piece P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

PMSUS
10 Days

Alterations	Hole Position from Left	Hole Position from Bottom	Relief at Four Corners
			
Code	XC	YC	CN
Spec.	XC=1 mm Increment 5≤XC≤1186 (#400 Grind) S≤XC≤786 (Mirror Finish) (2H / 4H Type) d (d1)/2+2.5≤XC≤A-F-d (d1)/2-2.5 (6H / 8H Type) d(d1)/2+2.5≤XC≤A-2F-d(d1)/2-2.5	YC=1 mm Increment 5≤YC≤986 (#400 Grind) 5≤YC≤786 (4H / 6H Type) d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5 (8H Type) d(d1)/2+2.5≤YC≤B-2G- d(d1)/2-2.5 ⊗Not applicable to 2H Type	CN=1 mm Increment Machines relief at 4 corners. 5≤CN≤50 Ordering Code CN=25 ···› CN25
Price Adder	4,00	4,00	3,00

Surface Grinding Comparison Photos

-**PASUS**(#400 Grind)



-**PMSUS**(Mirror Finish, #800 Grind, No Grinding Marks)



Price

Standard Type € Unit Price

The price of PMSUS is found by multiplying the unit price by the material multiplier.

(Ex.) Part Number - A - B - T
PMSUS - 500 - 400 - 1.0

(€ Unit Price) x (material multiplier) = Standard Type € Unit Price
37,90 EUR x 1.7 = 64,40 EUR (Round down to ten Cent.)

Part Number	T	A	€ Unit Price B									
			50~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PASUS (400 Grind) PMSUS (Mirror Finish) Material Multiplier (x1.7)	0.8	50~100										
		101~200										
		201~300										
		301~400										
		401~500										
		501~600										
		601~700										
		701~800										
		801~900										
		901~1000										
		1001~1100										
		1101~1200										
	1.0	50~100										
		101~200										
		201~300										
		301~400										
		401~500										
		501~600										
		601~700										
		701~800										
		801~900										
		901~1000										
		1001~1100										
		1101~1200										
	1.2	50~100										
		101~200										
		201~300										
		301~400										
		401~500										
		501~600										
		601~700										
		701~800										
		801~900										
		901~1000										
		1001~1100										
		1101~1200										
	1.5	50~100										
		101~200										
		201~300										
		301~400										
		401~500										
		501~600										
		601~700										
		701~800										
		801~900										
		901~1000										
		1001~1100										
		1101~1200										
	2.0	50~100										
		101~200										
		201~300										
		301~400										
		401~500										
		501~600										
		601~700										
		701~800										
		801~900										
		901~1000										
		1001~1100										
		1101~1200										
	2.5	50~100										
		101~200										
		201~300										
		301~400										
		401~500										
		501~600										
		601~700										
		701~800										
		801~900										
		901~1000										
		1001~1100										
		1101~1200										
	3.0	50~100										
		101~200										
		201~300										
		301~400										
		401~500										
		501~600										
		601~700										
		701~800										
		801~900										
		901~1000										
		1001~1100										
		1101~1200										

For PMSUS, sizes in the red box in the price table are available. Applicable to only T=1.0, 800mm or less square.

Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes	
	N (Through Hole)	P (Counter-sink)
2H		
4H		
6H		
8H		

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal
PASUS4H - 500 - 400 - 1.0 - F240 - G160 - N6

(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price
37,90 EUR + 6,00 EUR = 43,90 EUR

Steel Panels

RoHS



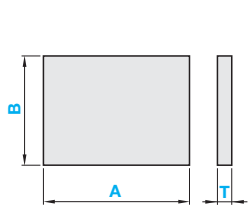
Type	Material	Surface Treatment
PAST	1.0038/S235JR	Zinc Plating

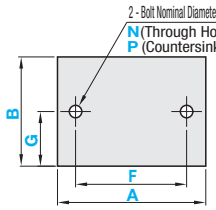
Standard Type

PAST

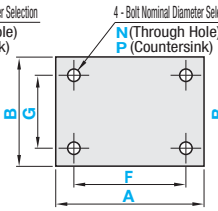
Hole Type

-2 Holes- 2H

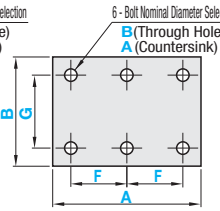




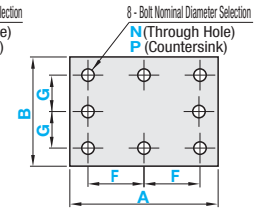
-4 Holes- 4H



-6 Holes- 6H

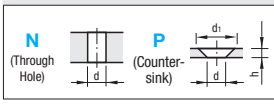


-8 Holes- 8H



※A≥B
※PAST (400 Grind) has brushed marks, but the direction can not be specified.
※Plating is not applied to end faces and drilled holes.

Details of Hole Machining



Bolt Nominal Diameter	3	4	5	6	8
d	3.5	4.5	5.5	6.5	8.5
d1	-	9.5	-	-	-
h	-	2.3	-	-	-

Precision Standards

T	1.0	1.6	2.3
-T Dimension Tolerance	±0.06	±0.08	±0.09

-Tolerance of A and B: 1000 or less±0.5; More than 1000±1.0

Standard Type

Part Number Type	1mm Increment A	1mm Increment B	Selection T
PAST	50~1200	50~1000	1.0 1.6 2.3

Hole Type

Part Number Type	Part Number Nominal	1mm Increment A	1mm Increment B	Selection T	1mm Increment F	1mm Increment G	Bolt Nominal Diameter N (Through Hole)	Bolt Nominal Diameter P (Countersink)
PAST	2H 4H 6H 8H	50~1200	50~1000	1.0	9~1191 (2H · 4H Type) 9~595 (6H · 8H Type)	5~995 (2H Type) 9~991 (4H · 6H Type) 9~495 (8H Type)	3 4 5 6 8	-
				1.6				-
				2.3				4

※Dimension F Specification Range : For 2H and 4H, $d(d_1)+5 \le F \le A-d(d_1)-5$; for 6H and 8H, $d(d_1)+5 \le F \le A/2-d(d_1)/2-2.5$.
※Dimension G Specification Range : For 2H, $d(d_1)/2+2.5 \le G \le B-d(d_1)/2-2.5$; for 6H, $d(d_1)+5 \le G \le B-d(d_1)-5$; for 8H, $d(d_1)+5 \le G \le B/2-d(d_1)/2-2.5$. (d for through hole, d_1 for countersink)

Order Example

Standard Type

Part Number	-	A	-	B	-	T
PAST	-	600	-	400	-	1.0

Hole Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal
PAST4H	-	800	-	600	-	2.0	-	F700	-	G500	-	N6

Days to Ship

Standard Type · Hole Type

8 Days

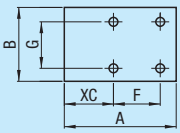
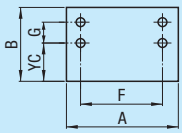
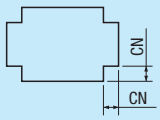
Express A | 8,00 EUR/piece | P.88

※A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal	-	(XC · YC · CN)
PAST4H	-	800	-	80	-	1.0	-	F50	-	G60	-	N4	-	XC10

10 Days

Alterations	Hole Position from Left	Hole Position from Bottom	Relief at Four Corners
			
Code	XC	YC	CN
Spec.	XC=1 mm Increment ※5≤XC≤1186 ※(2H · 4H Type) d (d1)/2+2.5≤XC≤A-F-d (d1)/2-2.5 ※(6H · 8H Type) d(d1)/2+2.5≤XC≤A-2F-d(d1)/2-2.5	YC=1 mm Increment ※5≤YC≤986 ※(4H · 6H Type) d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5 ※(8H Type) d(d1)/2+2.5≤YC≤B-2G- d(d1)/2-2.5 ⊗Not applicable to 2H Type	CN=1 mm Increment Machines relief at 4 corners. ※5≤CN≤50 Ordering Code CN=25 ⋯› CN25
Price Adder	4,00	4,00	3,00

Price

Standard Type € Unit Price

Part Number	T	A	€ Unit Price B									
			50~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PAST	1.0	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										
	1.6	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										
	2.3	50 ~ 100										
		101 ~ 200										
		201 ~ 300										
		301 ~ 400										
		401 ~ 500										
		501 ~ 600										
		601 ~ 700										
		701 ~ 800										
		801 ~ 900										
		901 ~ 1000										
		1001 ~ 1100										
		1101 ~ 1200										

Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes	
	N (Through Hole)	P (Countersink)
2H		
4H		
6H		
8H		

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

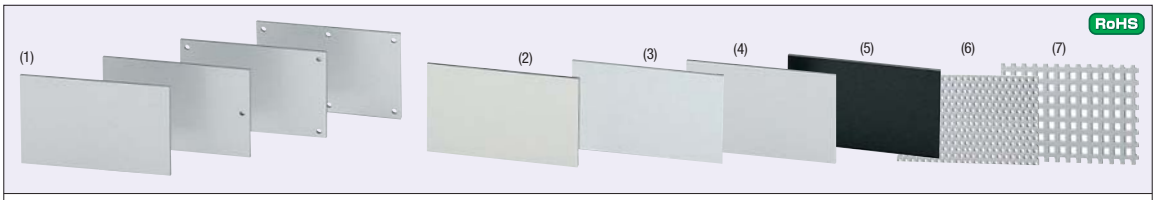
(Ex.)

Part Number		A		B		T		F		G		Bolt Nominal
PAST4H	-	500	-	400	-	1.0	-	F240	-	G160	-	N6

(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price

36,80 EUR + 6,80 EUR = 42,80 EUR

Add. Spec. Cover Panels



Standard Type

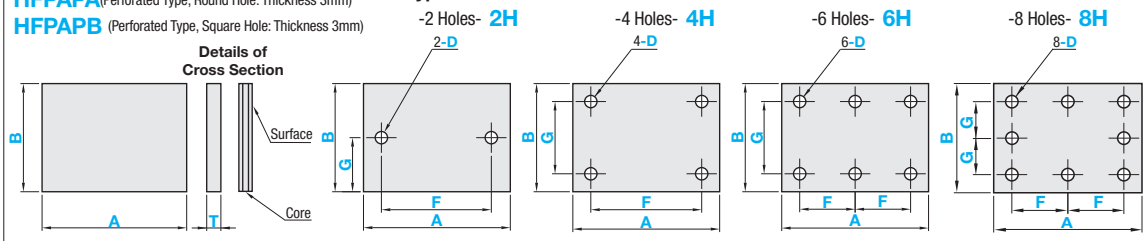
HFPAL (Silver Color Type: Thickness 3mm)
HFPALT (Antistatic Grade: Thickness 3mm)
HFPSTW (White Board Type: Thickness 3mm)
HFPSLW (Silver Color Type: Thickness 5mm)
HFPSTB (Black Color Type: Thickness 3mm)
HFPAPA (Perforated Type, Round Hole: Thickness 3mm)
HFPAPB (Perforated Type, Square Hole: Thickness 3mm)

Part Number	Material		Coating	Surface Color	Operation Temperature
	Core	Surface			
(1)**HFPAL**	Low Density Black Polyethylene Foam	EN AW 3004/DIN AlMn1Mg1/3.0526	Polyester Baked Finish	Silver	0~80°C
(2)**HFPALT**			Polyester Electrostatic Baked Finish	Ivory	
(3)**HFPSTW**	Low Density White Polyethylene Foam	1.0330/DC01	Polyester Baked Finish for White Board	White	
(4)**HFPSLW**	White Polyethylene Foam	EN AW 3004	Polyester Baked Finish	Silver*	
(5)**HFPSTB**	Low Density Black Polyethylene Foam	EN AW-1100/Al99Cu	Black Polyester Type Baked Finish	Black	
(6)**HFPAPA**	Low Density Black Polyethylene Foam	EN AW 3004/DIN AlMn1Mg1/3.0526	Polyester Baked Finish	Silver	
(7)**HFPAPB**					

* Note that there are some difference in color tone between HFPSLW and HFPAL.

Hole Type

-2 Holes- **2H** -4 Holes- **4H** -6 Holes- **6H** -8 Holes- **8H**

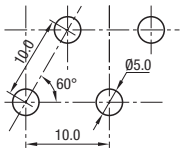


(P) Antistatic treatment is not applied to end faces and drilled holes of HFPALT.
(P) The color of HFPSLW is white with one glossy side and the other matt side.

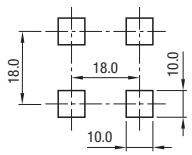
(P) A≥B (A≤B is applicable to Perforated Types)
⊗ HFPAPA / HFPAPB are available in Standard Type only.

Hole Shape Details for Perforated Types

HFPAPA (Round Hole)
Opening Ratio: 22.6%



HFPAPB (Square Hole)
Opening Ratio: 30.9%



Precision Standards

- **T Dimension Tolerance** ±0.3
- **Tolerance of A and B** ±1.0

(P) Punched holes and material edges are in arbitrary relationship.

Standard Type

Part Number	T	1mm Increment	
		A	B
HFPAL HFPALT HFPSTW HFPSTB HFPAPA HFPAPB	3	50~1800	50~900
HFPSLW	5		

Hole Type

Part Number		T	1mm Increment		1mm Increment		Hole Dia. D
Type	Nominal		A	B	F	G	
HFPAL HFPALT HFPSTW HFPSTB	2H 4H 6H 8H	3	50~1800	50~900	9~ 1791 9~ 895	9~895 9~891 9~445	3.5 4.5 5.5 7
HFPSLW	2H 4H 6H 8H	5			9~ 1791 9~ 895	9~895 9~891 9~445	3.5 4.5 5.5 7

(P) F Dimension Specification Range : For 2H and 4H, D+5≤F≤A-D-5; for 6H and 8H, D+5≤F≤A/2-D/2-2.5.
(P) Dimension G Specification Range : For 2H, D/2+2.5≤G≤B-D/2-2.5; for 4H or 6H, D+5≤G≤B-D-5; for 8H, D+5≤G≤B/2-D/2-2.5.

Order Example

• Standard Type

Part Number	-	T	-	A	-	B
HFPAL	-	3	-	600	-	400

• Hole Type

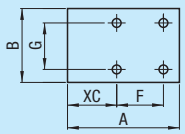
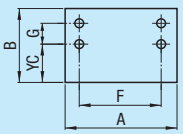
Part Number	-	T	-	A	-	B	-	F	-	G	-	Hole Dia. D
HFPAL4H	-	3	-	800	-	600	-	700	-	500	-	D7

Days to Ship

8 Days

Alterations

Part Number	-	T	-	A	-	B	-	F	-	G	-	Hole Dia. D	-	(XC · YC)
HFPAL4H	-	3	-	100	-	80	-	50	-	60	-	D7	-	XC10

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment (P) 9≤XC≤1783 (P) 2H · 4H Type D/2+2.5≤XC≤A-F-D/2-2.5 (P) 6H · 8H Type D/2+2.5≤XC≤A-2F-D/2-2.5	YC=1 mm Increment (P) 9≤YC≤883 (P) 4H · 6H Type D/2+2.5≤YC≤B-G-D/2-2.5 (P) 8H Type D/2+2.5≤YC≤B-2G-D/2-2.5 ⊗ Not applicable to 2H Type
Price Adder	4,00	4,00

Price

■Standard Type

The price of HFPSTW is found by multiplying the € Unit Price by Material Multiplier 1.3.

(Ex.) Part Number - T - A - B
HFPSTW - 3 - 800 - 500

(€ Unit Price) x (material multiplier) = Standard Type € Unit Price
33,70 EUR x 1.3 = 43,80 EUR (Round down to ten Cent.)

Part Number	T	A	€ Unit Price B 50~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900
HFPAL (Silver Color Type : Thickness 3mm) HFPSTW (White Board Type) Material Multiplier (x1.3) HFPSTB (Black Color Type)	3	50~ 100									
		101~ 200									
		201~ 300									
		301~ 400									
		401~ 500									
		501~ 600									
		601~ 700									
		701~ 800									
		801~ 900									
		901~ 1000									
		1001~ 1100									
		1101~ 1200									
		1201~ 1300									
		1301~ 1400									
		1401~ 1500									
		1501~ 1600									
		1601~ 1700									
		1701~ 1800									
HFPSLW (Silver Color Type : Thickness 5mm)	5	50~ 100									
		101~ 200									
		201~ 300									
		301~ 400									
		401~ 500									
		501~ 600									
		601~ 700									
		701~ 800									
		801~ 900									
		901~ 1000									
		1001~ 1100									
		1101~ 1200									
		1201~ 1300									
		1301~ 1400									
		1401~ 1500									
		1501~ 1600									
		1601~ 1700									
		1701~ 1800									
HFPALT (Antistatic Grade)	3	50~ 100									
		101~ 200									
		201~ 300									
		301~ 400									
		401~ 500									
		501~ 600									
		601~ 700									
		701~ 800									
		801~ 900									
		901~ 1000									
		1001~ 1100									
		1101~ 1200									
		1201~ 1300									
		1301~ 1400									
		1401~ 1500									
		1501~ 1600									
		1601~ 1700									
		1701~ 1800									
HFPAPA (Perforated Type, Round Hole) HFPAPB (Perforated Type, Square Hole)	3	50~ 100									
		101~ 200									
		201~ 300									
		301~ 400									
		401~ 500									
		501~ 600									
		601~ 700									
		701~ 800									
		801~ 900									
		901~ 1000									
		1001~ 1100									
		1101~ 1200									
		1201~ 1300									
		1301~ 1400									
		1401~ 1500									
		1501~ 1600									
		1601~ 1700									
		1701~ 1800									

■Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes N(Through Hole)	P(Countersink)
2H		
4H		
6H		
8H		

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.) Part Number - A - B - T - F - G - Hole Dia. D
HFPAL4H - 500 - 400 - 3 - F240 - G160 - D3.5

(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price
19,40 EUR + 6,00 EUR = 25,40 EUR

■Characteristic Values

Item	Unit	(1) HFPAL	(2) HFPALT	(3) HFPSTW	(5) HFPSTB	(6) HFPAPA	(7) HFPAPB	(4) HFPSLW
Surface Density	(Kg/m²)	2.6	3.5	4	2.6	2	1.8	3.4
Thickness	mm	3.0						5.0
Thickness Precision	mm	±0.3						±0.5
Izot Impact Strength	N-cm / cm²	147						110

■Surface Paint Properties (1)~(7)

Surface Paint Properties			
	Acid Resistance	5% HCl	Standard
	Alkali Resistance	5% NaOH	Standard
	Oil Resistance	Volatile Oil For 10 days	Standard
	Saline Vapor Resistance	5% NaCl 35°C 1000 hrs	Standard
	Moisture Resistance	Humidity 95% · Temperature 50°C · 1000 hrs	Standard
	Light Exposure Resistance	Outdoor Exposure For 3 years	Good

Baked Finish Steel Panels

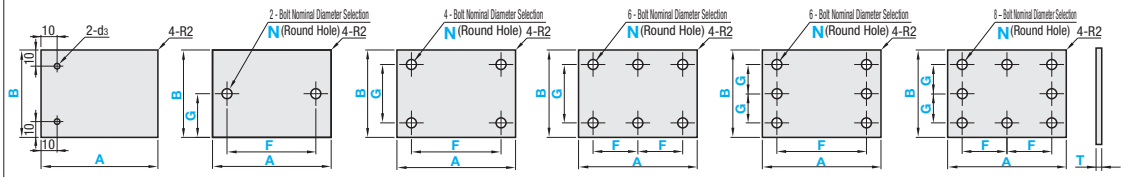
-Round Hole / Keyhole Shape Hole-



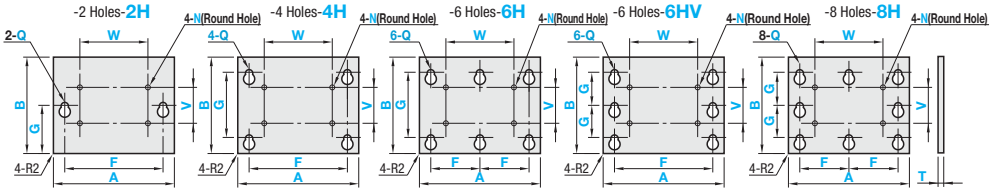
RoHS

T	M Material	S Surface Treatment
0.8 or 1.2	1.0330/DC01	Melamine Baked Finish (Base Coat: Cathodic electrodeposition coating)
1.6~3.2	1.0320/St.22	

Standard Type* **PDSPHC** — **Round Hole Type**

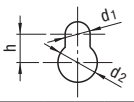


PDSPHD Keyhole Type



For standard type, there are 2 holes of Ø2.6 or Ø3.5 (d3) for paint process racking.
The round holes of PDSPHD are for handles. Select handles from **P.1037~P.1052**.

Details of Keyhole	Details of Hole Machining
Q(Keyhole)	**N(Round Hole)**

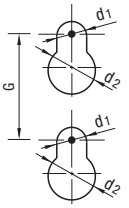


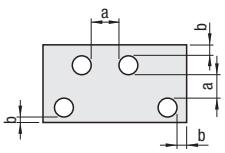
Keyhole Nominal Diameter	5	6	8
d1	6.8	8	10
d2	14	14	20
h	8	9	13



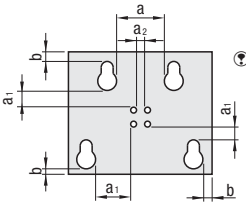
Bolt Nominal	3	4	5	6	8
d	3.5	4.5	5.2	6.8	9

***Reference Position of Keyhole**





Fabricating Conditions of Round Holes
a≥5
b≥2.5



Fabricating Conditions of Keyholes and Round Holes
a≥5
a1≥5
a2≥5
b≥5

<About Position of Keyhole>
(1): When 4H and 6H, the center of G dimension coincides with the center of B dimension.
(2): When 2H, 6HV and 8H, the diameter d_1 center of the middle Keyhole coincides with the center of B dimension.

Precision Standards

- Tolerance of A and B ±0.5
- T Dimension Tolerance

T	0.8	1.2	1.6	2.3	3.2
	+0.2 0		±0.2	±0.25	±0.3

Standard Type

Part Number Type	1mm Increment A	1mm Increment B	Selection T	Selection Paint Color	Holes for Racking d3
PDSPHC	200~1200	200~1000	0.8	19 Colors Below Types of Paint Colors	Ø2.6
			1.2		
			1.6		
			2.3		
			3.2		Ø3.5

Hole Type

Part Number Type	Nominal	1mm Increment A	1mm Increment B	Selection T	1mm Increment F	1mm Increment G	W	V	Hole Selection (1) Code	Hole Selection (1) Nominal Diameter	Hole for Handle (2) Code	Hole for Handle (2) Nominal Diameter	Selection Paint Color
PDSPHC (Round Hole)	2H 4H 6H 6HV 8H	200~1200	200~1000	0.8 1.2 1.6 2.3 3.2	14~1191 (2H · 4H · 6HV Type) 14~595 (6H · 8H Type)	5~995 (2H Type) 9~991 (4H · 6H Type) 9~495 (6HV · 8H Type)	-	-	N (Round Hole)	3 4 5 6 8	-	-	19 Colors Below Types of Paint Colors
* PDSPHD (Keyhole)	2H 4H 6H 6HV 8H	200~1200	200~1000	0.8 1.2 1.6 2.3 3.2	19~1176 (2H · 4H · 6HV Type) 19~588 (6H · 8H Type)	12~983 (2H Type) 23~971 (4H · 6H Type) 23~485 (6HV · 8H Type)	9~1148	9~939	Q (Keyhole)	5 6 8	N (Round Hole)	0 3 4 5 6 8	19 Colors Below Types of Paint Colors

*If the handle hole is specified as "No", there will be no hole.

Coating Colors (All finished in semi-gloss.): Specified by Japan Paint Manufacturers Association Color Code 2007 Edition

Color (19 Colors)

- U2570B Approx. Munsell No. 5Y7/1
- U2280D Approx. Munsell No. 2.5Y8/2
- U2290D Approx. Munsell No. 2.5Y9/2
- U2580B Approx. Munsell No. 5Y8/1
- U2790B Approx. Munsell No. 7.5Y9/1
- U2290B Approx. Munsell No. 2.5Y9/1
- U3590B Approx. Munsell No. 5GY9/1
- U3980H Approx. Munsell No. 10GY8/4
- U4270D Approx. Munsell No. 2.5G7/2
- U3960L Approx. Munsell No. 10GY6/6
- U1770X Approx. Munsell No. 7.5YR7/14
- U5760C Approx. Munsell No. 7.5BG6/1.5
- U6570L Approx. Munsell No. 5B7/6
- U6950T Approx. Munsell No. 10B5/10
- U7530P Approx. Munsell No. 5PB3/8
- UN10 Approx. Munsell No. N1
- U0740X Approx. Munsell No. 7.5R4/14
- UN95 Approx. Munsell No. N9.5
- UN70 Approx. Munsell No. N7

Order Example

■Standard Type

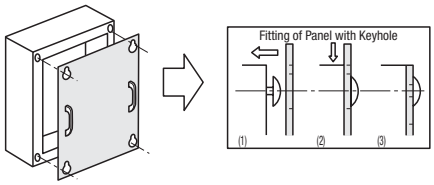
Part Number	A	B	T	Paint Color
PDSPHC	600	400	0.8	U2280D

■Hole Type

Part Number	A	B	T	F	G	W	V	Hole Selection (1) Code Nominal	Hole Selection (2) Code Nominal	Paint Color
PDSPHC4H	800	600	1.2	F700	G500			N6		U2280D
PDSPHD4H	800	600	1.2	F700	G500	W800	V100	Q6	N5	U2280D
PDSPHD4H	800	600	1.2	F700	G500	W0	V0	Q6	N0	U2280D

Days to Ship: 10 Days

Example



Price

The price of this product is found by multiplying the unit price by the material multiplier.

(Ex.) Part Number: PDSPHC - 500 - 400 - 1.6 - U2280D

(Price in the table) x (Material Multiplier) = Standard Type € Unit Price

20,70 EUR x 1.2 = 24,80 EUR (Round down to ten Cent.)

■Standard Type € Unit Price

Part Number	T (Material Multiplier)	A	€ Unit Price B 200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PDSPHC PDSPHD	0.8 (x0.8)	200~ 300								
		301~ 400								
		401~ 500								
	1.2 (x1.0)	501~ 600								
		601~ 700								
		701~ 800								
		801~ 900								
	1.6 (x1.2)	901~1000								
		1001~1100								
		1101~1200								
	2.3 (x1.0)	200~ 300								
		301~ 400								
		401~ 500								
		501~ 600								
		601~ 700								
		701~ 800								
	3.2 (x1.2)	801~ 900								
		901~1000								
		1001~1100								
		1101~1200								

■Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes: N(Round Hole)	Q(Keyhole) +N(Round Hole)	Q(Keyhole) +N0
2H			
4H			
6H			
6HV			
8H			

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.) Part Number: PDSPHC4H - 500 - 400 - 1.2 - F400 - G300 - N6 - U2280D

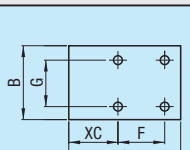
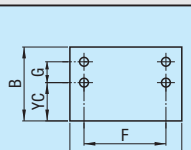
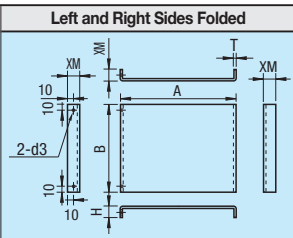
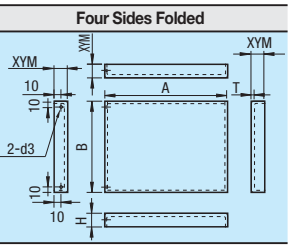
(Standard Type € Unit Price) +(Hole Machining Charge) = Hole Type Price

(20,70 EUR x1.0) + 4,00 EUR = 24,70 EUR

Alterations

Part Number	A	B	T	F	G	W	V	Hole Selection (1)	Hole Selection (2)	Paint Color	(XC · YC · XM · XYM)
PDSPHC4H	800	600	1.2	F700	G500			N5		U2280D	XC10

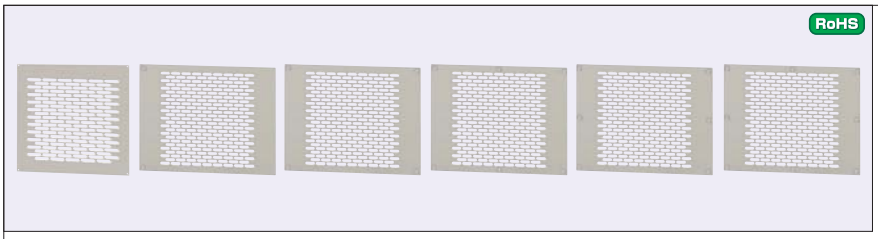
⊗Not applicable to PDSPHD.

Alterations	Round Hole Position from Left	Round Hole Position from Bottom	Left and Right Sides Folded	Four Sides Folded
				
Code	XC	YC	XM	XYM
Spec.	‹Fabrication Conditions › XC=1 mm Increment ⊕5≤XC≤1186 ⊕(2H · 4H · 6HV Type) d/2+2.5≤XC≤A-F-d/2-2.5 ⊕(6H · 8H Type) d/2+2.5≤XC≤A-2F-d/2-2.5 ⊗Not applicable to standard type.	‹Fabrication Conditions › YC=1 mm Increment ⊕5≤YC≤986 ⊕(4H · 6H Type) d/2+2.5≤YC≤B-G-d/2-2.5 ⊕(6HV / 8H Type) d/2+2.5≤YC≤B-2G-d/2-2.5 ⊗Not applicable to 2H Type ⊗Not applicable to standard type.	‹Fabrication Conditions› XM=1mm Increment T / XM 0.8 / 15≤XM≤100 1.2 / 17≤XM≤100 1.6 / 19≤XM≤100 2.3 / 21≤XM≤100 3.2 / 25≤XM≤100 ⊕Applicable to standard type only.	‹Fabrication Conditions› XYM=1mm Increment T / XYM 0.8 / 15≤XYM≤100 1.2 / 17≤XYM≤100 1.6 / 19≤XYM≤100 2.3 / 21≤XYM≤100 3.2 / 25≤XYM≤100 ⊕Applicable to standard type only.
Price Adder	4,00	4,00	20,00	40,00

Baked Finish Steel Panels

-Ventilation Hole-

CAD Data



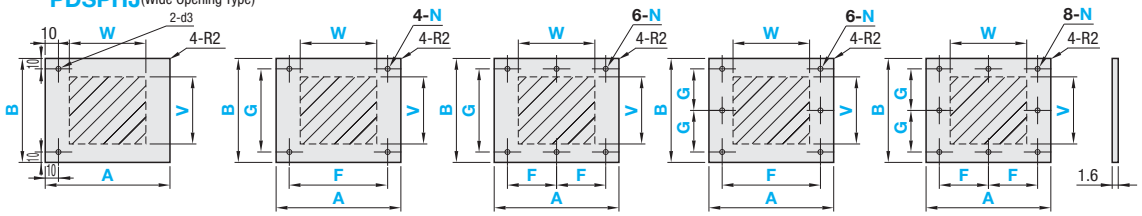
Type	Material	Surface Treatment
PDSPHK PDSPHJ	1.0320/ St.22	Melamine Baked Finish (Base Coat: Cathodic electrodeposition coating)

-Tolerance of A and B ±0.5

-Plate Thickness Tolerance ±0.2

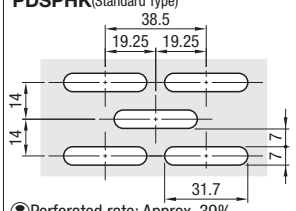
Standard Type
PDSPHK(Standard Type)
PDSPHJ(Wide Opening Type)

Hole Type
-4 Holes-**4H**
-6 Holes-**6H**
-6 Holes-**6HV**
-8 Holes-**8H**



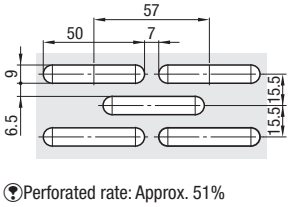
Details of Ventilation Holes

PDSPHK(Standard Type)

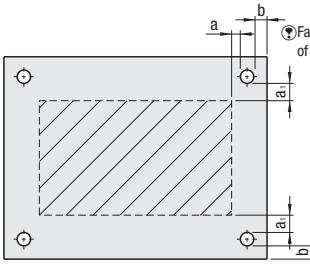


Perforated rate: Approx. 39%

PDSPHJ(Wide Opening Type)

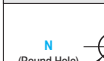


Perforated rate: Approx. 51%



Fabricating Conditions of Round Holes
a≥5
a1≥5
b≥5

Details of Hole Machining



Bolt Nominal Diameter	3	4	5	6	8
d	3.5	4.5	5.2	6.8	9

■Standard Type

Part Number Type	1mm Increment A	1mm Increment B	1mm Increment W	1mm Increment V	Selection Paint Color
PDSPHK (Standard Type) PDSPHJ (Wide Opening Type)	200 ~ 1200	200 ~ 1000	100 ~ 950	100 ~ 950	19 Colors P.835 Types of Paint Colors

■Round Hole Type

Part Number Type	Nominal	1mm Increment A	1mm Increment B	1mm Increment F	1mm Increment G	1mm Increment W	1mm Increment V	Mounting Holes N	Selection Paint Color
PDSPHK (Standard Type) PDSPHJ (Wide Opening Type)	4H 6H 6HV 8H	200 ~ 1200	200 ~ 1000	4H 9~1186 6H 9~593 6HV 364~1186 8H 182~593	4H 9~986 6H 364~986 6HV 9~493 8H 182~493	100 ~ 950	100 ~ 950	3 4 5 6 8	19 Colors P.835 Types of Paint Colors

Order Example

■Standard Type

Part Number	A	B	W	V	Paint Color
PDSPHJ	800	700	700	600	UN95

Days to Ship **10 Days**

■Hole Type

Part Number	A	B	F	G	W	V	Bolt Nominal	Paint Color
PDSPHK6H	800	600	F380	G500	W500	V400	N6	U2280D

Price

Part Number	A	€ Unit Price B 200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PDSPHK (Standard Type) PDSPHJ (Wide Opening Type)	200~ 300								
	301~ 400								
	401~ 500								
	501~ 600								
	601~ 700								
	701~ 800								
	801~ 900								
	901~1000								
	1001~1100								
	1101~1200								

■Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes N(Through Hole)
4H	
6H	
6HV	
8H	

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.)

Part Number	A	B	F	G	W	V	Bolt Nominal	Paint Color
PDSPHK4H	600	400	F580	G380	W500	V350	N6	U2280D

(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price
44,00 EUR + 6,00 EUR = 50,00 EUR

Baked Finish Steel Panels

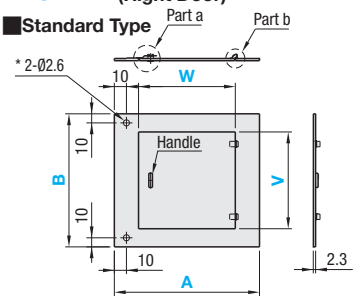
-Left, Right Door · Double Doors-



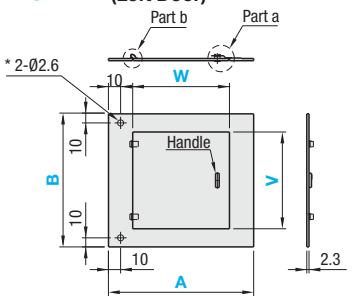
Type	Material	Surface Treatment
PDSPHR PDSPHL PDSPHA	1.0320/St.22	Melamine Baked Finish (Base Coat: Cathodic electrodeposition coating)

PDSPHR (Right Door)

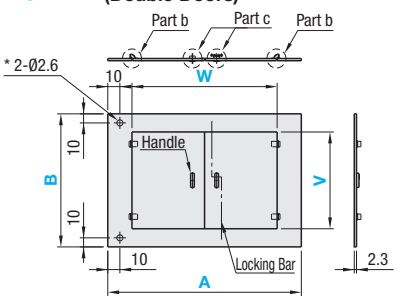
■Standard Type



PDSPHL (Left Door)

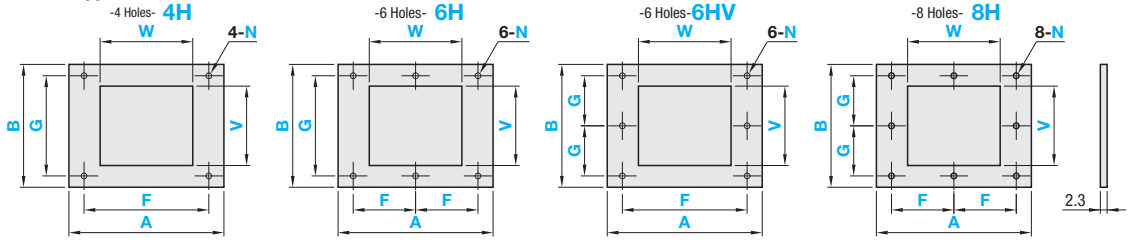


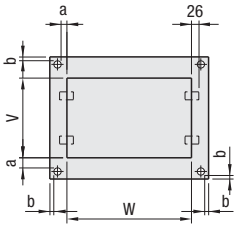
PDSPHA (Double Doors)



*For Standard Types, there are two holes for painting and handling. ⓟKeys are attached to all three types.

■Hole Type





ⓟFabricating Conditions of Round Holes
a≥31
b≥5

Details of Hole Machining

N (Round Hole)



Bolt Nominal Diameter	3	4	5	6	8
d	3.5	4.5	5.2	6.8	9

PDSPHR PDSPHL	When 701≤V≤1200, 1 handle with locking bar, 1 handle same as PDSPHA and 3 hinges are attached.
PDSPHA	When 701≤V≤1200, 3 hinges are attached.

■Standard Type

Part Number Type	A	B	W	V	Selection Paint Color
PDSPHR PDSPHL	500~ 800	500~1500	400~700	400~1200	19 Colors P.835 Types of Paint Colors
PDSPHA	800~1200				

■Hole Type

Part Number Type	Nominal	A	B	F	G	W	V	Mounting Holes N (Round Hole)	Selection Paint Color
PDSPHR PDSPHL	4H 6H 6HV 8H	500~ 800	500~1500	4H 9~1186 6H 9~593 6HV 466~1186 8H 233~593	4H 9~1486 6H 466~1486 6HV 9~743 8H 233~743	400~700	400~1200	3 4 5 6 8	19 Colors P.835 Types of Paint Colors
PDSPHA		800~1200							

ⓟA-W≥100 and B-V≥100 are required.

Order Example

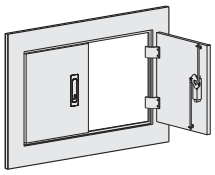
■Standard Type

Part Number	A	B	W	V	Paint Color
PDSPHR	620	520	460	420	U2280D

■Hole Type

Part Number	A	B	F	G	W	V	Bolt Nominal	Paint Color
PDSPHR4H	600	500	F550	G470	W450	V400	N6	U2280D

Example



Days to Ship

13 Days

Price

■Standard Type € Unit Price

Part Number	A	€ Unit Price B									
		500~600	601~700	701~800	801~900	901~1000	1001~1100	1101~1200	1201~1300	1301~1400	1401~1500
PDSPHR PDSPHL	500~ 600										
	601~ 700										
	701~ 800										
PDSPHA	800~ 900										
	901~ 1000										
	1001~ 1100										
	1101~ 1200										

■Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes N (Round Hole)
4H	
6H	
6HV	
8H	

ⓟThe price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

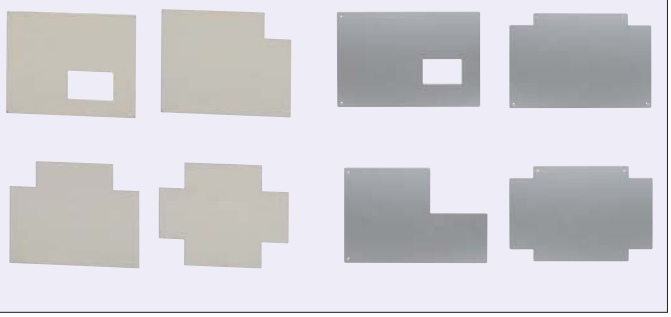
(Ex.)

Part Number	A	B	F	G	W	V	Bolt Nominal	Paint Color
PDSPHR4H	800	600	F780	G570	W680	V500	N6	U2280D

(Standard Type € Unit Price)+(Hole Machining Charge)=Total Price
51,00 EUR + 4,00 EUR =55,00 EUR

Baked Finish Steel Panels
-Selectable Shapes-

■PDSPH_ ■PAAL_ RoHS



Type	T	M Material	S Surface Treatment
PDSPH_	0.8 or 1.2	1.0330/DC01	Melamine Baked Finish (Base Coat: Cathodic electrodeposition coating)
	1.6~3.2	1.0320/St.22	
PAAL_	1.0~3.0	EN AW-5052	Clear Anodize

■Precision Standards

- Tolerance of A and B ±0.5
- T Dimension Tolerance

T Dimensions	0.8	1.2	1.6	2.3	3.2
PDSPH_	±0.2	±0.2	±0.2	±0.25	±0.3

T Dimensions	1.0	1.5	2.0	3.0
PAAL_	±0.06	±0.09	±0.09	±0.10

Round holes specified by F and G are positioned in the center of each side.
Cut surfaces and mounting holes of PAAL_ are not anodized.

Details of Hole Machining

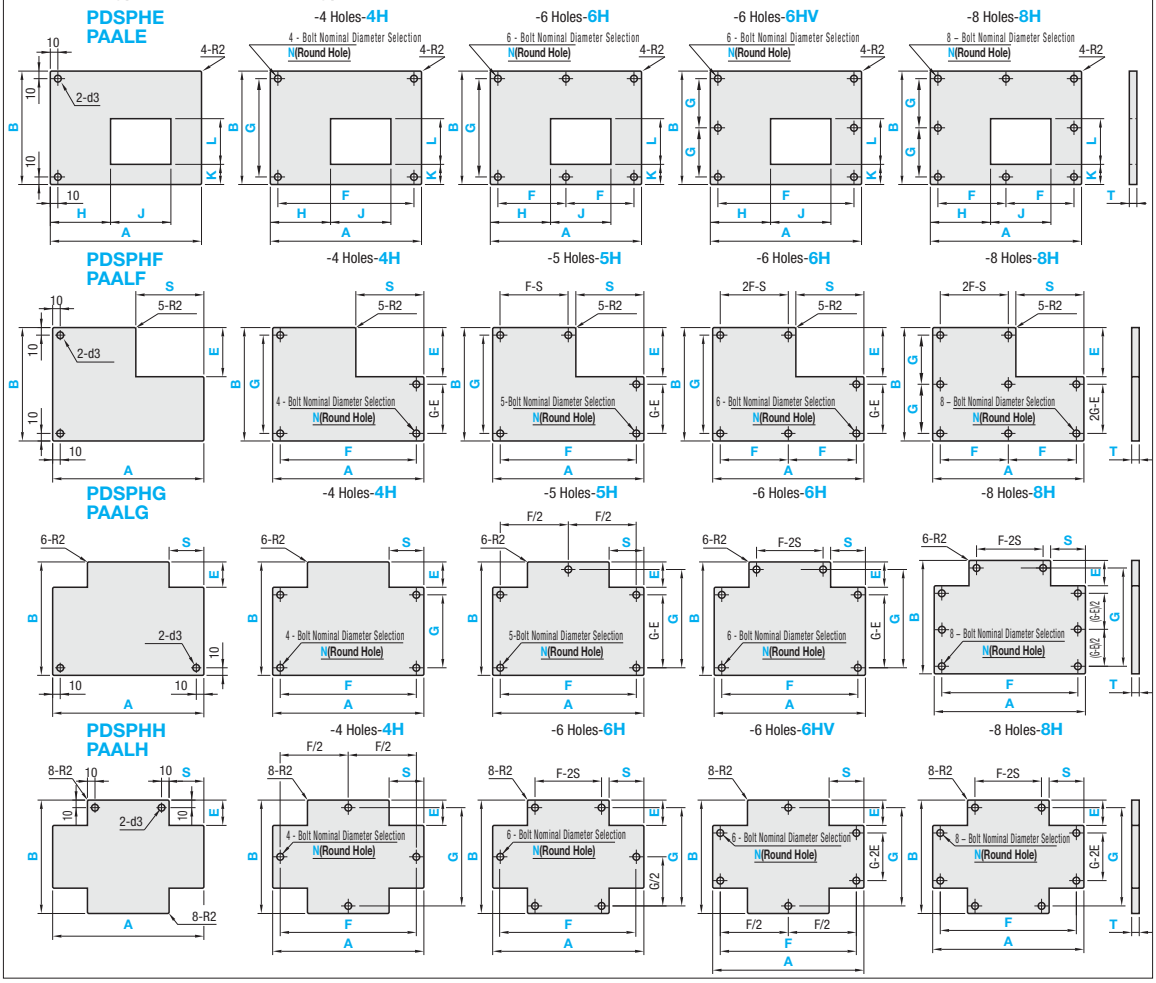
N(Round Hole)



Bolt Nominal Diameter	3	4	5	6	8
d	3.5	4.5	5.2	6.8	9

Fabricating Conditions: 5mm is required for the distance between the edge of the round hole and the end surface, and between the hole edges.

Standard Type Round Hole Type



■Coating Colors (All finished in semi-gloss.): Specified by Japan Paint Manufacturers Association Color Code 2007 Edition

Color (19 Colors)

U2570B Approx. Munsell No. 5Y7/1	U2280D Approx. Munsell No. 2.5Y8/2	U2290D Approx. Munsell No. 2.5Y9/2	U2580B Approx. Munsell No. 5Y8/1	U2790B Approx. Munsell No. 7.5Y9/1	UN10 Approx. Munsell No. N1
U2290B Approx. Munsell No. 2.5Y9/1	U3590B Approx. Munsell No. 5GY9/1	U3980H Approx. Munsell No. 10GY8/4	U4270D Approx. Munsell No. 2.5G7/2	U3960L Approx. Munsell No. 10GY6/6	U0740X Approx. Munsell No. 7.5R4/14
U1770X Approx. Munsell No. 7.5YR7/14	U5760C Approx. Munsell No. 7.5BG6/1.5	U6570L Approx. Munsell No. 5B7/6	U6950T Approx. Munsell No. 10B5/10	U7530P Approx. Munsell No. 5PB3/8	UN95 Approx. Munsell No. N9.5
					UN70 Approx. Munsell No. N7

Standard Type

Part Number Type	1mm Increment A	1mm Increment B	Selection T	1mm Increment E	S	H	J	K	L	Selection Paint Color
PDSPHE	200 ~ 1200	200 ~ 1000	0.8	-	-	10 ~ 1180	10 ~ 1180	10 ~ 980	10 ~ 980	19 Colors P.835 Types of Paint Colors
PDSPHF			1.2	10 ~ 983	10 ~ 1183	-	-	-	-	
PDSPHG			1.6	10 ~ 983	10 ~ 585	-	-	-	-	
PDSPHH			2.3	10 ~ 485	10 ~ 585	-	-	-	-	
PAALE	200 ~ 1000		3.2	-	-	10 ~ 980	10 ~ 980	10 ~ 980	10 ~ 980	-
PAALF			1.0	10 ~ 983	10 ~ 983	-	-	-	-	
PAALG			1.5	10 ~ 983	10 ~ 983	-	-	-	-	
PAALH			2.0	10 ~ 485	10 ~ 485	-	-	-	-	
			3.0							

For standard type, there are 2 holes (d3) for painting and handling.

T	d3
0.8 · 1.2 · 1.6 · 2.3	2.6
3.2	3.5

Hole Type

Part Number Type	Nominal	1mm Increment A	1mm Increment B	Selection T	1mm Increment E	S	F	G	H	J	K	L	Bolt Nominal Diameter N (Round Hole)	Selection Paint Color
PDSPHE	4H 6H 6HV 8H	200 ~ 1200	200 ~ 1000	0.8	-	-	9 ~ 1186	9 ~ 986	10 ~ 1180	10 ~ 1180	10 ~ 980	10 ~ 980	3 4 5 6 8	19 Colors P.835 Types of Paint Colors
PDSPHF	4H 5H 6H 8H			1.2	10 ~ 978	10 ~ 1186			-	-	-	-		
PDSPHG	4H 5H 6H 8H			1.6	10 ~ 978	10 ~ 585			-	-	-	-		
PDSPHH	4H 6H 6HV 8H			2.3	10 ~ 743	10 ~ 593			-	-	-	-		
PAALE	4H 6H 6HV 8H	200 ~ 1000		3.2	-	-			10 ~ 980	10 ~ 980	10 ~ 980	10 ~ 980		-
PAALF	4H 5H 6H 8H			1.0	10 ~ 978	10 ~ 986	9 ~ 986	9 ~ 986	-	-	-	-		
PAALG	4H 5H 6H 8H			1.5	10 ~ 978	10 ~ 485			-	-	-	-		
PAALH	4H 6H 6HV 8H			2.0	10 ~ 743	10 ~ 493			-	-	-	-		
				3.0										

For PDSPHE, there must be at least 10mm between end of body / through hole and opening.

Order Example

Standard Type

Part Number	A	B	T	E	S	H	J	K	L	Paint Color
PDSPHF	600	400	0.8	E100	S100					U2790B
PAALE	500	500	1.0			H550	J240	K200	L150	

Hole Type

Part Number	A	B	T	E	S	F	G	H	J	K	L	Bolt Nominal	Paint Color
PDSPHF4H	800	600	1.2	E100	S100	F550	G550					N5	U2790B
PDSPHE8H	900	500	2.3			F440	G240	H200	J500	K200	L150	N6	U2290D

Days to Ship

10 Days

Price

The price of this product is found by multiplying the unit price by the material multiplier.

(Ex.) Part Number: PDSPHF - 500 - 400 - 1.6 - E100 - S100 - Paint Color: U2280D

(Price in the table) x (Material Multiplier) = Standard Type € Unit Price

17,30 EUR x 1.2 = 20,70 EUR (Round down to ten Cent.)

Standard Type € Unit Price

Part Number	T (Material Multiplier)	A	€ Unit Price B 200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PDSPHE	0.8 (x0.8)	200~ 300								
	1.2 (x1.0)	301~ 400								
	1.6 (x1.2)	401~ 500								
	2.3 (x1.25)	501~ 600								
	3.2 (x1.5)	601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								
		1001~ 1100								
		1101~ 1200								
PDSPHF	0.8 (x0.8)	200~ 300								
	1.2 (x1.0)	301~ 400								
	1.6 (x1.2)	401~ 500								
	2.3 (x1.25)	501~ 600								
	3.2 (x1.5)	601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								
		1001~ 1100								
		1101~ 1200								
PDSPHG	0.8 (x0.8)	200~ 300								
	1.2 (x1.0)	301~ 400								
	1.6 (x1.2)	401~ 500								
	2.3 (x1.25)	501~ 600								
	3.2 (x1.5)	601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								
		1001~ 1100								
		1101~ 1200								
PDSPHH	0.8 (x0.8)	200~ 300								
	1.2 (x1.0)	301~ 400								
	1.6 (x1.2)	401~ 500								
	2.3 (x1.25)	501~ 600								
	3.2 (x1.5)	601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								
		1001~ 1100								
		1101~ 1200								

Part Number	T (Material Multiplier)	A	€ Unit Price B 200~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PAALE	1.0 (x1.1)	200~ 300								
	1.5 (x1.0)	301~ 400								
	2.0 (x1.2)	401~ 500								
	3.0 (x1.45)	501~ 600								
		601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								
PAALF	1.0 (x1.1)	200~ 300								
	1.5 (x1.0)	301~ 400								
	2.0 (x1.2)	401~ 500								
	3.0 (x1.45)	501~ 600								
		601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								
PAALG	1.0 (x1.1)	200~ 300								
	1.5 (x1.0)	301~ 400								
	2.0 (x1.2)	401~ 500								
	3.0 (x1.45)	501~ 600								
		601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								
PAALH	1.0 (x1.1)	200~ 300								
	1.5 (x1.0)	301~ 400								
	2.0 (x1.2)	401~ 500								
	3.0 (x1.45)	501~ 600								
		601~ 700								
		701~ 800								
		801~ 900								
		901~ 1000								

Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes N (Round Hole)
4H	
5H	
6H	
6HV	
8H	

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.) Part Number: PDSPHF4H - 500 - 400 - 1.2 - E50 - S50 - F400 - G300 - Bolt Nominal: N6 - Paint Color: U2280D

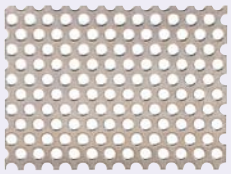
(Standard Type € Unit Price) +(Hole Machining Charge) =Hole Type Price

(17,30 EUR x 1.0) + 6,00 EUR =23,30 EUR

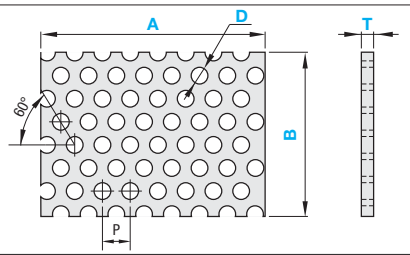
Perforated Metals

-Standard-

RoHS



Type	M Material	S Surface Treatment
PMS	1.0330/DC01	Nickel Plating
PMU	1.4301/X5CrNi18-10	-
PMAL	EN AW-1100/Al99Cu	-



(?)A≥B (?)Punched holes and material edges are in arbitrary relationship.

Part Number Type	D	1mm Increment A	1mm Increment B	T PMU	T PMAL	P	Perforated Rate (%)
PMU	1	50~700	50~700	0.5 0.8	0.5 0.8	2	22.6
	2			0.5 0.8 1.0	1.0	3	40.2
	3			1.0 1.2 1.6	1.0 1.2 1.5	5	32.6
	4					7	29.6
	5					8	35.4
	*8			-	1.5	13	34.3
PMAL	3	100~700	100~700	-	-	5	32.6
	5				1.0 2.0	8	35.4
	9					15	32.6

(?)*D8 is not available for PMS.

Order Example

Part Number	-	A	-	B	-	T
PMS4	-	480	-	420	-	1.2

Days to Ship 8 Days

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	Price List	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

1mm Increment A	1mm Increment B	D1 T=0.5	D1 T=0.8	D2 T=0.5	D2 T=0.8	D2 T=1.0	D3 T=1.0	D3 T=1.2	D3 T=1.6	D4 T=1.0	D4 T=1.2	D4 T=1.6	D5 T=1.0	D5 T=1.2	D5 T=1.6
50~100	50~100														
101~200	50~100														
	101~200														
201~300	50~100														
	101~200														
	201~300														
301~500	50~100														
	101~200														
	201~300														
	301~400														
	401~500														
501~700	50~100														
	101~200														
	201~300														
	301~400														
	401~500														
	501~700														

PMU

1mm Increment A	1mm Increment B	D1 T=0.5	D1 T=0.8	D2 T=1.0	D3 T=1.0	D3 T=1.2	D3 T=1.5	D4 T=1.0	D4 T=1.2	D4 T=1.5	D5 T=1.0	D5 T=1.2	D5 T=1.5	D8 T=1.5
50~100	50~100													
101~200	50~100													
	101~200													
201~300	50~100													
	101~200													
	201~300													
301~500	50~100													
	101~200													
	201~300													
	301~400													
	401~500													
501~700	50~100													
	101~200													
	201~300													
	301~400													
	401~500													
	501~700													

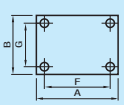
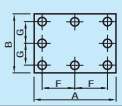
PMAL

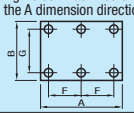
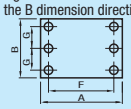
1mm Increment A	1mm Increment B	D3 T=1.0	D3 T=2.0	D5 T=1.0	D5 T=2.0	D9 T=1.0	D9 T=2.0
100~200	100~200						
201~300	100~200						
	201~300						
301~500	100~200						
	201~300						
	301~400						
	401~500						
501~700	100~200						
	201~300						
	301~400						
	401~500						
	501~700						

Alterations

Part Number	-	A	-	B	-	T	-	(XC · XWC · XAC · XBC)
PMS1	-	100	-	80	-	0.8	-	XC4.5 - F50 - G40

(?)Alteration is applicable to sizes D1 and D2 only.

Alterations	Code	Spec.	Price Adder
4 Mounting Holes *Adds 4 mounting holes. 	XC	XC, XWC= Hole Dia. Selectable F, G=1mm Increment Ordering Code XC4.5-F50-G40 XWC5.5-F35-G35 (?)Hole Dia. Selection Table XC / XWC 4.5 5.5 6.5 9	4,00
8 Mounting Holes *Adds 8 mounting holes. 	XWC	(?)XC+6≤F≤A-XC-6 (?)XC+6≤G≤B-XC-6 (?)XWC+6≤F≤A/2-XWC/2-3 (?)XWC+6≤G≤B/2-XWC/2-3	8,00

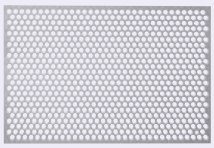
Alterations	Code	Spec.	Price Adder
6 Mounting Holes *Machines 6 mounting holes in the A dimension direction. 	XAC	XAC, XBC= Hole Dia. Selection F, G=1mm Increment Ordering Code XAC4.5-F76-G55 XBC5.5-F90-G45 (?)Hole Dia. Selection Table XAC / XBC 4.5 5.5 6.5 9	6,00
6 Mounting Holes *Adds 6 mounting holes in the B dimension direction. 	XBC	(?)XAC+6≤F≤A/2-XAC/2-3 (?)XAC+6≤G≤B-XAC-6 (?)XBC+6≤F≤A-XBC-6 (?)XBC+6≤G≤B/2-XBC/2-3	6,00

Perforated Metals

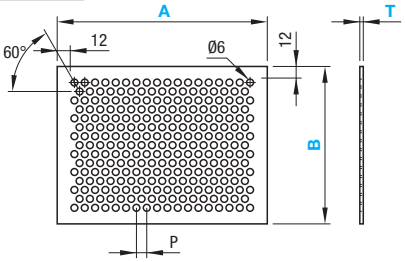
-Perforated Metals with Flames-

■Fixed Dimension Perforated Metals

RoHS



Type	Material	Suface Treatment
PMST	EN AW-5052/AlMg2,5	-
PMUT	1.4301/X5CrNi18-10	-



Part Number	Selection			€ Unit Price	P	Perforated Rate (%)
Type	A	B	T			
PMUT	200	300	0.3		9	40.3
	300	400				
PMST	200	300	0.6			
	300	400				

Order Example

Part Number	-	A	-	B	-	T
PMUT	-	200	-	300	-	0.3

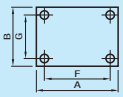
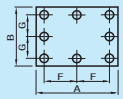
Days to Ship

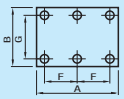
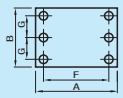
6 Days P.88

Alterations

Part Number	-	A	-	B	-	T	-	(XC · XWC · XAC · XBC)
PMUT	-	200	-	300	-	0.3	-	XC6.5 - F180 - G280

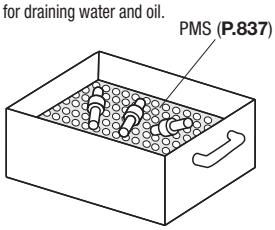
Days to Ship: 8 Days

Alterations	Code	Spec.	Price Adder
4 Mounting Holes *Adds 4 mounting holes. 	XC	XC, XWC= Hole Dia. Selectable F, G=1mm Increment Ordering Code XC4.5-F50-G40 XWC5.5-F35-G35 Hole Dia. Selection Table XC / XWC: 4.5 5.5 6.5 XC+6≤F≤A-XC-6 XC+6≤G≤B-XC-6 XWC+6≤F≤A/2-XWC/2-3 XWC+6≤G≤B/2-XWC/2-3	4,00
8 Mounting Holes *Adds 8 mounting holes. 	XWC		8,00

Alterations	Code	Spec.	Price Adder
6 Mounting Holes *Machines 6 mounting holes in the A dimension direction. 	XAC	XAC, XBC= Hole Dia. Selection F, G=1mm Increment Ordering Code XAC4.5-F76-G55 XBC5.5-F90-G45 Hole Dia. Selection Table XAC / XBC: 4.5 5.5 6.5 XAC+6≤F≤A/2-XAC/2-3 XAC+6≤G≤B-XAC-6 XBC+6≤F≤A-XBC-6 XBC+6≤G≤B/2-XBC/2-3	6,00
6 Mounting Holes *Adds 6 mounting holes in the B dimension direction. 	XBC		6,00

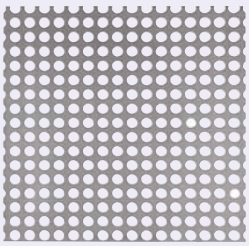
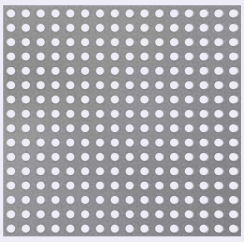
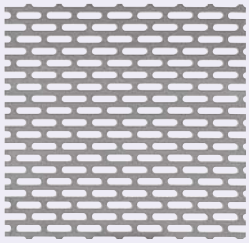
Example

Used for draining water and oil.



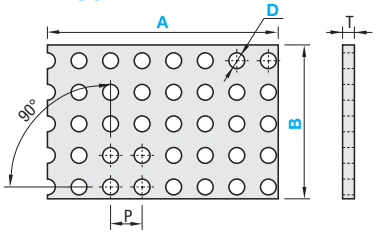
Perforated Metals
-Round Hole Parallel · Slot Hole-

RoHS

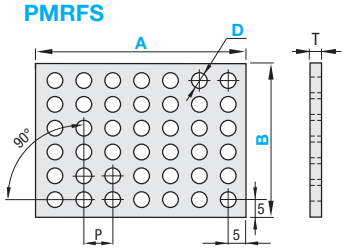
Type	M Material	S Surface Treatment
PMRU · PMRF · PMLU	1.0038/ S235JR	Zinc Plating
PMRUS · PMRFS · PMLUS	1.4301/ X5CrNi18-10	-

<Round Hole Parallel · 1mm Increment Type>
PMRU
PMRUS



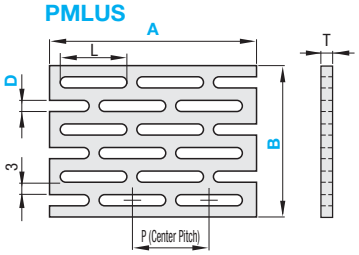
A · B Dimension Configurable : 1mm Increment
Cut edges may interrupt the perforations, as shown above.
(Cut location cannot be specified.)

<Round Hole Parallel · 10mm Increment Type>
PMRF
PMRFS



A · B Dimension Configurable : 10mm Increment
As the drawing above shows, no holes interfere the cutting surfaces.

<Long Hole Type>
PMLU
PMLUS



A≥B

Part Number Type	D	1mm Increment A	B	T	P	L	Perforated Rate %
PMRU PMRUS	5	100~500	100~500	1.0	8	-	30.7
	8				12	-	34.9
	10				15	-	34.9
PMLU PMLUS	5			1.0	25	20	47.1

Part Number Type	D	10mm Increment A	B	T	P	Perforated Rate %
PMRF PMRFS	5	100~500	100~500	1.0	10	19.6

Order Example: Part Number - A - B
PMLU5 - 480 - 420

Days to Ship: 8 Days

Price (euros)

Volume Discount (Round down to one Cent.) P.87

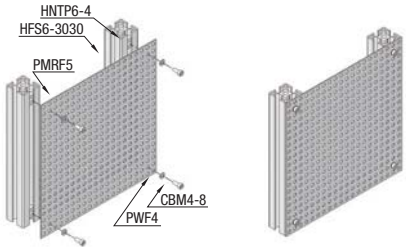
Quantity	1~9	10~29
Rate	Price List	5%

For orders larger than indicated quantity, please request a quotation.

1mm Increment A	B	€ PMRU D=5	D=8	D=10	€ PMRUS D=5	D=8	D=10	€ PMLU D=5	€ PMLUS D=5
100~200	100~200								
201~300	100~200								
	201~300								
301~500	100~200								
	201~300								
	301~400								
	401~500								

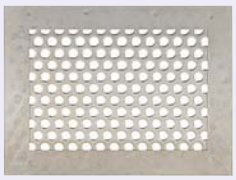
10mm Increment A	B	€ PMRF D=5	€ PMRFS D=5
100~200	100~200		
201~300	100~200		
	201~300		
301~500	100~200		
	201~300		
	301~400		
	401~500		

Example



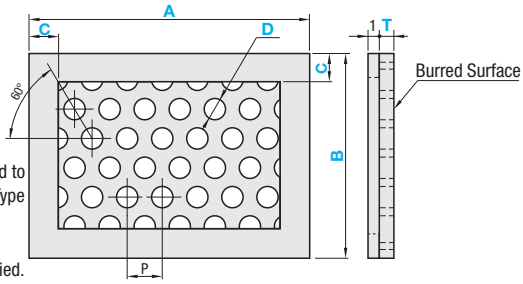
Perforated Metals
-Framed-

RoHS



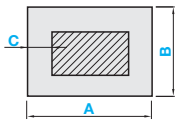
Type	M Material	S Surface Treatment
PMSF	1.0330/DC01	Nickel Plating
PMUF	1.4301/ X5CrNi18-10	-

- A≥B
- Frame of the same material is spot-welded to Perforated Metal Round Hole 60° Layout Type (PMS · PMU).
- PMUF is acid pickled after spot-welded.
- Hole positions on frames cannot be specified.



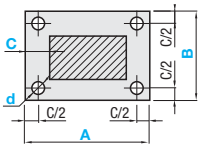
PMSF
PMUF

Standard Type

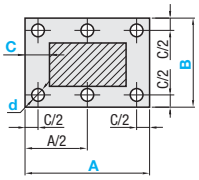


Hole Type

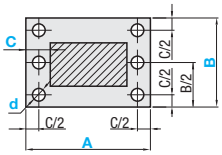
-4 Holes-**4H**



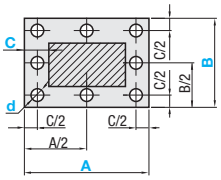
-6 Holes-**6H**



-6 Holes-**6HV**



-8 Holes-**8H**



■Standard Type

Part Number Type	D	1mm Increment A	1mm Increment B	T PMSF	T PMUF	C	P	Perforated Rate %
PMSF PMUF	1	50~500	50~500	0.5 0.8	0.5 0.8	10 15 20	2	22.6
	2			0.5 0.8 1.0	1.0		3	40.2
	3			1.0 1.2 1.6	1.0 1.2 1.5		5	32.6
	4						7	29.6
	5						8	35.4

■Hole Type

Part Number Type	Nominal	D	1mm Increment A	1mm Increment B	T PMSF	T PMUF	C	d	P	Perforated Rate %
PMSF PMUF	4H 6H 6HV 8H	1	50~500	50~500	0.5 0.8	0.5 0.8	10 15 20	4.5 5.5 6.5 9	2	22.6
		2			0.5 0.8 1.0	1.0			3	40.2
		3			1.0 1.2 1.6	1.0 1.2 1.5			5	32.6
		4							7	29.6
		5							8	35.4

- d6.5 or 9 is not selectable when C=10.

Order Example

Part Number	A	B	T	C	d
PMSF4	480	420	1.2	20	
PMSF4H3	480	420	1.2	20	6.5

Days to Ship 8 Days

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~49
Rate	Price List	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Type	1mm Increment A	1mm Increment B	€ D1 T=0.5	€ D1 T=0.8	€ D2 T=0.5	€ D2 T=0.8	€ D2 T=1.0	€ D3 T=1.0	€ D3 T=1.2	€ D3 T=1.6	€ D4 T=1.0	€ D4 T=1.2	€ D4 T=1.6	€ D5 T=1.0	€ D5 T=1.2	€ D5 T=1.6
PMSF	50~200	50~200														
	201~300	50~200														
		201~300														
	301~500	50~200														
		201~300														
		301~400														
		401~500														

Type	1mm Increment A	1mm Increment B	€ D1 T=0.5	€ D1 T=0.8	€ D2 T=1.0	€ D3 T=1.0	€ D3 T=1.2	€ D3 T=1.5	€ D4 T=1.0	€ D4 T=1.2	€ D4 T=1.5	€ D5 T=1.0	€ D5 T=1.2	€ D5 T=1.5
PMUF	50~200	50~200												
	201~300	50~200												
		201~300												
	301~500	50~200												
		201~300												
		301~400												
		401~500												

■Hole Machining Charge

Hole Type	Hole Machining Charge d (Through Hole)
4H	
6H	
6HV	
8H	

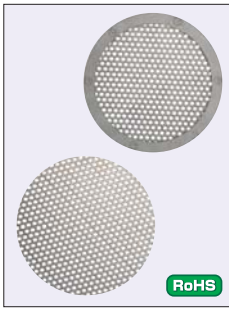
The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.) Part Number - A - B - T - C - d
PMSF4H3 - 480 - 420 - 1.2 - 20 - 6.5

(Standard Type € Unit Price)+(Hole Machining Charge) = Total Price
61,80 EUR + 4,00 EUR = 65,80 EUR

Perforated Metals

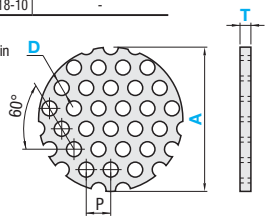
-Standard Circular / Framed Circular-



Type		Material	Surface Treatment
Standard	Framed		
PMC	PMCF	1.0330/DC01	Nickel Plating
PMCU	PMCUF	1.4301/X5CrNi18-10	-

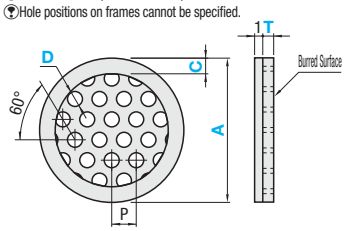
PMC · PMCU

Punched holes and material edges are in arbitrary relationship.



PMCF · PMCUF

Frame of the same material is spot-welded to Standard Type (PMC / PMCU).
PMCUF is acid pickled after spot-welded.
Hole positions on frames cannot be specified.



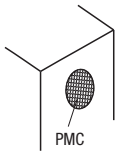
Part Number Type		D	1mm Increment A	T PMC · PMCF	T PMCU · PMCUF	C PMCF · PMCUF	P	Perforated Rate %
Standard	Framed	1	(Standard Type) 30~300 (Framed Type) 50~300	0.5 0.8	0.5 0.8	10 15 20	2	22.6
PMC	PMCF	2		0.5 0.8 1.0	1.0		3	40.2
PMCU	PMCUF	3					5	32.6
		4		1.0 1.2 1.6	1.0 1.2 1.5		7	29.6
		5					8	35.4

Order Example

Part Number	-	A	-	T	-	C
PMC4	-	280	-	1.0		
PMCF4	-	200	-	1.2	-	10

Days to Ship 10 Days

Example



Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~49
Rate	Price List	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

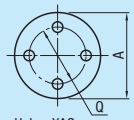
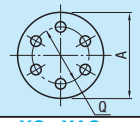
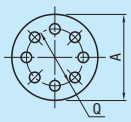
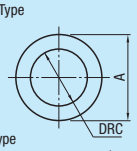
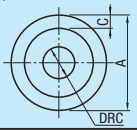
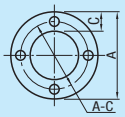
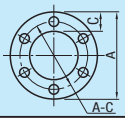
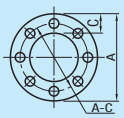
A	€ PMC													€ PMCU										
	D1		D2		D3			D4			D5			D1		D2	D3			D4			D5		
	T0.5	T0.8	T0.5	T0.8	T1.0	T1.0	T1.2	T1.6	T1.0	T1.2	T1.6	T1.0	T1.2	T1.6	T0.5	T0.8	T1.0	T1.0	T1.2	T1.5	T1.0	T1.2	T1.5	T1.0	T1.2	T1.5
30~100																										
101~200																										
201~300																										

A	€ PMCF													€ PMCUF										
	D1		D2		D3			D4			D5			D1		D2	D3			D4			D5		
	T0.5	T0.8	T0.5	T0.8	T1.0	T1.0	T1.2	T1.6	T1.0	T1.2	T1.6	T1.0	T1.2	T1.6	T0.5	T0.8	T1.0	T1.0	T1.2	T1.5	T1.0	T1.2	T1.5	T1.0	T1.2	T1.5
50~100																										
101~200																										
201~300																										

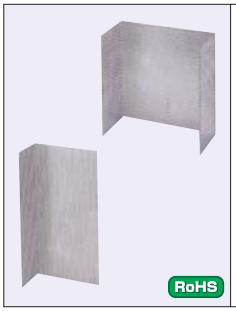
Alterations

Part Number	-	A	-	T	-	C	-	(XC · XAC · XWC · DRC · NC · NAC · NWC)
PMC1	-	100	-	0.8			-	XC9 - Q60
PMCF4	-	200	-	1.2	-	10	-	NC4.5

Alteration XC, XAC and XWC are applicable to sizes D1 and D2 only.

	4 · 6 Mounting Holes	8 Mounting Holes	Through Hole Drilled	4 · 6 Mounting Holes	8 Mounting Holes
Alterations	•4 Mounting Holes: XC  •6 Mounting Holes: XAC 		·Standard Type  ·Framed Type 	•4 Mounting Holes: NC  •6 Mounting Holes: NAC 	
Code	XC · XAC	XWC	DRC	NC · NAC	NWC
Spec.	XC, XAC=Hole Dia. Selectable Q=1 mm Increment Ordering Code XC4.5-Q30 XAC5.5-Q50 Hole Dia. Selection Table XC / XAC: 4.5 5.5 6.5 9 XC+10≤Q≤A-XC-6 XAC+20≤Q≤A-XAC-6 Applicable to standard type only. XC hole diameter 9 is applicable to A≥50. XAC is applicable to A≥50.	XWC=Hole Dia. Selection Q=1 mm Increment Hole Dia. Selection Table XWC: 4.5 5.5 6.5 9 XWC+20≤Q≤A-XWC-6 Applicable to Standard Type only. Applicable when A≥50	*Adds a drill hole in the center. DRC=1 mm Increment Ordering Code DRC40 -Standard Type 20≤DRC≤A-30 ⊗Combination use of XC, XAC, XWC is not possible. -Framed Type 20≤DRC≤A-2C-30 Applicable when A≥50	NC, NAC=Hole Dia. Selection Ordering Code NC4.5 NAC6.5 Hole Dia. Selection Table C: 10 — d: 4.5 5.5 C: 15 — d: 4.5 5.5 6.5 9 C: 20 — d: 4.5 5.5 6.5 9 Applicable to framed type only.	NWC=Hole Dia. Selection Ordering Code NWC9 Hole Dia. Selection C C: 10 — d: 4.5 5.5 C: 15 — d: 4.5 5.5 6.5 9 C: 20 — d: 4.5 5.5 6.5 9 Applicable to framed type only.
Price Adder	XC:4,00 XAC:6,00	8,00	2,00	NC:4,00 NAC:6,00	8,00

Perforated Metals
-L-Shaped · U-Shaped-

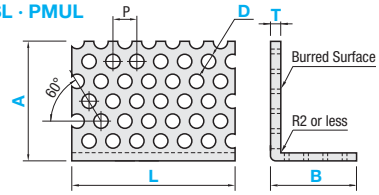


Type		M Material	S Surface Treatment
L-Shaped	U-Shaped		
PMSL	PMSU	1.0330/DC01	Nickel Plating
PMUL	PMUU	1.4301X5CrNi18-10	-

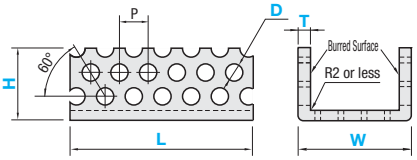
Hole positions on cut surface cannot be specified (The curved section doesn't always have holes).

T	A · B Tolerance	W Tolerance	H Tolerance
0.5	±0.5	±1.0	±0.5
0.8	±0.8	±1.6	±0.8
1.0	±1.0	±2.0	±1.0

PMSL · PMUL



PMSU · PMUU



■L-Shaped

Part Number		1mm Increment			T		P	Perforated Rate %
Type	D	A	B	L	PMSL	PMUL		
PMSL	1	30~200	30~200	30~300	0.5 0.8	0.5 0.8	2	22.6
PMUL	2				0.5 0.8 1.0	1.0	3	40.2

■U-Shaped

Part Number		1mm Increment			T		P	Perforated Rate %
Type	D	W	H	L	PMSU	PMUU		
PMSU	1	60~200	30~100 (H≤W/2)	30~300	0.5 0.8	0.5 0.8	2	22.6
PMUU	2				0.5 0.8 1.0	1.0	3	40.2

Order Example

Part Number	A	B	L	T
PMUL2	100	50	200	1.0

Part Number	W	H	L	T
PMSU1	120	60	200	0.8

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	Price List	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 10 Days

■L-Shaped

A	L	€ PMSL D1 T0.5	€ PMSL D1 T0.8	€ PMSL D2 T0.5	€ PMSL D2 T0.8	€ PMSL D2 T1.0	€ PMUL D1 T0.5	€ PMUL D1 T0.8	€ PMUL D2 T1.0
30~ 50	30~100								
	101~200								
	201~300								
51~100	30~100								
	101~200								
	201~300								
101~150	30~100								
	101~200								
	201~300								
151~200	30~100								
	101~200								
	201~300								

■U-Shaped

W	L	€ PMSU D1 T0.5	€ PMSU D1 T0.8	€ PMSU D2 T0.5	€ PMSU D2 T0.8	€ PMSU D2 T1.0	€ PMUU D1 T0.5	€ PMUU D1 T0.8	€ PMUU D2 T1.0
60~100	30~100								
	101~200								
	201~300								
101~150	30~100								
	101~200								
	201~300								
151~200	30~100								
	101~200								
	201~300								

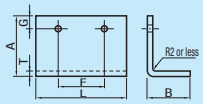
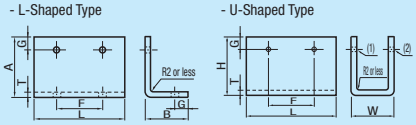
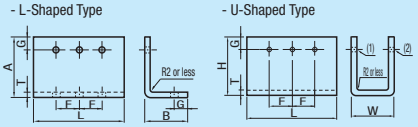
Alterations

- L-Shaped Type

Part Number	A	B	L	T	(XC · XWC · XTC)
PMSL1	100	70	200	0.8	XC4.5-F45-G15

- U-Shaped Type

Part Number	W	H	L	T	(XWC · XTC)
PMSU2	120	60	85	1.0	XWC4.5-F25-G10

Alterations	2 Mounting Holes	4 Mounting Holes	6 Mounting Holes
		- L-Shaped Type / - U-Shaped Type 	- L-Shaped Type / - U-Shaped Type 
Code	XC	XWC	XTC
Spec.	*Adds 2 mounting holes. XC=Hole Dia. Selection F, G=1mm Increment Ordering Code XC4.5-F45-G15 Hole Dia. Selection Table XC 4.5 5.5 6.5 9 XC+6≤F≤L-XC-6 XC/2+3≤G≤(A-T)-XC/2-6 Applicable to L-shape type only.	*Adds 4 mounting holes. XWC=Hole Dia. Selection F, G=1mm Increment Ordering Code XWC4.5-F55-G12 Hole Dia. Selection Table XWC 4.5 5.5 6.5 9 XWC+6≤F≤L-XWC-6 - L-Shaped Type XWC+3≤G≤(A(B)-T)-XWC/2-6 - U-Shaped Type XWC/2+3≤G≤(H-T)-XWC/2-6	*Adds 6 mounting holes. XTC=Hole Dia. Selection F, G=1mm Increment Ordering Code XTC5.5-F25-G15 Hole Dia. Selection Table XTCa 4.5 5.5 6.5 9 XTC+6≤F≤L/2-XTC/2-3 - L-Shaped Type XTC+3≤G≤(A(B)-T)-XTC/2-6 - U-Shaped Type XTC/2+3≤G≤(H-T)-XTC/2-6
Price Adder	2,00	4,00	6,00

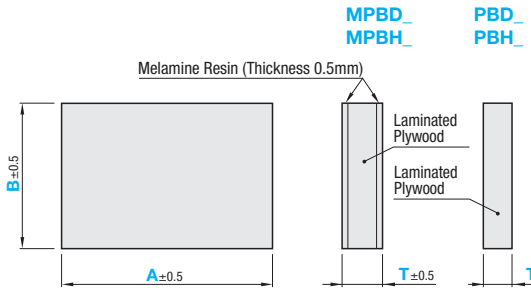
The holes of (1) and (2) might not be in the same position since the folding operation is performed after hole machining.

Double-sided Melamine Resin Glued Laminated Plywoods / Particle Boards

RoHS



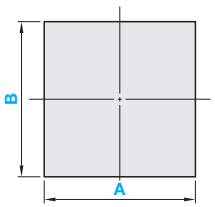
MPBD_ (Glued Melamine Resin) **PBD_** (Laminated Plywood)
MPBH_ (Glued Melamine Resin) **PBH_** (Laminated Plywood)



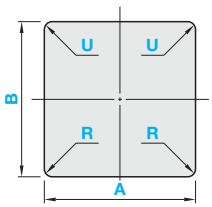
Melamine Resin Allowable Temperature -20°~100°C

Type	Material
MPBD_ MPBH_	Laminated Plywood (Poplar) + Glued Melamine on Both Sides
PBD_ PBH_	Laminated Plywood (Poplar)

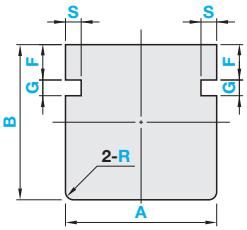
MPBD
PBD



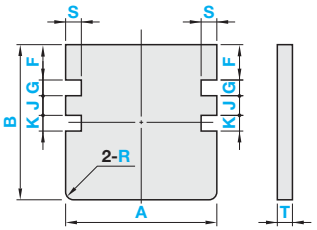
MPBDA
PBDA



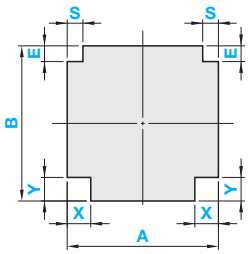
MPBDB
PBDB



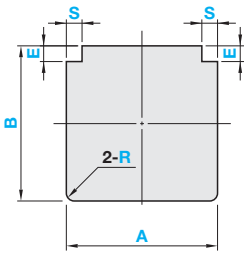
MPBDC
PBDC



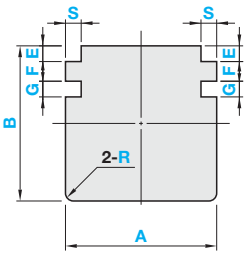
MPBH
PBH



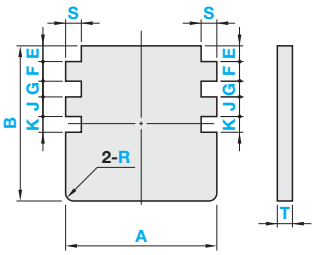
MPBHA
PBHA

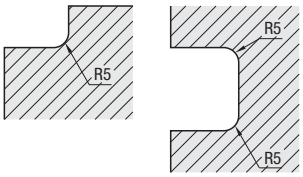


MPBHB
PBHB



MPBHC
PBHC





The shapes of notched angle are as in the figure to the right.

Part Number		A 1mm Increment	B 1mm Increment	Color	R U Selection	E	G	K	S	X	Y	F	J
Type	T					15~60 1mm Increment						1mm Increment	
MPBD	10 15 20	200~1200	200~1000	S (Gray)	-			-					-
MPBDA					0 10 20 30			-					-
MPBDB						-	G	-	S	-		F	-
MPBDC						-	G	K	S	-		F	J
MPBH					-	E	-		S	X	Y	-	
MPBHA					0 10 20 30	E	-		S	-		-	
MPBHB						E	G	-	S	-		F	-
MPBHC						E	G	K	S	-		F	J
PBD	12 16 20			-	-			-					-
PBDA					0 10 20 30			-					-
PBDB						-	G	-	S	-		F	-
PBDC						-	G	K	S	-		F	J
PBH					-	E	-		S	X	Y	-	
PBHA					0 10 20 30	E	-		S	-		-	
PBHB						E	G	-	S	-		F	-
PBHC						E	G	K	S	-		F	J

Reduced Delivery Time

Order Example

Part Number	-	A	-	B	-	Color	-	R	-	U	-	E · G · K · S · X · Y · F · J
MPBHB20	-	800	-	600	-	S	-	R20	-		-	E30 - G30 - S30 - F60
PBD12	-	320	-	250								

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29
Rate	Price List	5%

For orders larger than indicated quantity, please request a quotation.

For the Alteration Type, add notching charge to the price of the base plate shown below.

Part Number Type	T	A Selection	€ Unit Price B 200~400	401~600	601~800	801~1000
‹Base Plate› MPBD MPBDA MPBDB MPBDC MPBH MPBHA MPBHB MPBHC (Melamine Resin Coated Plywood)	10	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	15	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				

Part Number Type	T	A Selection	€ Unit Price B 200~400	401~600	601~800	801~1000
‹Base Plate› PBD PBDA PBDB PBDC PBH PBHA PBHB PBHC (Laminated Plywood)	12	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	16	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				

Notching Charge

Applicable Codes	€ Unit Price/Right and Left 2 Places
(Notching) E G K Y	
(Corner) U R	

The unit price is for 2 notches provided symmetrically on right and left sides.

(Ex.)

Part Number	-	A	-	B	-	Color	-	R	-	E · G · S · F
MPBHB10	-	800	-	600	-	S	-	R20	-	E30-G30- S30-F60

Base Plate 46,60 EUR | No. of E·G 2 x 5,00=10,00 EUR | No. of R 1 x 5,00=5,00 EUR | Total 61,60 EUR

Days to Ship

MPBD · PBD

8 Days

Others

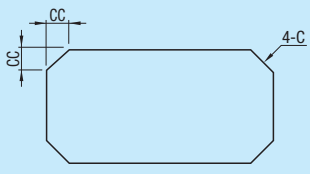
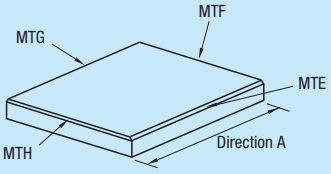
10 Days

Express A | 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	Color	-	(CC · MTE · MTF…etc.)
MPBD10	-	250	-	200	-	S	-	CC15

Alterations Code	Four Corner Cuts CC	Edge Chamfering MTE · MTF · MTG · MTH
Spec.	 Cuts 4 corners. 5≤CC≤50 1mm Increment Ordering Code CC25 Applicable to MPBD and PBD	 Chamfers any desired edge. 0.5~1R Ordering Code MTE-MTG Notched portions will not be chamfered.
Price Adder	4,30	2,00/Side

Load Capacity Guideline

Supported on two edges of length B.

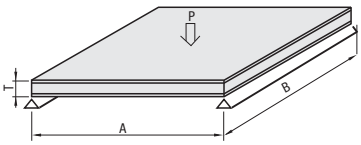
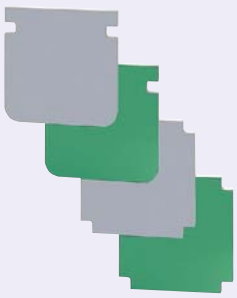


	Plate Size T	A	B	Load Standard N	kgf
Both Side Melamine Glued Laminated Plywood / Laminated Plywood	10	900	300	127	13
			600	275	28
			750	333	34
		1200	300	59	6
			600	118	12
	15	900	300	363	37
			600	745	76
			750	922	94
		1200	300	157	16
			600	304	31
			750	392	40
	20	900	300	598	61
			600	1216	124
			750	1471	150
		1200	300	245	25
			600	510	52
			750	647	66

Single-Sided Rubber Glued Laminated Plywoods

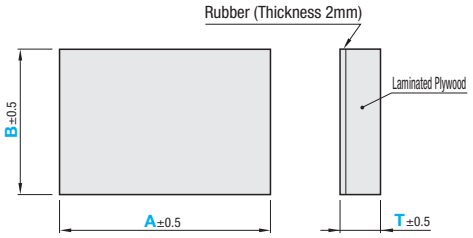
-Standard · Antistatic-



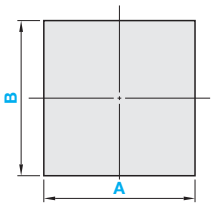
RoHS

NTBD_ (Standard Type)
NTBH_ (Standard Type)
ATBD_ (Antistatic Type)
ATBH_ (Antistatic Type)

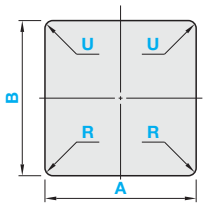
Type	Material	Color
NTBD_ NTBH_	Laminated Plywood (Poplar) + Glued Chloroprene Synthetic Rubber	Light Gray
ATBD_ ATBH_		Light Green



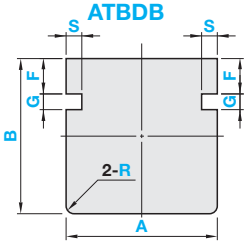
NTBD
ATBD



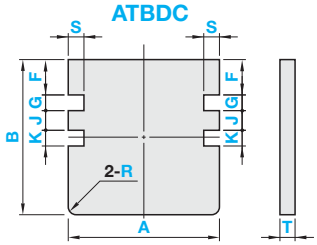
NTBDA
ATBDA



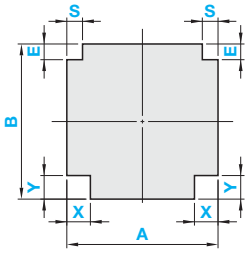
NTBDB
ATBDB



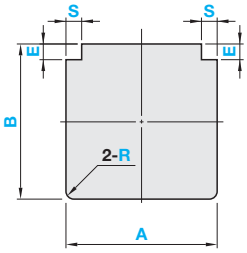
NTBDC
ATBDC



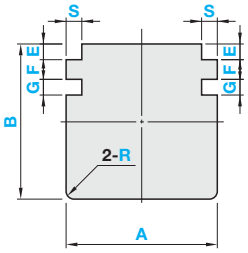
NTBH
ATBH



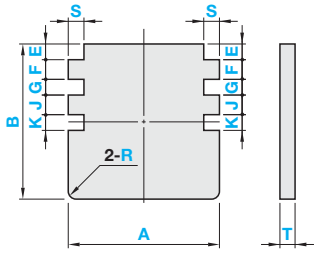
NTBHA
ATBHA

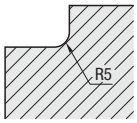


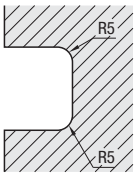
NTBHB
ATBHB



NTBHC
ATBHC







The shapes of notched angle are as in the figure to the right.

Part Number		A	B	Color	R U	E	G	K	S	X	Y	F	J
Type	T	1mm Increment	1mm Increment		Selection	15~60	1mm Increment					1mm Increment	
NTBD	10 14 20	200~1200	200~1000	G (Light Gray)	-			-				-	
NTBDA					0			-				-	
NTBDB					10 20	-	G	-	S	-		F	-
NTBDC					30	-	G	K	S	-		F	J
NTBH					-	E	-		S	X	Y	-	
NTBHA					0	E	-		S	-		-	
NTBHB					10 20	E	G	-	S	-		F	-
NTBHC					30	E	G	K	S	-		F	J
ATBD	10 14 20	200~1200	200~1000	L (Light Green)	-			-				-	
ATBDA					0			-				-	
ATBDB					10 20	-	G	-	S	-		F	-
ATBDC					30	-	G	K	S	-		F	J
ATBH					-	E	-		S	X	Y	-	
ATBHA					0	E	-		S	-		-	
ATBHB					10 20	E	G	-	S	-		F	-
ATBHC					30	E	G	K	S	-		F	J

Order Example

Part Number	-	A	-	B	-	Color	-	R	-	U	-	E · G · K · S · X · Y · F · J
ATBHB14	-	800	-	600	-	L	-	R20			-	E30 - G30 - S30 - F60

Days to Ship **10 Days**

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29
Rate	Price List	5%

For orders larger than indicated quantity, please request a quotation.

For the Alteration Type, add notching charge to the price of the base plate shown below.

Part Number		A	€ Unit Price			
			B			
Type	T	Selection	200~400	401~600	601~800	801~1000
‹Base Plate› NTBD NTBDA NTBDB NTBDC NTBH NTBHA NTBHB NTBHC (Standard Type)	10	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	14	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
‹Base Plate› ATBD ATBDA ATBDB ATBDC ATBH ATBHA ATBHB ATBHC (Antistatic Type)	10	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	14	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				

Notching Charge

Applicable Codes	€ Unit Price/Right and Left 2 Places
(Notching) E G K Y	
(Corner) U R	

The unit price is for 2 notches provided symmetrically on right and left sides.

(Ex.)

Part Number	-	A	-	B	-	Color	-	R	-	G · S · F
ATBDB10	-	800	-	600	-	L	-	R20	-	G30 - S30 - F60

Base Plate 70,50 EUR
No. of E·G 1 x 5,00=5,00 EUR
No. of R 1 x 5,00=5,00 EUR
Total 80,50 EUR

Load Capacity Guideline

Supported on two edges of length B.

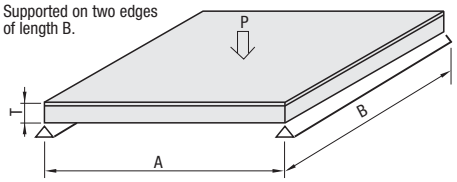
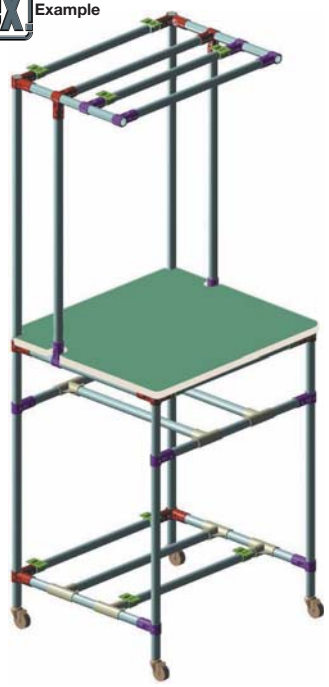


Plate Size			Load Standard	
T	A	B	(N)	(kgf)
10	900	300	127	13
		600	275	28
		750	333	34
	1200	300	59	6
		600	118	12
14	900	300	339	35
		600	695	71
		750	861	88
	1200	300	147	15
		600	284	29
		750	366	37
20	900	300	598	61
		600	1216	124
		750	1417	150
	1200	300	245	25
		600	510	52
		750	647	66

Example



Properties of Antistatic Rubber

Item	Unit	Rubber used for NTBD_ · NTBH_.	Antistatic rubber used for ATBD_ · ATBH_.
Specific Gravity	-	1.6	1.2
Elongation	%	450	190
Tensile Strength	MPa	6.7	12.8
Tearing Strength	N/mm	22	30
Specific Volume Resistivity	Ω · cm	$2x10^{11}$	$6.9x10^{8}$

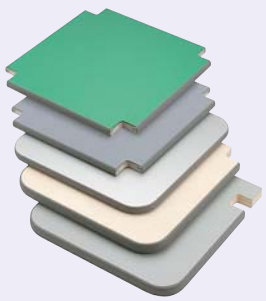
Testing Method: JIS K 6301

The above values are not guaranteed values but an example of measured values.

Laminated Plywoods with Edge Moldings

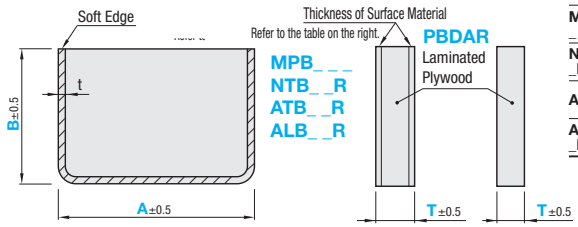
-Soft Edged Type · Adhesive Type-

RoHS



<Laminated Plywoods with Soft Edge Moldings>

PBDAR (Laminated Plywood)
MPB_ _R (Melamine Resin+Laminated Plywood)
NTB_ _R (Rubber+Laminated Plywood)
ATB_ _R (Antistatic Rubber+Laminated Plywood)
ALB_ _R (Aluminum+Laminated Plywood)



T Dimension 10 , 12=t3 T Dimension 14 , 15 , 16=t4 T Dimension 20=t5

<End Tape Glued Laminated Plywood>

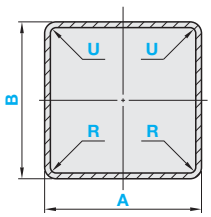
MPB_ _T (Melamine Resin+Laminated Plywood)

Type	Glued	Surface Thickness (mm)	M Material
PBDAR	None	-	Laminated Plywood (Poplar)
MPB_ _ _	Both Sides	0.5	Melamine Laminated Plywood
NTB_ _R	Single Side	2	Rubber Coated Plywood
ATB_ _R	Single Side	2	Antistatic Rubber Coated Plywood
ALB_ _R	Both Sides	0.8	Aluminum Glued Laminated Plywood

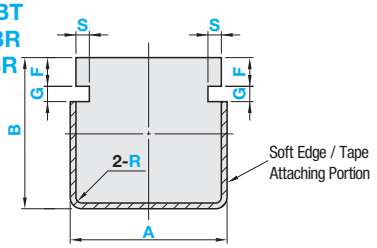
Soft Edge
M Material: Polypropylene+Elastomer
Max. Temperature ~80°C
Color Gray

Tape
M Material: Acrylic-impregnated paper (Thickness 0.45mm)
Color Beige

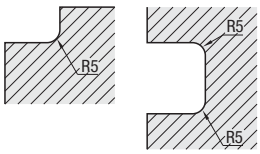
PBDAR
MPBDAR
MPBDAT
NTBDAR
ATBDAR
ALBDAR



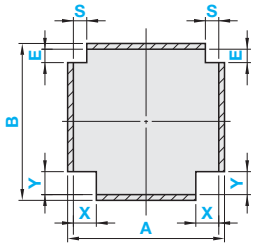
MPBDBR
MPBDBT
NTBDBR
ATBDBR



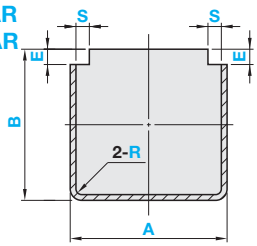
The shape of the notches are as shown below.



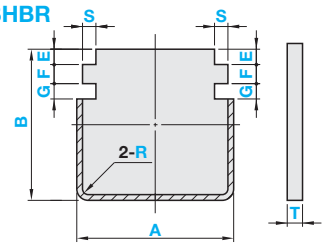
MPBHR
MPBHT
NTBHR
ATBHR
ALBHR



MPBHAR
MPBHAT
NTBHAR
ATBHAR
ALBHAR



MPBHBR
MPBHBT
NTBHBR
ATBHBR



Part Number Type	T	A 1mm Increment	B 1mm Increment	Color	R U Selection	E	G	S	X	Y	F
						15~60mm 1mm Increment					1mm Increment
PBDAR	12 16 20	200~1200	200~1000	-	10 20	-					-
MPBDAR MPBDAT	10 15 20			S (Gray)							
NTBDAR ATBDAR	10 14 20			G (Light Gray)							
				L (Light Green)							
ALBDAR				-	20						
MPBDBR MPBDBT	10 15 20			S (Gray)	30	-	G	S	-		F
NTBDBR ATBDBR	10 14 20			G (Light Gray)							
				L (Light Green)							
MPBHR MPBHT	10 15 20			S (Gray)	-	E	-	S	X	Y	-
NTBHR ATBHR	10 14 20			G (Light Gray)							
ALBHR				L (Light Green)							
				-							
MPBHAR MPBHAT	10 15 20			S (Gray)	10 20	E	-	S	-		-
NTBHAR ATBHAR	10 14 20			G (Light Gray)							
				L (Light Green)							
ALBHAR				-							
MPBHBR MPBHBT	10 15 20			S (Gray)	30	E	G	S	-		F
NTBHBR ATBHBR	10 14 20			G (Light Gray)							
				L (Light Green)							

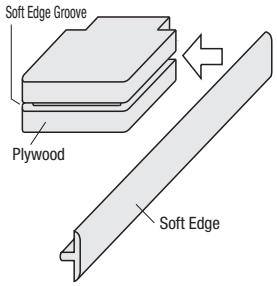
T dimension of aluminum glued laminated plywood is nominal. Refer to "Actual Dimension T" in the table to the right.

Actual Dimension T

	Nominal Dimension		
	10	15	20
Aluminum Glued Laminated Plywood	9.6	13.6	19.6

Example

Locations for soft edge moldings are grooved.



Order Example

Part Number	-	A	-	B	-	Color	-	R	-	U	-	E · G · S · X · Y · F
MPBHR20	-	800	-	600	-	S					-	E30-S30-X30-Y30
MPBDAT10	-	320	-	250	-	S	-	R10	-	U10		

Days to Ship **10 Days**

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29
Rate	Price List	5%

For orders larger than indicated quantity, please request a quotation.

For the Alteration Type, add notching charge to the price of the base plate shown below.

Base Plate Price

Part Number Type	T	A Selection	€ Unit Price B 200~400	401~600	601~800	801~1000
<Laminated Plywood> PBDAR (Soft Edge)	12	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	16	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
<Melamine Laminated Plywood> MPBDAR MPBDBR MPBHR MPBHAR MPBHBR (Soft Edge) MPBDAT MPBDBT MPBHT MPBHAT MPBHBT (End Tape Glued) Material Multiplier (x0.9)	10	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	15	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				

Part Number Type	T	A Selection	€ Unit Price B 200~400	401~600	601~800	801~1000
<Rubber Coated Plywood> NTBDAR NTBDBR NTBHR NTBHAR NTBHBR (Soft Edge)	10	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	14	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
<Antistatic Rubber Coated Plywood> ATBDAR ATBDBR ATBHR ATBHAR ATBHBR (Soft Edge)	10	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	14	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
<Aluminum Glued Laminated Plywood> ALBDAR ALBHR ALBHAR (Soft Edge)	10	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	15	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				
	20	200~ 400				
		401~ 600				
		601~ 800				
		801~1000				
		1001~1200				

Notching Charge

Applicable Codes				€ Unit Price/Right and Left 2 Places
(Notching)	E	G	Y	
(Corner R)	U	R		

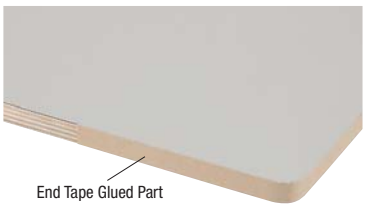
The unit price is for 2 notches provided symmetrically on right and left sides.

(Ex.)

Part Number	-	A	-	B	-	Color	-	R	-	E / S
MPBHAR10	-	800	-	600	-	S	-	R20	-	E30-S30

Base Plate 68,30 EUR No. of E 1 x 6,50=6,50 EUR
No. of R 1 x 6,50=6,50 EUR Total 81,30 EUR

End Tape Glued Laminated Plywood



End tape glued products to prevent wood tips from scattering.

The price of End Tape Glued Laminated Plywood is found by multiplying the € Unit Price by Material Multiplier 0.9.

(Ex.)

Part Number	-	A	-	B	-	Color	-	R	-	U
MPBDAT10	-	320	-	250	-	S	-	R10	-	U10

(Price in the table) x (Material Multipler) + (Notching Charge) = End Tape Glued Laminated Plywood € Unit Price
48,60 EUR x 0.9 + 13,00 = 56,70

Stainless Steel Panels with Protective Sheet

CAD Data

RoHS













Name of Parts		Material	Finishing	Color	Max. Temperature
(A)Panel		1.4301/X5CrNi18-10	One Side #400 Grind	Silver	5 ~ 40°C
Protective sheet	(B)Surface	Ethlene Vinyl Acetate Copolymer (EVA)	-	White	
	(C)Adsorption layer	Acrylic Ester	-		

Standard Type

PACL

Hole Type

-2 Holes- **2H**

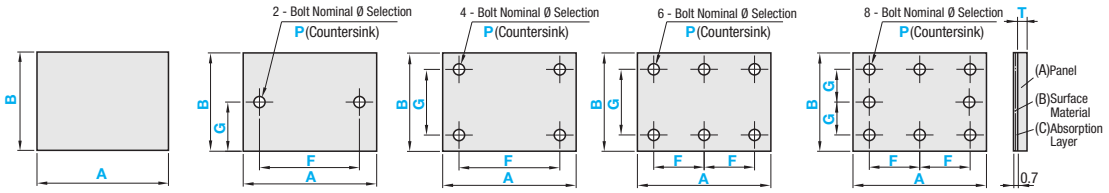
-4 Holes- **4H**

-6 Holes- **6H**

-8 Holes- **8H**

No hole machining on the sheet.





A≥B

This product has brushed marks, but the direction can not be specified.

Glue protective sheet with the polishing surface on PACL.

Adsorption layer can be used repeatedly.

Precision Standards

T	2.0	2.5	3.0
-T Dimension Tolerance	±0.17	±0.20	±0.25

-Tolerance of A and B: 1000 or less±0.5; More than 1000±1.0

Details of Hole Machining



Bolt Nominal Diameter	3	4	5
d	3.5	4.5	5.5
d1	7.5	9.5	11.5
h	2	2.5	3

Outgas Testing Results of Protective Sheet

Measurement Method	GCMS	GCMS	GCMS	GCMS
Outgas	Acetaldehyde	t - Trimethylpentene	Dimethylheptane	Xylene
60°C 60min.	Below detection limit	Below detection limit	Below detection limit	Below detection limit
Detection Limit	0.01μg/g	0.01μg/g	0.01μg/g	0.01μg/g

Standard Type

Part Number	1mm Increment		Selection of Panel Plate Thickness T
Type	A	B	
PACL	50~800	50~500	2.0 2.5 3.0

Hole Type

Part Number		1mm Increment		Selection of Panel Plate Thickness T	1mm Increment		Bolt Nominal Diameter
Type	Nominal	A	B		F	G	P (Countersink)
PACL	2H 4H 6H 8H	50~800	50~500	2.0	9~791 (2H · 4H Type) 9~395 (6H · 8H Type)	5~495 (2H Type) 9~491 (4H · 6H Type) 9~245 (8H Type)	3
				2.5			4
				3.0			5

Dimension F Specification Range : For 2H and 4H, $d_1+5 \le F \le A-d_1-5$; for 6H and 8H, $d_1+5 \le F \le A/2-d1/2-2.5$.

Dimension G Specification Range : For 2H, $d_1/2+2.5 \le G \le B-d_1/2-2.5$; for 4H and 6H, $d_1+5 \le G \le B-d_1-5$; for 8H, $d_1+5 \le G \le B/2-d_1/2-2.5$.

Price

Standard Type € Unit Price

Part Number	T	A	€ Unit Price B				
			50~100	101~200	201~300	301~400	401~500
PACL	2.0	50~100					
		101~200					
		201~300					
		301~400					
		401~500					
		501~600					
		601~700					
		701~800					
	2.5	50~100					
		101~200					
		201~300					
		301~400					
		401~500					
		501~600					
		601~700					
		701~800					
	3.0	50~100					
		101~200					
		201~300					
		301~400					
		401~500					
		501~600					
		601~700					
		701~800					

Hole Machining Charge

Hole Type	Machining Charge of Bolt Nominal Holes P(Countersink)
2H	
4H	
6H	
8H	

The price of Hole Type is found by adding the Standard Type unit price to the hole machining charge.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal

PACL2H - 500 - 400 - 2.0 - F240 - G160 - P3

(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price

54,00 EUR + 4,00 EUR = 58,00 EUR

Order Example

Standard Type

Part Number - A - B - T

PACL - 600 - 400 - 2.0

Hole Type

Part Number - A - B - T - F - G - Bolt Nominal

PACL4H - 800 - 400 - 2.0 - F700 - G300 - P3

Days to Ship

10 Days

Net Plates
-No Frame / Framed-

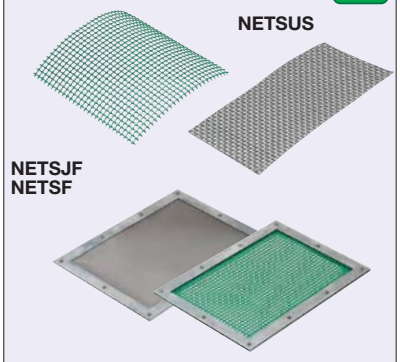
Reduced Delivery Time

CAD Data

NETSJ RoHS

NETSUS

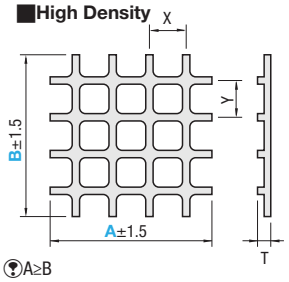
NETSJF
NETSF

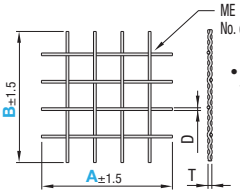


Type	Material	Max. Temperature	Applicable
NETSJ	High Density Polyethylene	-60~120°C	No Frame
NETSJF			With Frame

Type	Material	Applicable
NETSUS0.05-200	1.4401/ X5CrNiMo17-12-2	Interweave · No Frame
NETSF0.05-200		Interweave · With Frame
NETSUS0.37-20	1.4301/ X5CrNi18-10	Interweave · No Frame
NETSF0.37-20		Interweave · With Frame

High Density





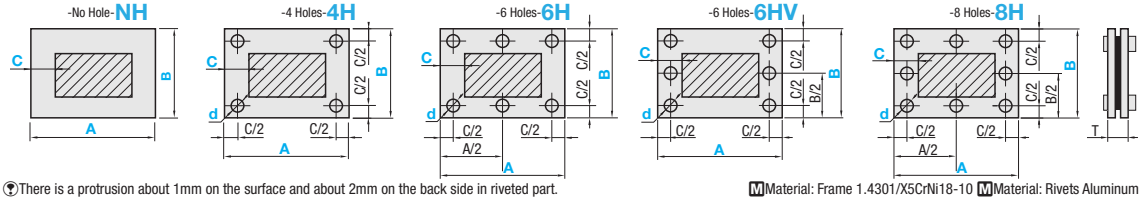
- Interweaved alternately. The intersections are not welded.

A≥B

NETSUS may be shipped folded depending on size.

Caution: Handle with care as cut surfaces are sharp.

NETSJF NETSF NETSJ and NETSUS_ are sandwiched between two 1.4301/X5CrNi18-10 frames, 1.5mm each in thickness, then riveted in approx. 100mm pitch.



There is a protrusion about 1mm on the surface and about 2mm on the back side in riveted part.

Material: Frame 1.4301/X5CrNi18-10 Material: Rivets Aluminum

No Frame Type

Part Number Type	Part Number No.	1mm Increment A	1mm Increment B	Color	T	X	Y	D	ME
NETSJ	1-6.4	100~ 1200	100~ 1000	G(Green)	1.7	6.4	6.4	-	-
	0.5 - 3.0			B(Black)	1	3.0	3.0	-	-
NETSUS	0.05-200	100~ 1000	100~ 1000	-	-	0.09	-	-	0.05	200
	0.37-20			-	0.5	-	-	0.37	20

Framed

There are 2 weldings on the frame and some grinding marks remain.

Part Number Type	Part Number Nominal	Part Number No.	1mm Increment A	1mm Increment B	C Selection	d Selection	Color	T	X	Y	D	ME
NETSJF	NH	1-6.4	100~ 700	100~ 700	15 20	4.5 5.5 6.5 9	G(Green)	4.5	6.4	6.4	-	-
	4H 6H 6HV 8H	0.5-3.0					B(Black)	1	3.0	3.0	-	-
NETSF		0.05-200					-	3	-	-	0.05	200
		0.37-20					-	3.5	-	-	0.37	20

€ Unit Price of No Frame Type

Part Number	A	€ Unit Price B 100~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
NETSJ 1-6.4	100 ~ 200									
	201 ~ 300									
	301 ~ 400									
	401 ~ 500									
	501 ~ 600									
	601 ~ 700									
	701 ~ 800									
	801 ~ 900									
	901 ~1000									
	1001 ~1100									
	1101 ~1200									
NETSJ 0.5-3.0	100 ~ 200									
	201 ~ 300									
	301 ~ 400									
	401 ~ 500									
	501 ~ 600									
	601 ~ 700									
	701 ~ 800									
	801 ~ 900									
	901 ~1000									
	1001 ~1100									
	1101 ~1200									
NETSUS 0.05-200 NETSUS 0.37-20	100 ~ 200									
	201 ~ 300									
	301 ~ 400									
	401 ~ 500									
	501 ~ 600									
	601 ~ 700									
	701 ~ 800									
	801 ~ 900									
	901 ~1000									

Material Multiplier (x0.8)

The unit price of NETSUS0.37-20 is the price shown in the table multiplied by each material multiplier. (Round down to ten Cent.)

(Ex.) Part Number - A - B
NETSUS0.37-20 - A550 - B340
(Price in the table) x (Material Multipler) =€ Unit Price of No Frame Type
TPN26,50 x 0.8 =21,20 EUR (Round down to ten Cent.)

€ Unit Price of Framed Type

Part Number	A	€ Unit Price B 100~200	201~300	301~400	401~500	501~600	601~700
NETSJF 1-6.4	100~200						
	201~300						
	301~400						
	401~500						
	501~600						
	601~700						
NETSJF 0.5-3.0	100~200						
	201~300						
	301~400						
	401~500						
	501~600						
	601~700						
NETSF 0.05-200	100~200						
	201~300						
	301~400						
	401~500						
	501~600						
	601~700						
NETSF 0.37-20	100~200						
	201~300						
	301~400						
	401~500						
	501~600						
	601~700						

The prices of Framed Type are Standard Type unit Price plus hole machining charges.

(Ex.) Part Number - A - B - Color - C - d
NETSJF4H1-6.4 - A500 - B300 - G - 15 - 6.5

(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price
95,30 EUR + 4,00 EUR = 99,30 EUR

Framed Hole Machining Charge

Hole Fabrication Nominal	Machining Charge d (Through Hole)
NH	
4H	
6H	
6HV	
8H	

Order Example

Part Number - A - B - Color - C - d

NETSJ 1-6.4 - A300 - B200 - G
NETSJF4H1-6.4 - A500 - B300 - G - 15 - 6.5
NETSFNH0.37-20 - A400 - B350 - 20

Alterations

Part Number - A - B - Color - C - d - (PK)
NETSJF4H1-6.4 - A500 - B300 - G - 15 - 6.5 - PK

Alteration	Code	Spec.	Price Adder
Adds packing on back side of frame.	PK	Attaches sponge packing on back side of a frame with adhesive tapes. (Nitrile Rubber: Black) - Packing Dimension: Thickness 3mm Width: Same as Frame Width - Allowable Temperature 80°C	9,00

Days to Ship

No Frame Type: 8 Days

Framed: 10 Days

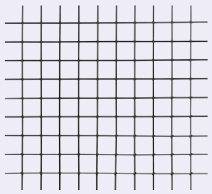
Express A 8,00 EUR/ piece P.88

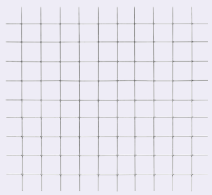
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Fence Nets
-Welded / Meshed-

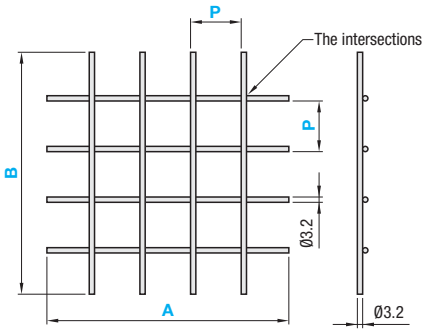
■Welded

RoHS





FENP(Matt black acrylic paint)
FENM(Trivalent Chromate)



■Precision Standards

-Tolerance of A and B ±1.0

- A≥B
- Cutting position can not be specified.
- When used with Safety Fence Frame (**P.759**), addition of the below alteration is recommended for smooth fit of four corners of the net into frame grooves.

Type	Material	Surface Treatment
FENP	1.0038/ S235JR	(Matt black acrylic paint)
FENM		Trivalent Chromate Plating

Part Number		1mm Increment		Weight (Kg/m²)	Wire Dia.
Type	P	A	B		
FENP	30	300~1100	300~1100	4.4	3.2
	50			2.65	
FENM	30			4.4	
	50			2.65	

Order Example

Part Number	-	A	-	B
FENP30	-	600	-	400

Days to Ship: **8 Days**

Express A 8,00 EUR/piece P.88

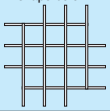
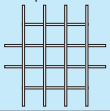
- A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Part Number		A	€ Unit Price B							
Type	P		300~400	401~500	501~600	601~700	701~800	801~900	901~1000	1001~1100
FENP	30	300 ~ 400								
		401 ~ 500								
		501 ~ 600								
		601 ~ 700								
		701 ~ 800								
		801 ~ 900								
		901 ~1000								
		1001 ~1100								
	50	300 ~ 400								
		401 ~ 500								
		501 ~ 600								
		601 ~ 700								
		701 ~ 800								
		801 ~ 900								
		901 ~1000								
		1001 ~1100								
FENM	30	300 ~ 400								
		401 ~ 500								
		501 ~ 600								
		601 ~ 700								
		701 ~ 800								
		801 ~ 900								
		901 ~1000								
		1001 ~1100								
	50	300 ~ 400								
		401 ~ 500								
		501 ~ 600								
		601 ~ 700								
		701 ~ 800								
		801 ~ 900								
		901 ~1000								
		1001 ~1100								

Alterations

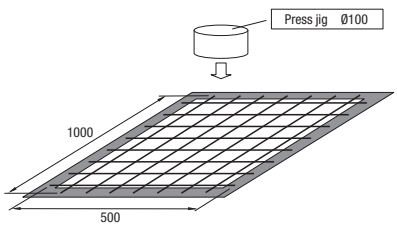
Part Number	-	A	-	B	-	(FD · FS)
FENP30	-	600	-	400	-	FD

Alteration Code	Cuts projected portion of each side	
	FD	FS
Spec.	Cut at one point of projected portion of each side into the shape below. 	Cut at one point of projected portion of each side into the shape below. 
Price Adder	Free of Charge	Free of Charge

- Specify when using with Safety Fence Frames (**P.759**). Provides smooth fit into grooves.

■Deflection

Measured by applying loads to the center of FENP30-1000-500.



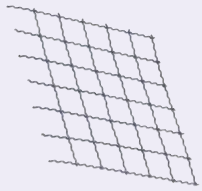
Load (N)	Deflection (mm)
100	15.5
200	24.1
300	30.4
400	35.7
500	40.4
700	48.1
1000	60.2

- The above data are for reference, not guaranteed.

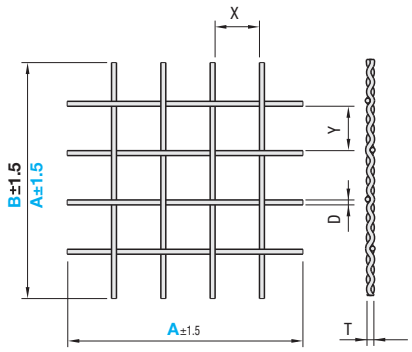
Reduced Delivery Time

■Meshed

RoHS



NETSU



- A≥B
- Alternately Interweaved.
  The intersections are not welded.
- ⚠ **Caution:** Handle with care as cut surfaces are sharp.

Type	Material	Applicable
NETSU	1.4301/X5CrNi18-10	Interweave

Part Number		1mm Increment		T	X	Y	D
Type	No.	A	B				
NETSU	2.5-30	100~1000	100~1000	4.8	30	30	2.5
	3-30			5.8			3.0

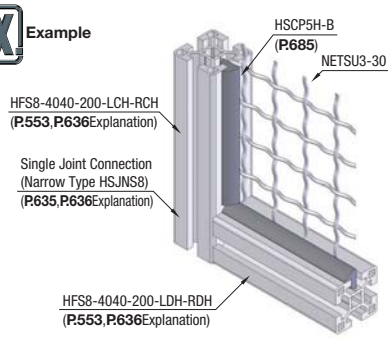
Order Example: Part Number - A - B
NETSU2.5-30 - A400 - B250

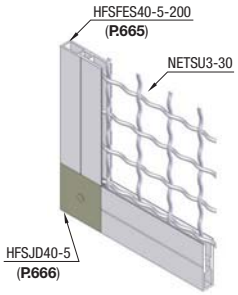
Days to Ship: 10 Days

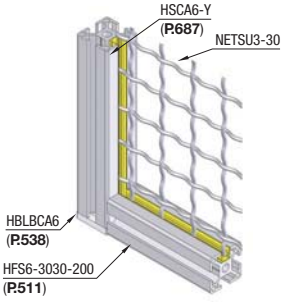
Price

Part Number	A	€ Unit Price B								
		100~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
NETSU 2.5-30	100~200									
	201~300									
	301~400									
	401~500									
	501~600									
	601~700									
	701~800									
	801~900									
	901~1000									
NETSU 3-30	100~200									
	201~300									
	301~400									
	401~500									
	501~600									
	601~700									
	701~800									
	801~900									
	901~1000									

Example

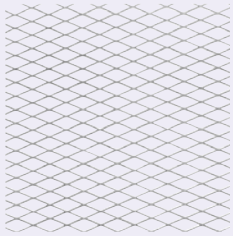
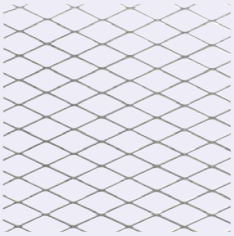
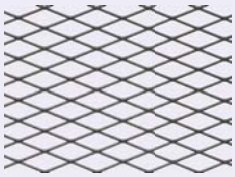
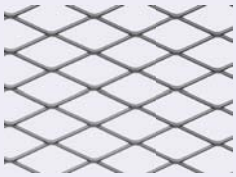






Folding Nets
-No Frame Framed-

RoHS

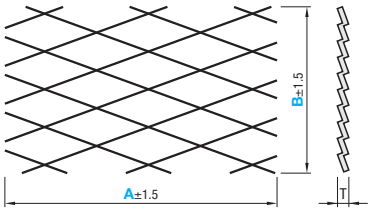





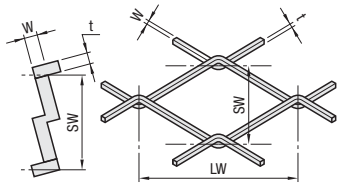
Type	Material	Surface Treatment	Color
EXPM	1.4301/X5CrNi18-10	-	Silver
EXPMB	1.0038/S235JR	Cathodic Electrodeposition Coating	Black

No Frame

EXPM

EXPMB(Cathodic Electrodeposition, Black)





Cut surface of EXPMB are not anodized.

Caution: Handle with care as cut surfaces are sharp.

Part Number Type	No.	1mm Increment A	B	T	SW	LW	W	t	Mass kg/m²
EXPM	31	100~1200	100~1000	3.5	12	30.5	1.5	1.2	2.36
EXPMB	42			5.3	22	50.8	2.5	2.3	4.1

Order Example

Part Number	-	A	-	B
EXPM31	-	A325	-	B255

Days to Ship: **8 Days**

Express A 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

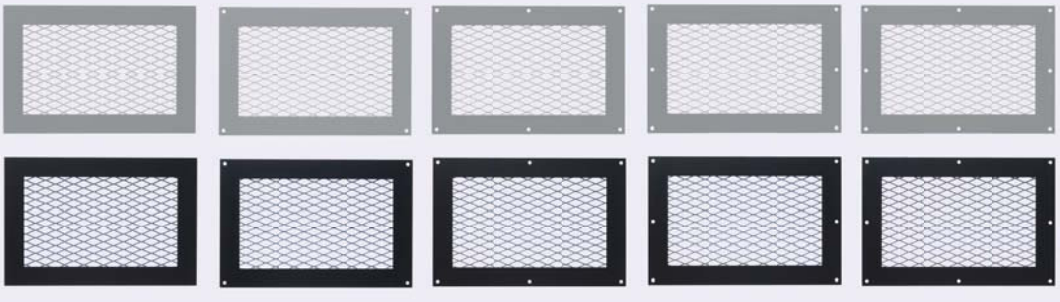
Price

No Frame Type € Unit Price

Part Number Type	No.	A	€ Unit Price B 100~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
EXPM	31	100 ~ 200									
		201 ~ 300									
		301 ~ 400									
		401 ~ 500									
		501 ~ 600									
		601 ~ 700									
		701 ~ 800									
		801 ~ 900									
		901 ~1000									
		1001 ~1100									
		1101 ~1200									
	42	100 ~ 200									
		201 ~ 300									
		301 ~ 400									
		401 ~ 500									
		501 ~ 600									
		601 ~ 700									
		701 ~ 800									
		801 ~ 900									
		901 ~1000									
		1001 ~1100									
		1101 ~1200									
EXPMB	31	100 ~ 200									
		201 ~ 300									
		301 ~ 400									
		401 ~ 500									
		501 ~ 600									
		601 ~ 700									
		701 ~ 800									
		801 ~ 900									
		901 ~1000									
		1001 ~1100									
		1101 ~1200									
	42	100 ~ 200									
		201 ~ 300									
		301 ~ 400									
		401 ~ 500									
		501 ~ 600									
		601 ~ 700									
		701 ~ 800									
		801 ~ 900									
		901 ~1000									
		1001 ~1100									
		1101 ~1200									

Reduced Delivery Time

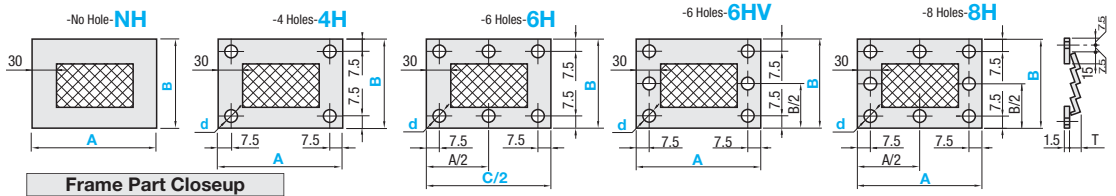
RoHS



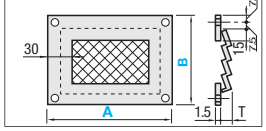
■Framed

Frames spot-welded with EXPM.

EXPMF
EXPMFB(Cathodic Electrodeposition, Black)



Frame Part Closeup



Type	Expanded Metals / Frames		
	M Material	S Surface Treatment	Color
EXPMF	1.4301/X5CrNi18-10	-	Silver
EXPMFB	1.0038/S235JR	Cathodic Electrodeposition Coating	Black

- A≥B
- Positional relationship between frame and expanded metal mesh is random.
- There are 2 weldings on the frame and some grinding marks remain.
- ⚠ **Caution:** Handle with care as cut surfaces are sharp.

Part Number Type	Nominal	No.	1mm Increment A	1mm Increment B	d	T
EXPMF EXPMFB	NH 4H 6H 6HV 8H	31	100~700	100~700	4.5 5.5 6.5 9	3.5
		42				5.3

Order Example

Part Number - A - B - d
EXPMF4H31 - A600 - B400 - 5.5

Days to Ship

10 Days

Price

■Framed Type € Unit Price

Part Number Type	Nominal	No.	A	€ Unit Price B 100~200	201~300	301~400	401~500	501~600	601~700
EXPMF	NH 4H 6H 6HV 8H	31	100~200						
			201~300						
			301~400						
			401~500						
			501~600						
			601~700						
		42	100~200						
			201~300						
			301~400						
			401~500						
			501~600						
			601~700						
EXPMFB		31	100~200						
			201~300						
			301~400						
			401~500						
			501~600						
			601~700						
		42	100~200						
			201~300						
			301~400						
			401~500						
			501~600						
			601~700						

■Hole Machining Charge of Framed Type

Hole Fabrication Nominal	Hole Machining Charge d (Through Hole)
NH	
4H	
6H	
6HV	
8H	

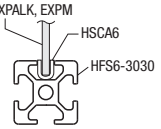
The prices of Framed Type are Standard Type unit Price plus hole machining charges.

(Ex.) Part Number - A - B - d
EXPMF4H31 - A600 - B400 - 5.5

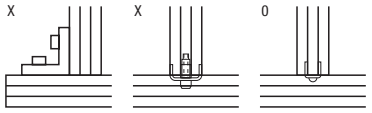
(Standard Type € Unit Price) + (Hole Machining Charge) = Hole Type Price
81,80 EUR + 4,00 EUR = 85,80 EUR

■Installation of Non Framed Expanded Metals

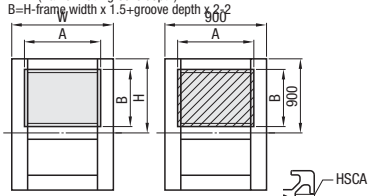
-Putting into Aluminum Frame Grooves-
When putting expanded metal Folding Nets into aluminum frame grooves, insert slot cover (HSCA) inside out as a holder. **P.687**



-Connection of Aluminum Frames-
When forming a frame with aluminum frames, use Single Joint Kit Narrow Type (**P.635**) for Blind Joint as junctions. Brackets, single / double joint for blind joint may become as obstacles for installation of slot covers and Folding Net.



-Size Specification-
When putting expanded metal Folding Nets into grooves in aluminum frames whose outer dimension is WxH, the dimension of the metal mesh AxB can be calculated by the following equation.
A=W-(frame width-groove depth) x 2-2
B=H-frame width x 1.5+groove depth x 2-2



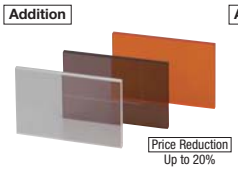
Ex.) In the case where outer dimension is W (900), H (900)
- For slot width 8, 30 square type:
  A=900-(30-8)x2-2=854
  B=900-30x1.5+8x2-2=869
- For slot width 10, 40 square type:
  A=900-(40-11.5)x2-2=841
  B=900-40x1.5+11.5x2-2=861
- For slot width 10, 45 square type:
  A=900-(45-12)x2-2=832
  B=900-45x1.5+11.5x2-2=853.5
  ≈ 853

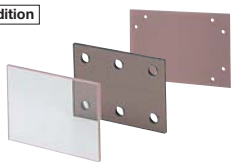
Groove depth when slot cover is installed

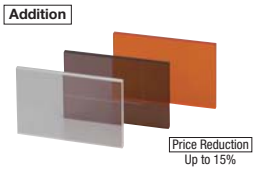
Series	t
30	8
40	11.5
45	12

Transparent Resin · Glass · Mirror · Engineered Plastic Plates

Transparent Resin Plates









Product Name	PET Plates	Antistatic PVC Plates	Acrylic (Resin) Plates	Acrylic Plates Economy
Page	865	869	871	875





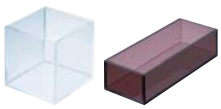




Curved Panels	Polycarbonate Plates	Resin Sheets	Resin Cover Plates -L-shaped Type-
876	877	881	883







-U-shaped Type-	Resin Circular Plates	Acrylic Cases
883	885	886

Glass / Mirror Plates





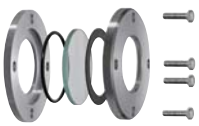




Product Name	Mirror Plates	Fused Silica Plates Square · Round	Square Glass Plates	Glass Plates Round
Page	887	888	889	890







Flanges for Round Glass Plates Type	Flange Covers for Round Glass Plates Type	Observation Port Set (Compact Type)
891	891	892

Engineered Plastic Plates


Price Reduction
Up to 13%




Price Reduction
Up to 20%


Price Reduction
Up to 10%


Price Reduction
Up to 15%

Product Name	Epoxy Glass Plates	Bakelite Plates -Paper / Fabric-	MC Nylon® Plates	Polyacetal Plates
Page	893	895	901	905




Price Reduction
Up to 15%


Price Reduction
Up to 10%





Ultra High-molecular-weight Polyethylene Plates	Fluororesin Plates	PEEK Plates	PPS Plates	ABS Plates
909	911	913	917	917











PBT Plates	Unilate®(Free-cutting Resin) Plates	Precision Resin Plates	Resin Blocks	Resin Circular Plates -Standard · Precision-
919	919	921	922	923-924



Ceramics Plates	Ceramics Circular Plates
925	926

NEW

Guide of "Material Shop 24 Resin site"

材料屋 24 形状加工

■XXX24XXXXXXXXXX

[XXXXXXXXXXXXXX
33 kinds of Engineered Plastics and Ceramics are available.
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Simultaneous quotation is available for up to 3 materials.

[XXXX•??XXXXXXXXXXXX]XXXX
XXXXXXXXX25XXXXXXXXXXXXXXXX
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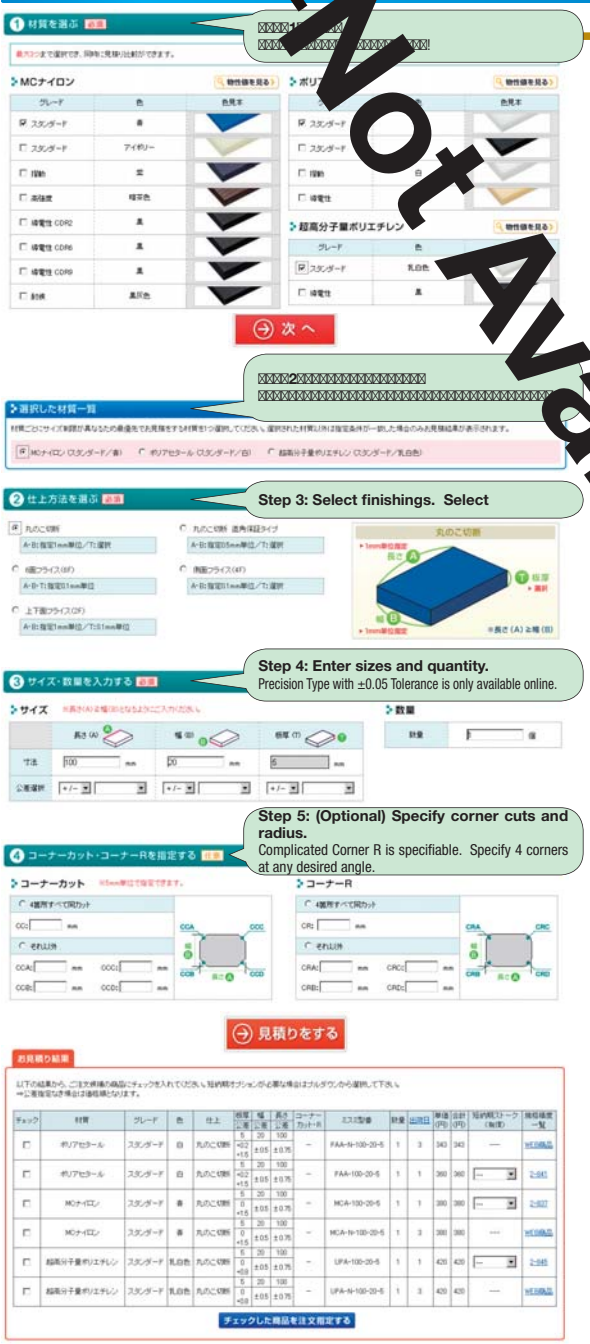


Not Available

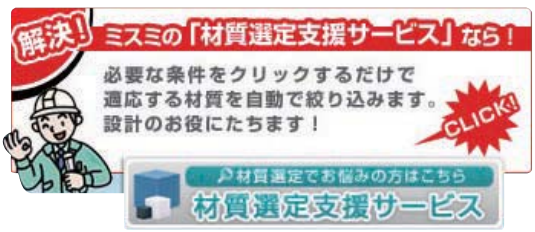
Step 3: Select finishings. Select

Step 4: Enter sizes and quantity.
Precision Type with ±0.05 Tolerance is only available online.

Step 5: (Optional) Specify corner cuts and radius.
Complicated Corner R is specifiable. Specify 4 corners at any desired angle.

XXXXXXXXX•??•??•??

絶縁用途で使用したい・・・
摺動するところで使うから耐摩耗性も重要。
加工もしやすい方がいい。
どんな材質を選べばいいの？





XXXXXXXXX!!

物性値を確認する
XXXXXXXXXXXXXXX
XXXX•??PDFXXXXXXXXXXX

材質特性の説明
XXXXXXXXXXXXXXX
XXXXXXXXXXXXXXX

耐薬品データ
XXXXXXXXXXXXXXX
XXXXXXXXXXXXXXX

XXX24XXXXXXXXXXXXXXX
XXX•??XX•??XXXXX•??XX)XXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXX	TEL	03X3647X7301
XXXXXXXXXX	FAX	03X3647X7301

Resin Plate Characteristics I

-Epoxy Glass · Bakelite and Ceramics-

For Heat Insulation Plates, see **P.1559~1574.**

Characteristics of Epoxy Glass, Bakelite and Ceramics

- Characteristics of Epoxy Glass Plate

Compared with paper based bakelite plates and fabric based bakelite plates, MISUMI's epoxy glass plates have high strength (mechanical strength), excellent heat resistance and moisture resistance.

High Temperature Type has an excellent antistatic property.

- Characteristics of Bakelite Plate

MISUMI's Bakelite Plates are products which can be used as insulating plates for switch board, controller and breaker.

Paper Type is available in natural color and black, and strong Fabric Type is also available.

Bakelite Color (Natural Color) may vary depending on production lot, but does not affect quality.

- Characteristics of Ceramics

Alumina 96 : Ceramics (Alumina 96/99) are excellent in abrasion resistance · insulation · heat resistance, and used for insulating · heat resisting parts in electricity, semiconductors and the other areas. In addition, it has equal or higher bending strength, compared with the common steel, and little elastic deformation.

Steatite : Ceramics Steatite are excellent in insulation and high frequency characteristic and are used as general insulation parts. It is a relatively low-cost material.

Machinable : Excellent machinability. Can be machined into complex forms. Precision finishing.Provides an excellent electric and thermal insulation.

Physical Property Values of Epoxy Glass and Bakelite

* For material colors or features, see **P.861**

Item				Part Number			
				Epoxy Glass Plates		Bakelite	
				Standard	High Temperature	Paper Type	Fabric Type
			Plates	P.893	P.893	P.895 P.921	P.895
			Circular Plates	P.923	-	P.923	P.923
			Unit	EPXA	EPXAR	BLA BLBA	BLSA
Component	Main Base Material		-	Glass Fiber	Glass Fiber	Kraft Paper	Cotton
	Main Material		-	Epoxy Resin	Super-insulated Epoxy	Phenol Resin	Phenol Resin
Mechanical Properties	Bending Strength		MPa {kgf/mm^2}	310~450 {31~45}	499 (Vertical) / 553 (Horizontal) {51 (Horizontal) / 56 (Vertical)}	120~180 {12~18}	100~150 {10~15}
	Compression Strength	Vertical to Lamination	MPa {kgf/mm^2}	470~539 {47~53.9}	-	250~320 {25~32}	200~250 {20~25}
		Horizontal to Lamination	MPa {kgf/mm^2}	294~392 {29.4~39.2}	-	170~210 {17~21}	100~150 {10~15}
	Izot Impact Strength		J/cm	4.6 or More	-	0.2~0.5	0.5~0.7
	Cleavage Strength		kN	6.9~10.8	-	3.9~5.9	6.0~8.0
Thermal Characteristics	Recommended Operation Temperature (Note 1)		°C	Ambient Temp. ~ 155	Ambient Temperature ~ 260 (300°C Normal for 5 min.)	-50 ~ 100 (130°C 2h Normal)	-50 ~ 100 (140°C 2h Normal)
	Reference - Destructive Temp. (Note 2)		°C	-	-	120	140
	Expansion Coefficient		°C^{-1}	6.05x10^{-5}	6.0x10^{-5}	1.6x10^{-4}	0.6x10^{-4}
	Thermal Conductivity		W/m·k {cal/cm·sec·°C}	0.471 {1.125x10^{-3}}	0.38 {9.0x10^{-4}}	0.21 {0.5x10^{-3}}	0.38 {0.9x10^{-3}}
Electric Characteristics	Through Layer Dielectric Breakdown		kV/mm	20~30	-	20~28	12~20
	Edgewise Withstand Voltage		kV	-	-	12~18	8~15
	Volume Resistivity	4h/150°C	Ω·cm	-	-	3.0x10^{9}	4.0x10^{8}
		100h/25°C/90%RH	Ω·cm	-	-	9.0x10^{8}	5.0x10^{7}
	Surface Resistance		Ω	10^{13}~10^{14}	1.0x10^{7}	5.0x10^{10}	9.0x10^{8}
	Insulation Resistance	Ordinary Condition	Ω	10^{12}~10^{14}	-	10^{10}~5x10^{11}	5x10^{9}~10^{10}
		After Boiling	Ω	5x10^{10}~10^{13}	-	5x10^{7}~10^{8}	10^{8}~10^{9}
Others	Arc Resistance		sec	-	-	-	-
	Water Absorption Ratio		%	0.02~0.03	0.02	0.5~1.3	1.6~1.8
	Specific Gravity		-	1.75~1.9	1.95	1.4	1.4

Testing method conforms to JIS K6911. Listed values are not guaranteed values but representative values.

(Note 1) "Recommended Operation Temperature" is the temperature when a long-term use does not reduce the quality rapidly.

(Note 2) "Destructive Temperature" is the temperature to start carbonization, collapse and melt.

Physical Property Values of Ceramics

Item	Unit	Part Number		
		CEA · PCEA	CCES · PCCES	CEM
Material Name	-	Alumina 96 $Al_2O_3$96%	Steatite MgO / SiO_2	Machinable SiO_2 / MgO
Apparent Density	g/cm^3	3.7	2.5	2.5
Water Absorption Ratio	%	0	0	0
Bending Strength	Mpa	300	120	94
Thermal Conductivity	W/m·k {cal/cm·sec·°C}	18 {4.0x10^{-2}}	2 {5.0x10^{-3}}	1.46
Thermal Expansion Coefficient	(20 ~ 500°C) x 10^{-6}/°C	7.3	7.4	9.4
	(20 ~ 800°C) x 10^{-6}/°C	8.0	8.1	12.6
Melting Point	°C	2050	1557	1200
Safety Operation Temperature	°C	1300	1000	1000
Insulation Resistance	kV/mm	>10	>10	40
Specific Volume Resistivity	Ω·cm	>10^{14}	>10^{14}	>10^{16}
Dielectric Constant	MHz	9	5.2	6.0
Loss Coefficient	-	10.0x10^{4}	7.0x10^{4}	-

Listed values are not guaranteed values but representative values.

- Drilling Conditions of the Epoxy Glass

	Circular Cut	Milling	Drilling
Tools	Carbide (K-10)	Carbide (K-10)	Carbide (K-10)
Cutting Speed V (m/min)	Large ~ Small Blades 45~200	Large ~ Small Blades 100~300	Large ~ Small Blades 120~350
Revolutions (r.p.m.)	Large ~ Small Blades 50~1000	Large ~ Small Blades 300~1000	Ø2 Drill 1000 ~ 1500 Ø5 Drill 500 ~ 1000
Cutting Depth (mm)	0.3~0.5	0.5~2.0	-
Feed (mm/Rotation)	0.1~0.2	0.1~0.2	0.1~0.5

The above values are references only.

- Machinable Ceramics Drilling Conditions

	Tools	High-Speed Steel	Carbide
Circular Cut	Cutting Speed (m/min)	9~15	30~50
	Feed (mm/Rotation)	0.05~0.13	
	Cutting Depth (mm)	0.5~6	
Milling	Cutting Speed (m/min)	-	6~11
	Feed (mm/Rotation)	-	0.05
	Cutting Depth (mm)	-	0.5~5
Note	Revolution Frequency	Revolutions per minute =Cutting Speed (m/min) / Diameter (mm) x 0.00314	

The above values are references only.

Resin Plates Characteristics II

-General-purpose Engineered Plastic Plates-

■Characteristics of MC Nylon · Polyacetal · Ultra High-molecular-weight Polyethylene · Fluororesin · PEEK · PPS · ABS · PBT and Free-cutting Resin

MISUMI's general-purpose Engineered Plastic plates have superior properties of lightweight, noise reduction and corrosion resistance and can be used as a replacement for metal plates.
Selectable from nine types of materials and several grades for various purposes.

· MC Nylon : Having better abrasion resistance than that of polyacetal plates, MC nylon is generally used for slide guide plates. The product lineup are as follows: Sliding Grade with highly-improved sliding performance; High Strength Grade with excellent strength; three types of Conductive Grade effective for antistatic purposes; and Weather Resistance Grade superior in strength deterioration.

· Polyacetal : Widely used in wheels, rollers and gears, because of its excellent mechanical strength. MISUMI's polyacetal plates have two types of color: white and black. In addition, Sliding Grade with highly-improved sliding performance and Conductive Grade effective for antistatic purposes are also available.

· Ultra High-molecular-weight Polyethylene : It excels in abrasion resistance and sliding properties, and is used for carrier rollers and guide rails. In addition to Standard Grade, Conductive Grade effective for antistatic purposes is also available.

* For material colors or features, see **P.861**

Item			Testing Method ASTM		Part Number												
					MC Nylon							Polyacetal			Ultra High-molecular-weight Polyethylene	
					Standard	Sliding	High Strength	Weather Resistance	Conductivity CDR2	Conductivity CDR6	Conductivity CDR9	Standard	Sliding	Electric Conductivity	Standard	Electric Conductivity
				Plates	P.901 P.921	P.901	P.901	P.901	P.901	P.901	P.901	P.905 P.921	P.905	P.905	P.909	P.909
				Circular Plates	P.923	P.923	-	P.923	P.923	P.923	P.923	P.923	P.923	P.923	P.923	P.923
				Unit	MCA MCAW MCAB	MCAS	MCAY	MCAPS	MCCA MCCB	MCDA MCDB	MCEA	PAA PABA PAAB PABB	PABAH	PACA	UPA	UPACA
Mechanical Properties	Tensile Strength	Normal Temperature	D-638	MPa {kgf/cm²}	96 {980}	66 {670}	98 {1000}	83 {850}	68 {700}	74 {760}	88 {900}	61 {620}	61 {620}	42 {430}	45 {460}	35 {360}
		Continuous Use at High Temperature		MPa {kgf/cm²}	39 (120°C) {400 (120°C)}	-	-	-	-	-	-	29 (95°C) {300 (95°C)}	-	-	-	-
	Elongation		D-638	%	30	19	20	40	10	7	7	40	46	30	400	300
	Bending Strength		D-790	MPa {kgf/cm²}	110 {1120}	92 {940}	152 {1550}	110 {1120}	117 {1200}	117 {1200}	132 {1350}	89 {910}	80.4 {820}	49 {500}	25 {250}	25 {250}
	Flexural Modulus		D-790	MPa	3530	2599	4609	-	4110	4020	4160	2589	2450	1370	900	1103
	Compression Strength	Yield Point	D-695	MPa {kgf/cm²}	103 {1050}	-	-	101 {1030}	-	-	-	-	-	-	20 {200}	-
		5% Deformation		MPa {kgf/cm²}	95 {970}	75 {760}	118 {1200}	93 {948}	98 {1000}	93 {950}	-	103 {1050}	75 {765}	44 {450}	-	25 {250}
	Izot Impact Strength		D-256	J/m	50	39	50	50	35	35	35	74	59	77	Does not break	Does not break
	Rockwell Hardness	R Scale	D-785	-	120	110	120	120	119	117	119	119	119	111	56	52
		M Scale		-	-	-	-	-	-	-	-	78	78	-	-	-
Thermal Characteristics	Temperature of Continuous Use		-	°C	-40~120	-40~120	Ambient Temp. ~ 150	Ambient Temp. ~ 120	Ambient Temp. ~ 120	Ambient Temp. ~ 120	Ambient Temp. ~ 150	-45~95	-45~95	Ambient Temp. ~ 80	-100~80	-100~80
	Melting Point		-	°C	222	221	222	222	215	215	218	165	165	-	136	-
	Deflection Temp. Under Load	0.45Mpa	D-648	°C	215	215	215	215	215	215	-	158	110	-	80	108
		1.82Mpa		°C	200	115	200	200	200	200	200	110	-	106	-	55
	Linear Expansion Coefficient		D-696	$°C^{-1}$	$9.0x10^{-5}$	$9.0x10^{-5}$	$6.5x10^{-5}$	$9.0x10^{-5}$	$8.0x10^{-5}$	$7.5x10^{-5}$	$8.6x10^{-5}$	$9.0x10^{-5}$	$9.0x10^{-5}$	$16.7x10^{-5}$	$1.7x10^{-4}$	$19x10^{-5}$
	Thermal Conductivity		D-177	W/m·k	0.233	0.233	-	0.23	0.512	0.709	-	0.233	-	-	0.42	-
Electric Characteristics	Surface Resistivity		D-257	-	-	-	-	-	-	-	-	-	-	-	10^{13}	-
	Specific Volume Resistivity		D-257	Ω·cm	$4.2x10^{15}$	-	-	-	10^2~10^4	10^4~10^6	10^6~10^8	$>10^{14}$	-	10^{10}~10^{12}	10^{17}	10^4
	Insulation Breakdown Voltage		D-149	kV/mm	20	-	-	18	-	-	-	20	-	-	68	-
	Dielectric Constant	10^6Hz	D-150	-	3.7	-	-	3.7	-	-	-	3.7	-	-	2.3	-
	Dissipation Factor	10^6Hz	D-150	-	0.02	-	-	0.02	-	-	-	0.007	-	-	-	-
Others	Specific Gravity		D-792	-	1.16	1.11	1.27	1.16	1.2	1.23	1.19	1.41	1.41	1.33	0.94	0.95
	Water Absorption Ratio	In water, Level	D-570	%	6	-	-	6.0	-	-	-	0.7	-	-	<0.01	-
		In water, 24hs	D-570	%	0.8	0.5	-	0.8	-	-	-	0.22	-	2	0.8	-
	Abrasion Resistance		-	-	○	◎	○	◎	△	△	○	△	◎	○	◎	○
	Sliding Properties		-	-	○	◎	○	○	○	○	○	○	◎	○	◎	○
	Dynamic Friction Coefficient		-	-	-	0.05~0.1	-	-	-	-	-	-	0.1~0.2	0.18	0.07~0.22	0.17~0.19
	Dimension Stability		-	-	△	△	△	△	△	△	△	○	○	△	△	△
	Impact Resistance		-	-	○	○	○	-	○	○	○	○	○	○	◎	◎
	Flame Resistance		[UL94]	-	-	-	-	(HB or Equivalent)	-	-	-	HB	HB	-	HB	-
	Food Sanitation Laws		-	-	Suitable*	Suitable*	Suitable*	Suitable (After boiling)	Suitable*	Suitable*	Suitable*	Suitable	Suitable	Suitable	Suitable	Suitable
	FDA Registration		-	-	-	-	-	-	-	-	-	-	-	-	Finished	-
	Chemical Resistance	Oil	-	-	○	○	○	○	○	○	○	○	○	○	○	○
		Acid	-	-	×	×	×	×	×	×	×	△~×	△~×	△~×	◎	○
		Alkali	-	-	○~△	○~△	○~△	○~△	○~△	○~△	○~△	○	○	○	◎	○
		Organic Solvent	-	-	○	○	○	○	○	○	○	○	○	○	◎	○

* Comply with Food Sanitation Laws (MC Nylon · Standard · Sliding Grade and High Strength Grade: After boiling for 1.5hrs; Conductive CDR2 · CDR6 and CDR9: After boiling for 2hrs) ⓘListed values are not guaranteed values but representative values.

· Fluorine Resin : It can be used for sheet packing and electric insulator since it has excellent impact strength as well as chemical stability and electric property. In addition to Standard Grade, Conductive Grade is also available.
· PEEK : Super Engineered Plastic with high heat and chemical resistance. It excels in mechanical characteristics under high temperature. In addition to Standard Grade, Conductive Grade effective for antistatic measures is also available.
· PPS : It excels in heat resistance, rigidity, flame resistance and dimension stability. It also excels in chemical resistance at ambient temperature and is used for parts of semiconductor and liquid crystal manufacturing equipment and inspection device.
· ABS : Excels in machinability and coating. Widely used as a material which coating on plastic body is possible.
· PBT : It excels in insulation, machinability, low water absorption and long term heat stability, and is used for auto electric parts.
· Free-cutting Resin (Unilate®) : It excels in insulation, low water absorption and rigidity, and is easy to machine and cut.

* For material colors or features, see **P.861**

Item			Testing Method ASTM		Part Number									
					Fluorine Resin		PEEK					ABS	PBT	Free-cutting Resin (Unilate®)
					Standard	Electric Conductivity	Standard	Sliding	Electric Conductivity	Standard	Abrasion Resistance			
				Plates	P.911	P.911	P.913	P.913	P.913	P.917	P.917	P.917	P.919	P.919
				Circular Plates	P.923	P.923	P.923	-	P.923	P.923	P.923	P.923	P.923	-
				Unit	PTFE	PTFCA	PKA	PKAH	PKCA	NPPS	NPMS	NABS	NPBT	YCA
Mechanical Properties	Tensile Strength	Normal Temperature	D-638	MPa {kgf/cm²}	13.7~34.3 {140~350}	11 {120}	98 {1000}	75 {765}	130 {1330}	85 {870}	75	39 {400}	49 {500}	110 (Vertical) - 65 (Horizontal) {1120 (Horizontal) - 660 (Vertical)}
		Continuous Use at High Temperature		MPa {kgf/cm²}	-	-	20 (250°C) {200 (250°C)}	-	-	-	220	-	-	-
	Elongation		D-638	%	200~400	100	20	5	5	27	5	-	200	2.4
	Bending Strength		D-790	MPa {kgf/cm²}	-	19 {190}	170 {1730}	97 {990}	227 {2320}	142 {1450}	72	64 {650}	93 {950}	220 (Vertical) - 125 (Horizontal) {2240 (Horizontal) - 1270 (Vertical)}
	Flexural Modulus		D-790	MPa	550	1560	4021	5001	-	3900	3689	2500	2550	110 (Vertical) - 7000 (Horizontal)
	Compression Strength	Yield Point	D-695	MPa {kgf/cm²}	-	-	-	-	-	-	-	-	100 {1020}	135 {1370}
		5% Deformation		MPa {kgf/cm²}	11.8 {120}	19 {200}	119 {1210}	107 {1090}	144 {1470}	-	100 {1020}	-	80 {820}	-
	Izot Impact Strength		D-256	J/m	160	115	77	35	55	18	75	314	49	64
	Rockwell Hardness	R Scale	D-785	-	-	60	120	120	-	100	-	105	75	120
		M Scale		-	-	-	105	-	-	-	84	-	-	-
Thermal Characteristics	Temperature of Continuous Use		-	°C	-40~250	Ambient Temp. ~ 260	-50~250	Ambient Temp. ~ 250	Ambient Temp. ~ 250	Ambient Temp. ~ 190	Ambient Temp. ~ 220	Ambient Temp. ~ 50	Ambient Temp. ~ 120	Ambient Temp. ~ 120
	Melting Point		-	°C	327	327	340	340	340	275	280	-	225	252
	Deflection Temp. Under Load	0.45Mpa	D-648	°C	121	-	-	-	-	-	-	-	-	235
		1.82Mpa		°C	55	99	155	195	230	108	116	85	68	-
	Linear Expansion Coefficient		D-696	°C–1	$1.0x10^{-4}$	$10.3x10^{-5}$	$5.0x10^{-5}$	$5.0x10^{-5}$	$2.5x10^{-5}$	$2.6x10^{-5}$	5.0	$9.5x10^{-5}$	$10.0x10^{-5}$	$4.0x10^{-5}$ (Vertical) $7.4x10^{-5}$ (Horizontal)
	Thermal Conductivity		D-177	W/m·k	0.25	-	0.25	0.92	0.24	-	-	-	-	0.51
Electric Characteristics	Surface Resistivity		D-257	-	$>10^{18}$	-	-	-	-	-	-	-	-	10^{15}
	Specific Volume Resistivity		D-257	Ω·cm	$>10^{18}$	10^{10}~10^{12}	10^{16}	-	10^{5}~10^{6}	$2.0x10^{16}$	10^{14}	$9.0x10^{15}$	$5.0x10^{16}$	10^{15}
	Insulation Breakdown Voltage		D-149	kV/mm	19	-	19	-	-	15	-	24	14	-
	Dielectric Constant	10^{6}Hz	D-150	-	2.1	-	3.3	-	-	3.6	-	-	3.3	3.8
	Dissipation Factor	10^{6}Hz	D-150	-	$<2x10^{-4}$	-	$3x10^{-3}$	-	-	$1.1x10^{-3}$	-	-	-	0.025
Others	Specific Gravity		D-792	-	2.14~2.2	2.3	1.32	1.45	1.41	1.35	1.43	1.05	1.31	1.63
	Water Absorption Ratio	In water, Level	D-570	%	<0.01	-	0.5	-	-	-	-	0.3	-	-
		In water, 24hs	D-570	%	<0.01	0.03	0.14	0.06	-	0.02	0.01	-	0.09	0.1
	Abrasion Resistance		-	-	○	○	○	○	○	△	◎	△	△	△
	Sliding Properties		-	-	◎	○	○	○	○	△	○	△	○	△
	Dynamic Friction Coefficient		-	-	0.04~0.25	-	-	0.24	0.21	-	-	-	-	-
	Dimension Stability		-	-	×~△	△	○	○	○	○	◎	◎	○	○
	Impact Resistance		-	-	○	○	△	○	○	△	△	○	○	○
	Flame Resistance		[UL94]	-	V-0	V-0	V-0	V-0	V-0	V-0	(V-0 or Equivalent)	HB	HB	HB
	Food Sanitation Laws		-	-	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
	FDA Registration		-	-	Finished	-	Finished	-	-	-	-	-	-	-
	Chemical Resistance	Oil	-	-	○	◎	◎	◎	◎	◎	◎	○~△	○	◎
		Acid	-	-	○	◎	◎	◎	◎	◎	◎	○~△	○	○
		Alkali	-	-	○	◎	◎	◎	◎	◎	◎	○~△	○~△	×
		Organic Solvent	-	-	○	◎	◎	◎	◎	◎	◎	×	○~△	○

(P)Listed values are not guaranteed values but representative values.

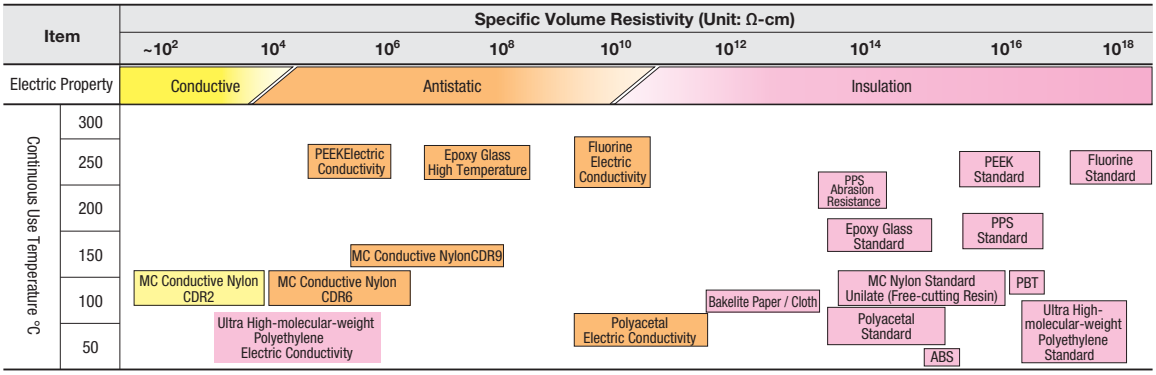
Line-ups and Characteristics of Engineered Plastics

Page	Materials	Color Sample	Grade	Color	Generic Name	Properties: Electric Property Properties	Properties: Continuous Use	Properties: Dimension Stability	Properties: Abrasion Resistance	Properties: Sliding Properties	Features
P.893	Epoxy Glass		Standard	Green	Glass Epoxy	Insulation	Normal Temperature ~ 155°C	○ ~ ◎	X ~ Δ	X ~ Δ	[Features]Excels in heat resistance, heat insulation and electrical insulation. [Appearance]Upper and lower surfaces are glossy and smooth. Cut surfaces appear whitish. [Machinability]Because made of laminated glass fiber and epoxy resin, drilling or cutting in the direction of lamination may cause cracks.
			Electric Conductivity	Black	-	Antistatic	Normal Temperature ~ 260°C	○ ~ ◎	X ~ Δ	X ~ Δ	[Features]Excels in heat resistance, heat insulation and antistatic effect. [Appearance]Upper and lower surfaces are not glossy but smooth. [Machinability]Same as Standard Type.
P.895	Bakelite Paper Type		Paper Bakelite	Natural Color	Laminated phenol formaldehyde resin w/paper base	Insulation	-50°C ~ 100°C	○	X ~ Δ	X ~ Δ	[Features]General material for various purposes such as insulation and heat resistance. Paper based materials are more inexpensive than fabric based materials. [Appearance]Upper and lower surfaces are glossy and smooth. Natural color tone vary per production lot. Color becomes darker due to oxidation over time. However, it does not affect properties. Paper-based black color does not change. [Machinability]Good machinability but dust scatters when machined.
			Paper Bakelite	Black	Laminated phenol formaldehyde resin w/paper base	Insulation	-50°C ~ 100°C	0	X ~ Δ	X ~ Δ	
			Cloth Bakelite	Natural Color	Laminated phenol formaldehyde resin w/cloth base	Insulation	-50°C ~ 100°C	○	X ~ Δ	X ~ Δ	[Features]General material for various purposes such as insulation and heat resistance. Cloth-based materials have higher strength than paper-based materials. [Appearance]Upper and lower surfaces are smooth and have grains. [Machinability]Good machinability but dust scatters when machined. Fabric based materials have less machinability than paper based materials due to lamination.
P.901	MC Nylon		Standard	Blue	MC901	Insulation	-40°C ~ 120°C	Δ	○	○	[Features]MC Nylon® of Nippon Polypenco Ltd. is the most general material in engineered plastics and used for various industrial purposes. Excels in mechanical strength and abrasion resistance, but not in dimension stability due to high water absorption. [Appearance]Stripes on upper and lower surfaces of materials are developed from production process. Colors may have lot variations but it does not affect the physical properties. [Machinability]Machinability is good but less than that of Polyacetal due to special stickiness.
			Standard	Ivory	MC901NC	Insulation	-40°C ~ 120°C	Δ	0	0	
			Sliding	Purple	MC703HL	Insulation	-40°C ~ 120°C	Δ	◎	◎	[Features]Dynamic Friction Coefficient is low. Excels in sliding properties, abrasion resistance and mechanical strength. [Appearance]Stripes on upper and lower surfaces of materials are developed from production process. Feel rough due to the special additive. [Machinability]Same as Standard Type. [Caution]Do not use for processing of food oils and fats.
			High Strength	Dark Brown	MC602ST	Insulation	Normal Temperature ~ 150°C	Δ	○	○	[Features]Upper temperature limit is higher than that of Standard Type and excels in mechanical strength. [Appearance]Stripes on upper and lower surfaces of materials are developed from production process. [Machinability]Same as Standard Type. Material is harder than that of Standard Type.
			Weather Resistance	Dark Gray	MC801	Insulation	Normal Temperature ~ 120°C	Δ	◎	○	[Features]Excels in weather resistance and abrasion resistance. Can be used outdoors over a long period of time. [Appearance]Stripes on upper and lower surfaces of materials are developed from production process. [Machinability]Same as Standard Type.
			Electric Conductivity CDR2	Black	MC501CDR2	Conductive	Normal Temperature ~ 120°C	Δ	Δ	○	[Features]Conductivity CDR2:Has the highest conductivity in MC Nylon® of conductive grade. Suitable where quick conductivity is required. Conductivity CDR6:Electric property is between conductive and antistatic. The most general and economical in MC Nylon® of conductive grade. Conductivity CDR9:Electric property is antistatic. Has the highest heat resistance in MC Nylon® of conductive grade. [Appearance]Marks are printed with "R2" (white), "R6" (yellow) and "R9" (green) markers on upper and lower surfaces of the material to distinguish the conductive grades. Stripes on upper and lower surfaces of materials are developed from production process. [Machinability]Same as Standard Type. Material contains carbons and is harder than that of Standard Type. [Caution]Do not use as heating elements or electric parts such as contact points or terminals.
			Electric Conductivity CDR6	Black	MC501CDR6	Antistatic	Normal Temperature ~ 120°C	Δ	Δ	○	
			Electric Conductivity CDR9	Black	MC501CDR9	Antistatic	Normal Temperature ~ 150°C	Δ	○	○	
P.905	Polyacetal		Standard	White	POM Duracon	Insulation	-45°C ~ 95°C	○	Δ	○	[Features]General Engineered Plastics for various industrial purposes. Equal to Duracon®. Has low water absorption and excels in dimension stability. Inferior to MC Nylon® in heat resistance and abrasion resistance. [Appearance]Upper and lower surfaces look and feel smooth. Weld line (resin flow mark) is developed from production process. [Machinability]Good machinability.
			Standard	Black	POM Duracon	Insulation	-45°C ~ 95°C	○	Δ	○	
			Sliding	White	-	Insulation	-45°C ~ 95°C	○	◎	◎	[Features]Only small friction heat is generated when sliding and therefore small power is required for operation. Excels in abrasion resistance and dimension stability. [Appearance]Same as Standard Type. [Machinability]Same as Standard Type.
			Electric Conductivity	Ocher	-	Antistatic	Normal Temperature ~ 80°C	Δ	○	○	[Features]No-carbon antistatic material is used and effective for antistatic. [Appearance]Unlike Standard Type, weld line (resin flow) is not highly visible. [Machinability]Same as Standard Type.
P.909	Ultra High-molecular-weight Polyethylene		Standard	Milky White	UHPE UHMWPE New Lite(R)	Insulation	-100°C ~ 80°C	Δ	◎	◎	[Features]Standard:Has low specific gravity and is lightweight. Excels in abrasion resistance and sliding properties. New Lite® of Saxin Corporation is used for the standard type of ultra-high molecular weight polyethylene. Electric Conductivity: Excels in sliding property and abrasion resistance at ambient temperature with low load. Also excels in conductivity. [Appearance]Clear white for Standard Type. Pullout marks are left at the extruded direction. Surfaces feel smooth. [Machinability]Hard to machine as they are soft. Be careful of the way to fix. [Caution]Storing them against the wall causes warpage. Be sure to lay them out flat. Do not use Conductive Type as heating elements or electric parts such as contact points or terminals.
			Electric Conductivity	Black	-	Conductive	-100°C ~ 80°C	Δ	○	○	
P.911	Fluorine		Standard	White	Teflon PTFE	Insulation	-40°C ~ 250°C	X ~ Δ	○	◎	[Features]Standard:Excels in heat resistance and chemical resistance. Fluorine resin is Polytetrafluoroethylene resin (equal to teflon). Electric Conductivity: Excels in heat resistance, chemical resistance and sliding property. No-carbon antistatic material is used and effective for antistatic. [Appearance]Standard:Upper and lower surfaces look and feel very smooth. Electric Conductivity: Feel less smooth than Standard Type, but excels in sliding property. [Machinability]Hard to machine as they are soft and become swollen. [Caution]Storing them against the wall causes warpage. Be sure to lay them out flat. Do not use Conductive Type as heating elements or electric parts such as contact points or terminals.
			Electric Conductivity	White	-	Antistatic	Normal Temperature ~ 260°C	Δ	○	○	

Page	Materials	Color Sample	Grade	Color	Generic Name	Properties: Electric Property Properties	Properties: Continuous Use	Properties: Dimension Stability	Properties: Abrasion Resistance	Properties: Sliding Properties	Features
P.913	PEEK		Standard	Ash Brown	PEEK	Insulation	-50°C ~ 250°C	○	○	○	[Features]Standard:Well balanced in heat resistance, insulation, dimension stability, chemical resistance, abrasion resistance and machinability. Sliding: In addition to the features of Standard Type, it excels in mechanical characteristics and sliding property at high temperature. Conductivity: In addition to the features of Standard Type, Specific Volume Resistivity is low and excels in conductivity. [Appearance]Upper and lower surfaces of the material are glossy. Weld line (resin flow mark) is developed from production process. It can be removed by milled surface finishing. [Machinability]Machinability is good, however, they may be chipped off at the direction of the milling cutter pulled out. Beware of the milling speed. When drilling a hole, the reference feeding speed when going through is 0.1mm per rotation. [Caution]Do not use Sliding Type and Conductive Type as heating elements or electric parts such as contact points or terminals.
			Sliding	Black	-	Insulation / Conductive Mixed Not measurable.	Normal Temperature ~ 250°C	○	○	○	
			Conductive	Black	-	Conductive	Normal Temperature ~ 250°C	○	○	○	
P.917			Standard	Natural Color		Insulation	Normal Temperature ~ 190°C	○	Δ	Δ	[Features]Standard: Excels in heat resistance, chemical resistance and dimension stability. More economical than PEEK. Abrasion Resistance: Superior in abrasion resistance and sliding property, especially in dimension stability to Standard Type. [Appearance]Upper and lower surfaces of the material are glossy. Weld line (resin flow mark) is developed from production process. It can be removed by milled surface finishing. [Machinability]Machinability is good, however, they may be chipped off at the direction of the milling cutter pulled out.Beware of the milling speed. When drilling a hole, the reference feeding speed when going through is 0.1mm per rotation. [Caution]PPS generates an oxide film on the surface and the color turns to brown when it is exposed to light and heat (direct sunlight, fluorescent light, mercury lamp and high-temperature atmosphere) for long hours. However, it changes little in mechanical properties and physical properties. * Unlike Standard Type, discoloration doesn't occur due to the addition of color.
			Abrasion Resistance	Blue	-	Antistatic	Normal Temperature ~ 220°C	◎	◎	○	
P.917	ABS		Standard	Natural Color	ABS	Insulation	Normal Temperature ~ 50°C	◎	Δ	Δ	[Features]Excels in machinability and adhesion is possible. The material is often used for prototypes. [Appearance]Upper and lower surfaces are glossy and smooth by the size up to 10mm. [Machinability]Good machinability.
P.919	PBT		Standard	White	PBT	Insulation	Normal Temperature ~ 120°C	○	Δ	Δ ~ ○	[Features] Excels in heat resistance, electric property, dimension stability and insulation. [Appearance]Marks of machining on upper and lower surfaces are developed from production process. [Machinability]Good machinability.
P.919	Unilate®		Standard	Natural Brown	Unilate®	Insulation	Normal Temperature ~ 120°C	○	Δ	Δ	[Features]Unilate® excels in heat resistance, voltage resistance, strength and machinability. Unilate® of Unitica Ltd., not annealed material, is used. [Appearance]Upper and lower surfaces are very smooth. [Machinability]Laminated plate with relatively good machinability.

Reference Values of Specific Volume Resistivity and Heat Resistance

(For physical properties, see P.858~P.860)

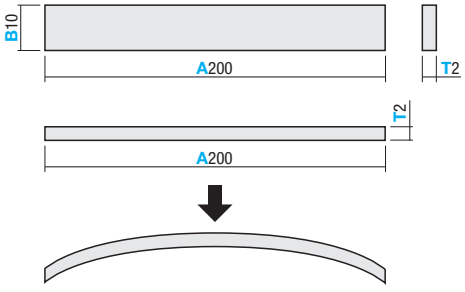


Designing of Resin Products

Resin, unlike metals, can be easily distorted, expanded or contracted due to temperature and humidity.
See note below for designing.

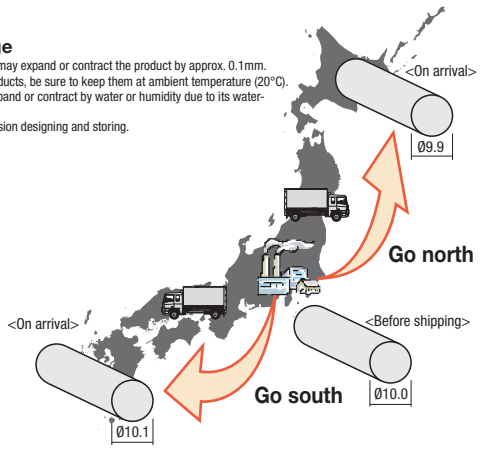
(1)Shape Distortion

Avoid long and thin shapes when possible. These shapes cause more distortion.
It is recommended to split the dimension or place bolts to fasten.



(2)Dimension Change

1°C change of the temperature may expand or contract the product by approx. 0.1mm.
When storing the purchased products, be sure to keep them at ambient temperature (20°C).
MC Nylon especially tends to expand or contract by water or humidity due to its water-absorbing property.
Pay extra attention to the dimension designing and storing.



Ⓣ Distorted parts can be fixed to a certain extent with weight on them for 24 hours or so.

Ⓣ Dimension change of the parts will be back to a certain extent after leaving them at ambient temperature.

Resin Plates Characteristics III

-Transparent Resin Plate-

■Characteristics of PET · Antistatic PVC · Acrylic and Polycarbonate

MISUMI provides four types of clear plates with superior transparency. In addition to the standard grade, antistatic grade with antistatic function is available.
4 colors, transparent, smoke brown, smoke grey and orange, are available.

- PET
  It has approx. 4 times stronger impact resistance than that of acrylic. Moreover it is an environment-friendly material, which generates no poisonous gas when burned. It is also cost effective.
- Antistatic PVC
  Excels in chemical resistance and flame resistance, and superior in cost-effectiveness among anti-static materials.
- Acrylic
  Excels in transparency, weather resistance and machinability, and is used widely for indoor and outdoor purposes, such as covers for industrial machinery, art display cases and signboards.
- Polycarbonate
  The level of impact strength is ranked as the highest among the transparent resin materials (approx. 30 times higher than that of acrylic plates).
  It excels in resistance against high and low temperatures, and is widely used.

Item		Testing Method JIS	Unit	Part Number										
				PET		PVC	Acrylic (Cast)		Acrylic Economy (Extruded)			Polycarbonate		
				Standard	Antistatic	Antistatic	Standard	Antistatic	Standard		Antistatic	Standard	Antistatic	Abrasion-resistant
				P.865		P.869	P.881		P.885			P.887		
				PYA PYBA PYDA	PYTA PYBTA	ENBT ENBBT	ACA ACBA ACDA	ACTA ACBTA	ACAE	ACBAE	ACTAE ACBTAE	PCTA PCTBA PCTGA	PCTTA PCTBTA	PCTSP
Transmittance	Light transmittance (Top: Transparent) (Middle: Smoke Brown) (Bottom: Smoke Gray)	-	%	PYA: 87 PYBA: 28 PYDA:45	PYTA: 80 PYBTA: 30	ENBT: 80 ENBBT: 29	ACA: 93 ACBA: 25 ACDA:43	ACTA: 79 ACBTA: 32	ACAE: 92	ACBAE: 34	ACTAE: 87 ACBTAE: 25	PCTA: 90 PCTBA: 35 PCTGA: 33	PCTTA: 86 PCTBTA: 35	PCTSP: 91
Mechanical Properties	Tensile Strength	K-7113	MPa {kgf/cm²}	62 {630}	52 {530}	63 {640}	75 {760}	75 {760}	67 {682}	76 {774}	73 {754}	65 {663}	65 {663}	65 {663}
	Elongation*	K-7113	%	15	-	50	2~7	5	4	5	5	83	83	83
	Bending Strength	K-7203	MPa {kgf/cm²}	83 {850}	71 {730}	98 {1000}	117 {1200}	106 {1080}	111	125 {1274}	122 {1244}	90 9.2	90 9.2	93 9.5
	Flexural Modulus	K-7203	MPa	2.4x103	2.0x103	3.4x103	3.2x103	3.3x103	3400	3500	3300	2300	2300	2300
	Compression Strength (Yield Point)	K-7181	MPa {kgf/cm²}	-	60 {610}	83 {850}	124 {1270}	-	120 {1200}	-	-	78 7.95	78 7.95	-
	Izot Impact Strength	K-7110	kJ/m²	10	-	2.9	2.7	-	2.5	1.5	2	15	15	-
	Rockwell Hardness (M Scale)	-	-	59	46	-	100	100	100	99	97	67	70	-
Thermal Characteristics	Temperature of Continuous Use	-	°C	-15~55	-15~55	-30~60	-30~80	-30~80	-30~70	-30~70	-30~60	-30~100	-30~100	-30~100
	Deflection Temp. Under Load (0.45MPa)	K-7191	°C	70	69	-	100	85	90	110	92	135	135	135
	Linear Expansion Coefficient	K-7140	°C⁻¹	$6.8x10^{-5}$	$7.5x10^{-5}$	$7.0x10^{-5}$	$7.0x10^{-5}$	$5.9x10^{-5}$	$7.0x10^{-5}$	$7.0x10^{-5}$	$7.0x10^{-5}$	$6.5x10^{-5}$	$5.2x10^{-5}$	$6.5x10^{-5}$
	Thermal Conductivity	-	W/m·k	-	-	0.16	0.21	-	0.21	0.21	-	0.24	-	-
	Specific Heat	-	J/g·K	1.3	1.35	1.12	1.46	1.46	1.46	1.47	1.5	1.3	1.2	-
Electric Characteristics	Surface Resistivity	K-6911	Ω	$>10^{10}$	10^{6}~10^{8}	10^{7}~10^{8}	$>10^{15}$	10^{6}~10^{8}	$>10^{15}$	$>10^{16}$	10^{7}~10^{8}	$>2.0x10^{16}$	10^{6}~10^{8}	$>2.0x10^{16}$
	Specific Volume Resistivity	K-6911	Ω·cm	$>10^{11}$	$>10^{17}$	-	$>10^{15}$	$>10^{17}$	$>10^{15}$	$>10^{15}$	$>10^{15}$	$>10^{17}$	$>10^{17}$	$>10^{17}$
	Insulation Breakdown Voltage	K-6911	kV/mm	-	-	-	20	-	20	20	-	20	-	20
	Dielectric Constant (10^{6}Hz)	K-6911	-	3.2	-	-	3.2	2.9	3.1	4	-	3	3	3
	Dissipation Factor (10^{6}Hz)	K-6911	-	-	-	-	0.06	0.032	0.06	0.06	-	0.009	0.06	-
Others	Specific Gravity	-	-	1.27	1.27	1.4	1.2	1.2	1.2	1.19	1.19	1.2	1.2	1.2
	Water Absorption Ratio	K-7209	%	-	-	0.03	0.4	0.18	0.4	0.3	0.4	0.24	0.15	-
	Flame Resistance	-	-	-	-	Self-extinguishing	X	X	-	-	-	Self-extinguishing	-	-
	Chemical Resistance: Oil	-	-	○	○	○	○	○	○	○	○	○	X	○
	Chemical Resistance: Acid	-	-	X	X	○	○	○	○	○	X~Δ	Δ	X	Δ
	Chemical Resistance: Alkali	-	-	X~Δ	X~Δ	○	○	○	○	○	○	X	X	X
	Chemical Resistance: Organic Solvent	-	-	X	X	X~Δ	X~Δ	X~Δ	X~Δ	X~Δ	X~Δ	X	X	X

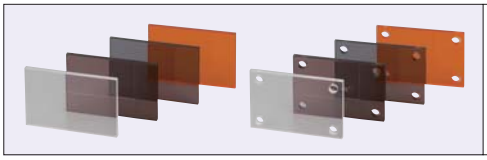
Ⓣ Listed values are not guaranteed values but representative values.
* Values of elongation of polycarbonate and PET are % values measured by JIS K-7162-1B/50.

■Characteristics of Acrylic Cast Plates and Extruded Plates

As for Acrylic Plates, cast plates made by cell-cast method and extruded plates are available.
Cast plates have better heat resistance and stronger mechanical strength than extruded plates.
Extruded plates are more inexpensive than cast plates.

When extruded plates have contact with vaporizing liquid such as methanol and methylene chloride after they are thermal-processed such as laser machining, they may have cracks. Also, extruded plates may have deflection at high temperature.

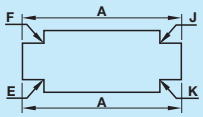
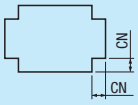
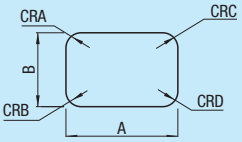
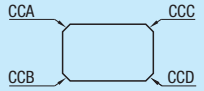
Transparent Resin Plates



MISUMI provides clear plate of four materials superior in transparency.
In addition to the standard grade, antistatic grade with antistatic function is available.
4 colors, transparent, smoke brown, smoke grey and orange, are available.
Often used as a cover, and variety of options for mounting hole alterations are available.
Use MISUMI Transparent Resin Plates.

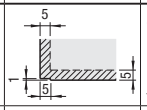
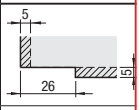
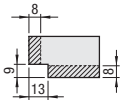
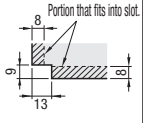
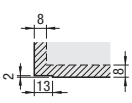
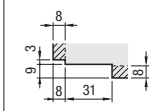
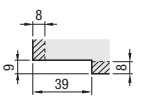
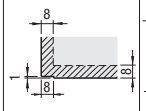
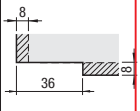
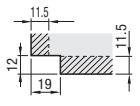
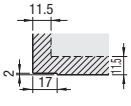
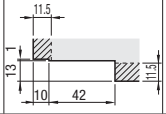
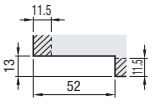
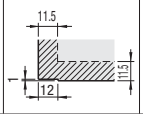
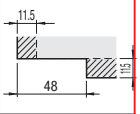
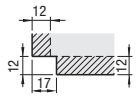
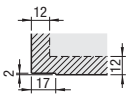
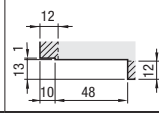
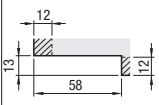
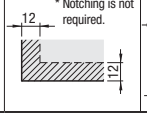
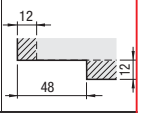
Materials		PET		Vinyl Chloride (Antistatic)	Acrylic (Cast)		Acrylic Economy (Extrusion)	Polycarbonate	
Page		P.881	P.865~	P.869	P.881	P.881~	P.885	P.881	P.887~
Size	Width (B)	20~300	20~1000	100~ 900	20~300	20~1000	300~ 900	20~300	20~1000
	Length (A)	20~300	20~2000	100~1100	20~300	20~2000	300~1100	20~300	20~2000
	Plate Thickness (T)	0.5 · 1.5	1 · 2 · 3 · 4 · 5 · 8	3 · 5	0.5 · 1 · 1.5 · 2	3 · 4 · 5 · 6 · 8 10 · 15 · 20 · 25	3 · 5 · 8	0.5 · 1 · 1.5 · 2	3 · 4 · 5 · 6 · 8 · 10
Drilling Method		Saw Cut		Saw Cut	Saw Cut - Sides Milled		Saw Cut	Saw Cut	
Drilling		Through Hole · Countersink · Keyhole · Thread Insert							
Alterations		See below.							

Alterations

Alterations	Notching for Blind Joints of Aluminum Frame	Relief at Four Corners	Corner Radius	Corner Cut
				
Code	F_ _ - E_ _ - J_ _ - K_ _	CN	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD
Spec.	Machines relief for blind joints of aluminum frames. Thermal expansion of the plate is not taken into account. Longitudinal direction of notching is all on A dimension side. Not applicable to T=8 Ordering Code F S 6 (Frame Type / Joint Type / Notching Position (See the diagram above.)) Applicable to standard sizes only.	CN = 1mm Increment Machines relief at four corners. 5≤CN≤50 Ordering Code CN=25 ⋯› CN25 Applicable to standard sizes only.	Adds radius to any corner. Applicable to T3 - T5 only. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA · CRB · CRC · CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Applicable to standard sizes only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.)When the corners of A and D are cut by C5⋯› CCA5-CCD5 Applicable to standard sizes only.
Price Adder	2,00 / Corner	4,00	5≤R≤20: 2,00 / Corner; 25≤R≤50: 3,00 / Corner; 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner; 25≤C≤50: 3,00 / Corner

See below for details

Part Number	A	B	T	F Corner	E Corner	J Corner	K Corner	10 Days
ACAE	800	600	3	FS6	ED6	JS6	KD6	

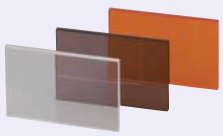
Notched Shapes for Various Joints	Simple Joint Kits (P.633)	Single Joint Kits (P.635) Screw Joint Kits (P.628)		Pre-assembly Double Joint Kits (P.637)		Center Joints (P.629)	Post-assembly Double Joints (P.631)
		Single Joint Kit Standard Type	Single Joint Kits Narrow Type / Screw Joint Kits	Standard Type	Eccentric Nut Type		
	(Ex. 1) P (Ex. 2) For Ex.2, panel notching is not required.	S	N The figure above shows Single Joint Kit Narrow Type.	D	(Ex. 1) H	C (Ex. 2)	A
HFS5 Series 5	-	-	-	-	-		
HFS6 Series 6							
HFS8 Series 8	-						
HFS8-45 Series 845	-						

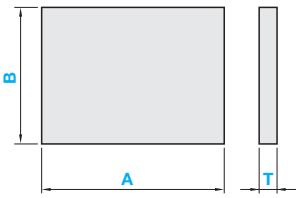
For how to select panels, refer to **P.679 · 680**
Dimensions above include a margin of 1mm at the groove part.
Make the margin larger for resin plate and etc., because it expands or shrinks largely by the temperature fluctuation.
Ex.) For Acrylic Plate Economy Type of 1 m length with the temperature difference of 10°C, it expands and contracts 0.7 mm. The margin of approx. 2 mm is necessary in the case of temperature difference of 30°C.

PET Plates

■Standard Type

RoHS





A≥B

Type	M Grade	Color	Light transmittance	Operating Ambient Temperature
PYA	Standard	Transparent	87%	- 15~55°C
PYBA	Standard	Smoke Brown	28%	
PYDA	Standard	Orange	45%	
PYTA	Antistatic	Transparent	77%	
PYBTA	Antistatic	Smoke Brown	30%	

- T Dimension Tolerance

T	T Dimension Tolerance
1	±0.15
2 · 3	±0.2
4 · 5	±0.3
8	±0.6

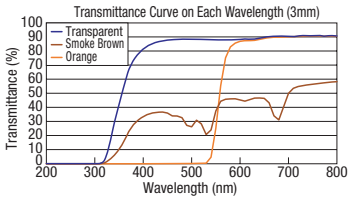
- Dimension Tolerance of A and B±1.0

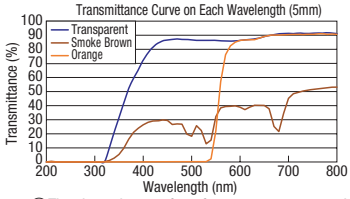
Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

■Standard Type

Part Number	A	B	T
Standard Size	**1mm Increment**		**Selection**
PYA (Standard Transparent)	20~1200	20~1000	1 · 2 · 3 · 4 · 5 · 8
PYBA (Standard Smoke Brown)			3 · 4 · 5
PYDA (Standard Orange) PYTA (Antistatic Transparent) PYBTA (Antistatic Smoke Brown)			3 · 5
Large Size			
L-PYA (Standard Transparent) L-PYBA (Standard Smoke Brown) L-PYDA (Standard Orange) L-PYTA (Antistatic Transparent) L-PYBTA (Antistatic Smoke Brown)	1201~2000	20~1000	3 · 5

For T0.5 and 1.5, refer to **P.881**





The above data are for reference, not guaranteed.

Order Example

■Standard Size

Part Number	-	A	-	B	-	T
PYA	-	1200	-	800	-	8

■Large Size

Part Number	-	A	-	B	-	T
L-PYA	-	1300	-	800	-	3

Days to Ship

■Standard Size (Except PYDA).

6 Days P.88

One day shipping is available for orders received by 5pm.
Orders received after 5pm will be shipped on the next business day.

■Large Size · PYDA

8 Days

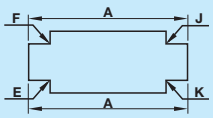
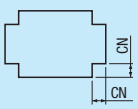
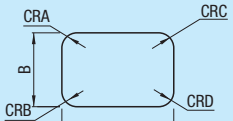
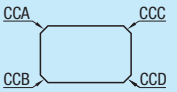
Price

For Price List, refer to P.867

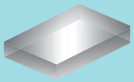
Alterations

Part Number	-	A	-	B	-	T	-	(CRA ect.)
PYA	-	100	-	80	-	3	-	CRA10-CRC10

When alterations are specified, 10 Days

Alterations	Notching for Blind Joints of Aluminum Frame	Relief at Four Corners	Corner Radius	Corner Cut
				
Code	F_ _ · E_ _ · J_ _ · K_ _	CN	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD
Spec.	Machines relief for blind joints of aluminum frames. Thermal expansion of the plate is not taken into account. Longitudinal direction of notching is all on A dimension side. Applicable to standard sizes only. ⊗ Not applicable to T=8 Ordering Code F S 6 (Frame Type / Joint Type / Notching Position (See the diagram above.)) Applicable to standard sizes only.	CN = 1mm Increment Machines relief at four corners. 5≤CN≤50 Applicable to standard sizes only. Ordering Code CN=25 ⋯› CN25 Applicable to standard sizes only.	Adds radius to any corner. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Applicable to standard sizes only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.)When the corners of A and D are cut by C5⋯› CCA5-CCD5 Applicable to standard sizes only.
Price Adder	2,00 / Corner	4,00	5≤R≤20: 2,00 / Corner; 25≤R≤50: 3,00 / Corner; 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner; 25≤C≤50: 3,00 / Corner

For details of notching alterations for blind joint of aluminum frames, refer to **P.864**



Price Reduction
Up to 20%

■Pre-drilled Type RoHS



Type	M Grade	Color	Light transmittance	Operating Ambient Temperature
PYA	Standard	Transparent	87%	- 15~55°C
PYBA	Standard	Smoke Brown	28%	
PYDA	Standard	Orange	45%	
PYTA	Antistatic	Transparent	77%	
PYBTA	Antistatic	Smoke Brown	30%	

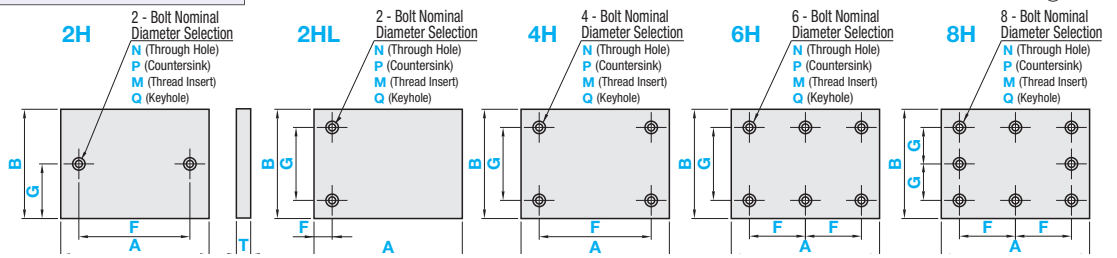
- T Dimension Tolerance

T	T Dimension Tolerance
1	±0.15
2 · 3	±0.2
4 · 5	±0.3
8	±0.6

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

- Dimension Tolerance of A and B±1.0

(?)A≥B



Drilling Details

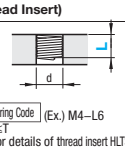
N(Through hole)



P (Countersink)



M (Thread Insert)



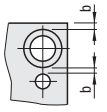
Ordering Code (Ex.) M4–L6
(?)L≤T
(?)For details of thread insert HLTS, refer to P.255

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	7.5	9.5	11.5	13.5	19	23
h	2	2.5	3	3.5	5	6

■Table 1

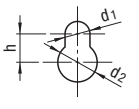
Bolt Nominal Dia.	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9
L	3	4	5	6	8
	4.5	6	7.5	9	12
	6	8	10	12	16

(N-P-M) Drilling Conditions



Hole Diameter	b (Min. value)
3~10	2.5

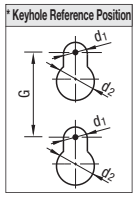
Q (Keyhole)



Keyhole Nominal Dia.	5	6	8
d1	6	7	9
d2	14	16	20
h	11	12	15

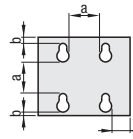
(?)Use with flat washers (P.232) to prevent damage to the resin.

Drilling Conditions Q (Keyhole)



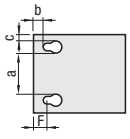
(?)Keyhole Machining Conditions a≥5 b≥5 c≥5

2H · 4H · 6H · 8H



(?)b≥5

2HL



<Keyhole Position>
(1): When 2H, the center of diameter d1 is consistent with G.
(2): When 4H and 6H, the center of G dimension is consistent with the center of B dimension.
(3): When 8H, the diameter d1 center of the middle Keyhole is consistent with the center of B dimension.
(4): When 2HL, keyholes turn sideways and the center of diameter d1 is consistent with F.

■Pre-drilled Type

Part Number Type	Part Number Nominal	A 1mm Increment	B 1mm Increment	T PYA	T PYBA	T PYDA PYTA PYBTA	F 0.5mm Increment	G 0.5mm Increment	Select Mounting Holes: Through Hole N	Countersink P	Keyhole Q	Thread Insert M
PYA (Standard Transparent)	2H(Horizontal)	20~1200	20~1000	1	-	-	6~1191.5 (2H · 4H)	4.5~995.5 (2H)	3	-	5 6 8	-
PYBA (Standard Smoke Brown)	2HL(Vertical)			2	-	-			4	-		-
PYDA (Standard Orange)	4H			3	3	3	4.5~1195.5 (2HL)	6~991.5 (2HL · 4H · 6H)	5	3		-
PYTA (Antistatic Transparent)	6H			4	4	-			6	3 4 5		3
PYBTA (Antistatic Smoke Brown)	8H			5	5	5	6~595.5 (6H · 8H)	6~495.5 (8H)	8	3 4 5 6		3 4
				8	-	-			10	4 5 6 8		3 4

(?)Dimension F Specification Range For 2H and 4H: d(d1)+2.5≤F≤A-d(d1)-5; for 2HL: (d1)/2+2.5≤F≤A-d(d1)/2-2.5; for 6H and 8H: d(d1)+2.5≤F≤(A-d(d1)-5)/2.
(?)Dimension G Specification Range For 2H: d(d1)/2+2.5≤G≤B-d(d1)/2-2.5; for 2HL, 4H and 6H: (d1)+2.5≤G≤B-d(d1)-5; for 8H: d(d1)+2.5≤G≤(B-d(d1)-5)/2. (d for through hole, d1 for countersink.)

■Drilling

Order Example

Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
PYBA4H	900	700	4	F750	G650	P4	
PYA4H	850	500	5	F450	G300	M4	L4

Days to Ship

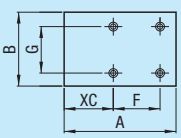
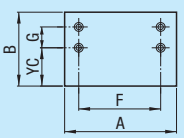
8 Days

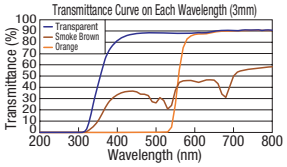
Price

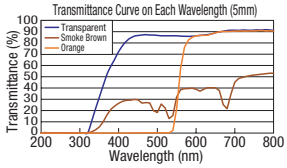
For Price List, refer to P.867
Pre-drilled Type Price = Standard Type Price + Hole Charge

Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC · YC)
PYA4H - 200 - 100 - 4 - F160 - G50 - N6 - YC35

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (?)(2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (?)(6H / 8H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment (?)d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	4,00	4,00





(?)The above data are for reference, not guaranteed.

PET Plates Price List

Price

Volume Discount (Round down to one Cent.) P.87

Standard Size - Pre-drilled Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Large Size

Qty.	1~3	4~9	10~15	16~20	21 or More
Discount Rate	€ Unit Price	5%	8%	10%	Please request a quotation for Days to Ship and Price.
Days to Ship	Regular				

PET Plate Standard Transparent (1mm Increment)

Type	T	A	€ Unit Price B									
			20~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PYA	1	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
	2	701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
PYA	3	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PYA		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
PYA	4	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
PYA	5	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PYA		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
PYA	8	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										

Hole Charge

Drilling Type	Hole Charge			
	N (Through hole)	P (Countersink)	Q (Keyhole)	M (Thread Insert)
2H / 2HL				
4H				
6H				
8H				

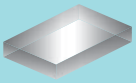
Pre-drilled Price = Standard Type € Unit Price + Hole Charge

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

PYA4H - 500 - 400 - 8 - F240 - G160 - N8

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

\+ 3,80 = 25,50 EUR


Saw Cut

Price Reduction
Up to 20%

Check each Material Rate.

The unit price of this product is the price shown in the table multiplied by Material rate. (Round down to ten Cent.)

PET Plate Standard Smoke Brown · Orange (1mm Increment)

Type	T	A	€ Unit Price B									
			20~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
Type(Material Rate) (Material)	3	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
PYBA(x1.0) (Smoke Brown) PYDA(x1.5) (Orange)		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PYBA(x1.0) (Smoke Brown) L-PYDA(x1.2) (Orange)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
PYBA	4	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
PYBA(x1.0) (Smoke Brown) PYDA(x1.5) (Orange)	5	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PYBA(x1.0) (Smoke Brown) L-PYDA(x1.2) (Orange)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										

PET Plate Antistatic (1mm Increment)

Type	T	A	€ Unit Price B									
			20~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
PYTA (Transparent) PYBTA (Smoke Brown)	3	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PYTA (Transparent) L-PYBTA (Smoke Brown)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
PYTA (Transparent) PYBTA (Smoke Brown)	5	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PYTA (Transparent) L-PYBTA (Smoke Brown)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										

Antistatic PVC Plates

■Cost-effective as antistatic type with high flame and chemical resistance.

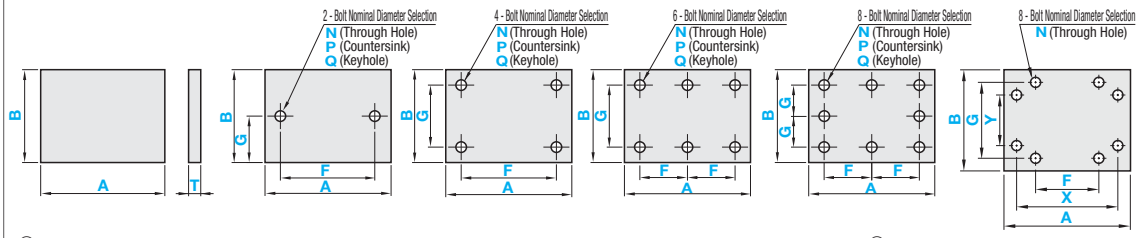


ENBT (Antistatic PVC Plate - Transparent)
ENBBT (Antistatic PVC Plate - Smoke Brown)

Type	Ambient Operating Temp.
Antistatic PVC Plates	-30~60°C

Standard Type

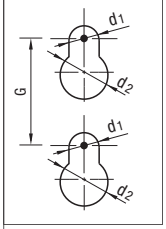
Pre-drilled Type
-2 Holes- **2H** -4 Holes- **4H** -6 Holes- **6H** -8 Holes- **8H** -8 Holes- **8HV**



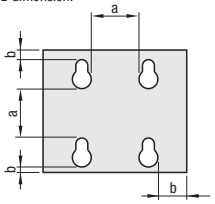
A≥B

Light Transmission: ENBT80%, ENBBT29%

*** Keyhole Reference Position**



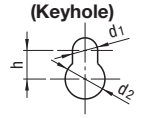
<Keyhole Position>
(1): When 2H, the center of diameter d1 is consistent with G.
(2): When 4H and 6H, the center of G dimension is consistent with the center of B dimension.
(3): When 8H, the diameter d1 center of the middle Keyhole is consistent with the center of B dimension.



Keyhole Machining Conditions
a≥5
b≥5

Details of Keyhole

Q (Keyhole)



Keyhole Nominal Dia.	5	6	8
d1	6	7	9
d2	14	16	20
h	11	12	15

Use with flat washers (P.232) to prevent damage to resin.

Drilling Details

N (Through hole)



P (Countersink)



Bolt Nominal Dia.	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9
d1	7.5	9.5	11.5	13.5	-
h	2	2.5	3	3.5	-

■Precision Standards

- T Dimension Tolerance ±0.5
- Dimension Tolerance of A and B ±1.0

■Standard Type

Part Number	1mm Increment		T
Type	A	B	
ENBT ENBBT	100~1100	100~900	3 5

■Pre-drilled Type

Part Number		1mm Increment		T	1mm Increment				Select Mounting Holes		
Type	Nominal	A	B		F	G	x	Y	N (Through Hole)	P (Countersink)	Q (Keyhole)
ENBT ENBBT	2H 4H 6H 8H	100 ~ 1100	100 ~ 900	3	9~1091 (2H · 4H Type) 9~545 (6H · 8H · 8HV Type)	5~895 (2H Type) 9~891 (4H · 6H Type) 9~445 (8H · 8HV Type)	-	-	3 4 5 6 8	3	5 6 8
				5						3 4 5 6	
	8HV			3, 5			19~535	19~435		-	-

Dimension F Specification Range: For 2H and 4H, d(d1)+5≤F≤A-d(d1)-5. For 6H and 8H, d(d1)+5≤F≤A/2-d(d1)/2-2.5.
Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5. For 4H and 6H, d(d1)+5≤G≤B-d(d1)-5. For 8H, d(d1)+5≤G≤B/2-d(d1)/2-2.5.
(d for through hole; d1 for countersink.)
X Dimension Range: d+5≤X≤A/2-d/2-2.5
Y Dimension Range: d+5≤Y≤B/2-d/2-2.5
For 8HV: X-2d-F>10, G-2d-Y>10

Order Example

■Standard Type

Part Number	-	A	-	B	-	T
ENBT	-	955	-	825	-	5

■Pre-drilled Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter
ENBBT6H	-	800	-	400	-	3	-	F375	-	G350	-	N5

Days to Ship

■Standard Type

8 Days

Express A 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

■Pre-drilled Type

10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

■Standard Type € Unit Price

Price

Part Number	T	A	€ Unit Price B100 ~ 200	B201 ~ 300	B301 ~ 400	B401 ~ 500	B501 ~ 600	B601 ~ 700	B701 ~ 800	B801 ~ 900
ENBT (Transparent)	3	100~200								
		201~300								
		301~400								
		401~500								
		501~600								
		601~700								
		701~800								
		801~900								
		901~1000								
		1001~1100								
	5	100~200								
		201~300								
		301~400								
		401~500								
		501~600								
		601~700								
		701~800								
		801~900								
		901~1000								
		1001~1100								

Part Number	T	A	€ Unit Price B100 ~ 200	B201 ~ 300	B301 ~ 400	B401 ~ 500	B501 ~ 600	B601 ~ 700	B701 ~ 800	B801 ~ 900
ENBBT (Smoke Brown)	3	100~200								
		201~300								
		301~400								
		401~500								
		501~600								
		601~700								
		701~800								
		801~900								
		901~1000								
		1001~1100								
	5	100~200								
		201~300								
		301~400								
		401~500								
		501~600								
		601~700								
		701~800								
		801~900								
		901~1000								
		1001~1100								

Drilling Type	Bolt NominalDrilling € Unit Price N (Through Hole)	P (Countersink)	Q (Keyhole)
2H			
4H			
6H			
8H			
8HV			

Pre-drilled Type Price = Standard Type € Unit Price + Hole Charge

Part Number - A - B - T - F - G - Bolt Nominal Diameter

ENBT4H - 500 - 400 - 5 - F240 - G160 - N8

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

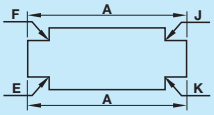
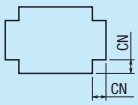
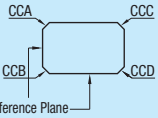
37,30 EUR + 6,00 EUR = 43,30 EUR

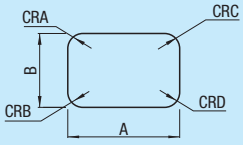
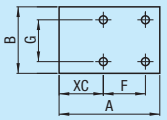
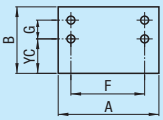
Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC·YC·CN...etc.)

ENBT4H - 500 - 400 - 3 - F300 - G300 - N6 - XC15 · YC35

10 Days

Alterations	Notching for Blind Joints of Aluminum Frame	Relief at Four Corners	Corner Cut
			
Code	F_ _ · E_ _ · J_ _ · K_ _	CN	CCA · CCB · CCC · CCD
Spec.	Machines relief for blind joints of aluminum frames. Thermal expansion of the plate is not taken into account. Longitudinal direction of notching is all on A dimension side. Ordering Code F S 6 — Frame Type / Joint Type / Notching Position (See the diagram above.)	CN = 1mm Increment Machines relief at four corners. 5≤CN≤50 Ordering Code CN=25 ···› CN25	Cuts any specified corner. 5≤Corner Cut≤50 5mm Increment Ordering Code Ex.) When the corners of A and D are cut by C5 ···› CCA5-CCD5 Available for Standard Type only.
Price Adder	2,00 / Corner	4,00	5≤C≤20: 2,00 / Corner; 25≤C≤50: 3,00 / Corner

Alterations	Corner Radius	Hole Position from Left	Hole Position from Bottom
			
Code	CRA · CRB · CRC · CRD	XC	YC
Spec.	Adds radius to any corner. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Available for Standard Type only.	XC=1 mm Increment 5≤XC≤1086 (2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H / 8H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	Specify in YC=1 mm Increment 5≤YC≤886 (4H / 6H Type) d(d1)/2+2.5≤YC≤B–G–d(d1)/2–2.5 (8H Type) d(d1)/2+2.5≤YC≤B–2G–d(d1)/2–2.5 Not available for 2H
Price Adder	5≤R≤20: 2,00 / Corner; 25≤R≤50: 3,00 / Corner; 55≤R≤100: 4,50 / Corner	4,00	4,00

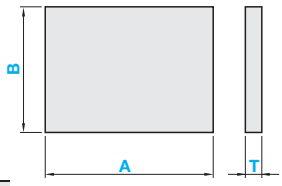
Acrylic Plates
-Cast Plate-

■MISUMI Acrylic Plates have two types: cast plates and extrusion plates. Sides Milled is now available for cast plates.
■Features Cast Plates: Excels in heat resistance and mechanical strength. Extruded Plates on **P.885**: More inexpensive than cast plates. For details of cast plates and extruded plates, refer to **P.863**

■Standard Type

RoHS





- T Dimension Tolerance

T	Tolerance
3	±0.5
4, 5	±0.6
6	±0.8
8	±0.9
10	±1.1
15	±1.5
20	±2.0
25	±2.5

- Dimension Tolerance of A and B±1.0

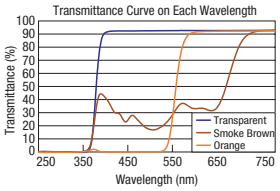
Type	M Grade	Color	Light transmittance	Operating Ambient Temperature
ACA	Standard	Transparent	93%	-30~80°C
ACBA	Standard	Smoke Brown	25%	
ACDA	Standard	Orange	43%	
ACTA	Antistatic	Transparent	79%	
ACBTA	Antistatic	Smoke Brown	32%	

A≥B

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~
Sides Milled(4F)	Milling	6.3 √	Material	~

■Standard Type

Part Number: Material Selection	Finish Selection	A / B Dimension Tolerance Selection	A	B	T
Standard Size	**Saw Cut**		**1mm Increment**		**Selection**
ACA(Standard Transparent)	-	Not available	20~1200	20~1000	3 · 4 · 5 · 6 · 8 · 10
			20~800	20~600	15 · 20 · 25
ACBA(Standard Smoke Brown)					3 · 4 · 5 · 6 · 8 · 10
ACDA(Standard Orange) ACTA(Antistatic Transparent) ACBTA(Antistatic Smoke Brown)			20~1200	20~1000	3 · 5
Large Size					
L-ACA(Standard Transparent) L-ACBA(Standard Smoke Brown) L-ACTA(Antistatic Transparent) L-ACBTA(Antistatic Smoke Brown)			1201~2000	20~1000	3 · 5
Sides Milled	**Sides Milled**		**0.1mm Increment**		
ACA(Standard Transparent)	4F	Q(0~+0.2) N(±0.1) M(-0.2~0)	10~400	10~200	5 · 6 · 8 · 10 · 15 · 20 · 25
ACBA(Standard Smoke Brown)					5 · 6 · 8 · 10
ACDA(Standard Orange) ACTA(Antistatic Transparent) ACBTA(Antistatic Smoke Brown)					5



The above data are for reference, not guaranteed.

For T0.5, 1.0, 1.5 and 2.0, refer to **P.881**

Order Example

■Standard Size

Part Number	A	B	T
ACTA	955	825	3

■Large Size

Part Number	A	B	T
L-ACA	1500	800	5

■Sides Milled

Part Number	A	B	T
ACA4FQ	300	200	15

Days to Ship

■Saw Cut standard size (except ACDA)
6 Days

■Large Size · ACDA
8 Days

■Sides Milled
8 Days

One day shipping is available for orders received by 5pm.
Orders received after 5pm will be shipped on the next business day.

Price

For Price List, refer to P.883

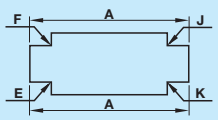
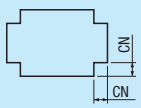
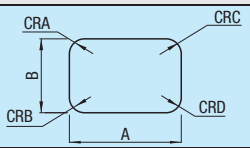
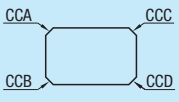
-Saw Cut = Standard Type € Unit Price
-Sides Milled = Standard Type € Unit Price + Sides Milled Machining Price
The price of the Sides Milled is that of the Standard type plus Sides Milled charge.

Alterations

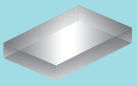
Part Number	A	B	T	(CRA...etc.)
ACA	100	80	3	CRA10-CRC10

When alterations are specified, **10 Days**

Alterations

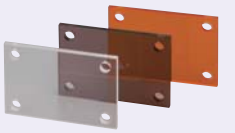
	Notching for Blind Joints of Aluminum Frame	Relief at Four Corners	Corner Radius	Corner Cut
				
Code	F_ _ · E_ _ · J_ _ · K_ _	CN	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD
Spec.	Machines relief for blind joints of aluminum frames. Thermal expansion of the plate is not taken into account. Longitudinal direction of notching is all on A dimension side. Applicable to standard sizes only. ⊗Not applicable to T=8 Ordering Code F S 6 Frame Type Joint Type Notching Position (See the diagram above.) Applicable to standard sizes only.	CN = 1mm Increment Machines relief at four corners. 5≤CN≤50 Applicable to standard sizes only. Ordering Code CN=25 ⋯› CN25 Applicable to standard sizes only.	Adds radius to any corner. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Applicable to standard sizes only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code Applicable to standard sizes only. (Ex.)When the corners of A and D are cut by C5⋯› CCA5-CCD5
Price Adder	2,00 / Corner	4,00	5≤R≤20: 2,00 / Corner 25≤R≤50: 3,00 / Corner 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner 25≤C≤50: 3,00 / Corner

For details of notching alterations for blind joint of aluminum frames, refer to **P.864**
Alterations are not available for Sides Milled.



Price Reduction
Up to 15%

■Pre-drilled Type RoHS



Type	M Grade	Color	Light transmittance	Operating Ambient Temperature
ACA	Standard	Transparent	93%	-30~80°C
ACBA	Standard	Smoke Brown	25%	
ACDA	Standard	Orange	43%	
ACTA	Antistatic	Transparent	79%	
ACBTA	Antistatic	Smoke Brown	32%	

- T Dimension Tolerance

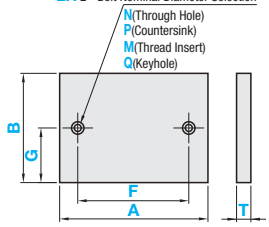
T	Tolerance
3	±0.5
4, 5	±0.6
6	±0.8
8	±0.9
10	±1.1
15	±1.5
20	±2.0
25	±2.5

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

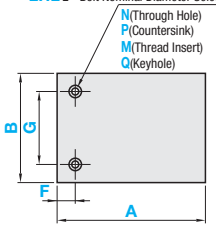
- Dimension Tolerance of A and B±1.0

(?)A≥B

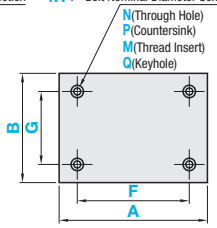
2H 2 - Bolt Nominal Diameter Selection
N(Through Hole) P(Countersink) M(Thread Insert) Q(Keyhole)



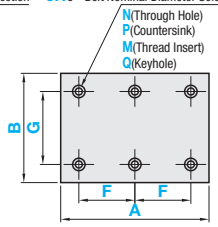
2HL 2 - Bolt Nominal Diameter Selection
N(Through Hole) P(Countersink) M(Thread Insert) Q(Keyhole)



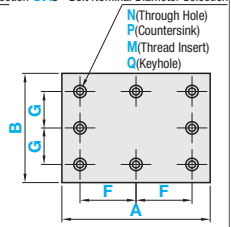
4H 4 - Bolt Nominal Diameter Selection
N(Through Hole) P(Countersink) M(Thread Insert) Q(Keyhole)



6H 6 - Bolt Nominal Diameter Selection
N(Through Hole) P(Countersink) M(Thread Insert) Q(Keyhole)



8H 8 - Bolt Nominal Diameter Selection
N(Through Hole) P(Countersink) M(Thread Insert) Q(Keyhole)



Drilling Details

N(Through hole)

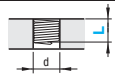


P (Countersink)



Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	7.5	9.5	11.5	13.5	19	23
h	2	2.5	3	3.5	5	6

M (Thread Insert)

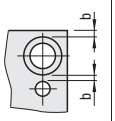


Ordering Code (Ex.) M4–L6
(?)L≤T
(?)For details of thread insert HLTS, refer to **P.255**

■Table 1

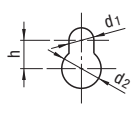
Bolt Nominal Dia.	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9
L	3	4	5	6	8
	4.5	6	7.5	9	12
	6	8	10	12	16

Drilling Conditions (N-P-M)



Hole Diameter	b (Min. value)
3~10	2.5

Q (Keyhole)

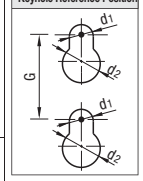


Keyhole Nominal Dia.	5	6	8
d1	6	7	9
d2	14	16	20
h	11	12	15

(?)Use with flat washers (**P.232**) to prevent damage to the resin.

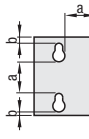
Drilling Conditions Q(Keyhole)

* Keyhole Reference Position



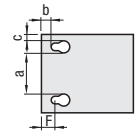
(?)Keyhole Machining Conditions a≥5 b≥5 c≥5

2H · 4H · 6H · 8H



(?)b≥5

2HL



<Keyhole Position>
(1): When 2H, the center of diameter d1 is consistent with G.
(2): When 4H and 6H, the center of G dimension is consistent with the center of B dimension.
(3): When 8H, the diameter d1 center of the middle Keyhole is consistent with the center of B dimension.
(4): When 2HL, keyholes turn sideways and the center of diameter d1 is consistent with F.

■Pre-drilled Type

Material Code	Nominal	A	B	T Selection			F	G	Select Mounting Holes				
									Through Hole	Countersink	Keyhole	Thread Insert	
		1mm Increment		ACA	ACBA	ACDA ACTA ACBTA	0.5mm Increment		N	P	Q	M	L
ACA (Standard Transparent)	2H (Horizontal) 2HL (Vertical) 4H 6H 8H	20~1200	20~1000	3	3	3	6~1191.5 (2H · 4H) 4.5~1195.5 (2HL) 6~595.5 (6H · 8H)	4.5~995.5 (2H) 6~991.5 (2HL / 4H / 6H) 6~495.5 (8H)	3 4 5 6 8 10	3	5 6 8	-	Select from Table 1
ACBA (Standard Smoke Brown)				4	4	-				3 4 5		3	
ACDA (Standard Orange)				5	5	5				3 4 5 6		3 4	
ACTA (Antistatic Transparent)				6	6	-				4 5 6		4 5	
ACBTA (Antistatic Smoke Brown)				8	8	-				4 5 6 8		4 5 6	
				10	10	-				4 5 6 8 10		4 5 6 8	
ACA (Standard Transparent)		20~800	20~600	15	-	-	6~791.5 (2H · 4H) 4.5~795.5 (2HL) 6~395.5 (6H · 8H)	4.5~595.5 (2H) 6~591.5 (2HL · 4H · 6H) 6~295.5 (8H)		5 6 8 10		5 6 8 10	
				20	-	-				5 6 8 10		5 6 8 10	
				25	-	-				5 6 8 10		5 6 8 10	

Order Example

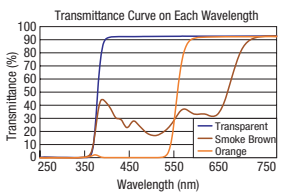
Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
ACA6H	800	400	3	F250	G355	N3	
ACA6H	800	400	8	F250	G300	M4	L6

Alterations

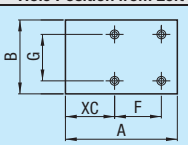
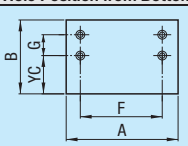
Part Number	A	B	T	F	G	Bolt Nominal Diameter	(XC · YC)
ACA4H	200	100	4	F160	G50	N6	XC15-YC35

Days to Ship 8 Days P.88

Price
For Price List, refer to P.883
Pre-drilled Type Price
= Standard Type Price + Hole Charge



(?)The above data are for reference, not guaranteed.

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (?)(2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (?)(6H / 8H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment (?)d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	4,00	4,00

Acrylic Plates Price List
-Cast Plate-

Price

Volume Discount (Round down to one Cent.) P.87

Standard Size - Pre-drilled Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Large Size

Qty.	1~3	4~9	10~15	16~20	21 or More
Discount Rate	€ Unit Price	5%	8%	10%	Please request a quotation for Days to Ship and Price.
Days to Ship	Regular				

Sides Milled

Qty.	1~10
Discount Rate	€ Unit Price

Acrylic Plate Cast Plate Standard

(Saw Cut: 1mm Increment Sides Milled: 0.1mm Increment) ( ) are the dimension range for Sides Milled.

Type	T	A	€ Unit Price B 20~100 (100.9)	101~200 (200)	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
Type(Material Rate) (Material) ACA(x1.0) (Transparent) ACBA(x1.0) (Smoke Brown) ACDA(x1.2) (Orange)	3	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-ACA(x1.0) (Transparent) L-ACBA(x1.0) (Smoke Brown)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
ACA(x1.0) (Transparent) ACBA(x1.0) (Smoke Brown)	4	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
ACA(x1.0) (Transparent) ACBA(x1.0) (Smoke Brown) ACDA(x1.2) (Orange)	5	20 ~ 100 (100.9)										
		101 ~ 200 (200)										
		201 ~ 300 (300.9)										
		301 ~ 400 (400)										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-ACA(x1.0) (Transparent) L-ACBA(x1.0) (Smoke Brown)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
ACA(x1.0) (Transparent) ACBA(x1.0) (Smoke Brown)	6	20 ~ 100 (100.9)										
		101 ~ 200 (200)										
		201 ~ 300 (300.9)										
		301 ~ 400 (400)										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
	8	20 ~ 100 (100.9)										
		101 ~ 200 (200)										
		201 ~ 300 (300.9)										
		301 ~ 400 (400)										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
	10	20 ~ 100 (100.9)										
		101 ~ 200 (200)										
		201 ~ 300 (300.9)										
		301 ~ 400 (400)										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
ACA(x1.0) (Transparent)	15	20 ~ 100 (100.9)										
		101 ~ 200 (200)										
		201 ~ 300 (300.9)										
		301 ~ 400 (400)										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
	20	20 ~ 100 (100.9)										
		101 ~ 200 (200)										
		201 ~ 300 (300.9)										
		301 ~ 400 (400)										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
	25	20 ~ 100 (100.9)										
		101 ~ 200 (200)										
		201 ~ 300 (300.9)										
		301 ~ 400 (400)										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										

Hole Charge

Drilling Type	Hole Charge N (Through Hole)	P (Counter-sink)	Q (Keyhole)	M (Thread Insert)
2H · 2HL				
4H				
6H				
8H				

Pre-drilled Type Price = Standard Type Price + Hole Charge

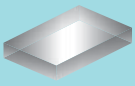
(Ex.)

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter
ACA4H	-	500	-	400	-	5	-	F240	-	G160	-	N8

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 3,80 = 38,00 EUR

Check each Material Rate. The unit price of this product is the price shown in the table multiplied by Material rate. (Round down to ten Cent.)



Price Reduction
Up to 15%

Acrylic Plate Cast Plate Antistatic (Saw Cut: 1mm Increment Sides Milled: 0.1mm Increment)

Type	T	A	€ Unit Price B 20~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
ACTA (Transparent) ACBTA (Smoke Brown)	3	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-ACTA (Transparent) L-ACBTA (Smoke Brown)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
ACTA (Transparent) ACBTA (Smoke Brown)	5	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-ACTA (Transparent) L-ACBTA (Smoke Brown)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										

Sides Milled Charge (0.1mm Increment)

Type	T	A	€ Unit Price B 10~50.9	51~100.9	101~150.9	151~200
Standard ACA4F_ (Transparent) ACBA4F_ (Smoke Brown) ACDA4F_ (Orange) Antistatic ACTA4F_ (Transparent) ACBTA4F_ (Smoke Brown)	5	10~ 50.9				
		51~100.9				
		101~150.9				
	6	151~200.9				
		201~250.9				
	8	251~300.9				
		301~350.9				
		351~400				
ACA4F_ (Transparent) ACBA4F_ (Smoke Brown)	10	10~ 50.9				
		51~100.9				
		101~150.9				
		151~200.9				
		201~250.9				
		251~300.9				
		301~350.9				
		351~400				

Type	T	A	€ Unit Price B 10~50.9	51~100.9	101~150.9	151~200
ACA4F_ (Transparent)	15	10~ 50.9				
		51~100.9				
		101~150.9				
		151~200.9				
		201~250.9				
		251~300.9				
		301~350.9				
		351~400				
	20	10~ 50.9				
		51~100.9				
		101~150.9				
		151~200.9				
		201~250.9				
		251~300.9				
		301~350.9				
		351~400				
	25	10~ 50.9				
		51~100.9				
		101~150.9				
		151~200.9				
		201~250.9				
		251~300.9				
		301~350.9				
		351~400				

Sides Milled = Standard Type € Unit Price + Sides Milled Machining Price

(Ex.) Part Number - A - B - T

ACA4FQ - 300 - 200 - 10

(Standard Type € Unit Price) + Sides Milled Charge = Sides Milled Charge

+ 22,70 = 35,40 EUR

Acrylic Plates Economy

-Extruded Plates-

■MISUMI Acrylic Plates have two types: cast plates and extrusion plates.

■Features: Extruded plates: More inexpensive than cast plates. Cast Plates on **P. 871**: Excels in heat resistance and mechanical strength. For details of cast plates and extruded plates, refer to **P.863**



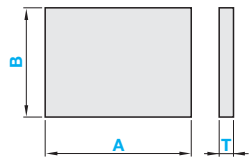
RoHS

Type	Grade	Color	Light transmittance	Operating Ambient Temperature
ACAE	Standard	Transparent	93%	-30~70°C
ACBAE		Smoke Brown	34%	
ACTAE	Antistatic	Transparent	87%	-30~60°C
ACBTAE		Smoke Brown	25%	

■Precision Standards

- T Dimension Tolerance ±0.5
- Dimension Tolerance of A and B ±1.0

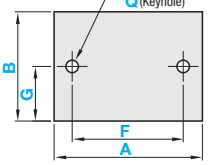
Standard Type



Pre-drilled Type 2H

2 - Bolt Nominal Diameter Selection

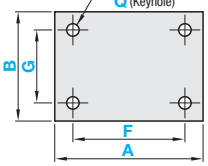
N (Through Hole)
P (Countersink)
Q (Keyhole)



4H

4 - Bolt Nominal Diameter Selection

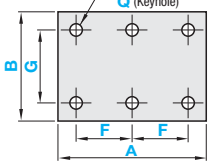
N (Through Hole)
P (Countersink)
Q (Keyhole)



6H

6 - Bolt Nominal Diameter Selection

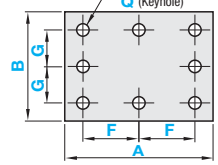
N (Through Hole)
P (Countersink)
Q (Keyhole)



8H

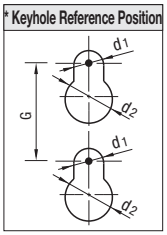
8 - Bolt Nominal Diameter Selection

N (Through Hole)
P (Countersink)
Q (Keyhole)



Ⓟ A≥B

*** Keyhole Reference Position**

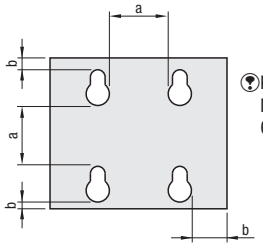


<Keyhole Position>

(1): When 2H, the center of diameter d_1 is consistent with G.

(2): When 4H and 6H, the center of G dimension is consistent with the center of B dimension.

(3): When 8H, the diameter d_1 center of the middle Keyhole is consistent with the center of B dimension.

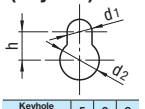


Ⓟ Keyhole Machining Conditions

a≥5
b≥5

Details of Keyhole

Q(Keyhole)

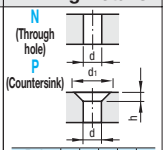


Keyhole Nominal Dia.	5	6	8
d_1	6	7	9
d_2	14	16	20
h	11	12	15

Ⓟ Use with flat washers (**P.232**) to prevent damage to resin.

Drilling Details

N (Through hole)
P (Countersink)



Bolt Nominal Dia.	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9
d_1	7.5	9.5	11.5	13.5	19
h	2	2.5	3	3.5	5

■**Standard Type**

Part Number Type	1mm Increment A	1mm Increment B	Selection T
ACAE ACBAE	300 ~ 1100	300 ~ 900	3 5 8
ACTAE ACBTAE			3 5

■**Pre-drilled Type**

Part Number Type	Part Number Nominal	1mm Increment A	1mm Increment B	Selection T	1mm Increment F	1mm Increment G	Select Mounting Holes N (Through Hole)	Select Mounting Holes P (Countersink)	Select Mounting Holes Q (Keyhole)
ACAE ACBAE	2H 4H 6H	300 ~ 1100	300 ~ 900	3	9~1091 (2H · 4H)	5~895 (2H) 9~891 (4H · 6H)	3 4 5 6	3	5 6 8
				5				3 4 5 6	
				8				4 5 6 8	
ACTAE ACBTAE	8H			3	9~545 (6H · 8H)	9~445 (8H)		3	
				5				3 4 5 6	

Ⓟ For plate thicknesses other than above, refer to **P.881~P.884**

Ⓟ Dimension F Specification Range: For 2H and 4H, $d(d_1)+5 \le F \le A-d(d_1)-5$. For 6H and 8H, $d(d_1)+5 \le F \le A/2-d(d_1)/2-2.5$.

Ⓟ Dimension G Specification Range: For 2H, $d(d_1)/2+2.5 \le G \le B-d(d_1)/2-2.5$. For 4H and 6H, $d(d_1)+5 \le G \le B-d(d_1)-5$. For 8H, $d(d_1)+5 \le G \le B/2-d(d_1)/2-2.5$. (d for through hole, d1 for countersink.)

Order Example

■**Standard Type**

Part Number - A - B - T

ACAE - 955 - 825 - 3

■**Pre-drilled Type**

Part Number - A - B - T - F - G - Bolt Nominal Diameter

ACAE6H - 800 - 400 - 3 - F250 - G355 - N3

Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC · YC · CN . . . etc.)

ACAE4H - 500 - 400 - 3 - F300 - G300 - N6 - XC15 · YC35

Days to Ship

■**Standard Type**

8 Days — Express A — 8,00 EUR/ piece — **P.88**

Ⓟ A Express Charge of 21,60 EUR for 3 or more identical pieces.

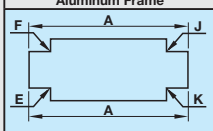
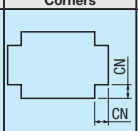
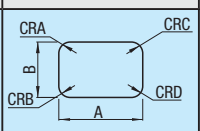
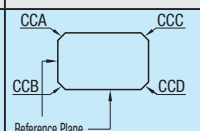
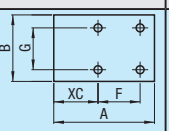
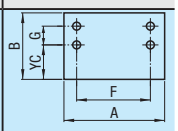
■**Pre-drilled Type**

10 Days — Express B — 5,00 EUR/ piece — **P.88**

Ⓟ A Express Charge of 13,50 EUR for 3 or more identical pieces.

10 Days

Alterations

	Notching for Blind Joints of Aluminum Frame	Relief at Four Corners	Corner Radius	Corner Cut	Hole Position from Left	Hole Position from Bottom
						
Code	F_ _ · E_ _ · J_ _ · K_ _	CN	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD	XC	YC
Spec.	Machines relief for blind joints of aluminum frames. Ⓟ Thermal expansion of the plate is not taken into account. Ⓟ Longitudinal direction of notching is all on A dimension side. Ordering Code F S 6 Frame Type Joint Type Notching Position (See the diagram above) Ⓟ Available for Standard Type only.	CN = 1mm Increment Machines relief at four corners. Ⓟ 5≤CN≤50 Ordering Code CN=25 ⋯› CN25 Ⓟ Available for Standard Type only.	Adds radius to any corner. R=5mm Increment Ⓟ 10≤A(B)–R(2R) Ⓟ 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Ⓟ Available for Standard Type only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.)When the corners of A and D are cut by C5⋯› CCA5-CCD5 Ⓟ Available for Standard Type only.	XC=1 mm Increment Ⓟ 5≤XC≤1086 Ⓟ (2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 Ⓟ (6H / 8H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	Specify in YC=1 mm Increment Ⓟ 5≤YC≤886 Ⓟ (4H / 6H Type) d(d1)/2+2.5≤YC≤B–G–d(d1)/2–2.5 Ⓟ (8H Type) d(d1)/2+2.5≤YC≤B–2G–d(d1)/2–2.5 Not available for 2H
Price Adder	2,00 / Corner	4,00	5≤R≤20: 2,00 / Corner; 25≤R≤50: 3,00 / Corner; 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner; 25≤C≤50: 3,00 / Corner	4,00	4,00

Ⓟ For Notching for Blind Joints of Aluminum Frame, refer to **P.864**

Curved Panels

CAD Date

Price

Standard Type € Unit Price

Standard

Part Number	T	A	€ Unit Price B300 ~ 400	B401 ~ 500	B501 ~ 600	B601 ~ 700	B701 ~ 800	B801 ~ 900
ACAE (Transparent)	3	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
	5	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
	8	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
ACBAE (Brown Smoke)	3	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
	5	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
	8	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						

Antistatic

Part Number	T	A	€ Unit Price B300 ~ 400	B401 ~ 500	B501 ~ 600	B601 ~ 700	B701 ~ 800	B801 ~ 900
ACTAE (Transparent)	3	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
	5	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
ACBTAE (Brown Smoke)	3	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						
	5	300~400						
		401~500						
		501~600						
		601~700						
		701~800						
		801~900						
		901~1000						
		1001~1100						

Hole Charge

Drilling Type	Bolt Nominal N (Through Hole)	P (Countersink)	Q (Keyhole)
2H			
4H			
6H			
8H			

Pre-drilled Type Price = Standard Type € Unit Price + Hole Charge

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

ACTAE4H - 500 - 400 - 5 - F240 - G160 - N8

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

46,70 EUR + 6,00 EUR = 52,70 EUR

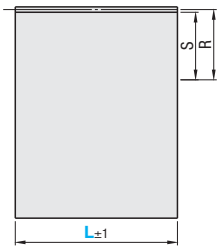
Curved Panels

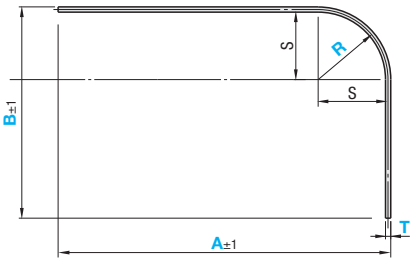
RoHS



ACALMG
(Acrylic · Transparent)

ACBLMG
(Acrylic · Smoke Brown)





Properties P.863

Operating Ambient Temperature: -30 ~ 80°C

Part Number Type	T	A 1mm Increment	B 1mm Increment	L 1mm Increment	R*	S
ACALMG ACBLMG	5	200~700	200~700	200~1000	140	137.5

* Curved panels for R300 and R500 are not available.

Order Example

Part Number	-	A	-	B	-	L	-	R
ACALMG5	-	A435	-	B685	-	L770	-	R140

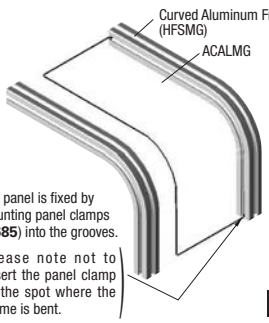
Days to Ship: 13 Days

Fits in the slots of Curved Aluminum Extrusion HFSMG.
P.482 · P.522 · P.562

Curved panel dimensions A and B are $E/2$ shorter than A and B dimension of HFSMG.$E/2$
(E: One side length of frame cross section)

Price

Part Number Type	T	A	B	€ Unit Price L 200~500	501~600	601~700	701~800	801~900	901~1000
ACALMG ACBLMG	5	200~500	200~500						
			501~600						
			601~700						
		501~600	400~500						
			501~600						
			601~700						
		601~700	400~500						
			501~600						
			601~700						



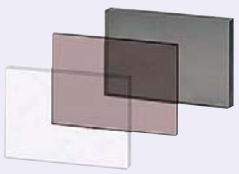
The panel is fixed by mounting panel clamps (P.685) into the grooves.

Please note not to insert the panel clamp to the spot where the frame is bent.

Polycarbonate Plates

■The level of impact strength is ranked as the highest among the transparent resin materials (30 times stronger than Acrylic) and also excellent in heat-resistance and cold-resistance.

■Standard Type RoHS

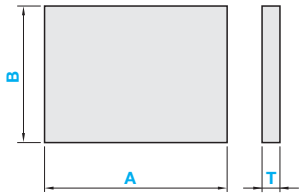


Type	Grade	Color	Light transmittance	Operating Ambient Temperature
PCTA	Standard	Transparent	90%	-30 ~ 100°C
PCTBA	Standard	Smoke Brown	35%	
PCTGA	Standard	Smoke Gray	33%	
PCTTA	Antistatic	Transparent	86%	
PCTBTA	Antistatic	Smoke Brown	35%	
PCTSP	Abrasion-resistant	Transparent	91%	

- T Dimension Tolerance

T	Tolerance
3 ~ 6	±0.5
8, 10	±1.0

- Dimension tolerance of A and B: ±1.0



A≥B

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

■Standard Type

Part Number	A	B	T
Standard Size	1mm Increment		
PCTA (Standard Transparent)	20~1200	20~1000	3 · 4 · 5 · 6 · 8 · 10
PCTBA (Standard Smoke Brown) PCTGA (Standard Smoke Gray) PCTTA (Antistatic Transparent) PCTBTA (Antistatic Smoke Brown) PCTSP (Abrasion Resistance Transparent)			3 · 5
Large Size			
L-PCTA (Standard Transparent) L-PCTBA (Standard Smoke Brown) L-PCTGA (Standard Smoke Gray) L-PCTTA (Antistatic Transparent) L-PCTBTA (Antistatic Smoke Brown) L-PCTSP (Abrasion Resistance Transparent)	1201~2000	20~1000	3 · 5

For T0.5, 1.0, 1.5 and 2.0, refer to **P.881**

Order Example

■Standard Size

Part Number - A - B - T

PCTA - 1200 - 800 - 8

■Large Size

Part Number - A - B - T

L-PCTSP - 1300 - 800 - 3

Days to Ship

■Standard Size: 6 Days P.88

■Large Size: 8 Days

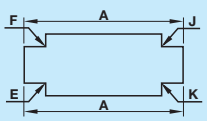
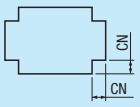
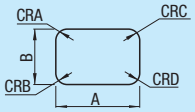
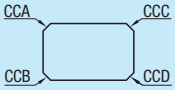
Price For Price List, refer to **P.889**

Alterations

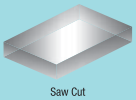
Part Number - A - B - T - (CRA · CRB...etc.)

PCTA - 200 - 200 - 5 - CRA5

When alterations are specified, 10 Days

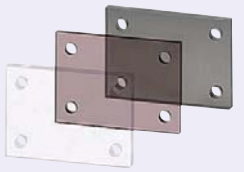
Alterations	Notching for Blind Joints of Aluminum Frame	Relief at Four Corners	Corner Radius	Corner Cut
				
Code	F_ _ · E_ _ · J_ _ · K_ _	CN	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD
Spec.	Machines relief for blind joints of aluminum frames. Thermal expansion of the plate is not taken into account. Longitudinal direction of notching is all on A dimension side. Applicable to standard sizes only. ⊗Not applicable to T=8 Ordering Code F S 6 Frame Type Joint Type Notching Position (See the diagram above.)	CN = 1mm Increment Machines relief at four corners. 5≤CN≤50 Applicable to standard sizes only. Ordering Code CN=25 ···› CN25	Adds radius to any corner. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.) Adds R10 at the corner of A and C. CRA10-CRC10 Applicable to standard sizes only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.)When the corners of A and D are cut by C5···› CCA5-CCD5 Applicable to standard sizes only.
Price Adder	2,00 / Corner	4,00	5≤R≤20: 2,00 / Corner 25≤R≤50: 3,00 / Corner 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner 25≤C≤50: 3,00 / Corner

For details of notching alterations for blind joint of aluminum frames, refer to **P.864**



Price Reduction
Up to 12%

■Pre-drilled Type RoHS



Type	Grade	Color	Light transmittance	Operating Ambient Temperature
PCTA	Standard	Transparent	90%	-30 ~ 100°C
PCTBA	Standard	Smoke Brown	35%	
PCTGA	Standard	Smoke Gray	33%	
PCTTA	Antistatic	Transparent	86%	
PCTBTA	Antistatic	Smoke Brown	35%	
PCTSP	Abrasion-resistant	Transparent	91%	

· T Dimension Tolerance

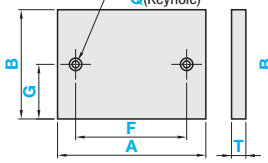
T	Tolerance
3~6	±0.5
8, 10	±1.0

· Dimension tolerance of A and B: ±1.0

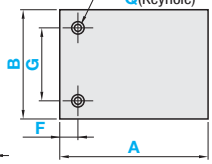
Finish	4 Sides		Upper-lower Surface	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

A≥B

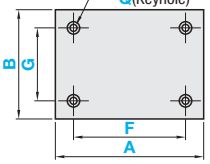
2H 2 - Bolt Nominal Diameter Selection
N(Through Hole)
P(Countersink)
M(Thread Insert)
Q(Keyhole)



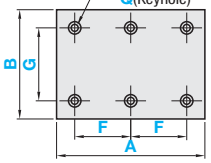
2HL 2 - Bolt Nominal Diameter Selection
N(Through Hole)
P(Countersink)
M(Thread Insert)
Q(Keyhole)



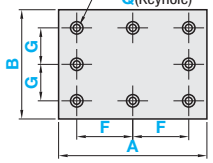
4H 4 - Bolt Nominal Diameter Selection
N(Through Hole)
P(Countersink)
M(Thread Insert)
Q(Keyhole)



6H 6 - Bolt Nominal Diameter Selection
N(Through Hole)
P(Countersink)
M(Thread Insert)
Q(Keyhole)



8H 8 - Bolt Nominal Diameter Selection
N(Through Hole)
P(Countersink)
M(Thread Insert)
Q(Keyhole)



Drilling Details

N(Through hole)

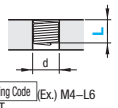


P (Countersink)



Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d₁	7.5	9.5	11.5	13.5	19	23
h	2	2.5	3	3.5	5	6

M (Thread Insert)

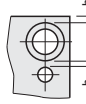


Ordering Code (Ex.) M4–L6
L≤T
For details of thread insert HLTS, refer to P.255

■Table 1

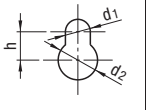
Bolt Nominal Dia.	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9
L	3	4	5	6	8
	4.5	6	7.5	9	12
	6	8	10	12	16

Drilling Conditions (N-P-M)



Hole Diameter	b (Min. value)
3~10	2.5

Q (Keyhole)

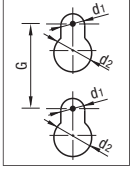


Keyhole Nominal Dia.	5	6	8
d₁	6	7	9
d₂	14	16	20
h	11	12	15

Use with flat washers (P.232) to prevent damage to the resin.

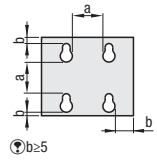
Drilling Conditions Q(Keyhole)

* Keyhole Reference Position



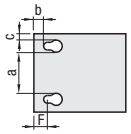
Keyhole Machining Conditions a≥5b≥5c≥5

2H · 4H · 6H · 8H



b≥5

2HL



<Keyhole Position>
(1): When 2H, the center of diameter d₁ is consistent with G.
(2): When 4H and 6H, the center of G dimension is consistent with the center of B dimension.
(3): When 8H, the diameter d₁ center of the middle Keyhole is consistent with the center of B dimension.
(4): When 2HL, keyholes turn sideways and the center of diameter d₁ is consistent with F.

■Pre-drilled Type

Part Number	Nominal	A	B	T		F	G	Select Mounting Holes				
								Through Hole	Countersink	Keyhole	Thread Insert	
		1mm Increment		PCTA	PCTA Except	0.5mm Increment		N	P	Q	M	L
PCTA (Standard Transparent) PCTBA (Standard Smoke Brown) PCTGA (Standard Smoke Gray) PCTTA (Antistatic Transparent) PCTBTA (Antistatic Smoke Brown) PCTSP (Abrasion Resistance Transparent)	2H(Horizontal) 2HL(Vertical) 4H 6H 8H	20 ~ 1200	20 ~ 1000	3	3	6~1191.5 (2H · 4H) 4.5~1195.5 (2HL) 6~595.5 (6H · 8H)	4.5~995.5 (2H) 6~991.5 (2HL · 4H / 6H) 6~495.5 (8H)	3 4 5 6 8 10	3	5 6 8	-	Select from Table 1
				4	-				3 4 5		3	
				5	5				3 4 5 6		3 4	
				6	-				4 5 6		4 5	
				8	-				4 5 6 8		4 5 6	
				10	-				4 5 6 8 10		4 5 6 8	

Dimension F Specification Range
For 2H and 4H: d(d₁)+2.5≤F≤A-d(d₁)-5; for 2HL: d(d₁)/2+2.5≤F≤A-d(d₁)/2-2.5;
for 6H and 8H: d(d₁)+2.5≤F≤(A-d(d₁)-5)/2.
Dimension G Specification Range
For 2H: d(d₁)/2+2.5≤G≤B-d(d₁)/2-2.5; for 2HL, 4H and 6H: (d₁)+2.5≤G≤B-d(d₁)-5; for 8H: d(d₁)+2.5≤G≤(B-d(d₁)-5)/2.
(d for through hole; d₁ for countersink)

■Drilling

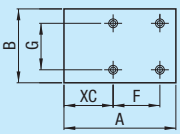
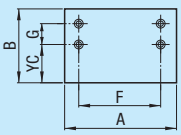
Order Example: Part Number - A - B - T - F - G - Bolt Nominal Diameter
PCTA4H - 800 - 600 - 6 - F700 - G500 - P5

Days to Ship: 8 Days

Price: For Price List, refer to P.889
Pre-drilled Type Price = Standard Type Price + Hole Charge

Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC · YC)
PCTA4H - 100 - 80 - 4 - F50 - G60 - N4 - XC10

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (2H · 4H Type) d (d₁)/2+2.5≤XC≤A–F–d (d₁)/2–2.5 (6H · 8H Type) d (d₁)/2+2.5≤XC≤A–2F–d (d₁)/2–2.5	YC = 0.5mm Increment d (d₁)/2+2.5≤YC≤B–G–d (d₁)/2–2.5
Price Adder	4,00	4,00

Polycarbonate Plates Price List

Price

Volume Discount (Round down to one Cent.) P.87

Standard Size · Pre-drilled Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

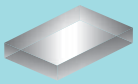
Large Size

Qty.	1~3	4~9	10~15	16~20	21 or More
Discount Rate	€ Unit Price	5%	8%	10%	Please request a quotation for Days to Ship and Price.
Days to Ship	Regular				

Polycarbonate Plate Standard · Abrasion Resistant (1mm Increment)

Refer to the next page for the price calculation method.

Type	T	A	€ Unit Price B									
			20~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
Type(Material Rate) (Material)	3	20~ 100										
PCTA (x1.0) (Transparent)		101~ 200										
PCTBA (x1.0) (Smoke Brown)		201~ 300										
PCTGA (x1.2) (Smoke Gray)		301~ 400										
PCTSP (x3.0) (Abrasion Resistance Transparent)		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PCTA (x1.0) (Transparent)		1201~1300										
L-PCTBA (x1.0) (Smoke Brown)		1301~1400										
L-PCTGA (x1.2) (Smoke Gray)		1401~1500										
L-PCTSP (x3.0) (Abrasion Resistance Transparent)		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
PCTA (x1.0) (Transparent)	4	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
PCTA (x1.0) (Transparent) PCTBA (x1.0) (Smoke Brown) PCTGA (x1.2) (Smoke Gray) PCTSP (x3.0) (Abrasion Resistance Transparent)	5	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size L-PCTA (x1.0) (Transparent) L-PCTBA (x1.0) (Smoke Brown) L-PCTGA (x1.2) (Smoke Gray) L-PCTSP (x3.0) (Abrasion Resistance Transparent)		1201~1300										
		1301~1400										
		1401~1500										
		1501~1600										
		1601~1700										
		1701~1800										
		1801~1900										
		1901~2000										
PCTA (x1.0) (Transparent)	6	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
PCTA (x1.0) (Transparent)	8	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
	10	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
		401~ 500										
		501~ 600										
		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										



Price Reduction
Up to 12%

Polycarbonate Plate Antistatic (1mm Increment)

Type	T	A	€ Unit Price B 20~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800	801~900	901~1000
Type(Material Rate) (Material)	3	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
PCTTA(x1.0) (Transparent)		401~ 500										
		501~ 600										
PCTBTA(x1.0) (Smoke Brown)		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size		1201~1300										
		1301~1400										
		1401~1500										
L-PCTTA(x1.0) (Transparent)		1501~1600										
		1601~1700										
L-PCTBTA (x1.1) (Smoke Brown)		1701~1800										
		1801~1900										
		1901~2000										
	5	20~ 100										
		101~ 200										
		201~ 300										
		301~ 400										
PCTTA(x1.0) (Transparent)		401~ 500										
		501~ 600										
PCTBTA(x1.0) (Smoke Brown)		601~ 700										
		701~ 800										
		801~ 900										
		901~1000										
		1001~1100										
		1101~1200										
Large Size		1201~1300										
		1301~1400										
		1401~1500										
L-PCTTA(x1.0) (Transparent)		1501~1600										
		1601~1700										
L-PCTBTA (x1.1) (Smoke Brown)		1701~1800										
		1801~1900										
		1901~2000										

Check each Material Rate.

The unit price of this product is the price shown in the table multiplied by Material rate. (Round down to ten Cent.)

(Ex.) Part Number - A - B - T
PCTSP - 500 - 400 - 5

(Price in the table) x (Material Rate) = Standard Type € Unit Price
35,00 x 3.0 = 105,00 EUR

Hole Charge

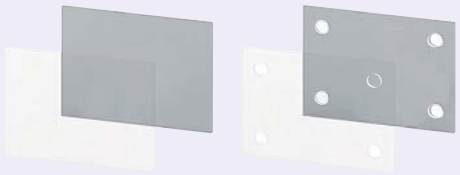
Drilling Type	Hole Charge N (Through hole)	P (Countersink)	Q (Keyhole)	M (Thread Insert)
2H · 2HL				
4H				
6H				
8H				

Pre-drilled Type: Standard Type € Unit Price + Hole Charge

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter
PCTTA4H - 500 - 400 - 5 - F240 - G160 - N8

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price
+ 3,80 = 61,40 EUR

Resin Sheets



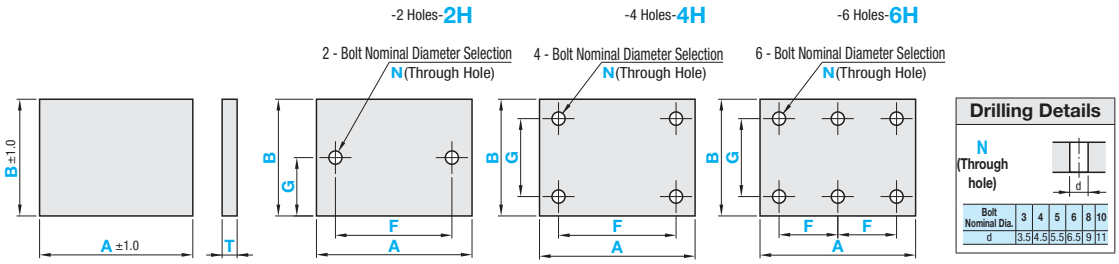
RoHS

Type	Material	Grade	Color	Light Transmission Transmittance	Operating Ambient Temperature
ACSH	Acrylic	Standard	Transparent	93%	-30~80°C
PCTSH	Polycarbonate		Transparent	90%	-30 ~ 100°C
PYSH	PET		Transparent	87%	- 15~55°C
PASH	Polyacetal		White	-	-45~95°C
UPSH	Ultra High-molecular-weight Polyethylene		Milky White		-100~80°C

Properties P.859-863

Standard Type

Pre-drilled Type



A≥B

Standard Type

Part Number	1mm Increment		T Selection		
Type	A	B	ACSH PCTSH PASH	PYSH	UPSH
ACSH PCTSH PYSH PASH UPSH	20~300	20~300	0.5 1.0 1.5 2.0	0.5 1.5	1.0 2.0

- T Dimension Tolerance

T	ACSH PYSH PCTSH PASH	UPSH
0.5	±0.1	-
1.0	±0.12	-0.2~+0.5
1.5	±0.2	-
2.0		-0.2~+0.5

Pre-drilled Type

Part Number		1mm Increment		T Selection			0.5mm Increment		Select Mounting Holes
Type	Nominal	A	B	ACSH PCTSH PASH	PYSH	UPSH	F	G	N (Through Hole)
ACSH PCTSH PYSH PASH UPSH	2H 4H 6H	20~300	20~300	0.5 1.0 1.5 2.0	0.5 1.5	1.0 2.0	6~291.5 (2H · 4H) 6~145.5 (6H)	4.5~295.5 (2H) 6~291.5 (4H · 6H)	3 4 5 6 8 10

T1.0 and 2.0 are not available for PYSH. Use PYA instead on **P.865**
Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A-d(d1)-5. For 2HL: (d1)/2+2.5≤F≤A-d(d1)/2-2.5.
For 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.
Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5. For 2HL · 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5.
PASH and UPSH have camber caused by manufacturing process.

Order Example

Standard Type

Part Number	-	A	-	B	-	T
ACSH	-	150	-	118	-	1.0

Pre-drilled Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter
ACSH2H	-	50	-	25	-	1.5	-	F34	-	G10	-	N4

Days to Ship

Standard Type

6 Days P.88

One day shipping is available for orders received by 5pm.
Orders received after 5pm will be shipped on the next business day.

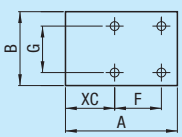
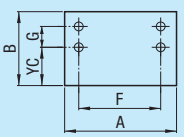
Pre-drilled Type

10 Days | Express B | 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter	-	(XC · YC)
ACSH4H	-	200	-	180	-	0.5	-	F100	-	G140	-	N4	-	XC30

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (2H · 4H Type) d/2+2.5≤XC≤A−F−d/2−2.5 (6H Type) d/2+2.5≤XC≤A−2F−d/2−2.5	YC = 0.5mm Increment d/2+2.5≤YC≤B−G−d/2−2.5
Price Adder	4,00	4,00

Price

(Pre-drilled Type Price = Standard Type € Unit Price + Hole Charge)

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

ACSH2H - 100 - 80 - 0.5 - F65 - G55 - N4

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 3,00 = 6,10 EUR

Hole Charge

Drilling Type	Hole Charge N (Through Hole)
2H	3,00 EUR
4H	6,00 EUR
6H	9,00 EUR

Volume Discount (Round down to one Cent.) P87

Standard Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1~10	11~20	21~50	51 or More
Discount Rate	€ Unit Price	5%	10%	Please request a quotation for Days to Ship and Price.

Standard Type € Unit Price

Part Number	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300
ACSH	0.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	1.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	1.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	2.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
PCTSH	0.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	1.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	1.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	2.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						

Part Number	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300
PYSH	0.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	1.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
PASH	0.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	1.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	1.5	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	2.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
UPSH	1.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	2.0	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						

For orders larger than indicated quantity, please request a quotation.

Resin Cover Plates

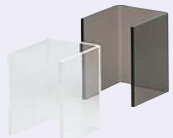
-L-shaped / U-shaped / Acrylic /PET-

■L-Shaped Type RoHS





■U-Shaped Type





Properties P.863

Part Number		Material	Grade	Color
ACAL	ACAU	Acrylic	Standard	Transparent
ACBL	ACBU			Smoke Brown
ACTAL	ACTAU		Antistatic Grade	Transparent
ACBTAL	ACBTAU			Smoke Brown
PYAL	PYAU	PET	Standard	Transparent
PYBL	PYBU			Smoke Brown
PYTAL	PYTAU		Antistatic Grade	Transparent
PYBTAL	PYBTAU			Smoke Brown

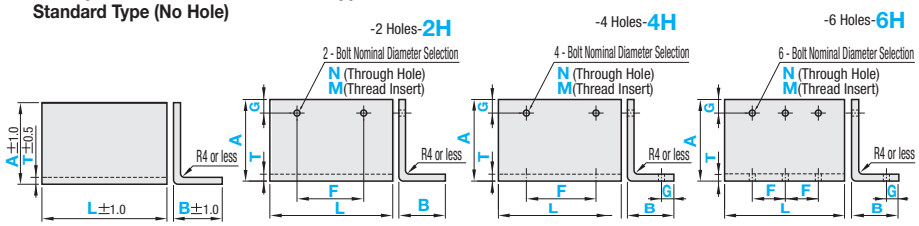
■L-shaped Pre-drilled Type

Standard Type (No Hole)

-2 Holes-2H

-4 Holes-4H

-6 Holes-6H

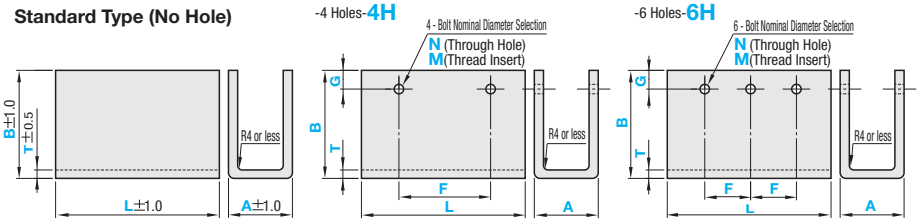


■U-shaped Pre-drilled Type

Standard Type (No Hole)

-4 Holes-4H

-6 Holes-6H



■Standard Type

Part Number Type		1mm Increment B	A	L	Selection T
ACA PYA ACB PYB ACTA PYTA ACBTA PYBTA	L (L-Shaped) U (U-Shaped)	30~200	30~200	30~500 U-shaped L≤Ax3 L-shaped L≤Ax3 L≤Bx3	3 4 5 6* 8*

* T6 - 8 is not available for PYAL(U) and PYBL(U).
Antistatic grade is only available for T3 and T5.
Antistatic coating on the curved section may be peeled off in antistatic grade.

Drilling Details N (Through hole)	Thread Insert Machining Details M (Thread Insert)
	

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11

■Table 1

Bolt Nominal Dia.	3	4	5	6
d	3.5	4.5	5.5	6.5
L	3 4.5 6	4 6	5 7.5	6

Ordering Code (Ex.) M4–L6
L≤T
For details of thread insert HLTS, refer to P.255
When L+5<T, drilled holes will be blind ones.

■Pre-drilled Type

Part Number Type	Shape	Nominal	1mm Increment B	A	L	Selection T	1mm Increment F	G	Bolt Nominal Diameter N (Through Hole)	Thread Insert Bolt Nominal Diameter M (Thread Insert)	L (Insert Length)
ACA PYA ACB PYB ACTA PYTA ACBTA PYBTA	L (L-Shaped) U (U-Shaped)	(Drilling) 2H 4H 6H	30~200	30~200	30~500 L≤Ax3 (Applicable to L-shape type only.) L≤Bx3	3 4 5 6* 8*	9~491 (2H · 4H Type) (K2H · K4H Type) 9~245 (6H Type) (K6H Type)	5~192	3 4 5 6 8 10	- 3 3 4 3 4 5 3 4 5 6	- Select from Table 1

No. of holes 2H is available for L Shape Type only. * T6 and T8 are not selectable for PYAL (U) and PYBL (U).
Dimension F Specification Range: For 2H and 4H, d+5≤F≤L–d–5; for 6H, d+5≤F≤L/2–d/2–2.5.
Dimension G Specification Range: d/2+2.5≤G≤(A(B)–T)–d/2–2.5 (for 4H and 6H, the smaller size of A and B is applicable).
Antistatic grade is only available for T3 and T5.

Order Example

Days to Ship

■Standard Type (L-shaped · U-shaped)

Part Number Type	Shape	B	A	L	T
ACA	L	40	50	55	3
ACA	U	65	100	120	6

■Pre-drilled Type (L-shaped · U-shaped)

Part Number Type	Shape	Nominal	B	A	L	T	F	G	Bolt Nominal Diameter	L
PYA	L	4H	50	80	100	5	F76	G15	N5	
PYA	U	4H	100	120	200	5	F160	G20	M4	L4

■Standard Type
8 Days
Express A 8,00 EUR/piece P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

■Pre-drilled Type
10 Days
Express B 5,00 EUR/piece P.88
A Express Charge of 0,01 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) **P87**

Qty.	1~10	11~20	21~50	51 or More
Discount Rate	€ Unit Price	5%	10%	Please request a quotation for Days to Ship and Price.
Days to Ship	Regular			

Pre-drilled Type = Standard Type € Unit Price + Hole Charge

(Ex.)

Part Number										
Type	Shape	Nominal	-	B	A	L	T	F	G	Bolt Nominal Diameter	-	L
ACB	L	2H	-	65	150	80	5	F50	G20	N6		

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 3,00 = 21,20 EUR

Hole Charge

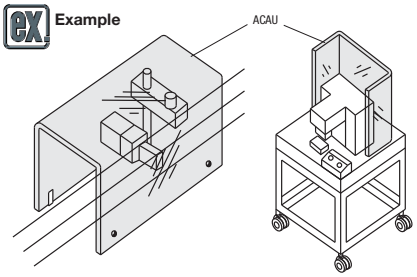
Drilling Type	Hole Charge	
	N (Through Hole)	M (Thread Insert)
2H		
4H		
6H		

Standard Type € Unit Price

Check each Material Rate.

B	L	€ Unit Price											
		ACAL · ACBL ACTAL(x1.6) ACBTAL(x1.6)			PYAL · PYBL PYTAL(x5.0) PYBTAL(x5.0)			ACAU · ACBU ACTAU(x1.6) ACBTAU(x1.6)			PYAU · PYBU PYTAU(x5.0) PYBTAU(x5.0)		
		T3, 4	T5, 6	T8	T3	T4	T5	T3, 4	T5, 6	T8	T3	T4	T5
30~39	30~ 60												
	61~ 90												
	91~117												
40~49	30~ 60												
	61~ 90												
	91~120												
	121~147												
50~59	30~ 60												
	61~ 90												
	91~120												
	121~150												
	151~177												
60~79	30~ 60												
	61~ 90												
	91~120												
	121~150												
	151~180												
	181~237												
80~99	30~ 60												
	61~ 90												
	91~120												
	121~150												
	151~180												
	181~210												
	211~240												
	241~270												
	271~297												
100~119	30~ 60												
	61~ 90												
	91~120												
	121~150												
	151~180												
	181~210												
	211~240												
	241~270												
	271~300												
	301~350												
	351~400												
120~149	30~ 60												
	61~ 90												
	91~120												
	121~150												
	151~180												
	181~210												
	211~240												
	241~270												
	271~300												
	301~350												
	351~400												
	401~500												
150~200	30~ 60												
	61~ 90												
	91~120												
	121~150												
	151~180												
	181~210												
	211~240												
	241~270												
	271~300												
	301~350												
	351~400												
	401~450												
	451~500												

Example

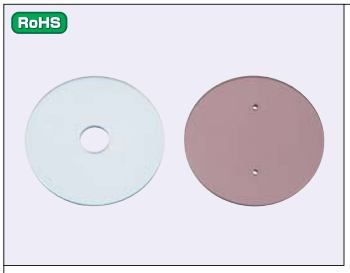


Alterations

Part Number													
Type	Shape	Nominal	-	B	A	L	T	F	G	Bolt Nominal Diameter	-	L	- (XC)
ACB	L	2H	-	65	150	80	5	F50	G20	N6			- XC10

Alteration	Hole Position from Left	
	L-Shaped Type	U-Shaped Type
Code	XC	
Spec.	XC=1 mm Increment 5≤XC≤486	(2H · 4H Type)d/2+2.5≤XC≤L−F−d/2−2.5 (6H Type)d/2+2.5≤XC≤L−2F−d/2−2.5
Price Adder	4,00	

Resin Circular Plates



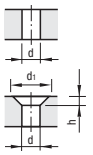
Type	Material	Grade	Color
ENJAC	Acrylic	Standard Grade	Transparent
ENJAB			Smoke Brown
ENJAT		Antistatic Grade	Transparent
ENJABT			Smoke Brown
ENJPC	Polycarbonate	Standard Grade	Transparent
ENJPCB			Smoke Brown
ENJPT		Antistatic Grade	Transparent
ENJPCT			Smoke Brown
ENJPY	PET	Standard Grade	Transparent
ENJPYB		Standard Grade	Smoke Brown
ENJPZ		Antistatic Grade	Transparent

Properties P.863

Drilling Details

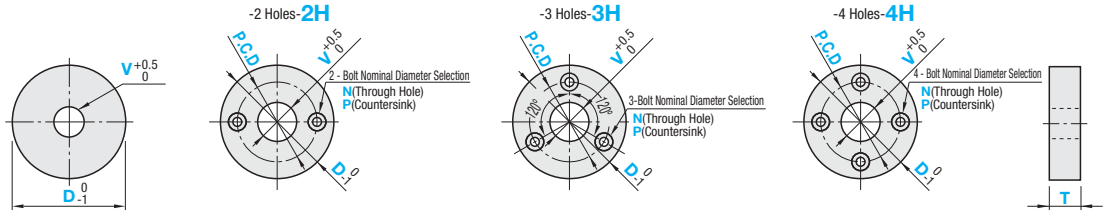
N (Through hole)

P (Countersink)



Screw Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d_1	7.5	9.5	11.5	13.5	19	23
h	2	2.5	3	3.5	5	6

Standard Type **Pre-drilled Type**



■Standard Type

Check each Material Rate.

Part Number Type		T	1mm Increment D	1mm Increment V	€ Unit Price D50~100	D101~150	D151~200	D201~250	D251~300	D301~350	D351~400
ENJAC (x1.0) ENJAB (x1.0)	ENJAT (x1.3) ≤5) ENJABT (x1.4) ≤5)	3	50~400	0~50 (V≤D−10)							
		5									
		10									
ENJPC (x1.0) ENJPCB (x1.0) ≤5)	ENJPT (x1.3) ≤5) ENJPCT (x1.4) ≤5)	3									
		5									
		10									
ENJPY (x1.0) ENJPZ (x1.4) ≥3)	ENJPYB (x1.0) ≥3)	1									
		3									
		5									

The unit price of this product is the price shown in the table multiplied by Material rate. (Round down to ten Cent.)

(Ex.) Part Number - D - V

ENJAT5 - 150 - 50

(Price in the table) 9,70 x (Material Rate) 1.3 = Standard Type € Unit Price 12,61 EUR ➡ 12,60 EUR

■Pre-drilled Type

Part Number Type		Nominal	T	1mm Increment D	V	P.C.D	Pre-drilled Hole Nominal Diameter N (Through Hole)	P (Countersink)
ENJAC ENJAB	ENJAT (T≤5) ENJABT(T≤5)	2H 3H 4H	3	50~400	0~50 (V≤D−10)	20~390°	3 4 5 6 8 10	3
			5					3 4 5 6
			10					4 5 6 8 10
ENJPC ENJPCB(T≤5)	ENJPT (T≤5) ENJPCT(T≤5)		3					3
			5					3 4 5 6
			10					4 5 6 8 10
ENJPY ENJPZ(T≥3)	ENJPYB(T≥3)		1					-
			3					3
			5					3 4 5 6

* P.C.D. V+5+d(d_1)≤P.C.D≤D−5−d(d_1) (d for through hole, d_1 for counterbore hole)

■Hole Charge

Drilling Type	Bolt Nominal N (Through Hole)	Bolt Nominal P (Countersink)
2H		
3H		
4H		

(Ex.) Part Number - D - V - P.C.D - Bolt Nominal Diameter

ENJAC4H10 - 350 - 50 - 200 - P5

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 8,00 = 69,60 EUR

Order Example

■Standard Type

Part Number - D - V

ENJPC5 - 300 - 50

■Pre-drilled Type

Part Number - D - V - P.C.D - Bolt Nominal Diameter

ENJPC3H5 - 200 - 20 - 100 - N4

Days to Ship

■Standard Type ■Pre-drilled Type

8 Days | 10 Days | Express B 5,00 EUR/ piece P.88

A Express Charge of 0,01 EUR for 3 or more identical pieces.

Price

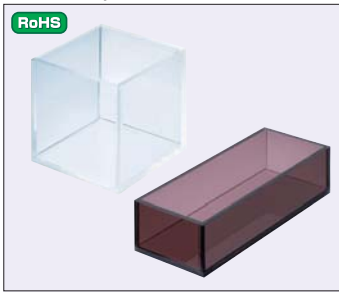
■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

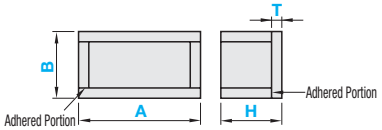
Acrylic Cases

■Bonded acrylic cases are now available.



Type	M Grade	Color	Light transmittance	Operating Ambient Temperature
S-ACA	Standard	Transparent	93%	-30~80°C
S-ACBA	Standard	Smoke Brown	25%	
S-ACTA	Antistatic	Transparent	79%	
S-ACBTA	Antistatic	Smoke Brown	32%	

Properties P.863



The bonded parts may have air bubbles.

Part Number		1mm Increment		
Type	T Selection	A	B	H
S-ACA S-ACBA	3 · 5 · 8 · 10	50~500 A≥B	50~500	20~500
S-ACTA S-ACBTA	3 · 5			

Order Example

Part Number	-	A	-	B	-	H
S-ACA5	-	200	-	200	-	100
S-ACTA5	-	300	-	155	-	55

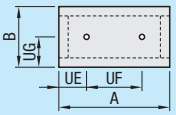
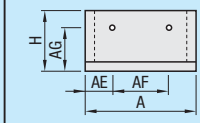
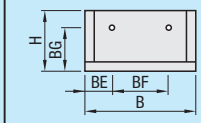
Days to Ship: 10 Days

Alterations

Part Number - A - B - H - Alterations

S-ACA5 - 200 - 200 - 100 - UN3-UE50-UF100-UG200

S-ACA5 - 200 - 200 - 100 - AN3-AE50-AF100-AG200-W

Alterations	Bottom Face Drilling	A Face Drilling	B Face Drilling	Both Sides of A and B Drilling
				Only applicable when AN_ and BN_ are specified. Refer to the drawings of AN_ and BN_. W Charge is added to Price of AN_ and BN_.
Code	UN_	AN_	BN_	W
Spec.	Adds 2 through holes to the bottom face. Ordering Code UN3-UE50-UF100-UG200 UN_ For _, select the appropriate nominal for the part from the hole processing details. UE, UF, UG: 1mm increment T+2.5+(d/2)≤UE≤A-(T+5+(d/2)+d) T+5+(d/2)+d≤UF≤A-(T+2.5+(d/2)) T+2.5+(d/2)≤UG≤B-(T+2.5+(d/2))	Adds 2 through holes to one side of Face A (longitudinal face). Ordering Code AN3-AE50-AF100-AG200 AN_ For _, select the appropriate nominal for the part from the hole processing details. AE, AF, AG: 1mm increment T+2.5+(d/2)≤AE≤A-(T+5+(d/2)+d) T+5+(d/2)+d≤AF≤A-(T+2.5+(d/2)) T+2.5+(d/2)≤AG≤H-(2.5+(d/2))	Adds 2 through holes to one side of Face B (shorter face). Ordering Code BN3-BE50-BF100-BG200 BN_ For _, select the appropriate nominal for the part from the hole processing details. BE, BF, BG: 1mm increment T+2.5+(d/2)≤BE≤B-(T+5+(d/2)+d) T+5+(d/2)+d≤BF≤B-(T+2.5+(d/2)) T+2.5+(d/2)≤BG≤H-(2.5+(d/2))	Adds 2 through holes to 2 opposite faces. Ordering Code and Price AN3-AE50-AF100-AG200-W BN3-BE50-BF100-BG200-W 2,50 EUR + 2,50 EUR With the same dimension as AN_, holes on 2 facing surfaces of A (long surface) are processed. With the same dimension as BN_, holes on 2 facing surfaces of B (short surface) are processed.
Price Adder	2,50	2,50	2,50	2,50

Drilling Details

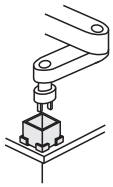
N (Through hole)



Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11

Example

For taking away wrong or defective products.



Price

(Ex.) S-ACBTA5-100-100-30

€ Unit Price X Material Rate = Price

X 1.3 = 36,40 EUR

Round down to ten Cent.

Volume Discount (Round down to one Cent.) P.87

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Check each Material Rate.

Type	T	B	A	€ Unit Price H 20~100	101~200	201~300	301~400	401~500
Type (Material Rate)	3	50~100	50~100					
			101~200					
			201~300					
			301~400					
			401~500					
		101~200	101~200					
			201~300					
			301~400					
			401~500					
		201~300	201~300					
S-ACA (x1.0)			301~400					
			401~500					
S-ACBA (x1.0)		301~400	301~400					
			401~500					
		401~500	401~500					
S-ACTA (x1.3)	5	50~100	50~100					
			101~200					
S-ACBTA (x1.3)			201~300					
			301~400					
			401~500					
		101~200	101~200					
			201~300					
			301~400					
			401~500					
		201~300	201~300					
			301~400					
			401~500					
		301~400	301~400					
			401~500					
		401~500	401~500					

Type	T	B	A	€ Unit Price H 20~100	101~200	201~300	301~400	401~500
Type (Material Rate)	8	50~100	50~100					
			101~200					
			201~300					
			301~400					
			401~500					
		101~200	101~200					
			201~300					
			301~400					
			401~500					
		201~300	201~300					
S-ACA (x1.0)			301~400					
			401~500					
		301~400	301~400					
			401~500					
		401~500	401~500					
S-ACBA (x1.0)	10	50~100	50~100					
			101~200					
			201~300					
			301~400					
			401~500					
		101~200	101~200					
			201~300					
			301~400					
			401~500					
		201~300	201~300					
			301~400					
			401~500					
		301~400	301~400					
			401~500					
		401~500	401~500					

Mirror Plates
-Glass Type / Acrylic Type-

Reduced Delivery Time

■Two types of mirror, glass and Acrylic, to check work are available. Mounting holes are selectable from through hole or countersink.

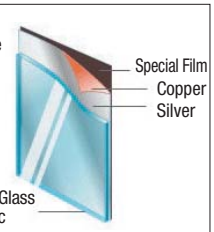


RoHS

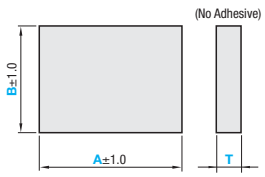
No Adhesive Type	With Adhesive Type	Material	Heat-resistant Temperature Continuous Use
MRG	MRGA	Glass	80°C
MRA	MRAA	Acrylic	50°C

Heat resistant temperature will be largely depending on the operating condition. Values are not guaranteed.

Mirror Structure

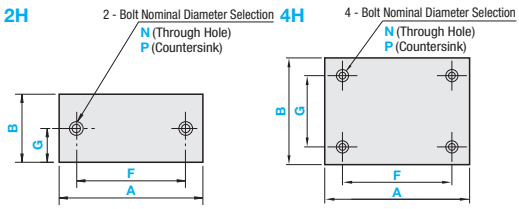


■Standard Type



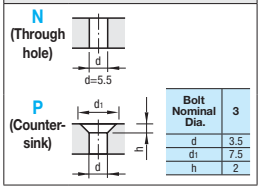
A≥B Circumference Chamfering C1.0~2.0

■Pre-drilled Type



Keep a dimension of 5mm or more between hole end and glass end.

Drilling Details



Bolt Nominal Dia.	3
d	3.5
d1	7.5
h	2

■Standard Type

Part Number Type			T	1mm Increment A	1mm Increment B
No Adhesive	With Adhesive				
MRG	MRGA	(Glass Mirror)	3	10~300	10~300
MRA	MRAA	(Acrylic Mirror)			

■Comparison of Glass and Acrylic Mirror Features

	Weight	Scratch Resistance	Break	Heat Resistance	Chemical Resistance
Glass Mirror	Heavy (Specific Gravity 2.5)	○	Frangible	80°C	○
Acrylic Mirror	Light (Specific Gravity 1.2)	X	Irrefrangible	50°C	X (Organic solvents resistance)

■Pre-drilled Type

Part Number Type			T	1mm Increment A	B	F	G	Select Mounting Holes N (Through Hole)	P (Countersink)
No Adhesive	With Adhesive								
MRG	MRGA	(Glass Mirror)	2H 4H	3	10~300	10~300	9~241	9~241	5	3
MRA	MRAA	(Acrylic Mirror)								

■Glass Mirror

Part Number Type	T	A 1mm Increments	€ Unit Price B 1mm Increment 10~50	51~100	101~150	151~200	201~300
MRG No Adhesive	3	10~50					
		51~100					
		101~150					
		151~200					
		201~300					
MRGA With Adhesive	3	10~50					
		51~100					
		101~150					
		151~200					
		201~300					

■Acrylic Mirror

Part Number Type	T	A 1mm Increments	€ Unit Price B 1mm Increment 10~50	51~100	101~150	151~200	201~300
MRA No Adhesive	3	10~50					
		51~100					
		101~150					
		151~200					
		201~300					
MRAA With Adhesive	3	10~50					
		51~100					
		101~150					
		151~200					
		201~300					

■Hole Charge

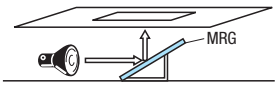
Drilling Type	€ N (Through hole)	€ P (Countersink)
2H		
4H		

Pre-drilled Type Price = Standard Type € Unit Price + Hole Charges

(Ex.) Part Number - A - B - F - G - Bolt Nominal
MRG4H3 - 200 - 180 - F160 - G140 - N5

(Standard Type € Unit Price) + (Drilling Charge) = (Pre-drilled Type € Unit Price)
28,80 + 18,00 = 46,80 EUR

Example



As an indirect light angle adjustor of an image processing device

Order Example

Part Number - A - B
MRG3 - 250 - 100

Part Number - A - B - F - G - Bolt Nominal
MRG4H3 - 200 - 180 - F160 - G140 - N5

Days to Ship

■Glass Mirror: 8 Days
■Acrylic Mirror · Pre-drilled Type: 10 Days

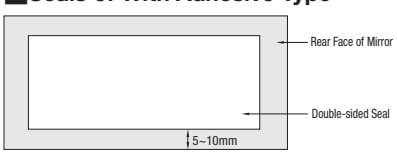
Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~4	5~9	10~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Seals of With Adhesive Type



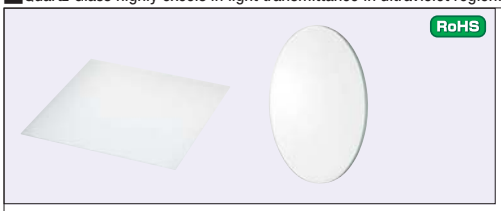
For easy attachment, the size of double-faced adhesive tape is smaller than that of the mirror. (Approx. 5mm~10mm)
Seals are not attached to mirrors for shipping.
Seal thickness is 2mm.

It may fall due to its own weight depending on its size. Avoid mounting only by the adhesive sheets.

Avoid use in the areas splashed with water, which may cause dirt and tarnishing on mirrors.

Fused Silica Plates Square · Round

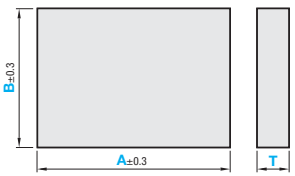
■Quartz Glass highly excels in light transmittance in ultraviolet region. Can be specified in 1mm increments.



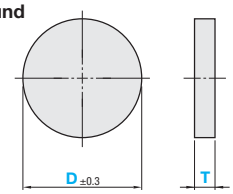
Type	Shape	Material	Heat-resistant Temperature	
			Continuous Use	Max.
FGLKS	Square	Fused Transparent Quartz Glass	1000°C	1200 °C
FGLMS	Round			

Heat resistant temperature will be largely depending on the operating condition. Values are not guaranteed.

■Square



■Round



A≥B Circumference Chamfering C0.3~1.0

Circumference Chamfering C0.3~1.0 •T Dimension Tolerance ±0.3

■Square

Part Number Type	T	A 1mm Increment	€ Unit Price B 1mm Increment 20~100	101~150	151~200	201~250	251~300
FGLKS	1	20~50					
		51~100					
		101~150					
	2	20~100					
		101~150					
		151~200					
		201~250					
		251~300					
	3	20~100					
		101~150					
		151~200					
		201~250					
		251~300					

■Round

Part Number Type	T	€ Unit Price D 1mm Increment 20~100	101~150	151~200	201~250	251~300
FGLMS	1					
	2					
	3					

Order Example

Part Number	-	A	-	B
FGLKS2	-	200	-	154

Part Number	-	D
FGLMS1	-	150

Days to Ship: 10 Days

Price

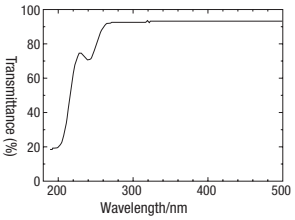
■Volume Discount (Round down to one Cent.) P.87

Qty.	1~4	5~9	10~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Optical Transparency of Quartz Glass

Ultraviolet - Visible Spectrum



■Features of Quartz Glass

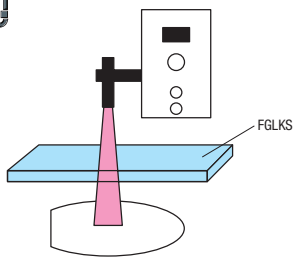
Transparent quartz glass highly excels in light transmittance at all wavelengths as compared to other general glasses (silicate glasses).

In the infrared region, it has better transmission and transparency range than normal glasses except for special glasses for the infrared.

In ultraviolet region, especially short wavelength ultraviolet region, it shows excellent transparency.

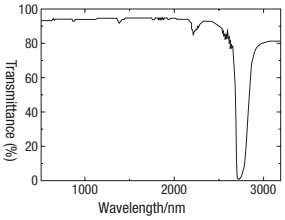
- Features of Oxy-hydrogen Fused Transparent Quartz Glass
Quartz glasses made by melting crystals with Oxyhydrogen flame.
It has high purity and little air bubbles.
Best suited as the material for tools for semiconductor manufacturing and physicochemical equipments.

Example



As a cover for the UV irradiation device

Visible - Infrared Spectrum



■Mechanical characteristics of Quartz Glass

Purity (%)	≥99.9
OH (ppm)	200
Density (gcm³)	2.2
Vickers Hardness (Mpa)	8900
Young's Modulus (Gpa)	74
Rigidity Modulus (Gpa)	31
Poisson ratio	0.17
Bending Strength (Mpa)	94.3
Compression Strength (Mpa)	1130
Tensile Strength (Mpa)	49
Torsion Strength (Mpa)	29

■Precaution for Use

- Make sure that plates are clean before use.
- Transparent quartz glasses have to be kept away from water and impurities.
Do not place them in high-temperature atmosphere if they are wet.
When using in high temperature, dry them well before use.
- Note that the glasses may be devitrified depending on the operating atmosphere.
- More resistant to quick heating and cooling and 10 times stronger than normal glasses. However, not resistant to extreme temperature changes.
- Has low thermal conductivity and may have cracks due to local, quick heating or cooling. The heat and impact resistance becomes lower as glasses get thicker.
- If temperature increases (decreases) with other objects attached to the quartz glasses, they may break due to thermal expansion differentials. Be careful when increasing (decreasing) temperature with other objects attached.
- If quartz glasses are used at high temperature for a long period of time, they may be deformed little by little due to their own weight or other loads. Their life span may become longer if support methods or conditions of use are designed specific to the application.

Square Glass Plates

Reduced Delivery Time

■Float Transparent Glass excels in smoothness and has little distortion. Heat Resistant Glass (TEMPAX Float®) excels in heat and impact resistance. Reinforced Glass has 3 to 5 times higher static strength compared to general glass with the same thickness.



RoHS

Fixed Dimension Type	Configurable Type	Material	Heat-resistant Temperature	
			Continuous Use	Max.
GLKF		Transparent Float Glass (Soda-lime glass)	100 °C	380 °C
GLKH		Heat Resistant Glass (TEMPAX Float®)	250 °C	450 °C
GLKK	-	Reinforced Glass	210 °C	250 °C

Heat resistant temperature will be largely depending on the operating condition. Values are not guaranteed.

T Tolerance

Type	T	Tolerance
GLKF GLKK	3, 5	±0.3
	8	±0.6
GLKH	3.3, 5	±0.2
	10	±0.4

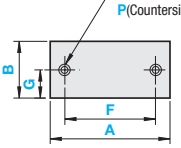
■Standard Type -Dimension Standard · Configurable-



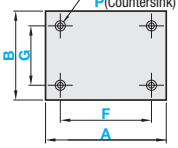
A≥B Circumference Chamfering C1.0~2.0

■Pre-drilled Type

2 - Bolt Nominal Diameter Selection



4 - Bolt Nominal Diameter Selection



Keep a dimension of 5mm or more between hole end and glass end.

Drilling Details

N (Through hole)



P (Counter-sink)



Bolt Nominal Dia.	3
d	3.5
d1	7.5
h	2

■Fixed Dimension Type

Part Number		A	B
Type	T		
GLKF (Float Transparent Glass)	3	50 100 150 200	50 100 150 200
	5		
GLKH (Heat Resistant Glass)	3.3	50 100 150 200	50 100 150 200
	5		
GLKK (Reinforced Glass)	3	50 100 150	50 100 150
	5	200 250 300	50 100 150 200 250 300

■Configurable Type

Part Number		1mm Increment	
Type	T	A	B
(Float Transparent Glass)	3	50~500	50~500
	5		
	8		
(Heat Resistant Glass)	3.3		
	5		
	10		

■Pre-drilled Type

Part Number			1mm Increment				Select Mounting Holes	
Type	No. of Holes	T	A	B	F	G	N (Through Hole)	P (Countersink)
(Float Transparent Glass)	2H	3	50 ~ 500	50 ~ 500	10 ~ 450	10 ~ 450	5	3
		5						
(Heat Resistant Glass)	4H	3.3						
		5						

Order Example

Part Number - A - B - F - G - Bolt Nominal

GLKK5 - 200 - 150
- 231 - 210
- 200 - 150 - F100 - G75 - N5

Days to Ship

■Fixed Dimension Type: 6 Days P.87

■Configurable Type: 8 Days

■Pre-drilled Type: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Fixed Dimension Type

Part Number		A	€ Unit Price B					
Type	T		50	100	150	200	250	300
GLKF (Float Transparent Glass)	3	50						
		100						
		150						
		200						
	5	50						
		100						
		150						
		200						
GLKH (Heat Resistant Glass)	3.3	50						
		100						
		150						
		200						
	5	50						
		100						
		150						
		200						
GLKK (Reinforced Glass)	3	50						
		100						
		150						
	5	200						
		250						
		300						

■Dimensions Configurable - Pre-drilled Type

Part Number		A 1mm Increment	€ Unit Price B 1mm Increment				
Type	T		20~100	101~200	201~300	301~400	401~500
(Float Transparent Glass)	3	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
	8	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
(Heat Resistant Glass)	3.3	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
	5	20~100					
		101~200					
		201~300					
		301~400					
		401~500					
	10	20~100					
		101~200					
		201~300					
		301~400					
		401~500					

■Hole Charge

	€ Hole Charge	
Drilling Type	N (Through hole)	P (Countersink)
2H		
4H		

Pre-drilled Type Price = Configurable Type € Unit Price + Hole Charge

(Ex.) Part Number - A - B - F - G - Bolt Nominal

- 200 - 180 - F180 - G140 - N5

(Standard Type € Unit Price) + (Hole Charge) = (Pre-drilled Type Price)

33,60 + 9,00 = 42,60 EUR

■Heat Resistant Glass (TEMPAX Float®)

Borosilicate Glass with both surfaces finished flat and smooth by the Float method. Has high optical transparency and excellent optical quality such as the distortion free property.

*Heat resistance and transparency of TEMPAX® is equal to those of Pyrex®.

Glass Plates Round

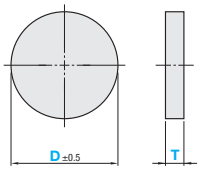
Reduced Delivery Time

■D dimension configurable type is now available. Dimension is configurable from 20Ø by 1mm increment.



Fixed Dimension Type	Configurable Type	Material	Heat-resistant Temperature	
			Continuous Use	Max.
GLMF	FGLMF	Float Transparent Glass	100 °C	380 °C
GLMH	FGLMH	Heat Resistant Glass (TEMPAX Float®)	250 °C	450 °C
GLMK	-	Reinforced Glass	210 °C	250 °C

Heat-resistant temperatures largely vary depending on operating conditions. Not guaranteed values.



Circumference Chamfering C1.0~2.0

T Tolerance

Part Number	T	Tolerance
GLMF GLMK FGLMF	3, 5	±0.3
	8	±0.6
GLMH FGLMH	3.3, 5	±0.2
	10	±0.4

■Fixed Dimension Type

Part Number	D \ T	€ Unit Price								
		GLMF			GLMH			GLMK		
		3	5	8	3.3	5	10	3	5	8
GLMF (Float Transparent Glass) GLMH (Heat Resistant Glass) GLMK (Reinforced Glass)	50									
	65									
	80									
	95									
	110									
	130									
	160									
	185									

The D dimensions above conform to JIS Flange Standards: O rings of B2290 - 1998.
* Not guaranteed against the strength under vacuum.

■Configurable Type

Part Number		€ Unit Price D 1mm Increment					
Type	T	20~50	51~100	101~150	151~200	201~250	251~300
FGLMF (Float Transparent Glass)	3						
	5						
FGLMH (Heat Resistant Glass)	3.3						
	5						
	10						

Order Example

Part Number	-	D	-	T
GLMH	-	95	-	5

Part Number	-	D
FGLMF3	-	100

Days to Ship

■Fixed Dimension Type: 6 Days P.88

■Configurable Type: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Vacuum Resistance of Glass

As GLMF(float transparent glass) is fragile, do not use it under vacuum pressure. The table includes the summary of calculating long-term edge allowable stress and max. deflection by the formula on the right, as to GLMH (heat resistant glass) and GLMK (reinforced glass).

If vacuum pressure is applied, be sure to keep within allowable range for vacuum-proof pressure, and take the max. deflection into account.

Do not use in ultrahigh vacuum atmosphere.

(Unit: MPa)

	GLMF Float Transparent Glass	GLMH Heat Resistant Glass	GLMK Reinforced Glass
Long-term Edge Allowable Stress	6.9	25	68.6

See the in-plane allowable stress of GLMH, not edge allowable force.

- Max. Deflection: $\delta C=0.756\frac{wa^4}{Et^3}$ E=Young's modulus of glass (7.16×10^4MPa)

Unit: mm

■Formula of Glass Strength

To calculate max. bending stress (edge allowable stress) and max. deflection at a circumference simple-supported circular plate under uniformly-distributed load.

* a = Glass Radius (mm), t = Glass Thickness (mm),

w = Uniform Load (N)

- Max. Bending Stress: $\delta C=1.212\frac{wa^2}{t^2}$: (Mpa)

Max. Bending Stress: $\sigma C <$ long-term edge allowable stress of each glass→

* Calculation Summary

D \ T	GLMH 3.3 Vacuum Resistance	GLMH 3.3 Max. Deflection	GLMH 5 Vacuum Resistance	GLMH 5 Max. Deflection	GLMH 10 Vacuum Resistance	GLMH 10 Max. Deflection	GLMK 3 Vacuum Resistance	GLMK 3 Max. Deflection	GLMK 5 Vacuum Resistance	GLMK 5 Max. Deflection	GLMK 8 Vacuum Resistance	GLMK 8 Max. Deflection
50	0	0.013	-	-			0	0.015	-	-		
65	0	0.038			-	-	0	0.044			-	-
80	0	0.087	0	0.025			0	0.101	0	0.022		
95	X		0	0.050			0	0.202	0	0.044		
110			0	0.089	0	0.011	0	0.363	0	0.078	0	0.019
130	-	-	0	0.174	0	0.022			0	0.153	0	0.037
160			-	-	0	0.050	-	-	0	0.351	0	0.086
185					0	0.089			0	0.627	0	0.153

Flanges / Flange Covers for Glass Plates Round Type

CAD Data

■Flanges and flange covers for glass plates round type are selectable between JIS-compliant type and compact type which is 15% smaller than JIS-compliant type in outer diameter.

■Flanges for Round Glass Plates Type RoHS

- JIS Type

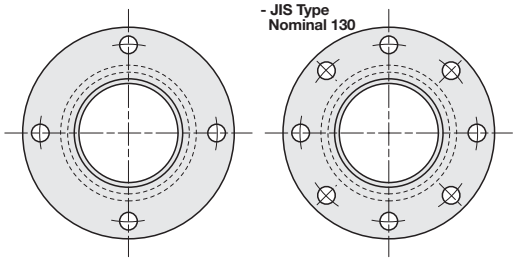


- Compact Type

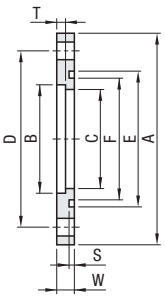


GLFBJ(JIS Flange Standard B2290-1998 compliant)
GLFBE(Compact Type)

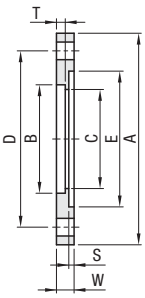
- JIS Type Nominal 130



GLFBJ (JIS)



GLFBE (Compact Type)



6.3

M Material: 1.4301/X5CrNi18-10

Compact type is not recommended for use in applications where reliability in sealing is required, such as vacuum environment.

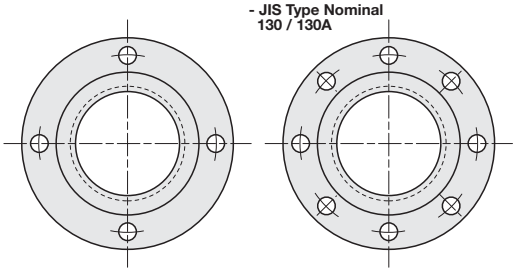
Part Number Type	Part Number Nominal (Glass Diameter)	Flange Outer Diameter A	Hollow Weld Outer Dia. B	Hollow Weld Inner Dia. C	Through Hole Pitch Circle Diameter D	Hollow Part Depth T	Suitable O-rings	O-ring Groove Outer Dia. E	O-ring Groove Inner Dia. F	O-ring Groove Depth S	Flange Thickness W	Through Hole No. - Diameter	Applicable Hollow Size Outer Dia. x Inner Dia.	Applicable Hollow Size JIS 3459 · 3465	€ Unit Price
GLFBJ (JIS)	50	90	35	32.5	70	4	V40	49	40	2.8	8	4-Ø10	34.0x31.0	25A	
	65	105	49.6	47.1	85	5	V55	64	55	2.8	10	4-Ø10	48.6x45.6	40A	
	95	145	77.3	74.3	120	5	V85	94	85	2.8	10	4-Ø12	76.3x72.3	65A	
	130	185	115.3	112.3	160	6	V120	129	120	2.8	12	8-Ø12	114.3x110.3	100A	
GLFBE (Compact)	50	75	35	32.5	61.5	4	V40	49	-	2.5	8	4-Ø7	34.0x31.0	25A	
	65	90	49.6	47.1	76.5	4	V55	64	-	2.5	8	4-Ø7	48.6x45.6	40A	
	95	125	77.3	74.3	109.5	6	V85	94	-	2.5	10	4-Ø7	76.3x72.3	65A	
	130	160	115.3	112.3	145.5	8	V120	129	-	2.5	12	4-Ø10	114.3x110.3	100A	

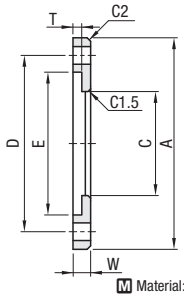
■Flange Covers for Round Glass Plates Type RoHS



GLFCJ(JIS Flange Standard B2290-1998 compliant)
GLFCE(Compact Type)

- JIS Type Nominal 130 / 130A





6.3

M Material: 1.4301/X5CrNi18-10

Part Number Type	Part Number Nominal (Glass Diameter)	Glass Thickness	Flange Cover A	Outer Diameter E	Inner Diameter C	Depth T	Cover Thickness W	Through Holes Pitch Circle Diameter D	Through Hole No. - Diameter	€ Unit Price
GLFCJ (JIS)	50	3~3.3	90	51	32.5	4.3	7	70	4-Ø10	
	65	3~3.3	105	66	47.1	4.3	7	85	4-Ø10	
	95	5.0	145	96	74.3	6	9	120	4-Ø12	
	130	8	185	131	112.3	9	13	160	8-Ø12	
	130A	10				11	15			
GLFCE (Compact)	50	3~3.3	75	51	32.5	4.3	7	61.5	4-Ø7	
	65	3~3.3	90	66	47.1	4.3	7	76.5	4-Ø7	
	95	5.0	125	96	74.3	6	9	109.5	4-Ø7	
	130	8	160	131	112.3	9	13	145.5	4-Ø10	
	130A	10				11	15			

Order Example: Part Number — GLFBJ50, GLFCE95

Days to Ship: 8 Days

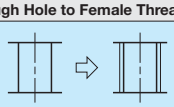
Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations: Part Number - (MAC) — GLFBE65 - MAC — 10 Days

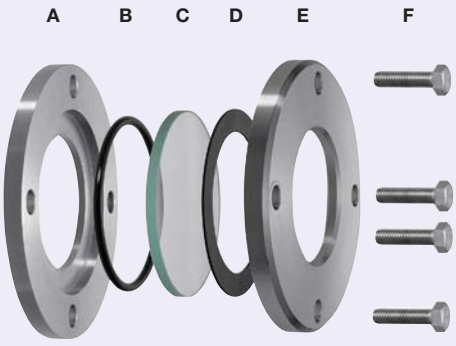
Alteration	Through Hole to Female Thread Hole 
Code	MAC
Spec.	Changes the diameter of through holes Ø7 to M6, Ø10 to M8 and Ø12 to M10. Ordering Code MAC Not applicable to flange covers.
Price Adder	4 Holes: 8,00 EUR, 8 Holes: 12,00 EUR

Observation Port Set (Compact Type)

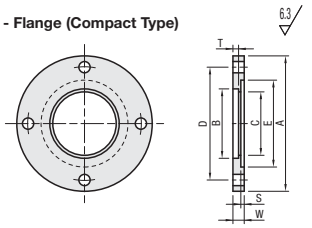
CAD Data

■Sets of flange, O-ring, glass plate, packing, flange cover and bolts to match Round Glass Plates.

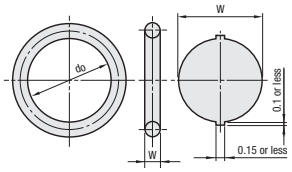
Part Number		A Material: Flange	B O-rings	C Glass Plates Round	D Rubber Gaskets	E Flange Cover	F Screw
Standard Type	GLSETN	1.4301/X5CrNi18-10	Nitrile Rubber	Reinforced Glass	Nitrile Rubber	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10 (Nuts · Washers) 4 Sets
Heat Resisting Type (Glass tolerable up to 230°C)	GLSETF		Fluorine	Heat Resistant Glass	Fluorine		



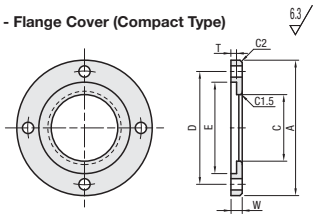
- Flange (Compact Type)



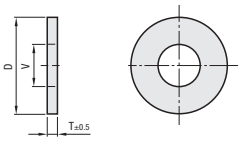
- O-ring



- Flange Cover (Compact Type)



- Rubber packing



RoHS

* Bolts come with Nuts, Spring Washers and Flat Washers. (4 pcs. Each)

Part Number Type	No.	A Flange P.891	B O-rings JIS	W	do	C Glass P.890	D Rubber Gaskets D-V-T	E Flange Cover P.891	F Screw	€ Unit Price
Standard Type GLSETN	50	GLFBE50	V40	4	39.5	GLMK-50-3	50-35-1	GLFCE50	M6-30	
	65	GLFBE65	V55		54.5	GLMK-65-3	65-50-1	GLFCE65	M6-30	
	95	GLFBE95	V85		84.0	GLMK-95-5	95-80-1	GLFCE95	M6-30	
	130	GLFBE130	V120		119.0	GLMK-130-8	130-115-1	GLFCE130	M8-40	
Heat Resisting Type GLSETF	50	GLFBE50	V40		39.5	GLMH-50-3.3	50-35-1	GLFCE50	M6-30	
	65	GLFBE65	V55		54.5	GLMH-65-3.3	65-50-1	GLFCE65	M6-30	
	95	GLFBE95	V85		84.0	GLMH-95-5	95-80-1	GLFCE95	M6-30	
	130	GLFBE130	V120		119.0	GLMH-130-10	130-115-1	GLFCE130A	M8-40	

Order Example Part Number GLSETF65

Days to Ship 8 Days

Price

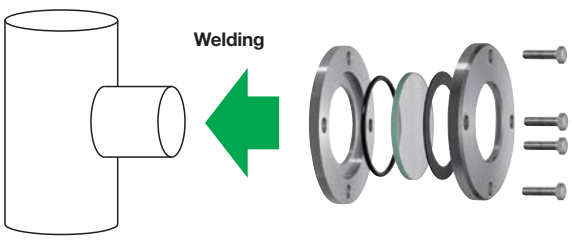
■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Installation
Use as welded to a pipe.
For compatible pipe diameter, refer to the spec list for Flanges for Glass Plate Round Type GLFBE on P.891.

■O-ring and Rubber Gaskets
For purchase of O-rings and rubber gaskets separately, refer to
O-Ring P.1-1313 O-Ring V Series
Rubber Gaskets P.425 Please use the Rubber Gasket Products

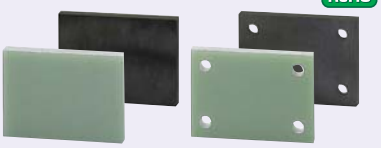


Epoxy Glass Plates

-Standard · High Temperature Grade-

■Epoxy Glass has high strength and excels in heat resistance and moisture resistance.
Standard Type excels in insulation and High Temperature Grade in antistatic effect.

* Details of color samples and features, see P.861



RoHS

Properties P.858

High Temperature Grade EPXAR excels in antistatic effect.

Type	Grade	Color	Operating Ambient Temperature
EPXA	Standard	Green	Ambient Temperature ~ 155°C
EPXAR	High Temperature	Black	Ambient Temperature ~ 260°C

Finish	4 Sides		Top · Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

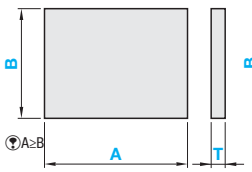
• A · B Dimension Tolerance

A · B Unit: mm	A · B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0

• T Dimension Tolerance, Rate of Camber and Torsion

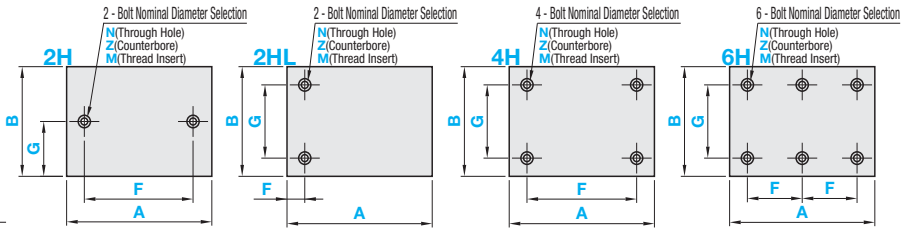
T	T Dimension Tolerance		Rates of Camber and Torsion
	EPXA	EPXAR	per 1,000mm
3	±0.30	±0.1	1.2% or Less
4	±0.40		
5	±0.55		1.0% or Less
6	±0.60		
8	±0.70		0.6% or Less
10	±0.80		0.5% or Less
12	±0.90	-	
15	±1.10		0.4% or Less
20	±1.30		0.2% or Less

■Standard Type



M Material: Epoxy Glass

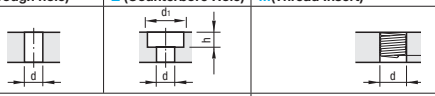
■Pre-drilled Type



■Standard Type

Part Number	A	B	T
Type	1mm Increment		Selection
EPXA (Standard)	20~800	20~600	3 · 4 · 5 · 6 · 8 · 10 · 12 · 15 · 20
EPXAR (High Temperature)			3 · 4 · 5 · 6 · 8 · 10

Drilling Details		Thread Insert Machining Details
N (Through hole)	Z (Counterbore Hole)	M(Thread Insert)



Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

■Table 1

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Ordering Code (Ex.) M4–L6

L≤T

For details of thread insert HLTS, refer to P.255

When L+5<T, drilled holes will be blind ones.

■Pre-drilled Type

Part Number		A	B	T Selection		F	G	Pre-drilled Hole Nominal Diameter			
								Through Hole	Counterbore Hole	Thread Insert	
Type	Nominal	1mm Increment		EPXA	EPXAR	0.5mm Increment		N	Z	M	L
EPXA (Standard)	2H (Horizontal)	20~800	20~600	3	3	6~791.5 (2H · 4H)	4.5~595.5 (2H)	3	-	-	Select from Table 1
				4	4			4	-	-	
	2HL (Vertical)			5	5	4.5~595.5 (2HL)		5	-	3 4	
EPXAR (High Temperature)	4H			6	6		6~591.5 (2HL · 4H · 6H)	6	3	3 4 5 6	
	6H			8	8			8	3 4 5	3 4 5 6 8	
				10	10			10	4 5 6	3 4 5 6 8 10	
				12	-	6~395.5 (6H)			4 5 6	3 4 5 6 8 10	
				15	-				4 5 6 8	3 4 5 6 8 10	
				20	-				4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A–d(d1)–5; for 2HL, d(d1)/2+2.5≤F≤A-d(d1)/2-2.5; for 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.

Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5. For 2HL · 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5.
(d for through hole, thread insert, d1 for counterbore)

For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).

Order Example

■Standard Type

Part Number - A - B - T

EPXAR - 100 - 55 - 10

■Pre-drilled Type

Part Number - A - B - T - F - G - Bolt Nominal Diameter - L

EPXA4H - 200 - 150 - 5 - F160 - G120 - N6

EPXA4H - 400 - 300 - 15 - F300 - G100 - M5 - L10

Days to Ship

■Standard Type

6 Days

■Pre-drilled Type

10 Days

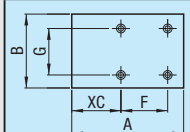
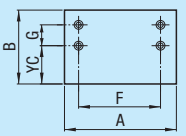
Express B 5,00 EUR/piece P.88

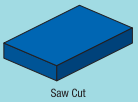
A Express Charge of 13,50 EUR for 3 or more identical pieces.

Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC · YC)

BLA2H - 50 - 40 - 5 - F10 - G20 - N3 - XC10

	Hole Position from Left	Hole Position from Bottom
Alterations		
Code	XC	YC
Spec.	XC = 0.5mm Increment (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	4,00	4,00



Price Reduction
Up to 13%

Price

■**Volume Discount** (Round down to one Cent.) **P.87**

Standard Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Pre-drilled Type

Qty.	1~10	11~20	21~50
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400	401~450	451~500	501~550	551~600
3 EPXA (x1.0) EPXAR (x3.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												
4 EPXA (x1.0) EPXAR (x3.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												
5 EPXA (x1.0) EPXAR (x3.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												
6 8 EPXA (x1.0) EPXAR (T10 only) (x3.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												

T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400	401~450	451~500	501~550	551~600
10 EPXA (x1.0) EPXAR (x3.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												
12 EPXA (x1.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												
15 EPXA (x1.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												
20 EPXA (x1.0)	20~50												
	51~100												
	101~150												
	151~200												
	201~250												
	251~300												
	301~350												
	351~400												
	401~450												
	451~500												
	501~550												
	551~600												
	601~650												
	651~700												
	701~750												
	751~800												

■Hole Charge

Drilling Type	Hole Charge N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H · 2HL			
4H			
6H			

The product price is the price shown in the table multiplied by the material rate. (Round down to ten Cent.)

(Ex.) Part Number - A - B - T | (Price in the table) x (Material Rate) = Standard Type € Unit Price

EPXAR - 300 - 200 - 10 | 63,10 x 3.0 = 189,30 EUR

■Price calculation method for Pre-drilled type

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

EPXA4H - 300 - 200 - 10 - F240 - G160 - Z6

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 8,00 = 71,10 EUR

Part Number - A - B - T - F - G - Bolt Nominal Diameter - L

EPXA6H - 700 - 300 - 10 - F200 - G200 - M5 - L5

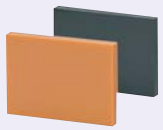
(Standard Type € Unit Price) + (Thread Insert Charge) = Thread Insert Type € Unit Price

+ 15,40 = 269,80 EUR

Bakelite Plates
-Paper Type · Fabric Type-

■Bakelite excels in insulation and heat resistance. Paper based materials are less expensive · and fabric based materials are stronger. New finish variations are now available in addition to the conventional saw cut.
* Details of color samples and features · see **P.861**

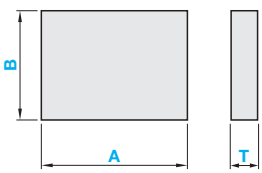
■Standard Type RoHS



Properties P.858

Type	Material	Color	Operating Ambient Temperature
BLA	Paper-based Bakelite	Natural Color	-50 ~ 100°C
BLBA	Paper-based Bakelite	Black	
BLSA	Fabric-based Bakelite	Natural Color	-50 ~ 100°C

Finish	4 Sides Drilling Method	4 Sides Finish Symbol	Top / Bottom Drilling Method	Top / Bottom Finish Symbol
Saw Cut (-)	Saw Cut	√	Material	~
Saw Cut 90° Guaranteed (NT)	Saw Cut	√	Material	~
Sides Milled (4F)	Milling	6.3	Material	~
All Surfaces Milled (6F)	Milling	6.3	Milling	6.3
Top / Bottom Milled (2F)	Saw Cut	√	Milling	6.3



A≥B

Dimensional tolerances of A and B

A · B Unit: mm	A · B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0

T Dimension Tolerance · Rate of Camber and Torsion

T	T Dimension Tolerance Paper Type	T Dimension Tolerance Fabric Type	Rates of Camber and Torsion per 1 ·000mm
2	±0.15	±0.25	3.0% or less
3	±0.20	±0.30	1.2% or Less
4	±0.25	±0.30	
5	±0.30	±0.40	1.0% or Less
6	±0.30	±0.50	
8	±0.40	±0.55	0.6% or Less
10	±0.45	±0.65	0.5% or Less
12	±0.50	±0.75	
15	±0.55	±0.80	0.4% or Less
20	±0.70	±1.10	0.2% or Less

Precision Guarantee

Finish	Width Parallelism Per 100mm	Perpendicularity of Reference Plane Per 100mm
Saw Cut 90° Guaranteed (NT)	0.1	0.1
Sides Milled (4F)		
All Surfaces Milled (6F)		

Reference plane stickers are attached to 4-side milled plates.

M Material: Bakelite (JIS PL-PEM)

■Standard Type

Type	Finish Selection	T Dimension Tolerance Selection	A · B Dimension Tolerance Selection	A	B	T
BLA (Paper-based Bakelite Natural Color) BLBA (Paper-based Bakelite Black) BLSA (Fabric-based Bakelite Natural Color)	Saw Cut			1mm Increment		Selection
	-	Not available	Not available	20~800	20~600	2 · 3 · 4 · 5 · 6 · 8 · 10 · 12 · 15 · 20
	Saw Cut 90° Guaranteed (NT)			0.5mm Increment		Selection
	NT	Not available	T2~10 / T12~20 Q 0~+0.3 / 0~+0.4 N ±0.2 / ±0.3 M -0.3~0 / -0.4~0	20~500	20~400	2 · 3 · 4 · 5 · 6 · 8 · 10 · 12 · 15 · 20
	Sides Milled (4F)			0.1mm Increment		Selection
	4F	Not available	Q 0~+0.2 N ±0.1 M -0.2~0	10~400	10~200	5 · 6 · 8 · 10 · 12 · 15 · 20
	All Surfaces Milled (6F)			0.1mm Increment		0.1mm Increment
	6F	Q 0~+0.2 N ±0.1 M -0.2~0	Q 0~+0.2 N ±0.1 M -0.2~0	10~400	10~200	5~19
	Top / Bottom Milled (2F)			1mm Increments		0.1mm Increment
	2F	Q 0~+0.2 N ±0.1 M -0.2~0	Not available	20~400	20~250	5~19

Order Example

- Saw Cut
- Saw Cut 90° Guaranteed
- Sides Milled
- All Surfaces Milled
- Top / Bottom Milled

Part Number	A	B	T
BLA	300	200	15
BLBANTQ	200.5	100.5	10
BLSA4FN	150.5	100.3	15
BLA6FMM	100.3	90.5	10.5
BLA2FN	80	50	5

Alterations

Part Number - A - B - T - (CRA...)
BLA - 300 - 200 - 15 - CRA10

When alterations are specified · 10 Days

Days to Ship

■Saw Cut · Saw Cut 90° Guaranteed
6 Days P.88

■Sides Milled · All Surfaces Milled · Top / Bottom Milled
8 Days

Price

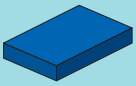
For Price List · refer to P.897

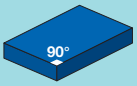
Price calculation methods are as follows:

- Saw Cut = € Unit Price
- Saw Cut 90° Guaranteed = € Unit Price + Finishing Charge
- Sides Mille € Unit Pricerice + Finishing Charge
- All Surfaces Mil € Unit Price Price + Finishing Charge
- Top / Bottom M € Unit Priceit Price + Finishing Charge

Alterations

	Corner Radius	Corner Cut
Code	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD
Spec.	Adds radius to any corner. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA · CRB · CRC · CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Not applicable to Sides Milled or All Surfaces Milled.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code Ex.) When the corners of A and D are cut by C5 ⇢ CCA5-CCD5 Not applicable to Sides Milled or All Surfaces Milled.
Price Adder	5≤R≤20: 2,00 / Corner 25≤R≤50: 3,00 / Corner 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner 25≤C≤50: 3,00 / Corner











Price Reduction
Up to 20%

■Pre-drilled Type RoHS



Properties P.858

Type	Material	Color	Operating Ambient Temperature
BLA	Paper-based Bakelite	Natural Color	-50 ~ 100°C
BLBA	Paper-based Bakelite	Black	
BLSA	Fabric-based Bakelite	Natural Color	-50 ~ 100°C

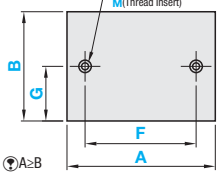
Dimensional tolerances of A and B

A · B Unit: mm	A · B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0

T Dimension Tolerance · Rate of Camber and Torsion

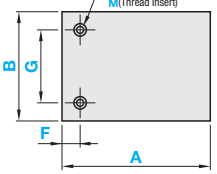
T	T Dimension Tolerance		Rates of Camber and Torsion
	Paper Type	Fabric Type	per 1 ·000mm
2	±0.15	±0.25	3.0% or less
3	±0.20	±0.30	1.2% or Less
4	±0.25	±0.30	
5	±0.30	±0.40	1.0% or Less
6	±0.30	±0.50	
8	±0.40	±0.55	0.6% or Less
10	±0.45	±0.65	0.5% or Less
12	±0.50	±0.75	
15	±0.55	±0.80	0.4% or Less
20	±0.70	±1.10	0.2% or Less

2H 2 - Bolt Nominal Diameter Selection
N(Through Hole) Z(Counterbore) M(Thread Insert)

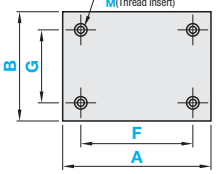


A≥B

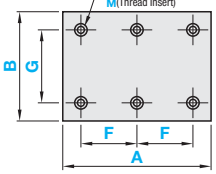
2HL 2 - Bolt Nominal Diameter Selection
N(Through Hole) Z(Counterbore) M(Thread Insert)

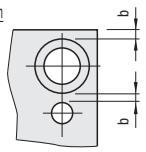


4H 4 - Bolt Nominal Diameter Selection
N(Through Hole) Z(Counterbore) M(Thread Insert)



6H 6 - Bolt Nominal Diameter Selection
N(Through Hole) Z(Counterbore) M(Thread Insert)

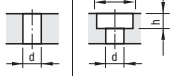




Hole Diameter	b (Min. value)
3~10	2.5

Drilling Details

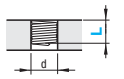
N (Through hole) / Z (Counter-bore Hole)



M (Through Hole) Z (Counterbore Hole) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d₁	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M (Thread Insert)



Ordering Code (Ex.) M4–L6
L≤T
For details of thread insert HLTS · refer to P.255

■Table 1 M (Thread Insert) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Finish	4 Sides		Top · Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut (-)	Saw Cut	√	Material	~
Top / Bottom Milled (2F)	Saw Cut	√	Milling	63 √

■Pre-drilled Type

Part Number Type	T Dimension tolerance Selection	Nominal	A	B	T	F	G
	Saw Cut		1mm Increment		Dimension Selection	0.5mm Increment	
BLA (Paper-based Bakelite Natural Color) BLBA (Paper-based Bakelite Black) BLSA (Fabric-based Bakelite Natural Color)	Not available	2H (Horizontal) 2HL (Vertical) 4H 6H	20~800	20~600	2 · 3 · 4 · 5 · 6 · 8 10 · 12 · 15 · 20 (Selectable)	6~791.5 (2H · 4H) 4.5~595.5 (2HL) 6~395.5 (6H)	4.5~595.5 (2H) 6~591.5 (2HL · 4H · 6H)
	Top / Bottom Milled (2F)		1mm Increment		0.1mm Increment	0.5mm Increment	
	2FQ 0~+0.2 2FN ±0.1 2FM -0.2~0	2H (Horizontal) 2HL (Vertical) 4H 6H	20~400	20~250	5~19 (1mm Increment)	6~391.5 (2H · 4H) 4.5~395.5 (2HL) 6~195.5 (6H)	4.5~245.5 (2H) 6~241.5 (2HL · 4H · 6H)

T Dimension	Pre-drilled Hole Nominal Diameter N (Through Hole)	Z (Counterbore Hole)	M (Thread Insert)	L (Insert Length)
2~4	3	-	-	-
5	4	-	3 4	Select from Table 1
6 · 7	5	3	3 4 5 6	
8 · 9	6	3 4 5	3 4 5 6 8	
10~14	8	4 5 6	3 4 5 6 8 10	
15~20	10	4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H · d(d₁)+2.5≤F≤A-d(d₁)-5; for 2HL · d(d₁)/2+2.5≤F≤A-d(d₁)/2-2.5; for 6H · d(d₁)+2.5≤F≤(A-d(d₁)-5)/2.
Dimension G Specification Range: For 2H · d(d₁)/2+2.5≤G≤B-d(d₁)/2-2.5. For 2HL · 4H and 6H · (d₁)+2.5≤G≤B-d(d₁)-5.
(d for through hole · thread insert · d₁ for counterbore)
For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type,

Order Example

■Pre-drilled Type

Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
BLA4H	400	325	15	F300	G200	Z6	
BLA4H	500	300	10	F300	G200	M5	L10

Days to Ship

■Pre-drilled Type

10 Days | Express B | 5 ·00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

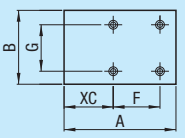
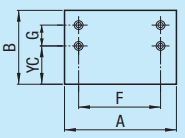
Price

For prices and price calculation methods · see P.897

Pre-drilled Type Price = Standard Type € Unit Price + Finishing Charge + Hole Charge
- Saw Cut Pre-drilled Type € Unit Price
  Standard Type Price + Hole Charge
- Top / Bottom Milled Pre-drilled Type
  Standard Type Price + Finishing Charge + Hole Charge

Alterations

Part Number	A	B	T	F	G	Bolt Nominal Diameter	(XC · YC)
BLA2H	50	40	5	F10	G20	N3	XC10

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (2H · 4H Type) d (d₁)/2+2.5≤XC≤A–F–d (d₁)/2–2.5 (6H Type) d (d₁)/2+2.5≤XC≤A–2F–d (d₁)/2–2.5	YC = 0.5mm Increment d (d₁)/2+2.5≤YC≤B–G–d (d₁)/2–2.5
Price Adder	4,00	4,00

Bakelite Plates- Paper Type- Price List

NEW

Price

Volume Discount (Round down to one Cent.) P.87

Saw Cut, Saw Cut 90° Guaranteed

For orders larger than indicated quantity, please request a quotation.

Qty.	1	2~10	11~20
Discount Rate	€ Unit Price	5%	8%

Sides Milled, All Surfaces Milled, Top / Bottom Milled

Qty.	1	2~10
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1	2~10	11~20	21~50
Discount Rate	€ Unit Price	5%	8%	10%

Paper-based Bakelite Plates Standard Type (Saw– Cut: 1mm Increment)

( ) are the dimension range for saw cut 90° Guaranteed, sides milled and all surfaces milled.

Type	T: Saw Cut Saw Cut 90° Guaranteed Sides Milled	T: Top / Bottom Milled All Surfaces Milled	A	€ Unit Price B: 20~50 (10 ~ 50.9)	51~100 (100.9)	101~150 (150.9)	151~200 (200.9)	201~250 (250.9)	251~300 (300.9)	301~350 (350.9)	351~400 (400)	401~450	451~500	501~550	551~600
BLA (Paper Type, Natural Color) BLBA (Paper Type, Black)	2 3 4 5	5	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												
	6 8	5.1 ~ 8.0	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												
	10 12	8.1 ~ 12	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												
	15	12.1 ~ 15	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												
	20	15.1 ~ 19	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												

NEW



Price Reduction
Up to 15%

■Finishing Charges

(?)( ) are the dimension range for Sides Milled and All Surfaces Milled.

Type	T: Saw Cut Saw Cut 90° Guaranteed Sides Milled	T: Top / Bottom Milled All Surfaces Milled	A	Saw Cut 90° Guaranteed (0.5mm Increment) € Unit Price B: 20~50.5	51~100.5	101~150.5	151~200.5	201~250.5	251~300.5	301~350.5	351~400	Sides Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	All Surfaces Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	Top / Bottom Milled (1mm Increment) € Unit Price B: 20~50	51~100	101~150	151~200	201~250
BLA (Paper Type, Natural Color) / BLBA (Paper Type, Black)	*2 *3 *4 5	5	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	6 8	5.1 ~ 8.0	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	10 12	8.1 ~ 12	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
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			251~300.9																					
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			351~400.9																					
			401~450.9																					
			451~500																					
	15	12.1 ~ 15	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	20	15.1 ~ 19	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					

(?)Marked with * is available for Saw Cut 90° Guaranteed.

■Hole Charge

Drilling Type	Hole Charge N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H · 2HL			
4H			
6H			

(Ex.)

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter
BLA2FQ4H	-	300	-	200	-	10	-	F240	-	G100	-	N8

(Standard Type € Unit Price) + (Top / Bottom Milled Finishing Charges) + (Hole Charge)

+ 18,90 + 6,00

= (Price of Top / Bottom Milled Pre-drilled Type) 46,20

■Price calculation method for Standard Type

Price calculation methods are as follows:

- Saw Cut =Standard Price
- Saw Cut 90° Guaranteed =Standard Type € Unit Price + Charge for Saw Cut 90° Guaranteed
- Sides Milled =Standard Type € Unit Price + Sides Milled Charge
- All Surfaces Milled =Standard Type € Unit Price + All Surfaces Milled Charge
- Top / Bottom Milled =Standard Type € Unit Price + Top / Bottom Milled Charge

■Price calculation method for Pre-drilled type

Pre-drilled Type Price = Standard Type Price + Hole Charge

- Saw Cut
  Pre-drilled Type Price = Standard Type Price + Hole Charge
- Top / Bottom Milled
  Pre-drilled Type Price = Standard Type Price + Finishing Charge of Top / Bottom Milled + Hole Charge

Bakelite Plates-Fabric Type- Price List

Price

Volume Discount (Round down to one Cent.) P.87

Saw Cut, Saw Cut 90° Guaranteed (For orders larger than indicated quantity, please request a quotation.

Qty.	1	2~10	11~20
Discount Rate	€ Unit Price	5%	8%

Sides Milled, All Surfaces Milled, Top / Bottom Milled

Qty.	1	2~10
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1	2~10	11~20	21~50
Discount Rate	€ Unit Price	5%	8%	10%

Fabric-based Bakelite Plates Standard Type (Saw Cut: 1mm Increment) ( ) are the dimension range for Saw Cut 90° Guaranteed, Sides Milled and All Surfaces Milled.

Type	T: Saw Cut Saw Cut 90° Guaranteed Sides Milled	T: Top / Bottom Milled All Surfaces Milled	A	€ Unit Price B: 20~50 (10 ~ 50.9)	51~100 (100.9)	101~150 (150.9)	151~200 (200.9)	201~250 (250.9)	251~300 (300.9)	301~350 (350.9)	351~400 (400)	401~450	451~500	501~550	551~600
BLSA (Fabric Type, Natural Color)	2 3 4 5	5	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												
	6 8	5.1 ~ 8.0	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												
	10 12	8.1 ~ 12	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
			251 ~ 300 (300.9)												
			301 ~ 350 (350.9)												
			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
			751~800												
	15	12.1 ~ 15	20 ~ 50 (10 ~ 50.9)												
			51 ~ 100 (100.9)												
			101 ~ 150 (150.9)												
			151 ~ 200 (200.9)												
			201 ~ 250 (250.9)												
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			451 ~ 500 (500)												
			501~550												
			551~600												
			601~650												
			651~700												
			701~750												
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			351 ~ 400 (400.9)												
			401 ~ 450 (450.9)												
			451 ~ 500 (500)												
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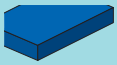
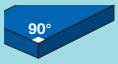
			601~650												
			651~700												
			701~750												
			751~800												













■Finishing Charges

(?)( ) are the dimension range for Sides Milled and All Surfaces Milled.

Type	T: Saw Cut / Saw Cut 90° Guaranteed / Sides Milled	T: Top / Bottom Milled / All Surfaces Milled	A	Saw Cut 90° Guaranteed (0.5mm Increment) € Unit Price B: 20~50.5	51~100.5	101~150.5	151~200.5	201~250.5	251~300.5	301~350.5	351~400	Sides Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	All Surfaces Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	Top / Bottom Milled (1mm Increment) € Unit Price B: 20~50	51~100	101~150	151~200	201~250
BLSA Fabric Type (Natural Color)	*2 *3 *4 5	5	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	6 8	5.1 ~ 8.0	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	10 12	8.1 ~ 12	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	15	12.1 ~ 15	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	20	15.1 ~ 19	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					

(?)Marked with * is available for saw cut 90° guaranteed.

■Hole Charge

Drilling Type	Hole Charge N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H / 2HL			
4H			
6H			

(Ex.)

Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
BLSA2FQ2H -	350 -	150 -	5 -	F150 -	G75 -	M3 -	L3

(Standard Type € Unit Price) + (Top / Bottom Milled Finishing Charges) + (Hole Charge) = (Top / Bottom Milled Pre-drilled Type Price)

\+ 18,40 + 6,20 =

■Price calculation method for Standard Type

Price calculation methods are as follows:

- Saw Cut =Standard Price
- Saw Cut 90° Guaranteed =Standard Type € Unit Price + Charge for Saw Cut 90° Guaranteed
- Sides Milled =Standard Type € Unit Price + Sides Milled Charge
- All Surfaces Milled =Standard Type € Unit Price + All Surfaces Milled Charge
- Top / Bottom Milled =Standard Type € Unit Price + Top / Bottom Milled Charge

■Price calculation method for Pre-drilled type

Pre-drilled Type Price = Standard Type Price + Hole Charge

- Saw Cut
  Pre-drilled Type Price = Standard Type Price + Hole Charge
- Top / Bottom Milled
  Pre-drilled Type Price = Standard Type Price + Finishing Charge of Top / Bottom Milled + Hole Charge

MC Nylon® Plates

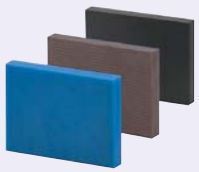
-Standard / Sliding / High Strength / Conductivity / Weather Resistance Grades-

■ MC Nylon® is the most versatile material among Engineered Plastics and used for various industrial purposes.
New finish variations are now available in addition to the conventional Saw Cut.

* Details of color samples and features, see P.861

■ Standard Type

RoHS



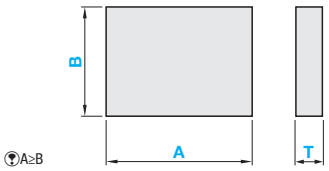
Properties P.859

Type	Grade / Material	Color	Operating Ambient Temperature
MCA	Standard / MC901	Blue	-40 ~ 120°C
MCAW	Standard / MC900NC	Ivory	
MCAS	Sliding / MC703HL	Purple	
MCAY	High Strength / MC602ST	Dark Brown	Ambient Temp. ~ 150°C
MCAPS	Weather Resistance / MC801	Dark Gray	Ambient Temp. ~ 120°C
MCCA	Conductivity CDR2 / MC501CDR2	Black	Ambient Temp. ~ 120 °C
MCDA	Conductivity CDR6 / MC501CDR6	Black	
MCEA	Conductivity CDR9 / MC501CDR9	Black	Ambient Temp. ~ 150°C

-T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance	Rates of Camber and Torsion per 1,000mm
5 · 7 · 10	0~+1.5	1.2% or Less
12 · 15 · 20		1.0% or Less
25 · 30	0~+2.0	0.4% or Less
40 · 50 · 60	0~+3.0	

Finish	4 Sides		Top / Bottom Surface	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut (-)	Saw Cut	√	Material	~
Saw Cut 90° Guaranteed (NT)	Saw Cut	√	Material	~
Sides Milled (4F)	Milling	6.3	Material	~
All Surfaces Milled (6F)	Milling	6.3	Milling	6.3
Top / Bottom Milled (2F)	Saw Cut	√	Milling	6.3



-Dimensional tolerances of A and B

T	A · B Unit: mm	A · B Dimension Tolerance
5~30	~99	±0.5
	100~250	±0.75
	251~	±1.0
40~60	~300	0~+5

-Precision Guarantee

Finish	Width Parallelism	Perpendicularity of Reference Plane
	Per 100mm	
Saw Cut 90°Guaranteed (NT)	0.1	0.1
Sides Milled (4F)		
All Surfaces Milled (6F)		

Reference plane stickers are attached to Sides Milled plates.

■ Standard Type

Type	Part Number: Finish Symbol Selection	T Dimension Tolerance Selection	A · B Dimension Tolerance Selection	By Material Dimension Range	A	B	T
	Saw Cut				1mm Increment		Selection
MCA (Standard Blue) MCAW (Standard Ivory) MCAS (Sliding) MCAY (High Strength) MCAPS (Weather Resistance) MCCA (Conductivity CDR2) MCDA (Conductivity CDR6) MCEA (Conductivity CDR9)	-	Not available	Not available	MCA	20~500	20~400	5 · 7 · 10 · 12 · 15 · 20 · 25 · 30
						40~300	40~300	40 · 50 · 60
				MCEA	20~500	20~400	10 · 12 · 15 · 20 · 25
				Others			5 · 7 · 10 · 12 · 15 · 20 · 25 · 30
	Saw Cut 90° Guaranteed (NT)				0.5mm Increment		Selection
	NT	Not available	T5·7·10 / T12·15·20 / T25·30 Q 0~+0.3 / 0~+0.4 / 0~+0.5 N ±0.2 / ±0.3 / ±0.4 M -0.3 ~ 0 / -0.4 ~ 0 / -0.5 ~ 0	MCEA	20~500	20~400	10 · 12 · 15 · 20 · 25
				Others			5 · 7 · 10 · 12 · 15 · 20 · 25 · 30
	Sides Milled (4F)				0.1mm Increment		Selection
	4F	Not available	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	MCEA	10~400	10~200	10 · 12 · 15 · 20 · 25
				Others			5 · 7 · 10 · 12 · 15 · 20 · 25 · 30
	All Surfaces Milled (6F)				0.1mm Increment		0.1mm Increment
	6F	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	MCEA	10~400	10~200	10~24
				Others			5~29
	Top / Bottom Milled (2F)				1mm Increment		0.1mm Increment
	2F	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	Not available	MCEA	20~400	20~250	10~24
				Others			5~29

T40 · 50 and 60 may have steps on cut surfaces.

Order Example

Part Number	A	B	T
- Saw Cut: MCA	300	200	40
- Saw Cut 90° Guaranteed: MCANTQ	200.5	100.5	10
- Sides Milled: MCA4FN	150.5	100.3	15
- All Surfaces Milled: MCA6FMM	100.3	90.5	10.5
- Top / Bottom Milled: MCA2FQ	80	50	5

Alterations

Part Number - A - B - T - (CRA...)
MCA - 300 - 200 - 5 - CRA10

When alterations are specified, 10 Days

Days to Ship

■ Saw Cut, Saw Cut 90° Guaranteed
6 Days P.88

■ Sides Milled · All Surfaces Milled · Top / Bottom Milled
8 Days

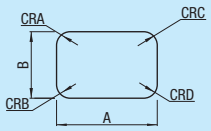
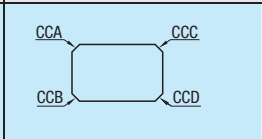
Price

For Price List, refer to P.903

Price calculation methods are as follows:

- Saw Cut	= Standard Type € Unit Price
- Saw Cut 90° Guaranteed	= Standard Type € Unit Price + Finishing Charge
- Sides Milled	= Standard Type € Unit Price + Finishing Charge
- All Surfaces Milled	= Standard Type € Unit Price + Finishing Charge
- Top / Bottom Milled	= Standard Type € Unit Price + Finishing Charge

Alterations

	Corner Radius			Corner Cut	
					
Code	CRA · CRB · CRC · CRD			CCA · CCB · CCC · CCD	
Spec.	Adds radius to any corner. R=5mm Increment (P)10≤A(B)–R(2R) (P)5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 (P)Not applicable to Sides Milled or All Surfaces Milled. (P)Not applicable to T40, 50 and 60.			Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.)When the corners of A and D are cut by C5 ···› CCA5-CCD5 (P)Not applicable to Sides Milled or All Surfaces Milled. (P)Not applicable to T40, 50 and 60.	
€ Price Adder	5≤R≤20	25≤R≤50	55≤R≤100	5≤C≤20	25≤C≤50
	2,00 / Corner	3,00 / Corner	4,50 / Corner	2,00 / Corner	3,00 / Corner



Price Reduction
Up to 10%

■Pre-drilled Type

RoHS



Properties P.859

Type	Grade / Material	Color	Operating Ambient Temperature
MCA	Standard / MC901	Blue	-40 ~ 120°C
MCAW	Standard / MC900NC	Ivory	
MCAS	Sliding / MC703HL	Purple	
MCAY	High Strength / MC602ST	Dark Brown	Ambient Temp. ~ 150°C
MCAPS	Weather Resistance / MC801	Dark Gray	Ambient Temp. ~ 120°C
MCCA	Conductivity CDR2 / MC501CDR2	Black	Ambient Temp. ~ 120°C
MCDA	Conductivity CDR6 / MC501CDR6	Black	
MCEA	Conductivity CDR9 / MC501CDR9	Black	Ambient Temp. ~ 150°C

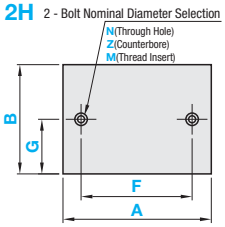
-Dimensional tolerances of A and B

T	A · B Unit: mm	A · B Dimension Tolerance
5~30	~99	±0.5
	100~250	±0.75
	251~	±1.0
40~60	~300	0~+5

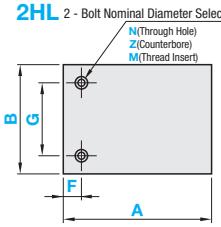
-T Dimension Tolerance · Rate of Camber and Torsion

T	T Dimension Tolerance	Rates of Camber and Torsion per 1,000mm
5 · 7 · 10	0~+1.5	1.2% or Less
12 · 15 · 20		1.0% or Less
25 · 30	0~+2.0	0.4% or Less
40 · 50 · 60	0~+3.0	

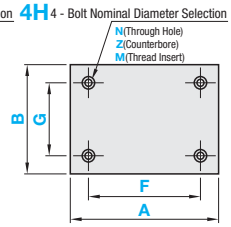
2H 2 - Bolt Nominal Diameter Selection



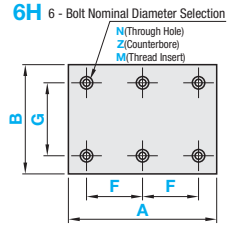
2HL 2 - Bolt Nominal Diameter Selection



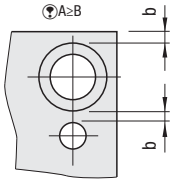
4H 4 - Bolt Nominal Diameter Selection



6H 6 - Bolt Nominal Diameter Selection



A≥B



Hole Diameter	b (Min. value)
3~10	2.5

Drilling Details

N(Through hole)



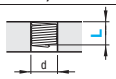
Z(Counterbore Hole)



N(Through Hole) Z(Counterbored Hole) Details

Boit Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M (Thread Insert)



Ordering Code (Ex.) M4–L6
L≤T
When L+5<T, drilled holes will be blind ones.

■Table 1 M(Thread Insert) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Finish	4 Sides		Upper-lower Surface	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~
Top / Bottom Milled	Saw Cut	√	Milling	6.3

■Pre-drilled Type

Part Number Type		T Nominal	A	B	By Material T Dimension Range	T	F	G
		Saw Cut	1mm Increment			Selection	0.5mm Increment	
MCA	(Standard Blue)	Not available	2H(Horizontal) 2HL(Vertical) 4H 6H	20~500	20~400	MCEA	10 · 12 · 15 · 20 · 25	6~491.5 (2H · 4H) 4.5~395.5 (2HL) 6~245.5 (6H)	4.5~395.5 (2H) 6~391.5 (2HL · 4H · 6H)
MCAW	(Standard Ivory)					Others	5 · 7 · 10 · 12 · 15 · 20 · 25 · 30		
MCAS	(Sliding)								
MCAY	(High Strength)								
MCAPS	(Weather Resistance)								
MCCA	(Conductivity CDR2)	Top / Bottom Milled (2F)	1mm Increment			0.1mm Increment	0.5mm Increment	
MCDA	(Conductivity CDR6)	2FQ 0~+0.2 2FN ±0.1 2FM -0.2 ~ 0	2H(Horizontal) 2HL(Vertical) 4H 6H	20~400	20~250	MCEA	10~24	6~391.5 (2H · 4H) 4.5~395.5 (2HL) 6~195.5 (6H)	4.5~245.5 (2H) 6~241.5 (2HL · 4H · 6H)
MCEA	(Conductivity CDR9)					Others	5~29		

T	Pre-drilled Hole Nominal Diameter			
	Through Hole	Counterbore Hole	Thread Insert	
	N	Z	M	L
5 · 6	3	-	3 4	(Thread Insert Length) Select from Table 1
7~9	4 5 6	3 4	3 4 5 6	
10~14	8	4 5 6	3 4 5 6 8 10	
15~30	10	4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A–d(d1)–5; for 2HL, d(d1)/2+2.5≤F≤A-d(d1)/2-2.5; for 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.

Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5. For 2HL · 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5.

For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).

Order Example

■Pre-drilled Type

Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
MCDA4H	200	155	5	F160	G120	N4	
MCDA4H	500	300	10	F300	G200	M5	L10

Days to Ship

■Pre-drilled Type

10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Alterations

Part Number	A	B	T	F	G	Bolt Nominal Diameter	(XC · YC)
MCA2H	50	40	5	F10	G20	N3	XC10

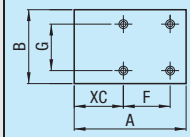
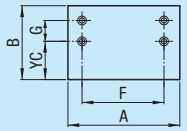
Price

For prices and price calculation methods, see P.903

Pre-drilled Type Price = Standard Type € Unit Price + Finishing Charge + Hole Charge

-Price of Saw Cut Pre-drilled Type
Standard Type Price + Hole Charge

-Price of Top / Bottom Milled Pre-drilled Type
Standard Type Price + Finishing Charge + Hole Charge

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	4,00	4,00

MC Nylon® Plates Price List

-Standard / Sliding / High Strength / Conductivity / Weather Resistance Grades-

Price

Volume Discount (Round down to one Cent.) P.87

Saw Cut · Saw Cut 90° Guaranteed

Qty.	1	2~10	11~20
Discount Rate	€ Unit Price	5%	8%

Sides Milled, All Surfaces Milled, Top · Bottom Milled

Qty.	1	2~10
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1	2~10	11~20	21~50
Discount Rate	€ Unit Price	5%	8%	10%

For orders larger than indicated quantity, please request a quotation.

Check each Material Rate.

( ) are the dimension range for saw cut 90° guaranteed, sides milled and all surfaces milled.

MC Nylon Plates Standard Type (Saw Cut: 1mm Increment)

Type	T: Saw Cut Saw Cut 90° Guaranteed Sides Milled	T: Top / Bottom Milled All Surfaces Milled	A	€ Unit Price B: 20~50 (10 ~ 50.9)	51 ~ 100 (100.9)	101 ~ 150 (150.9)	151 ~ 200 (200.9)	201 ~ 250 (250.9)	251 ~ 300 (300.9)	301 ~ 350 (350.9)	351 ~ 400 (400.9)
Type (Material Rate) Material Grade											
MCA (x1.0) Standard Blue	5	5.0~7.0	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
MCAW (x1.0) Standard Ivory	7		20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
MCAS (x2.5) Sliding	10	7.1~12	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
MCAY (x1.8) High Strength	12		20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
MCAPS (x1.4) Weather Resistance	15	12.1~15	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
MCCA (x2.5) Conductivity CDR2	20	15.1~20	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
MCDA (x1.5) Conductivity CDR6	25	20.1~25	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
MCEA (x2.0) Conductivity CDR9	30	25.1~29	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
	40	-	40 ~ 50 (50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
	50	-	40 ~ 50 (50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
	60	-	40 ~ 50 (50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								



Price Reduction
Up to 10%

Finishing Charges

(P) ( ) are the dimension range for Sides Milled and All Surfaces Milled.

Type	T: Saw Cut / Saw Cut 90° Guaranteed / Sides Milled	T: Top / Bottom Milled / All Surfaces Milled	A	Saw Cut 90° Guaranteed (0.5mm Increment) € Unit Price B: 20~50.5	51~100.5	101~150.5	151~200.5	201~250.5	251~300.5	301~350.5	351~400	Sides Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	All Surfaces Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	Top / Bottom Milled (1mm Increment) € Unit Price B: 20~50	51~100	101~150	151~200	201~250
Type Material Grade	5 7	5.0 ~ 7.0	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	10 12	7.1 ~ 12	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
MCA Standard Blue **MCAW** Standard Ivory **MCAS** Sliding	15	12.1 ~ 15	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
MCAY High Strength **MCAPS** Weather Resistance **MCCA** Conductivity CDR2 **MCDA** Conductivity CDR6 **MCEA** Conductivity CDR9	20	15.1 ~ 20	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	25	20.1 ~ 25	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	30	25.1 ~ 29	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					

Hole Charge

Drilling Type	Hole Charge N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H · 2HL			
4H			
6H			

(Ex.) Part Number: MCA2FQ4H - A: 150 - B: 100 - T: 12 - F: F75 - G: G50 - Bolt Nominal Diameter: Z5

(Standard Type € Unit Price) + (Top / Bottom Milled Finishing Charges) + (Hole Charge) = (Top / Bottom Milled Pre-drilled Type Price)

\+ 9,30 + 8,00 =

Price calculation method for Standard Type

(P)Round down to ten Cent.

Price calculation methods are as follows:

- Saw Cut = Standard Type € Unit Price x Material Rate
- Saw Cut 90° Guaranteed = Standard Type € Unit Price x Material Rate + Charge for Saw Cut 90° Guaranteed
- Sides Milled = Standard Type € € Unit Price x Material Rate + Sides Milled
- All Surfaces Milled = Standard Type € € Unit Price x Material Rate + All Surfaces Milled
- Top / Bottom Milled = Standard Type € Unit Price x Material Rate + Top / Bottom Milled

Price calculation method for Pre-drilled type

(P)Round down to ten Cent.

Price of Pre-drilled Type = Standard Type € Unit Price x Material Rate + Finishing Charge + Hole Charge

- Saw Cut
  Pre-drilled Type Price = Standard Type € Unit Price x Material Rate + Hole Charge
- Top / Bottom Milled
  Pre-drilled Type Price = Standard Type € Unit Price x Material Rate + Top / Bottom Milled + Hole Charge

NEW

Polyacetal Plates

-Standard / Sliding / Conductivity Grades-

■Polyacetal (equal to Duracone®) is a general Engineered Plastic used for various industrial purposes.
Conductivity Grade is made from non-carbon antistatic materials. New types of finishing are available for saw cut.

* Details of color samples and features, see P.861

■Standard Type

RoHS



Properties P.859

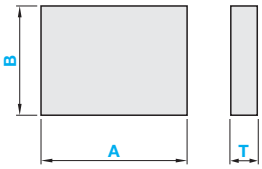
Type	M Grade	Color	Operating Ambient Temperature
PAA	Standard	White	-45~95°C
PABA		Black	
PABAH	Sliding	White	
PACA	Electric Conductivity	Ocher	Ambient Temperature ~ 80°C

Dimensional tolerances of A and B

T	A · B Unit: mm	A · B Dimension Tolerance
5~30	~99	±0.5
	100~250	±0.75
	251~	±1.0
40~60	~300	0~+5

T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance	Rates of Camber and Torsion per 1,000mm
5 · 6 · 8 · 9 · 10	+0.2~+1.5	1.0% or Less
12	+0.3~+2.0	
15 · 19 · 20 · 25 · 30		0.5% or Less
40 · 50 · 60	+0.5~+3.0	



A≥B

Finish	4 Sides Drilling Method	4 Sides Finish Symbol	Top / Bottom Drilling Method	Top / Bottom Finish Symbol
Saw Cut	Saw Cut	√	Material	~
Saw Cut 90° Guaranteed (NT)	Saw Cut	√	Material	~
Sides Milled (4F)	Milling	6.3	Material	~
All Surfaces Milled (6F)	Milling	6.3	Milling	6.3
Top / Bottom Milled (2F)	Saw Cut	√	Milling	6.3

Precision Guarantee

Finish	Width Parallelism Per 100mm	Perpendicularity of Reference Plane Per 100mm
Saw Cut 90° Guaranteed (NT)	0.1	0.1
Sides Milled (4F)		
All Surfaces Milled (6F)		

Reference plane stickers are attached to 4-side milled plates.

M Material: Polyacetal

Type	Finish Selection	T Dimension tolerance Selection	A · B Dimension Tolerance Selection	By Material Dimension Range	A	B	T
PAA (Standard White) PABA (Standard Black) PABAH (Sliding Grade) PACA (Conductivity Grade)	**Saw Cut**				1mm Increment		Selection
	-	Not available	Not available	PAA	20~500	20~400	5 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 30
					40~300	40~300	40 · 50 · 60
				PABA	20~500	20~400	5 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 30
				PABAH			10 · 12 · 15 · 20 · 25 · 30
				PACA			6 · 9 · 12 · 19 · 25
	Saw Cut 90° Guaranteed (NT)				0.5mm Increment		Selection
	NT	Not available	T5·6·8·9·10 / T12·15·19·20 / T25·30: Q 0~+0.3 / 0~+0.4 / 0~+0.5; N ±0.2 / ±0.3 / ±0.4; M -0.3 ~ 0 / -0.4 ~ 0 / -0.5 ~ 0	PAA	20~500	20~400	5 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 30
				PABA			
				PABAH			10 · 12 · 15 · 20 · 25 · 30
				PACA			6 · 9 · 12 · 19 · 25
	Sides Milled (4F)				0.1mm Increment		Selection
	4F	Not available	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	PAA PABA	10~400	10~200	5 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 30
				PABAH			10 · 12 · 15 · 20 · 25 · 30
				PACA			6 · 9 · 12 · 19 · 25
	All Surfaces Milled (6F)				0.1mm Increment		0.1mm Increment
	6F	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	PAA PABA	10~400	10~200	5~29
				PABAH			10~29
				PACA			5~24
	Top / Bottom Milled (2F)				1mm Increments		0.1mm Increment
	2F	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	Not available	PAA PABA	20~400	20~250	5~29
				PABAH			10~29
				PACA			5~24

T40, 50 and 60 may have steps on cut surfaces.

Order Example

- Saw Cut
- Saw Cut 90° Guaranteed
- Sides Milled
- All Surfaces Milled
- Top / Bottom Milled

Part Number	-	A	-	B	-	T
PAA	-	300	-	200	-	40
PAANTQ	-	200.5	-	100.5	-	10
PAA4FN	-	150.5	-	100.3	-	15
PAA6FMM	-	100.3	-	90.5	-	10.5
PAA2FQ	-	80	-	50	-	5

Days to Ship

■Saw Cut, Saw Cut 90° Guaranteed: **6 Days**

■Saw Cut·All Surfaces Milled·Top / Bottom Milled: **8 Days**

Price

For Price List, refer to P.907

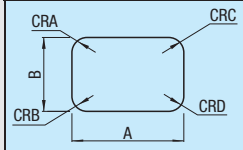
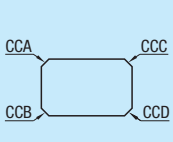
Price calculation methods are as follows:

- Saw Cut	= Standard Price
- Saw Cut 90° Guaranteed	= Standard Price + Finishing Charge
- Sides Milled	= Standard Price + Finishing Charge
- All Surfaces Milled	= Standard Price + Finishing Charge
- Top / Bottom Milled	= Standard Price + Finishing Charge

Alterations

Part Number	-	A	-	B	-	T	-	CRA...
PAA	-	300	-	200	-	10	-	CRA10

When alterations are specified, 10 Days

Alterations	Corner Radius	Corner Cut
		
Code	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD
Spec.	Adds radius to any corner. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Not applicable to Sides Milled or All Surfaces Milled. Not applicable to T40, 50 and 60.	Cuts any corner. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.) When the corners of A and D are cut by C5 ···› CCA5-CCD5 Not applicable to Sides Milled or All Surfaces Milled. Not applicable to T40, 50 and 60.

Price Adder	5≤R≤20	25≤R≤50	55≤R≤100	5≤C≤20	25≤C≤50
	2,00 / Corner	3,00 / Corner	4,50 / Corner	2,00 / Corner	3,00 / Corner



Price Reduction
Up to 15%

■Pre-drilled Type

RoHS



Properties P.859

Type	M Grade	Color	Operating Ambient Temperature
PAA	Standard	White	-45~95°C
PABA		Black	
PABAH	Sliding	White	
PACA	Electric Conductivity	Ocher	Ambient Temperature ~ 80°C

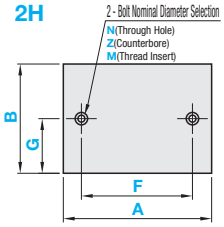
Dimensional tolerances of A and B

T	A · B Unit: mm	A · B Dimension Tolerance
5~30	~99	±0.5
	100~250	±0.75
	251~	±1.0
40~60	~300	0~+5

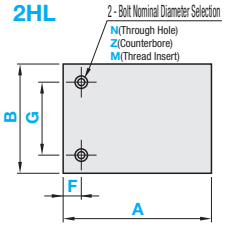
T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance	Rates of Camber and Torsion per 1,000mm
5 · 6 · 8 9 · 10	+0.2~+1.5	1.0% or Less
12 15 · 19 · 20 25 · 30	+0.3~+2.0	0.5% or Less
40 · 50 · 60	+0.5~+3.0	

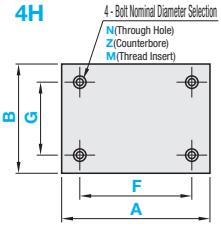
2H 2 - Bolt Nominal Diameter Selection
N(Through Hole)
Z(Counterbore)
M(Thread Insert)



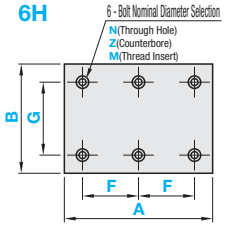
2HL 2 - Bolt Nominal Diameter Selection
N(Through Hole)
Z(Counterbore)
M(Thread Insert)



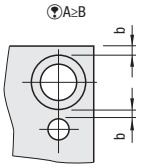
4H 4 - Bolt Nominal Diameter Selection
N(Through Hole)
Z(Counterbore)
M(Thread Insert)



6H 6 - Bolt Nominal Diameter Selection
N(Through Hole)
Z(Counterbore)
M(Thread Insert)



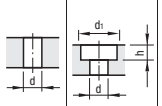
A≥B



Hole Diameter	b (Min. value)
3~10	2.5

Drilling Details

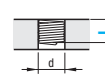
N (Through hole) / Z (Counterbore Hole)



N(Through Hole) Z(Counterbored Hole) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M(Thread Insert)



Ordering Code Ex.) M4–L6
L≤T
When L+5<T, drilled holes will be blind ones.

■Table 1 (Thread Insert) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Finish	4 Sides Drilling Method	4 Sides Finish Symbol	Upper-lower Surface Drilling Method	Upper-lower Surface Finish Symbol
Saw Cut	Saw Cut	√	Material	~
Top / Bottom Milled (2F)	Saw Cut	√	Milling	6.3 √

Type		Part Number T Dimension tolerance Selection	Part Number Nominal	A	B	By Material T Dimension Range	T	F	G
		Saw Cut		1mm Increment			Selection	0.5mm Increment	
PAA	(Standard White)	Not available	2H(Horizontal) 2HL(Vertical) 4H 6H	20~500	20~400	PAA PABA	5 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 30	6~491.5 (2H · 4H) 4.5~395.5 (2HL) 6~245.5 (6H)	4.5~395.5 (2H) 6~391.5 (2HL · 4H · 6H)
PABA	(Standard Black)					PABAH	10 · 12 · 15 · 20 · 25 · 30		
PABAH	(Sliding Grade)					PACA	6 · 9 · 12 · 19 · 25		
PACA	(Conductivity Grade)								
		Top / Bottom Milled (2F)		1mm Increment			T Dimension Configurable: 0.1mm Increment	0.5mm Increment	
		2FQ 0~+0.2 2FN ±0.1 2FM -0.2 ~ 0	2H(Horizontal) 2HL(Vertical) 4H 6H	20~400	20~250	PAA PABA	5~29	6~391.5 (2H · 4H) 4.5~395.5 (2HL) 6~195.5 (6H)	4.5~245.5 (2H) 6~241.5 (2HL · 4H · 6H)
						PABAH	10~29		
						PACA	5~24		

T	Pre-drilled Hole Nominal Diameter Through Hole N	Counterbore Hole Z	Thread Insert M	L
5	3 4 5 6 8 10	-	3 4	Select from Table 1
6 · 7		3	3 4 5 6	
8		3 4 5	3 4 5 6 8	
9		4 5 6	3 4 5 6 8	
10 · 11		4 5 6	3 4 5 6 8 10	
12~14		4 5 6	3 4 5 6 8 10	
15~30		4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A-d(d1)-5. For 2HL, (d1)/2+2.5≤F≤A-d(d1)/2-2.5.
For 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.

Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5. For 2HL, 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5.
(d for through hole, thread insert, d1 for counterbore)

For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).

Order Example

■Pre-drilled Type

Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
PABA4H	400	325	15	F300	G200	Z6	
PABA4H	500	300	10	F300	G200	M5	L10

Alterations

Part Number	A	B	T	F	G	Bolt Nominal Diameter	(XC · YC)
PAA2H	50	40	5	F10	G20	N3	XC10

Days to Ship

■Pre-drilled Type

10 Days

Express B 5,00 EUR/ piece P.88

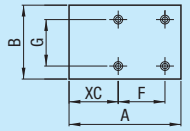
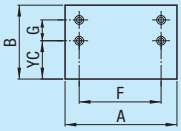
A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

For prices and price calculation methods, see P.907

Pre-drilled Type Price = Standard Type € Unit Price + Finishing Charge + Hole Charge

- Saw Cut
  Pre-drilled Type Price = Standard Type Price + Hole Charge
- Top / Bottom Milled
  Pre-drilled Type Price = Standard Type € Unit Price + Finishing Charge + Hole Charge

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	4,00	4,00

Polyacetal Plates Price List

-Standard / Sliding / Conductivity Grades-

Price

Volume Discount (Round down to one Cent.) P.87

Saw Cut, Saw Cut 90° Guaranteed

Qty.	1	2~10	11~20
Discount Rate	€ Unit Price	5%	8%

For orders larger than indicated quantity, please request a quotation.

Sides Milled, All Surfaces Milled, Top / Bottom Milled

Qty.	1	2~10
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1	2~10	11~20	21~50
Discount Rate	€ Unit Price	5%	8%	10%

Polyacetal Plates Standard Type (Saw Cut: 1mm Increment)

Check each Material Rate. ( ) are the dimension range for saw cut 90° guaranteed, sides milled and all surfaces milled.

Type	T: Saw Cut Saw Cut 90° Guaranteed Sides Milled	T: Top / Bottom Milled All Surfaces Milled	A	€ Unit Price B: 20~50 (10 ~ 50.9)	51 ~ 100 (100.9)	101 ~ 150 (150.9)	151 ~ 200 (200.9)	201 ~ 250 (250.9)	251 ~ 300 (300.9)	301 ~ 350 (350.9)	351 ~ 400 (400)
Type (Material Rate) Material Grade PAA (x1.0) Standard White PABA (x1.0) Standard Black PABAH (x2.5) Sliding PACA (x7.0) Electric Conductivity	5 6 8	5.0~8.0	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
	9 10 12	8.1~12	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
	15	12.1~15	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
	19 20	15.1~20	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
	25	20.1~25	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
	30	25.1~29	20 ~ 50 (10 ~ 50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
			301 ~ 350 (350.9)								
			351 ~ 400 (400.9)								
			401 ~ 450 (450.9)								
			451 ~ 500 (500)								
	40	-	40 ~ 50 (50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
	50	-	40 ~ 50 (50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								
	60	-	40 ~ 50 (50.9)								
			51 ~ 100 (100.9)								
			101 ~ 150 (150.9)								
			151 ~ 200 (200.9)								
			201 ~ 250 (250.9)								
			251 ~ 300 (300.9)								



Price Reduction
Up to 15%

Finishing Charges

(P)( ) are the dimension range for Sides Milled and All Surfaces Milled.

Type	T: Saw Cut / Saw Cut 90° Guaranteed / Sides Milled	T: Top / Bottom Milled / All Surfaces Milled	A	Saw Cut 90° Guaranteed (0.5mm Increment) € Unit Price B: 20~50.5	51~100.5	101~150.5	151~200.5	201~250.5	251~300.5	301~350.5	351~400	Sides Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	All Surfaces Milled (0.1mm Increment) € Unit Price B: 10~50.9	51~100.9	101~150.9	151~200	Top / Bottom Milled (1mm Increment) € Unit Price B: 20~50	51~100	101~150	151~200	201~250
Type Material Grade **PAA** Standard White **PABA** Standard Black **PABAH** Sliding **PACA** Electric Conductivity	5 6 8	5.0 ~ 8.0	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	9 10 12	8.1 ~ 12	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	15	12.1 ~ 15	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	19 20	15.1 ~ 20	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	25	20.1 ~ 25	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					
	30	25.1 ~ 29	(10) 20~50.9																					
			51~100.9																					
			101~150.9																					
			151~200.9																					
			201~250.9																					
			251~300.9																					
			301~350.9																					
			351~400.9																					
			401~450.9																					
			451~500																					

Hole Charge

Drilling Type	Hole Charge N (Through Hole)	Z (Counterbore Hole)	M (Thread Insert)
2H · 2HL			
4H			
6H			

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

PABAH2FN4H - 205 - 100 - 10 - F100 - G50 - N5

(Standard Type Price) x (Material Coefficient) + (Top / Bottom Milled Finishing Charges) + (Hole Charge) = (Top / Bottom Milled Pre-drilled Type Price)

11,90 x 2.5 + 13,20 + 6,00 =

Price calculation method for Standard Type (P)Round down to ten Cent.

Price calculation methods are as follows:

- Saw Cut = Standard Type € Unit Price x Material Rate
- Saw Cut 90° Guaranteed = Standard Type € Unit Price x Material Rate + Charge for Saw Cut 90° Guaranteed
- Sides Milled = Standard Type € Unit Price x Material Rate + Sides Milled Charge
- All Surfaces Milled = Standard Type € Unit Price x Material Rate + All Surfaces Milled Charge
- Top / Bottom Milled = Standard Type € Unit Price x Material Rate + Top / Bottom Milled Charge

Price calculation method for Pre-drilled type (P)Round down to ten Cent.

Price of Pre-drilled Type = Standard Type € Unit Price x Material Rate + Finishing Charge + Hole Charge

- Saw Cut
  Pre-drilled Type Price = Standard Type € Unit Price x Material Rate + Hole Charge
- Top / Bottom Milled
  Pre-drilled Type Price = Standard Type € Unit Price x Material Rate + Top / Bottom Milled Charge + Hole Charge

Ultra High-molecular-weight Polyethylene Plates
-Standard / Conductive-

■Ultra High-molecular-weight Polyethylene is light in specific gravity and weight.
Excels in abrasion resistance and sliding property. In addition to Standard Type, Conductive Grade for antistatic is also available.

* Details of color samples and features, see P.861

RoHS

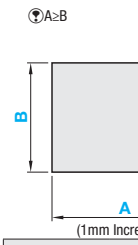


Properties P.859

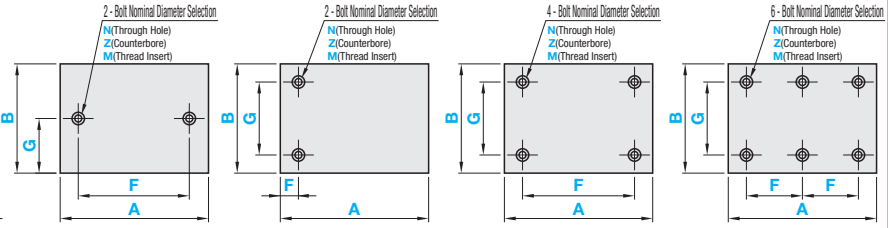
Type	M Grade	Color	Operating Ambient Temperature
UPA	Standard	Milky White	-100~80°C
UPACA	Electric Conductivity	Black	

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

■Standard Type



■Pre-drilled Type



Drilling Details

N (Through hole)



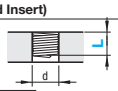
Z (Counterbore Hole)



N(Through Hole) Z(Counerbored Hole) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M (Thread Insert)

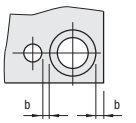


Ordering Code (Ex.) M4–L6
L≤T
When L+5<T, drilled holes will be blind ones.

■Table 1 M (Thread Insert) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Hole Diameter	b (Min. value)
3~10	2.5



M Material: Ultra High-molecular-weight Polyethylene (UHMWPE)

■Standard Type

Part Number	A	B	T
Type	1mm Increment		Selection
UPA (Standard)	20~500	20~400	3 · 5 · 8 · 10 · 15 · 20
UPACA (Conductive)			10 · 15 · 20

T3 and T5 have bows. T3 has especially large bow.

•T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance		Rates of Camber and Torsion per 1,000mm
	UPA	UPACA	
3	-0.2~+0.5	-	10% or Less
5	0~+0.8	-	2.0% or Less
8	0~+1.0	-	
10	0~+1.5	+0.4~+1.0	1.5% or Less
15	0~+2.0		
20	0~+2.5		

•Dimensional tolerances of A and B

A / B Unit: mm	A / B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0

■Pre-drilled Type

Part Number		A	B	T Selection		F	G	Pre-drilled Hole Nominal Diameter			
Type	Nominal							Through Hole	Counterbore Hole	Thread Insert	
		1mm Increment		UPA	UPACA	0.5mm Increment		N	Z	M	L
UPA (Standard) UPACA (Conductive)	2H 2HL 4H 6H	20~500	20~400	3	-	6~491.5 (2H · 4H) 4.5~395.5 (2HL) 6~245.5 (6H)	4.5~395.5 (2H) 6~391.5 (2HL · 4H · 6H)	3 4 5 6 8 10	-	-	(Thread Insert Length) Select from Table 1
				5	-				-	3 4	
				8	-				4 5	3 4 5 6 8	
				10	10				4 5 6	3 4 5 6 8 10	
				15	15				4 5 6 8	3 4 5 6 8 10	
				20	20				4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A–d(d1)–5; for 2HL, d(d1)/2+2.5≤F≤A-d(d1)/2-2.5; for 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.
Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5. For 2HL · 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5.
(d for through hole, thread insert, d1 for counterbore)
For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).

Order Example

■Standard Type

Part Number	-	A	-	B	-	T
UPA	-	150	-	118	-	5

■Pre-drilled · Thread Insert Type

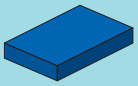
Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter	-	L
UPA2H	-	50	-	25	-	8	-	F34	-	G10	-	N4		
UPA2H	-	200	-	100	-	10	-	F70	-	G20	-	M5	-	L7.5

Days to Ship

■Standard Type: 6 Days

■Pre-drilled Type: 10 Days — Express B 5,00 EUR/piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.



Price

(Ex.) Part Number - A - B - T

UPACA - 300 - 200 - 10

(Price in the table) x (Material Rate) = Standard Type € Unit Price

23,20 x 1.2 =

Plate Price

Material rate should be noted. UPACAx1.2

Part Number	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400
UPA (x1.0) / UPACA (x1.2) Type (Material Rate)	3	20~ 50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	5	20~ 50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	8	20~ 50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								

Part Number	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400
UPA (x1.0) / UPACA (x1.2) Type (Material Rate)	10	20~ 50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	15	20~ 50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	20	20~ 50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								

Hole Charge

Drilling Type	Hole Charge N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H · 2HL			
4H			
6H			

Volume Discount

(Round down to one Cent.) P.88

Standard Type Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Pre-drilled Type Qty.	1~10	11~20	21~50
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

The prices of Pre-drilled Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

Price calculation method for Pre-drilled type

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

UPA4H - 300 - 200 - 10 - F240 - G160 - N8

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 6,00 = 29,20 EUR

Part Number - A - B - T - F - G - Bolt Nominal Diameter - L

UPACA2H - 300 - 200 - 10 - F240 - G160 - M5 - L5

(Standard Type € Unit Price) + (Thread Insert Charge) = Thread Insert Type € Unit Price

27,80 (23,20x1.2) + 6,20 = 34,00 EUR

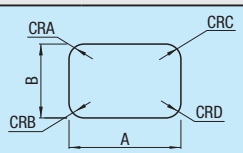
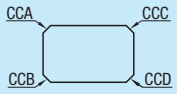
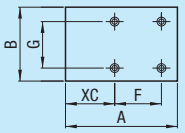
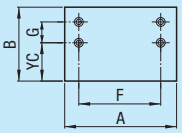
Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC · YC · CRA...etc.)

UPA4H - 200 - 180 - 8 - F100 - G140 - Z4 - XC10

UPACA - 200 - 130 - 15 - CRA10- CRB10

CRA · CRB · CRC · CRD: 10 Days

Alterations	Corner Radius	Corner Cut	Hole Position from Left	Hole Position from Bottom
				
Code	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD	XC	YC
Spec.	Adds radius to any corner. R=5mm Increment (10≤A(B)–R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Available for Standard Type only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.) When the corners of A and D are cut by C5⋯› CCA5-CCD5 Available for Standard Type only.	XC = 0.5mm Increment (2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	5≤R≤20: 2,00 / Corner; 25≤R≤50: 3,00 / Corner; 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner; 25≤C≤50: 3,00 / Corner	4,00	4,00

Fluororesin Plates
-Standard / Conductive-

■Fluororesin (equal to Teflon) excels in heat resistance and chemical resistance.
Conductivity Grade is made from non-carbon antistatic materials. In addition to Standard Type, Conductive Grade for antistatic is also available.

* Details of color samples and features, see **P.861**



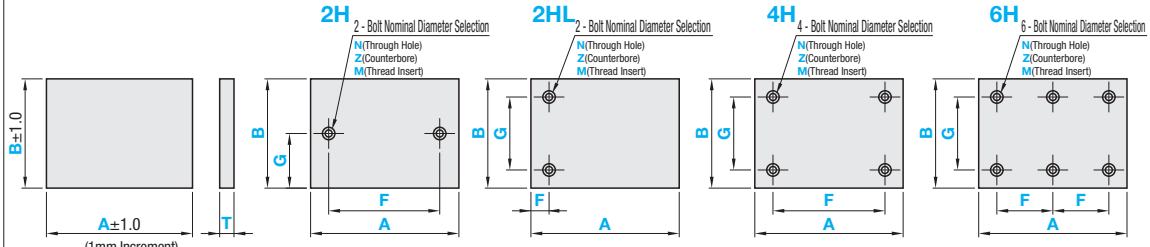
Properties P.860

Type	Grade	Color	Operating Ambient Temperature
PTFE	Standard	White	-40 ~ 250°C
PTFCA	Electric Conductivity		Ambient Temperature ~ 260°C

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

■Standard Type

■Pre-drilled Type



A≥B

Drilling Details

N(Through hole)



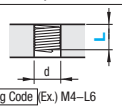
Z(Counterbore Hole)



N(Through Hole) Z(Counterbored Hole) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d₁	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M (Thread Insert)



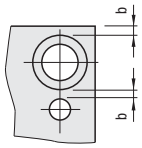
Ordering Code (Ex.) M4–L6

L≤T

When L+5<T, drilled holes will be blind ones.

■Table 1 M(Thread Insert) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20



Hole Diameter	b (Min. value)
3~10	2.5

M Material: Polytetrafluoroethylene Resin

■Standard Type

Part Number / Type	A (1mm Increment)	B (1mm Increment)	T Selection
PTFE (Standard)	20~500	20~300	1 · 2 · 3 · 5 · 8 · 10 · 15 · 20 · 25 · 30
PTFCA (Conductive)	20~300	20~300	6 · 9 · 12 · 19 · 25

T dimension 1~5 have large camber.

- T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance PTFE	Rates of Camber and Torsion per 1,000mm
1	±0.2	3.0% or less
2		
3	±0.4	
5		
8	0~+1.0	1.5% or Less
10		
15	0~+2.0	1.0% or Less
20		
25		
30		

T	T Dimension Tolerance PTFCA	Rates of Camber and Torsion per 1,000mm
6	+0.5~+4.5	1.5% or Less
9		
12	+0.5~+7.0	1.0% or Less
19		
25		

- Dimensional Tolerances of A and B ±1.0

■Pre-drilled Type

Part Number Type	Nominal	A (1mm Increment)	B (1mm Increment)	T Selection	F (0.5mm Increment)	G (0.5mm Increment)	Pre-drilled Hole Nominal Diameter: Through Hole N	Counterbore Hole Z	Thread Insert M	Thread Insert L
PTFE (Standard)	2H(Horizontal) 2HL(Vertical) 4H 6H	20~500	20~300	1 · 2 · 3	6~491.5 (2H · 4H) 4.5~395.5(2HL) 6~245.5 (6H)	4.5~295.5 (2H) 6~291.5 (2HL · 4H · 6H)	3 4 5 6 8 10	-	-	-
				5				-	3 4	Select from Table 1
				8				3 4 5	3 4 5 6 8	
				10				4 5 6	3 4 5 6 8 10	
				15 · 20 · 25 · 30				4 5 6 8	3 4 5 6 8 10	
PTFCA (Conductive)		20~300	20~300	6	6~291.5 (2H · 4H) 4.5~295.5 (2HL) 6~145.5 (6H)	4.5~295.5 (2H) 6~291.5 (2HL · 4H · 6H)		3	3 4 5 6	
				9				4 5 6	3 4 5 6 8	
				12				4 5 6	3 4 5 6 8 10	
				19 · 25				4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H, d(d₁)+2.5≤F≤A–d(d₁)–5; for 2HL, d(d₁)/2+2.5≤F≤A-d(d₁)/2-2.5; for 6H, d(d₁)+2.5≤F≤(A-d(d₁)-5)/2.
Dimension G Specification Range: For 2H, d(d₁)/2+2.5≤G≤B-d(d₁)/2-2.5. For 2HL, 4H and 6H, (d₁)+2.5≤G≤B-d(d₁)-5.
(d for through hole, thread insert, d₁ for counterbore)
For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).
PTFE may have camber as it is a soft material.

Order Example

■Standard Type

Part Number	A	B	T
PTFE	100	50	5

■Pre-drilled Type

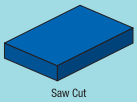
Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
PTFE4H	200	200	10	F180	G180	Z5	
PTFCA2H	230	130	25	F80	G50	M8	L12

Days to Ship

■Standard Type: 6 Days P.88

■Pre-drilled Type: 10 Days — Express B — 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.



Price Reduction
Up to 15%

Price

Volume Discount (Round down to one Cent.) P.88

Standard Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1~10	11~20	21~50
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Standard Type € Unit Price

Part Number	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300
PTFE	1	20~ 50						
		51~100						
		101~150						
		151~200						
	2	201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
	3	20~ 50						
		51~100						
		101~150						
		151~200						
	5	201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
	8	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
	10	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
PTFCA	6	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	9	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	12	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						

Part Number	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300
PTFE	15	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
	20	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
	25	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
	30	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
		301~350						
		351~400						
		401~450						
		451~500						
PTFCA	19	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	25	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						

Hole Charge

Drilling Type	Hole Charge N (Through Hole)	Z (Counterbore Hole)	M (Thread Insert)
2H · 2HL			
4H			
6H			

P.88

Price calculation method for Pre-drilled Type

The prices of Pre-drilled Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

PTFE4H - 300 - 200 - 10 - F240 - G160 - N8

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 6,00 = 83,00 EUR

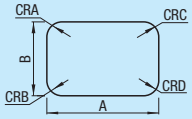
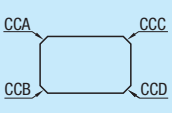
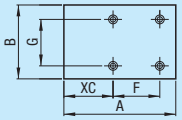
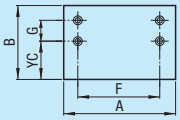
Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC·YC·CRA...etc.)

PTFE2H - 200 - 100 - 3 - F100 - G50 - N3 - XC10

PTFCA - 100 - 50 - 9 - CRA10- CRB10

CRA · CRB · CRC · CRD: 10 Days

	Corner Radius	Corner Cut	Hole Position from Left	Hole Position from Bottom
Alterations				
Code	CRA / CRB / CRC / CRD	CCA / CCB / CCC / CCD	XC	YC
Spec.	Adds radius to any corner. R=5mm Increment (10≤A(B)–R(2R) (5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.) Adds R10 at the corner of A and C. CRA10-CRC10 Available for Standard Type only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.) When the corners of A and D are cut by C5⋯› CCA5-CCD5 Available for Standard Type only.	XC = 0.5mm Increment (2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	5≤R≤20: 2,00 / Corner 25≤R≤50: 3,00 / Corner 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner 25≤C≤50: 3,00 / Corner	4,00	4,00

NEW

PEEK Plates

-Standard / Sliding · Conductivity Grades-

■ PEEK is a super Engineered Plastic with a variety of excellent features including high heat and chemical resistance.
New finish variations are now available in addition to the conventional saw cut.

* Details of color samples and features, see P.861

■Standard Type

RoHS

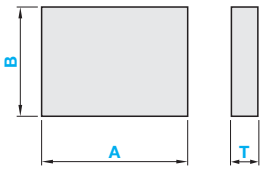


Properties P.860

Type	M Grade	Color	Operating Ambient Temperature
PKA	Standard	Ash Brown	-50 ~ 250°C
PKAH	Sliding	Black	
PKCA	Electric Conductivity	Black	Ambient Temperature~250°C

- Dimension Tolerance of A and B

A · B Unit: mm	A / B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0



A≥B M Material: PEEK

- T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance			Rates of Camber and Torsion
	PKA	PKAH	PKCA	per 1,000mm
5 · 8 · 10	0~+1.1	0~+1.1	0~+1.1	1.2% or Less
16 · 20	0~+1.7	-	0~+1.7	0.8% or Less
25		-	-	

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~
Saw Cut 90° Guaranteed (NT)	Saw Cut	√	Material	~
Sides Milled (4F)	Milling	6.3	Material	~
All Surfaces Milled (6F)	Milling	6.3	Milling	6.3
Top / Bottom Milled (2F)	Saw Cut	√	Milling	6.3

Precision Guarantee

Finish	Width Parallelism	Perpendicularity of Reference Plane
	Per 100mm	
Saw Cut 90° Guaranteed (NT)	0.1	0.1
Sides Milled(4F)		
All Surfaces Milled(6F)		

Reference plane stickers are attached to sides milled plates.

■Standard Type

Type	Finish Selection	T Dimension tolerance Selection	A / B Dimension Tolerance Selection	By Material Dimension Range	A	B	T
	Saw Cut				1mm Increment		Selection
PKA (Standard) PKAH (Sliding) PKCA (Conductive)	-	Not available	Not available	PKA	20~300	20~200	5 · 8 · 10
					20~250	20~150	16 · 20 · 25
				PKAH	20~300	20~200	5 · 8 · 10
				PKCA			10
					20~250	20~150	16 · 20
	Saw Cut 90° Guaranteed (NT)				0.1mm Increment		Selection
	NT	Not available	T5 · 8 · 10 / T16 · 20 / T25 Q 0~+0.3 / 0~+0.4 / 0~+0.5 N ±0.2 / ±0.3 / ±0.4 M -0.3 ~ 0 / -0.4 ~ 0 / -0.5 ~ 0	PKA	20~300	20~200	5 · 8 · 10
					20~250	20~150	16 · 20 · 25
				PKAH	20~300	20~200	5 · 8 · 10
				PKCA			10
					20~250	20~150	16 · 20
	Sides Milled (4F)				0.1mm Increment		Selection
	4F	Not available	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	PKA	10~300	10~200	5 · 8 · 10
					10~250	10~150	16 · 20 · 25
				PKAH	10~300	10~200	5 · 8 · 10
				PKCA			10
					10~250	10~150	16 · 20
	All Surfaces Milled (6F)				0.1mm Increment		0.1mm Increment
	6F	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	PKA	10~300	10~200	5~9
					10~250	10~150	9.1~24
				PKAH	10~300	10~200	5~9
				PKCA			
					10~250	10~150	9.1~19
	Top / Bottom Milled (2F)				1mm Increment		0.1mm Increment
	2F	Q 0~+0.2 N ±0.1 M -0.2 ~ 0	Not available	PKA	20~250	20~150	5~24
				PKAH			5~9
				PKCA			5~19

* T5 and T8 of PKCA are no longer available due to product discontinuation at the manufacturer; however, they are available as Top / Bottom Milled and All Surfaces Milled products.

Order Example

- Saw Cut
- Saw Cut 90° Guaranteed
- Sides Milled
- All Surfaces Milled
- Top / Bottom Milled

Part Number	-	A	-	B	-	T
PKA	-	300	-	200	-	5
PKANTQ	-	200.5	-	100.5	-	10
PKA4FN	-	150.5	-	100.3	-	16
PKA6FMN	-	100.3	-	90.5	-	10.5
PKA2FQ	-	80	-	50	-	5

Alterations

Part Number - A - B - T - (CRA...etc.)
PKA - 100 - 100 - 10 - CRA10

When alterations are specified, 10 Days

Days to Ship

■Saw Cut · Saw Cut 90° Guaranteed
6 Days

P.88

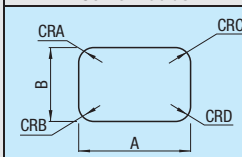
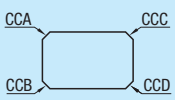
■Sides Milled · All Surfaces Milled · Top / Bottom Milled
8 Days

Price

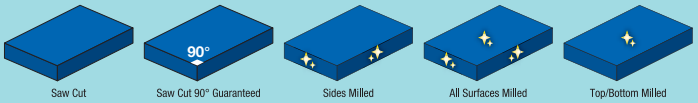
For Price List, refer to P915

Price calculation methods are as follows:

- Saw Cut	= Standard Price
- Saw Cut 90° Guaranteed	= Standard Price + Finishing Charge
- Sides Milled	= Standard Price + Finishing Charge
- All Surfaces Milled	= Standard Price + Finishing Charge
- Top / Bottom Milled	= Standard Price + Finishing Charge

Alterations	Corner Radius	Corner Cut
		
Code	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD
Spec.	Adds radius to any corner. R=5mm Increment 10≤A(B)~R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Available for Standard Type only. Not applicable to sides milled or all surfaces milled.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code Ex.) When the corners of A and D are cut by C5 ⇢ CCA5-CCD5 Not applicable to sides milled or all surfaces milled.

Price Adder	5≤R≤20	25≤R≤50	55≤R≤100	5≤C≤20	25≤C≤50
	2,00 / Corner	3,00 / Corner	4,50 / Corner	2,00 / Corner	3,00 / Corner



Price Reduction
Up to 10%

■Pre-drilled Type

RoHS



Properties P.860

Type	M Grade	Color	Operating Ambient Temperature
PKA	Standard	Ash Brown	-50 ~ 250°C
PKAH	Sliding	Black	
PKCA	Electric Conductivity	Black	Ambient Temperature ~250°C

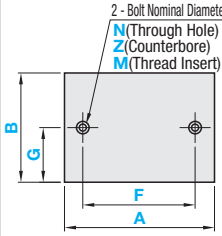
- Dimension Tolerance of A and B

A · B Unit: mm	A / B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0

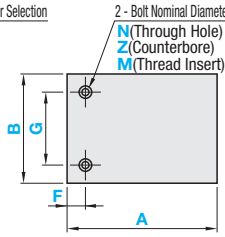
- T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance PKA	PKAH	PKCA	Rates of Camber and Torsion per 1,000mm
5 · 8 · 10	0~+1.1	0~+1.1	0~+1.1	1.2% or Less
16 · 20	0~+1.7	-	0~+1.7	0.8% or Less
25		-	-	

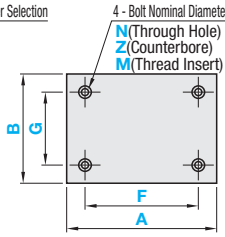
2H



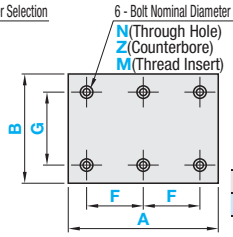
2HL



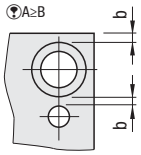
4H



6H



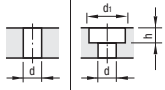
A≥B



Hole Diameter	b (Min. value)
3~10	2.5

Drilling Details

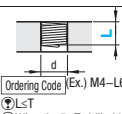
N(Through hole) / Z(Counterbore Hole)



N(Through Hole) Z(Counterbored Hole) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M(Thread Insert)



Ordering Code (Ex.) M4–L6

L≤T

When L+5<T, drilled holes will be blind ones.

Table 1 M(Thread Insert) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Finish	4 Sides Drilling Method	4 Sides Finish Symbol	Top / Bottom Drilling Method	Top / Bottom Finish Symbol
Saw Cut	Saw Cut	✓	Material	~
Top / Bottom Milled	Saw Cut	✓	Milling	6.3

■Pre-drilled Type

Part Number Type	T Dimension tolerance Selection	Nominal	A	B	By Material T Dimension Range	T	F	G
	Saw Cut		1mm Increment			Selection	0.5mm Increment	
PKA (Standard) PKAH (Sliding) PKCA (Conductive)	Not available	2H(Horizontal) 2HL(Vertical) 4H 6H	20~300	20~200	PKA	5 · 8 · 10	6~291.5 (2H · 4H) 4.5~295.5 (2HL) 6~145.5 (6H)	4.5~195.5 (2H) 6~191.5 (2HL · 4H · 6H)
					PKAH			
					PKCA	10		
			20~250	20~150	PKA	16 · 20 · 25	6~241.5 (2H · 4H) 4.5~245.5 (2HL) 6~120.5 (6H)	4.5~145.5 (2H) 6~141.5 (2HL · 4H · 6H)
					PKCA	16 · 20		
	Top / Bottom Milled		1mm Increment			0.1mm Increment	0.5mm Increment	
	2FQ 0~+0.2 2FN ±0.1 2FM -0.2 ~ 0	2H(Horizontal) 2HL(Vertical) 4H 6H	20~250	20~150	PKA	5~24	6~241.5 (2H · 4H) 4.5~245.5 (2HL) 6~120.5 (6H)	4.5~145.5 (2H) 6~141.5 (2HL · 4H · 6H)
					PKAH	5~9		
					PKCA	5~19		

T	Pre-drilled Hole Nominal Diameter Through Hole N	Counterbore Hole Z	Thread Insert M	Thread Insert L
5~7	3	-	3 4	(Thread Insert Length) Select from Table 1
8 · 9	4 5	3 4 5	3 4 5 6 8	
10~15	6 8	4 5 6	3 4 5 6 8 10	
16~25	10	4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A–d(d1)–5; for 2HL, d(d1)/2+2.5≤F≤A-d(d1)/2-2.5; for 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.

Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5. For 2HL · 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5. (d for through hole, thread insert, d1 for counterbore)

For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).

Order Example

■Pre-drilled Type

Part Number	A	B	T	F	G	Bolt Nominal Diameter	L
PKA2H	50	25	8	F34	G10	N4	
PKCA2H	150	120	10	F80	G60	M8	L8

Days to Ship

■Pre-drilled Type

10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

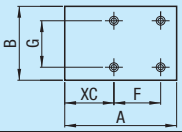
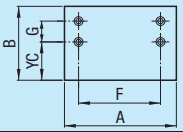
For prices and price calculation methods, see P.915

Pre-drilled Type Price = Standard Type € Unit Price + Finishing Charge + Hole Charge

- Saw Cut
  Pre-drilled Type Price = Standard Type Price + Hole Charge
- Top / Bottom Milled
  Pre-drilled Type Price = Standard Type € Unit Price + Finishing Charge + Hole Charge

Alterations

Part Number	A	B	T	F	G	Bolt Nominal Diameter	(XC · YC)
PKA4H	200	100	5	F160	G50	N6	XC15

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC = 0.5mm Increment (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	4,00	4,00

NEW

PEEK Plates Price List

-Standard / Sliding · Conductivity Grades-

Price

Volume Discount (Round down to one Cent.) P.87
Saw Cut, Saw Cut 90° Guaranteed
For orders larger than indicated quantity, please request a quotation.

Qty.	1	2~10	11~20
Discount Rate	€ Unit Price	5%	8%

Sides Milled · All Surfaces Milled · Top · Bottom Milled

Qty.	1	2~10
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1	2~10	11~20	21~50
Discount Rate	€ Unit Price	5%	8%	10%

PEEK Plates Standard Type (Saw Cut: 1mm Increment)

Check each Material Rate.
( ) are the dimension range for saw cut 90° guaranteed, sides milled and all surfaces milled.

Type	T: Saw Cut Saw Cut 90° Guaranteed Sides Milled	T: Top / Bottom Milled All Surfaces Milled	A	€ Unit Price B: 20~50 (10 ~ 50.9)	51~75 (75.9)	76~100 (100.9)	101~125 (125.9)	126~150 (150.9)	151~175 (176.9)	176~200
Type (Material Rate) Material Grade PKA (x1.0) Standard PKAH (x2.8) Sliding PKCA (x2.8) Electric Conductivity	5	5.0	20 ~ 50 (10 ~ 50.9)							
			51 ~ 75 (75.9)							
			76 ~ 100 (100.9)							
			101 ~ 125 (125.9)							
			126 ~ 150 (150.9)							
			151 ~ 175 (176.9)							
			176 ~ 200 (200.9)							
			201 ~ 225 (225.9)							
			226 ~ 250 (250.9)							
			251 ~ 275 (275.9)							
			276~300							
	8	5.1~8.0	20 ~ 50 (10 ~ 50.9)							
			51 ~ 75 (75.9)							
			76 ~ 100 (100.9)							
			101 ~ 125 (125.9)							
			126 ~ 150 (150.9)							
			151 ~ 175 (176.9)							
			176 ~ 200 (200.9)							
			201 ~ 225 (225.9)							
			226 ~ 250 (250.9)							
			251 ~ 275 (275.9)							
			276~300							
	10	8.1~10.0 *PKCA (5.0 ~ 10.0)	20 ~ 50 (10 ~ 50.9)							
			51 ~ 75 (75.9)							
			76 ~ 100 (100.9)							
			101 ~ 125 (125.9)							
			126 ~ 150 (150.9)							
			151 ~ 175 (176.9)							
			176 ~ 200 (200.9)							
			201 ~ 225 (225.9)							
			226 ~ 250 (250.9)							
			251 ~ 275 (275.9)							
			276~300							
PKA Standard (x1.0) PKCA Electric Conductivity (x2.8)	16	10.1~16.0	20 ~ 50 (10 ~ 50.9)							
			51 ~ 75 (75.9)							
			76 ~ 100 (100.9)							
			101 ~ 125 (125.9)							
			126 ~ 150 (150.9)							
			151 ~ 175 (176.9)							
			176 ~ 200 (200.9)							
			201 ~ 225 (225.9)							
			226~250							
	20	16.1~20.0	20 ~ 50 (10 ~ 50.9)							
			51 ~ 75 (75.9)							
			76 ~ 100 (100.9)							
			101 ~ 125 (125.9)							
			126 ~ 150 (150.9)							
			151 ~ 175 (176.9)							
			176 ~ 200 (200.9)							
			201 ~ 225 (225.9)							
			226~250							
	25	20.1~24	20 ~ 50 (10 ~ 50.9)							
			51 ~ 75 (75.9)							
			76 ~ 100 (100.9)							
			101 ~ 125 (125.9)							
			126 ~ 150 (150.9)							
			151 ~ 175 (176.9)							
			176 ~ 200 (200.9)							
			201 ~ 225 (225.9)							
			226~250							



Price Reduction
Up to 10%

■Finishing Charges

(💡)( ) are the dimension range for sides milled and all surfaces milled.

Type	T: Saw Cut Saw Cut 90° Guaranteed Sides Milled	T: Top / Bottom Milled All Surfaces Milled	A	Saw Cut 90°Guaranteed (0.5mm Increment) € Unit Price B 20~ 50.5	51~ 100.5	101~ 150.5	151~ 200	Sides Milled (0.1mm Increment) € Unit Price B 10~ 50.9	51~ 100.9	101~ 150.9	151~ 200	All Surfaces Milled (0.1mm Increment) € Unit Price B 10~ 50.9	51~ 100.9	101~ 150.9	151~ 200	Top / Bottom Milled (1mm Increment) € Unit Price B 20~ 50	51~ 100	101~ 150
Type Materials Grade **PKA** Standard **PKAH** Sliding **PKCA** Electric Conductivity	5	5.0	20 ~ 50.9 (10 ~ 50.9)															
			51~100.9															
			101~150.9															
			151~200.9															
			201~250.9															
			251~300															
	8	5.1 ≀ 8.0	20 ~ 50.9 (10 ~ 50.9)															
			51~100.9															
			101~150.9															
			151~200.9															
			201~250.9															
			251~300															
	10	8.1 ≀ 10.0 *PKCA (5.0 ~ 10.0)	20 ~ 50.9 (10 ~ 50.9)															
			51~100.9															
			101~150.9															
			151~200.9															
			201~250.9															
			251~300															
	16	10.1 ≀ 16.0	20 ~ 50.9 (10 ~ 50.9)															
			51~100.9															
			101~150.9															
			151~200.9															
			201~250															
	20	16.1 ≀ 20.0	20 ~ 50.9 (10 ~ 50.9)															
			51~100.9															
			101~150.9															
			151~200.9															
			201~250															
	25	20.1 ≀ 24	20 ~ 50.9 (10 ~ 50.9)															
			51~100.9															
			101~150.9															
			151~200.9															
			201~250															

■Hole Charge

Drilling Type	Hole Charge N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H · 2HL			
4H			
6H			

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

PKCA2FN4H - 75 - 50 - 8.9 - F50 - G20 - N3

(Standard Type € Unit Price) x (Material Rate) + (Top / Bottom Milled Finishing Charges) + (Hole Charge)

x 2.8 + 5,40 + 6,00

= (Price of Top / Bottom Milled Pre-drilled Type) → (💡)Round down to ten Cent.

= 97,08 → 97,00 EUR

■Price calculation method for Standard Type

Price calculation methods are as follows: (💡)Round down to ten Cent.

- Saw Cut = Standard Type € Unit Price x Material Rate
- Saw Cut 90° Guaranteed = Standard Type € Unit Price x Material Rate + Charge for Saw Cut 90° Guaranteed
- Sides Milled = Standard Type € Unit Price x Material Rate + Sides Milled Charge
- All Surfaces Milled = Standard Type € Unit Price x Material Rate + All Surfaces Milled Charge
- Top / Bottom Milled = Standard Type € Unit Price x Material Rate + Top / Bottom Milled Charge

■Price calculation method for Pre-drilled type (💡)Round down to ten Cent.

Price of Pre-drilled Type = Standard Type € Unit Price x Material Rate + Finishing Charge + Hole Charge

- Saw Cut
  Pre-drilled Type Price = Standard Type € Unit Price x Material Rate + Hole Charge
- Top / Bottom Milled
  Pre-drilled Type Price = Standard Type € Unit Price x Material Rate + Top / Bottom Milled Charge + Hole Charge

ABS Plates / PPS Plates

–Standard · Abrasion Resistance Grade–

■ABS excels in machinability and adhesion is possible.
■PPS excels in heat resistance, dimension stability and chemical resistance, and more inexpensive than PEEK.

* Details of color samples and features, see P.861

■ABS Plates



■PPS Plates (Standard Grade)



■PPS Plates (Abrasion Resistance Grade) RoHS

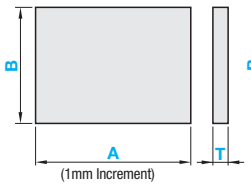


Properties P.860

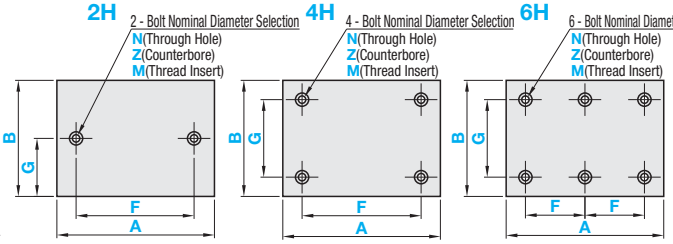
Type	Material / Grade	Color	Operating Ambient Temperature
NABS	ABS	Natural Color	Ambient Temperature ~ 50°C
NPPS	PPS / Standard	Natural Color	Ambient Temperature ~ 190°C
NPMS	PPS / Abrasion Resistance Grade - Sliding	Blue	Ambient Temperature ~ 220°C

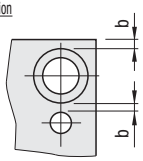
PPS Standard Type generates an oxide film on the surface and the color turns to brown when it is exposed to light and heat (direct sunlight, fluorescent light, mercury lamp and high-temperature atmosphere) for long hours. However, it changes little in mechanical properties and physical properties.

■Standard Type



■Pre-drilled Type



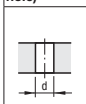


Hole Diameter	b (Min. value)
3~10	2.5

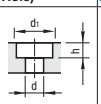
A≥B

Drilling Details

N(Through hole)



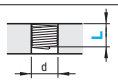
Z(Counterbore Hole)



N(Through Hole) Z(Counterbored Hole) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M(Thread Insert)



Ordering Code (Ex.) M4–L6
L≤T
When L+5<T, drilled holes will be blind ones.

■Table 1 M(Thread Insert) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

M Material: ABS Acrylic Nitrile - Butadiene, Styrene
PPS Polyphenylenesulfide

■Standard Type

Part Number / Type	A / 1mm Increment	B / 1mm Increment	T / Selection
NABS (ABS Plates)	20~500	20~400	5 · 6 · 8 · 10 · 15 · 20
NPPS (PPS Plates - Standard Grade)			6 · 10 · 15 · 20 · 25
NPMS (PPS Plates - Abrasion Resistance Grade - Sliding)			10 · 20

- T Dimension Tolerance, Rate of Camber and Torsion

T	T Dimension Tolerance (NABS)	Rates of Camber and Torsion per 1,000mm
5	±0.5	1.5% or Less
6	±0.6	
8		
10	±0.8	
15	0~+2.5	1.0% or Less
20		

T	T Dimension Tolerance NPPS	T Dimension Tolerance NPMS	Rates of Camber and Torsion per 1,000mm
6	0~+3	-	1.5% or Less
10	0~+4	0~+1.5	
15		-	
20		0~+2.5	1.0% or Less
25		-	

- Dimension Tolerance of A and B

A · B Unit: mm	A / B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0

■Pre-drilled Type

Part Number Type	Part Number Nominal	A / 1mm Increment	B / 1mm Increment	T NABS	T NPPS	T NPMS	F / 0.5mm Increment	G / 0.5mm Increment	Pre-drilled Hole Nominal Diameter N (Through Hole)	Z (Counterbore Hole)	M (Thread Insert)	L (Thread Insert)
NABS (ABS Plates)	2H 4H 6H	20~500	20~400	5	-	-	6~491.5 (2H · 4H)	4.5~395.5 (2H)	3	-	3 4	(Thread Insert Length) Select from Table 1
NPPS (Plates - Standard Grade)				6	6	-			4	3	3 4 5 6	
				8	-	-			5	3 4 5	3 4 5 6 8	
				10	10	10	6~245.5 (6H)	6~391.5 (4-hole and 6-hole Type)	6	3 4 5 6	3 4 5 6 8 10	
NPMS (Plates - Abrasion Resistance Grade - Sliding)				15	15	-			8	4 5 6 8	3 4 5 6 8 10	
				20	20	20			10	4 5 6 8	3 4 5 6 8 10	
				-	25	-				4 5 6 8	3 4 5 6 8 10	

Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A–d(d1)–5; for 2HL, d(d1)/2+2.5≤F≤A-d(d1)/2-2.5; for 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.
Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5d; for 2HL, 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5.
(d for through hole, thread insert, d1 for counterbore)
For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).

Order Example

■Standard Type

Part Number - A - B - T
NABS - 500 - 400 - 15

■Pre-drilled Type

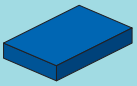
Part Number - A - B - T - F - G - Bolt Nominal Diameter - L
NABS4H - 500 - 400 - 20 - F300 - G200 - Z6
NPPS4H - 240 - 130 - 15 - F150 - G40 - M8 - L12

Days to Ship

■Standard Type
6 Days P.88

■Pre-drilled Type
10 Days | Express B | 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.



Price

Volume Discount (Round down to one Cent.) P.87

Standard Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1~10	11~20	21~50	51 or More
Discount Rate	€ Unit Price	5%	10%	Please request a quotation for Days to Ship and Price.

ABS Plates Standard Type € Unit Price (NABS)

Type	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400
NABS	5	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	6	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	8	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								

Type	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400
NABS	10	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	15	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	20	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								

PPS Plates Standard Type € Unit Price (NPPS · NPMS) Material rate should be noted. NPMS x 5.5

Type	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400
Type (Material Rate) NPPS (x1.0) NPMS (x5.5)	6	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	10	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	15	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								

Type	T	A	€ Unit Price B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400
Type (Material Rate) NPPS (x1.0) NPMS (x5.5)	20	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								
	25	20~50								
		51~100								
		101~150								
		151~200								
		201~250								
		251~300								
		301~350								
		351~400								
		401~450								
		451~500								

Hole Charge

Drilling Type	Hole Charge N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H			
4H			
6H			

Pre-drilled Price = Standard Type € Unit Price + Hole Charge

The product price is the price shown in the table multiplied by the material rate. (Round down to ten Cent.)

(Ex.) Part Number - A - B - T | (Price in the table) x (Material Rate) = Standard Type € Unit Price

NPMS – 130 – 100 – 10 | 51,40 x 5.5 = 282,70 EUR 282,70 EUR

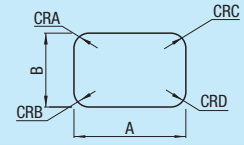
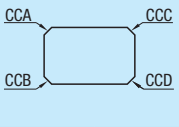
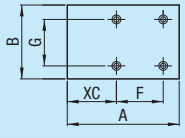
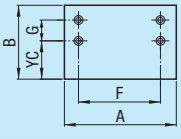
Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC · YC · CRA...etc.)

NABS - 200 - 100 - 8 - F100 - G140 - Z4 - XC10

NPPS - 200 - 100 - 15 - CRA10- CRB10

When alterations are specified, 10 Days

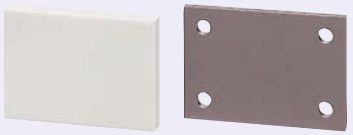
Alterations	Corner Radius	Corner Cut	Hole Position from Left	Hole Position from Bottom
				
Code	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD	XC	YC
Spec.	Adds radius to any corner. R=5mm Increment 10≤A(B)–R(2R) 5≤CRA · CRB · CRC · CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Available for Standard Type only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.) When the corners of A and D are cut by C5⋯› CCA5-CCD5 Available for Standard Type only.	XC = 0.5mm Increment (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	5≤R≤20: 2,00 / Corner 25≤R≤50: 3,00 / Corner 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner 25≤C≤50: 3,00 / Corner	4,00	4,00

PBT Plates / Unilate® (Free-cutting Resin) Plates

■PBT excels in insulation and machinability.
■Unilate® (Free-cutting Resin Plate) excels in heat resistance and insulation.

* Details of color samples and features, see **P.861**

■PBT Plates ■Unilate® Free-cutting Resin Plates RoHS

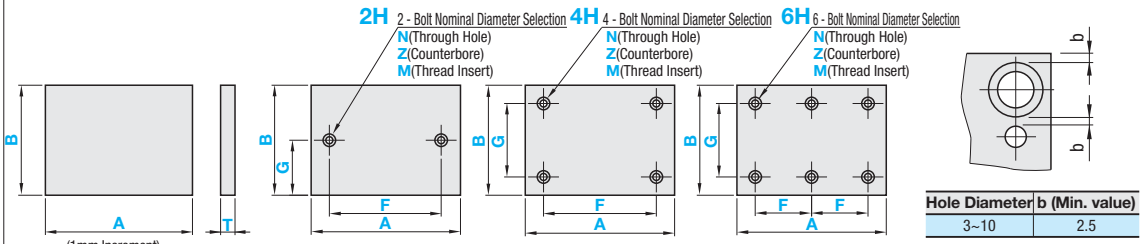


(?)Properties and Machining Conditions **P.860**

Type	Ⓜ Materials	Color	Operating Ambient Temperature
NPBT	PBT	White	Ambient Temp. ~ 120°C
YCA	Unilate® (Free-cutting Resin)	Natural Brown	

Unilate® is a registered trademark of Unitica Ltd.

■Standard Type ■Pre-drilled Type



(?)A≥B

Hole Diameter	b (Min. value)
3~10	2.5

Drilling Details

N (Through hole)



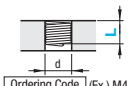
Z (Counter-bore Hole)



N(Through Hole) Z(Counterbored Hole) Details

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M (Thread Insert)



Ordering Code (Ex.) M4–L6
(?)L≤T
(?)When L+5<T, drilled holes will be blind ones.

■Table 1 M (Thread Insert) Details

Bolt Nominal Dia.	3	4	5.5	6.5	9	11
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Saw Cut	Saw Cut	√	Material	~

Ⓜ Material: PBT Plate: Polybutylene Terephthalate
Free-cutting Resin Plate: Polybutylene Terephthalate

■Standard Type

Part Number Type	A 1mm Increment	B 1mm Increment	T Selection
NPBT PBT	20~300	20~300	10 · 15 · 20
YCA Unilate® (Free-cutting Resin)	20~800	20~600	5 · 10 · 15

-T Dimension Tolerance · Rate of Camber and Torsion

T	T Dimension Tolerance NPBT	Rates of Camber and Torsion per 1,000mm
10	0~+1.5	1.5% or Less
15	0~+2.5	1.0% or Less
20		

T	T Dimension Tolerance YCA	Rates of Camber and Torsion per 1,000mm
5	±0.30	1.5% or Less
10	0~+3	
15	0~+4	1.0% or Less

-Dimensional tolerances of A and B

A · B Unit: mm	A / B Dimension Tolerance
~99	±0.5
100~250	±0.75
251~	±1.0

■Pre-drilled Type

Part Number Type	Nominal	A 1mm Increment	B 1mm Increment	T Selection	F 0.5mm Increment	G 0.5mm Increment	Pre-drilled Hole Nominal Diameter: Through Hole N	Counterbore Hole Z	Thread Insert M	L
NPBT PBT	2H 4H 6H	20~300	20~300	10	6~291.5 (2H · 4H) 6~145.5 (6H)	4.5~295.5 (2H) 6~291.5 (4H · 6H)	3	4 5 6	3 4 5 6 8 10	(Thread Insert Length) Select from Table 1
				15			4	4 5 6 8	3 4 5 6 8 10	
				20			5	4 5 6 8	3 4 5 6 8 10	
YCA Unilate® (Free-cutting Resin)		20~800	20~600	5	6~791.5 (2H · 4H) 6~395.5 (6H)	4.5~595.5 (2H) 6~591.5 (4H · 6H)	6	-	3 4	
				10			8	4 5 6	3 4 5 6 8 10	
				15			10	4 5 6 8	3 4 5 6 8 10	

(?)Dimension F Specification Range: For 2H and 4H, d(d1)+2.5≤F≤A–d(d1)–5; for 2HL, d(d1)/2+2.5≤F≤A-d(d1)/2-2.5; for 6H, d(d1)+2.5≤F≤(A-d(d1)-5)/2.
(?)Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B-d(d1)/2-2.5d; for 2HL, 4H and 6H, (d1)+2.5≤G≤B-d(d1)-5.
(d for through hole, thread insert, d1 for counterbore)
(?)For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).

Order Example

■Standard Type

Part Number	-	A	-	B	-	T
NPBT	-	300	-	200	-	10

■Pre-drilled Type

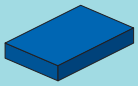
Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter	-	L
NPBT2H	-	200	-	100	-	15	-	F50	-	G30	-	N5		
YCA2H	-	180	-	100	-	10	-	F80	-	G60	-	M5	-	L5

Days to Ship

■Standard Type
6 Days **P.88**

■Pre-drilled Type
10 Days | Express B | 5,00 EUR/ piece **P.88**

(?)A Express Charge of 13,50 EUR for 3 or more identical pieces.



Price

Volume Discount (Round down to one Cent.) P.88

Standard Type

Qty.	1~10	11~20
Discount Rate	€ Unit Price	5%

Pre-drilled Type

Qty.	1~10	11~20	21~50	51 or More
Discount Rate	€ Unit Price	5%	10%	Please request a quotation for Days to Ship and Price.

Standard Type € Unit Price (NPBT)

Part Number	T	A	NPBT € Unit Price B 20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300
NPBT	10	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	15	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						
	20	20~ 50						
		51~100						
		101~150						
		151~200						
		201~250						
		251~300						

Standard Type € Unit Price (YCA)

Part Number	T	A	YCA € Unit Price B 20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600
YCA	5	20~ 50												
		51~100												
		101~150												
		151~200												
		201~250												
		251~300												
		301~350												
		351~400												
		401~450												
		451~500												
		501~550												
		551~600												
		601~650												
		651~700												
		701~750												
		751~800												
	10	20~ 50												
		51~100												
		101~150												
		151~200												
		201~250												
		251~300												
		301~350												
		351~400												
		401~450												
		451~500												
		501~550												
		551~600												
		601~650												
		651~700												
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	15	20~ 50												
		51~100												
		101~150												
		151~200												
		201~250												
		251~300												
		301~350												
		351~400												
		401~450												
		451~500												
		501~550												
		551~600												
		601~650												
		651~700												
		701~750												
		751~800												

Hole Charge

Drilling Type	Hole Charge N (Through Hole)	Z (Counterbore Hole)	M (Thread Insert)
2H			
4H			
6H			

Price calculation method for Pre-drilled type

Pre-drilled Type / Thread Insert Type = Standard Type € Unit Price + Hole Charge / Thread Insert Charge

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter

NPBT2H - 300 - 200 - 10 - F200 - G100 - Z6

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

\+ 4,00 = 92,20 EUR

Part Number - A - B - T - F - G - Bolt Nominal Diameter - L

NPBT2H - 250 - 250 - 10 - F150 - G150 - M5 - L5

(Standard Type € Unit Price) + (Thread Insert Charge) = Thread Insert Type € Unit Price

\+ 6,20 = 94,40 EUR

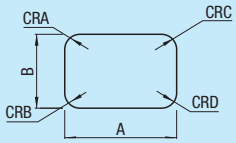
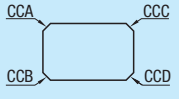
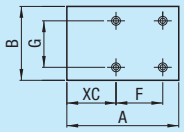
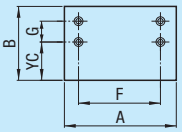
Alterations

Part Number - A - B - T - F - G - Bolt Nominal Diameter - (XC · YC · CRA...etc.)

NPBT4H - 200 - 180 - 10 - F100 - G140 - N4 - XC10

YCA - 200 - 130 - 15 - CRA10- CRC10

When alterations are specified, 10 Days

Alterations	Corner Radius	Corner Cut	Hole Position from Left	Hole Position from Bottom
				
Code	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD	XC	YC
Spec.	Adds radius to any corner. R=5mm Increment (10≤A(B)–R(2R) 5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 Available for Standard Type only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code (Ex.) When the corners of A and D are cut by C5⋯› CCA5-CCD5 Available for Standard Type only.	XC = 0.5mm Increment (2H · 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	5≤R≤20: 2,00 / Corner 25≤R≤50: 3,00 / Corner 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner 25≤C≤50: 3,00 / Corner	4,00	4,00

Precision Resin Plates · Resin Blocks

-Upper-lower Surface Milling · 6-surface Milling-



RoHS

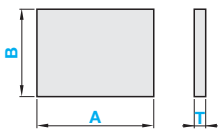
Properties P.858-859

Type	Material	Color	Operating Ambient Temperature
BLA	Bakelite (Paper Type)	Natural Color	-50 ~ 100°C
BLBA		Black	
PAA	Polyacetal (Standard)	White	-45 ~ 95°C
PABA		Black	
MCA	MC Nylon (Standard)	Blue	-40 ~ 120°C
MCAW		Ivory	
PKA	PEEK (Standard)	Ash Brown	-50 ~ 250°C

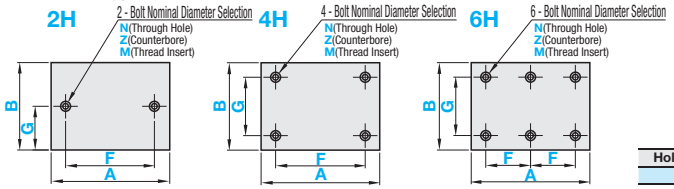
- Dimension Tolerance of A and B

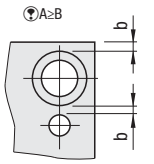
Finish Method	A · B Unit: mm	A · B Dimension Tolerance
V	~99	±0.5
	100~200	±0.75
W	~200	±0.2

■Standard Type



■Pre-drilled Type

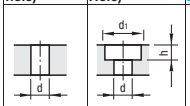




Hole Diameter	b (Min. value)
3~10	2.5

Drilling Details

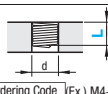
N(Through hole) / Z(Counterbore Hole)



N(ThroughHole) Z(Counerbored Hole) Details

Bolt Nominal Ø	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

M(Thread Insert)



Ordering Code (Ex.) M4–L6
(T)L≤T (T)When L+5<T, drilled holes will be blind ones.

■Table 1 M(Thread Insert)Details

Bolt Nominal Ø	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Finish	4 Sides		Top / Bottom	
	Drilling Method	Finish Symbol	Drilling Method	Finish Symbol
Top · Bottom Milled	Saw Cut	√	Milling	6.3
All Surfaces Milled	Milling	6.3	Milling	6.3

■Standard Type

Part Number			1mm Increment		T
Type	(1) Finish Method	(2) Plate Thickness	A	B	
BLA BLBA	V W	P N M	20~200	20~200	5 · 6 · 8 · 10 · 12 · 15 · 20
PAA PABA					5 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 30
MCA MCAW					5 · 7 · 10 · 12 · 15 · 20 · 25 · 30
PKA					5 · 8 · 10 · 16 · 20 · 25

(1) Finish Method

Finish Method	Milling
V	Top / Bottom
W	All Surfaces

(2) Plate Thickness Tolerance (T Dimension Tolerance)

Plate Thickness Tolerance	Precision
P	0~+0.1
N	±0.05
M	-0.1~0

■Pre-drilled Type

Part Number				A	B	T	F	G	T	Pre-drilled Hole Nominal Diameter			
Type	Finish Method	Plate Thickness Tolerance	Nominal	1mm Increment		Selection	1mm Increment			N (Through Hole)	Z (Counterbore Hole)	M (Thread Insert) M	L
BLA BLBA	V W	P N M	2H 4H 6H	20~200	20~200	5 · 6 · 8 · 10 12 · 15 · 20	9~191 (2H / 4H)	5~195 (2H)	5	3 4 5 6 8 10 12 15 16 20 25 30	-	3 4	Select from Table 1
									6		3	3 4 5 6	
									7		3 4	3 4 5 6	
PAA PABA						5 · 6 · 8 · 10 · 12 15 · 20 · 25 · 30			8		3 4 5	3 4 5 6 8	
									10		4 5 6	3 4 5 6 8 10	
									12		4 5 6	3 4 5 6 8 10	
MCA MCAW						5 · 7 · 10 · 12 · 15 20 · 25 · 30	9~145 (6H)	9~191 (4H / 6H)	15		4 5 6 8	3 4 5 6 8 10	
									16		4 5 6 8	3 4 5 6 8 10	
									20		4 5 6 8	3 4 5 6 8 10	
PKA						5 · 8 · 10 · 16 20 · 25			25		4 5 6 8	3 4 5 6 8 10	
									30		4 5 6 8	3 4 5 6 8 10	

(T)For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).
(T)Dimension F Specification Range: For 2H and 4H, d(d1)+5≤F≤A-d(d1)-5. For 6H, d(d1)+5≤F≤A/2-d(d1)/2-2.5.
(T)Dimension G Specification Range: For 2H, d(d1)/2+2.5≤G≤B–d(d1)/2-2.5. For 4H and 6H, d(d1)+5≤G≤B–d(d1)-5. (d for through hole, thread insert, d1 for counterbore)
(T)When ordering MCA with Finish W or Thickness Tolerance M, put "." (period) at the end of MCAWM for the part number.

Order Example

■Standard Type

Part Number	-	A	-	B	-	T
BLAVN	-	200	-	100	-	10

■Pre-drilled · Thread Insert Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Ø	-	L
MCAVP2H	-	200	-	150	-	20	-	F100	-	G75	-	N5		
PAAWP4H	-	100	-	50	-	5	-	F50	-	G25	-	M4	-	L4

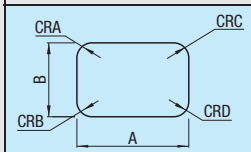
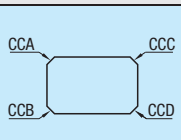
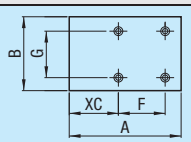
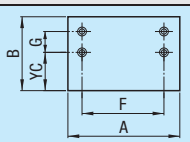
Alterations

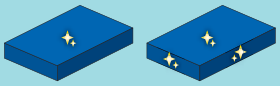
Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Ø	-	(XC, YC, CRA...etc.)
PABAVN4H	-	200	-	160	-	10	-	F100	-	G100	-	N5	-	XC15-YC35
BLAVM	-	100	-	50	-	20							-	CRA10-CRC10

10 Days

Days to Ship: 10 Days — Express B — 5,00 EUR/ piece — P.88

(T)A Express Charge of 13,50 EUR for 3 or more identical pieces.

	Corner Radius	Corner Cut	Hole Position from Left	Hole Position from Bottom
Alterations				
Code	CRA · CRB · CRC · CRD	CCA · CCB · CCC · CCD	XC	YC
Spec.	Adds radius to any corner. R=5mm Increment (T)10≤A(B)–R(2R) (T)5≤CRA, CRB, CRC, CRD≤100 Ordering Code (Ex.)Adds R10 at the corner of A and C. CRA10-CRC10 (T)Available for Standard Type only.	Cuts any corners. 5≤Corner Cut≤50 5mm Increment Ordering Code Ex.) When the corners of A and D are cut by C5⟶ CCA5-CCD5 (T)Available for Standard Type only.	XC = 0.5mm Increment (T)(2H / 4H Type) d (d1)/2+2.5≤XC≤A–F–d (d1)/2–2.5 (T)(6H Type) d (d1)/2+2.5≤XC≤A–2F–d (d1)/2–2.5	YC = 0.5mm Increment (T)d (d1)/2+2.5≤YC≤B–G–d (d1)/2–2.5
Price Adder	5≤R≤20: 2,00 / Corner; 25≤R≤50: 3,00 / Corner; 55≤R≤100: 4,50 / Corner	5≤C≤20: 2,00 / Corner; 25≤C≤50: 3,00 / Corner	4,00	4,00



Price

Volume Discount (Round down to one Cent.) P88

Qty.	1~10	11~20	21~50
Discount Rate	€ Unit Price	5%	10%
Days to Ship	Regular		

For orders larger than indicated quantity, please request a quotation.

The product price is the price shown in the table multiplied by the material rate. (Round down to ten Cent.)

(Ex.) Part Number - A - B - T

BLBAWP - 100 - 100 - 5

(Price in the table) 14,30 x (Material Rate) 1.2 = Standard Type € Unit Price 17,16 EUR 17,10 EUR

Material rate should be noted.

Standard Type € Unit Price

Part Number Type	T	A	€ Unit Price B20~50	B51~100	B101~150	B151~200
Type (Material Rate) (Top / Bottom Milled) BLAV_(x1.0) BLBAV_(x1.0) (All Surfaces Milled) BLAW_(x1.2) BLBAW_(x1.2)	5	20~ 50				
		51~100				
		101~150				
		151~200				
	6 8	20~ 50				
		51~100				
		101~150				
		151~200				
	10 12	20~ 50				
		51~100				
		101~150				
		151~200				
	15	20~ 50				
		51~100				
		101~150				
		151~200				
	20	20~ 50				
		51~100				
		101~150				
		151~200				
(Top / Bottom Milled) PAAV_(x1.0) PABAV_(x1.0) (All Surfaces Milled) PAAW_(x1.2) PABAW_(x1.2)	5 6 8	20~ 50				
		51~100				
		101~150				
		151~200				
	10 12	20~ 50				
		51~100				
		101~150				
		151~200				
	15	20~ 50				
		51~100				
		101~150				
		151~200				
	20	20~ 50				
		51~100				
		101~150				
		151~200				
	25	20~ 50				
		51~100				
		101~150				
		151~200				
	30	20~ 50				
		51~100				
		101~150				
		151~200				

Part Number Type	T	A	€ Unit Price B20~50	B51~100	B101~150	B151~200
Type (Material Rate) (Top / Bottom Milled) MCAV_(x1.0) MCAWV_(x1.0) (All Surfaces Milled) MCAW_(x1.2) MCAWW_(x1.2)	5 7	20~ 50				
		51~100				
		101~150				
		151~200				
	10 12	20~ 50				
		51~100				
		101~150				
		151~200				
	15	20~ 50				
		51~100				
		101~150				
		151~200				
	20	20~ 50				
		51~100				
		101~150				
		151~200				
	25	20~ 50				
		51~100				
		101~150				
		151~200				
	30	20~ 50				
		51~100				
		101~150				
		151~200				
(Top / Bottom Milled) PKAV_(x1.0) (All Surfaces Milled) PKAW_(x1.2)	5	20~ 50				
		51~100				
		101~150				
		151~200				
	8	20~ 50				
		51~100				
		101~150				
		151~200				
	10	20~ 50				
		51~100				
		101~150				
		151~200				
	16	20~ 50				
		51~100				
		101~150				
		151~200				
	20	20~ 50				
		51~100				
		101~150				
		151~200				
	25	20~ 50				
		51~100				
		101~150				
		151~200				

For orders larger than indicated quantity, please request a quotation.

Hole Charge

Drilling Type	Hole Charge N (Through Hole)	Z (Counterbore Hole)	M (Thread Insert)
2H			
4H			
6H			

The prices of Pre-drilled Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter - L

PAAWP4H - 100 - 100 - 10 - F50 - G25 - M5 - L5

(Standard Type € Unit Price) 19,60 (16,40x1.2) + (Hole Charge) 12,40 = Pre-drilled Price 32,00 EUR

Resin Blocks

RoHS

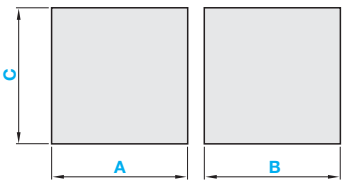


Type	Material	Grade / Color
PAAB	Polyacetal	Standard / White
MCAB	MC Nylon	Standard / Blue
MCDB	MC Nylon	Conductive Grade R6 (MC501 CDR6) / Black

Precision Standards

- Dimension Tolerance of A - B - C

	A - B - C	30	50	100
PAAB MCAB MCDB		±0.5	±0.5	±0.75



Order Example Part Number PAAB50

Days to Ship 6 Days P.88

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

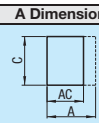
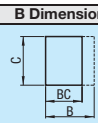
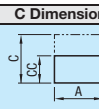
Part Number Type	A(=B=C)	€ Unit Price PAAB	MCAB	MCDB
PAAB MCAB	30			
	50			
	100			
MCDB	30			
	50			

Alterations

Part Number - (AC · BC · CC)

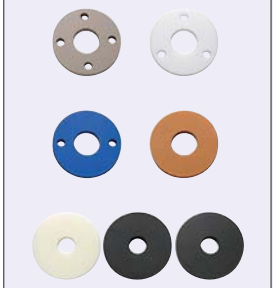
PAAB-50 - AC46-BC40

8 Days

Alterations	A Dimension	B Dimension	C Dimension
			
Code	AC	BC	CC
Spec.	Cuts the A dimension. AC = 1mm Increment 20≤AC	Cuts the B dimension. BC = 1 mm Increment 20≤BC	Cuts the C dimension. CC=1mm Increment 20≤CC
Price Adder	5,00	5,00	5,00

Resin Circular Plates

Resin Circular Plates RoHS



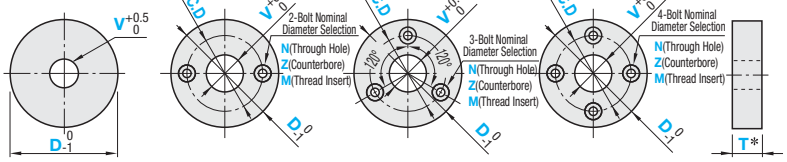
Type	Material		Color
ENJEP	Epoxy Glass	Standard	Green
ENJBL	Bakelite (Paper Type)	-	Natural Color
ENJBB			Black
ENJBS	Bakelite (Fabric Based)		Natural Color
ENJPA	Polyacetal	Standard	White
ENJPB			Black
ENJPBH		Sliding	White
ENJPAC		Electric Conductivity	Ocher
ENJMA	MC Nylon	Standard	Blue
ENJMW			Ivory
ENJMS		Sliding	Purple
ENJMCA		Conductivity CDR2	Black
ENJMDA		Conductivity CDR6	Black
ENJMEA		Conductivity CDR9	Black
ENJMP		Weather Resistance	Dark Gray

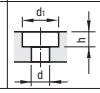
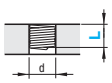
Type	Material		Color
ENJUP	Ultra High-molecular-weight Polyethylene	Standard	Milky White
ENJUPC		Electric Conductivity	Black
ENJPTE	Fluorine Resin	Standard	White
ENJPTC		Electric Conductivity	White
ENJPK	PEEK	Standard	White
ENJPKC		Electric Conductivity	Black
ENJPBT	PBT	Standard	White
ENJPPS			Natural Color
ENJPMS		Abrasion Resistance - Sliding	Blue
ENJABS	ABS	Standard	Natural Color

* For T dimension tolerance, refer to each material page.
Properties P.858~860

Standard Type Pre-drilled Type

-2 Holes-2H -3 Holes-3H -4 Holes-4H



Drilling Details		Thread Insert Machining Details
N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
		

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	-	8	9.5	11	14	-
h	-	5	6	7	9	-

Table 1

Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	16	20

Ordering Code (Ex.) M4-L6
L<T
For details of thread insert HLTS, refer to P.255

When L+5<T, drilled holes will be blind ones.

Standard Type

Check each Material Rate.

Part Number Type (Material Rate)	T	1mm Increment D	1mm Increment V	€ Unit Price D50~100	D101~150	D151~200	D201~250	D251~300	D301~350	D351~400
ENJEP(x1.0)	5	50~400	0~50 (V≤D−10)							
	10									
	15									
ENJBL(x1.0) ENJBB(x1.0) ENJBS(x1.8)	5									
	10									
	15									
	20									
ENJPA(x1.0) ENJPB(x1.0) ENJPBH(x2.0) (T≥10) ENJPAC*(x7.0)	5(6)									
	(9)10									
	(12)15									
	(19)20									
ENJMA(x1.0) ENJMW(x1.0) ENJMS(x2.3) ENJMCA(x2.4) ENJMDA(x1.3) ENJMEA(x1.8) (T≥10) ENJMP(x1.2)	5									
	10									
	15									
	20									
ENJUP(x1.0) ENJUPC(x1.1) (T≥10)	5									
	10									
	15									
	20									
ENJPTE(x1.0) ENJPTC*(x17.0)	5(6)									
	(9)10									
	(12)15									
	(19)20									
ENJPK(x1.0) ENJPKC(x3.0)	5									
	10									
	16									
ENJPBT(x1.0)	10									
	15									
	20									
ENJPPS(x1.0) ENJPMS(x5.0)	6									
	10*									
	15									
	20*									
ENJABS(x1.0)	5									
	10									
	15									
	20									

* For ENJPAC and ENJPTC, select from T6, 9, 12 or 19. The unit price of this product is the price shown in the table multiplied by Material rate. (Round down to ten Cent.)
* Select D≤290 for ENJPTC.
* T10 or 20 is available for ENJPMS.

(Ex.) Part Number - D - V
ENJMDA5 - 150 - 50

(Price in the table) x (Material Rate) = Standard Type € Unit Price
15,70 x 1.3 = 20,41 EUR ➡ 20,40 EUR

Price Revision

: New Price

Pre-drilled Type

Part Number Type	Nominal	T	1mm Increment D	V	P.C.D	Pre-drilled Hole Nominal Diameter Through Hole N	Counterbore Hole Z	Thread Insert M	L
ENJEP(T≥5)	2H 3H 4H	5	50 ~ 400	0~50 (V≤D−10)	20~390*	3 4 5 6 8 10	-	3 4	(Thread Insert Length) Select from Table 1
		10					4 5 6	3 4 5 6	
		15					4 5 6 8	3 4 5 6 8	
ENJBL ENJBB ENJBS		5					-	3 4	
		10					4 5 6	3 4 5 6 8 10	
		15					4 5 6 8	3 4 5 6 8 10	
		20					4 5 6 8	3 4 5 6 8 10	
ENJPA ENJPB ENJPBH(T≥10) ENJPAC*		5(6)					-	3 4	
		(9)10					4 5 6	3 4 5 6 8 10	
		(12)15					4 5 6 8	3 4 5 6 8 10	
		(19)20					4 5 6 8	3 4 5 6 8 10	
ENJMA ENJMW ENJMS ENJMCA ENJMDA ENJMEA(T≥10) ENJMP		5					-	3 4	
		10					4 5 6	3 4 5 6 8 10	
		15					4 5 6 8	3 4 5 6 8 10	
		20					4 5 6 8	3 4 5 6 8 10	
ENJUP ENJUPC(T≥10)		5					-	3 4	
		10					4 5 6	3 4 5 6 8 10	
		15					4 5 6 8	3 4 5 6 8 10	
		20					4 5 6 8	3 4 5 6 8 10	
ENJPTE ENJPTC*		5(6)					-	3 4	
		(9)10					4 5 6	3 4 5 6 8 10	
		(12)15					4 5 6 8	3 4 5 6 8 10	
		(19)20					4 5 6 8	3 4 5 6 8 10	
ENJPK ENJPKC		5					-	3 4	
		10					4 5 6	3 4 5 6 8 10	
		16					4 5 6 8	3 4 5 6 8 10	
ENJPBT		10					4 5 6	3 4 5 6 8 10	
		15					4 5 6 8	3 4 5 6 8 10	
		20					4 5 6 8	3 4 5 6 8 10	
ENJPPS ENJPMS		6					-	3 4	
		10*					4 5 6	3 4 5 6 8	
		15					4 5 6	3 4 5 6 8 10	
		20*					4 5 6 8	3 4 5 6 8 10	
ENJABS		5					-	3 4	
		10					4 5 6	3 4 5 6 8 10	
		15					4 5 6 8	3 4 5 6 8 10	
		20					4 5 6 8	3 4 5 6 8 10	

For Pre-drilled Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).
* For ENJPAC and ENJPTC, select from T6, 9, 12 or 19.
* Select D≤290 for ENJPTC. * T10 or 20 is available for ENJPMS.
* P.C.D: V+5+d(d1)≤P.C.D≤D−5−d(d1) (d for through hole, thread insert, d1 for counterbore hole)

Hole Charge

Drilling Type	Bolt Nominal N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H			
3H			
4H			

The prices of Pre-drilled Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.) Part Number - D - V - P.C.D - Bolt Nominal Diameter

ENJMA4H10 - 350 - 50 - 200 - Z5

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

+ 8,00 = 77,30 EUR

Part Number - D - V - P.C.D - Bolt Nominal Diameter - L

ENJPBT4H10 - 350 - 50 - 200 - M3 - 3

(Standard Type € Unit Price) + (Thread Insert Charge) = Thread Insert Type € Unit Price

+ 12,40 = 199,90 EUR

Standard Type

Part Number - D - V

ENJBL5 - 300 - 50

Pre-drilled Type

Part Number - D - V - P.C.D - Bolt Nominal Diameter - L

ENJEP3H5 - 200 - 20 - 100 - N4

ENJMA2H5 - 300 - 50 - 150 - M4 - L4

Days to Ship

Standard Type: 8 Days

Pre-drilled Type: 10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Ceramics Plates

-Alumina 96 · Steatite · Machinable Ceramics-

■Alumina 96: Excels in abrasion resistance, insulation and heat resistance.
■Steatite: Excels in insulation and high frequency characteristic.
■Machinable Ceramics: Excels in insulation, heat insulation and machinability. Can be machined into complex shapes or finished with precision.

■Ceramics Plates

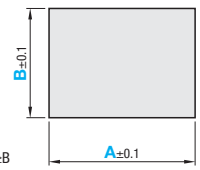
RoHS



Properties P.858

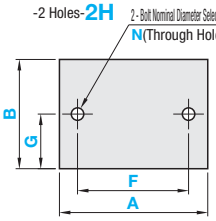
Part Number	Material	Finish Precision	Color	Operating Ambient Temperature
CEA	Alumina 96	Standard Class	White	Ambient Temperature ~ 1300°C
CEAV	Alumina 96	Precision Class (Upper-lower Surface Milling)		
CCES	Steatite	Standard Class	White	Ambient Temperature ~ 1000°C
CCESV	Steatite	Precision Class (Upper-lower Surface Milling)		
CEM	Machinable Ceramics	Standard Class	Natural Color	Ambient Temperature ~ 1000°C

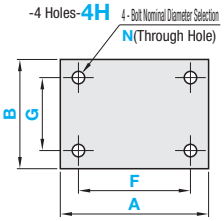
■Standard Type



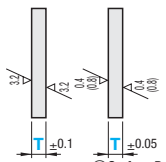
A≥B

■Pre-drilled Type





Standard Class	Precision Class
CEA CCES CEM	CEAV CCESV



Surface Roughness of CCESV (Ra)=0.8

■Standard Type

Part Number Type	1mm Increment A	1mm Increment B	T
CEA CEM	10~200	10~100	1 2
CEAV	10~100	10~100	2.5
CCES CCESV	10~70	10~70	3 5

■Precision Standards

Item		CEA · CCES · CEM	CEAV · CCESV
Thickness Parallelism (per 100mm)		0.1	0.05
Flatness	T=1	0.1	0.05
(per 100mm)	T=2~5	0.1	0.05

Drilling Details

N (Through hole)



Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11

■Pre-drilled Type

Part Number Type	Nominal	1mm Increment A	1mm Increment B	T	0.5mm Increment F	0.5mm Increment G	Select Mounting Holes N (Through Hole)
CEA CEM	2H	10~200	10~100	1 2	9~191	5~95 (2H) 9~91 (4H)	3 4
CEAV	2H	10~100	10~100	2.5	9~91		5
CCES CCESV	4H	10~70	10~70	3 5	9~61	5~65 (2H) 9~61 (4H)	6 8 10

For F dimension, d+5≤F≤A−d−5 is required.
For G Dimension: For 2H, d/2+2.5≤G≤B−d/2−2.5; for 4H, d+5≤G≤B−d−5.

Order Example

■Standard Type

Part Number	-	A	-	B	-	T
CEA	-	60	-	55	-	2

■Pre-drilled Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter
CEA4H	-	80	-	80	-	1	-	F55	-	G55	-	N6

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~12	13~14	15~19
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

■Standard Type (CEA · CCES · CEM)
10 Days

■Standard Type (CEAV · CCESV), Pre-drilled Type
13 Days

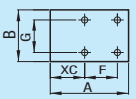
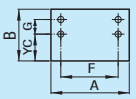
Alterations

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Diameter	-	(XC · YC)
CEA2H	-	80	-	80	-	1	-	F30	-	G40	-	N6	-	XC15

■Standard Type

Part Number	T	A	€ Unit Price CEA B10~50	CEA B51~100	CEAV B10~50	CEAV B51~100	CEM B10~50	CEM B51~100
CEA CEAV CEM	1	10~50						
		51~100						
		101~150						
		151~200						
	2	10~50						
		51~100						
		101~150						
		151~200						
	2.5	10~50						
		51~100						
		101~150						
		151~200						

Part Number	T	A	€ Unit Price CCES B10~35	CCES B36~70	CCESV B10~35	CCESV B36~70
CCES	3	10~35				
		36~70				
CCESV	5	10~35				
		36~70				

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤186 (CEA · CEM) 5≤XC≤86 (CEAV) 5≤XC≤56 (CCES · CCESV) d (d1)/2+2.5≤XC≤A−F−d (d1)/2−2.5	Specify in YC=1 mm Increment Not available for 2H 5≤YC≤86 (CEA · CEAV · CEM) 5≤YC≤56 (CCES · CCESV) d (d1)/2+2.5≤YC≤B−G−d (d1)/2−2.5
Price Adder	4,00	4,00

■Hole Charge

Drilling Type	Bolt Nominal N (Through Hole)
2H	
4H	

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Diameter
CEA2H - 90 - 60 - 1 - F60 - G30 - N6

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price
+ 18,00 = 39,70 EUR

Pre-drilled Type Price = Standard Type € Unit Price + Hole Charge

Ceramics Circular Plates

Ceramics Circular Plates

RoHS



Properties P.858

Part Number	Material	Finish Precision
PCEA	Alumina 96	Standard Class
PCEAV	Alumina 96	Precision Class (Upper-lower Surface Milling)
PCCES	Steatite	Standard Class
PCCESV	Steatite	Precision Class (Upper-lower Surface Milling)

Precision Standards

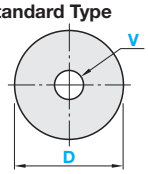
Item		PCEA · PCCES	PCEAV · PCCESV
Thickness Parallelism (D=50)		0.1	0.05
Flatness (D=50)	T=1	0.1	0.05
	T=2~5	0.1	0.05

- D Dimension Tolerance (Standard Class · Precision Class)

D20~80 ±1%

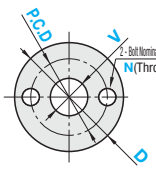
- V Dimension Tolerance (Standard Class · Precision Class) ±0.15

Standard Type

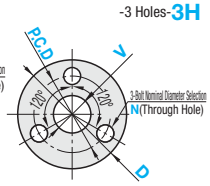


Pre-drilled Type

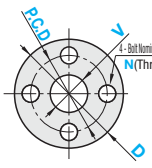
-2 Holes-2H



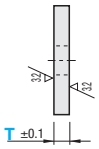
-3 Holes-3H



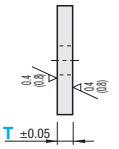
-4 Holes-4H



Standard Class PCEA PCCES



Precision Class PCEAV PCCESV



Surface Roughness of PCCESV (Ra)=0.8

Standard Type

Part Number Type	5mm Increment D	1mm Increment V	T PCEA PCEAV	T PCCES PCCESV
PCEA	20~80	0~70 (V≤D−10)	1 2 5	3 5
PCEAV	20~50			
PCCES	20~50			
PCCESV	20~50			

Dimension D for PCCES and PCCESV is in 10mm increment. When D≥55, T=1 and 2 are not selectable. (Only T=5 is selectable)

Drilling Details



Bolt Nominal Dia.	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11

Pre-drilled Type

Part Number Type	Part Number Nominal	5mm Increment D	1mm Increment V	T PCEA PCEAV	T PCCES PCCESV	1mm Increment P.C.D	Select Mounting Holes N (Through Hole)
PCEA	2H 3H 4H	20~80	0~70 (V≤D−10)	1 2 5	3 5	10~40 More than 3mm is required for the distance between holes and thickness of a hole and outer.	3 4 5 6 8 10
PCEAV		20~50					
PCCES		20~50					
PCCESV		20~50					

Dimension D for PCCES and PCCESV is in 10mm increment. When D≥55, T=1 and 2 are not selectable. (Only T=5 is selectable)

Order Example

Standard Type

Part Number - D - V - T

PCEA - 35 - 25 - 2

Pre-drilled Type

Part Number - D - V - T - P.C.D - Bolt Nominal Diameter

PCEA2H - 50 - 10 - 5 - 35 - N4

Days to Ship

Standard Type (PCEA · PCCES)

10 Days

Standard Type (PCEAV · PCCESV), Pre-drilled Type

13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~12	13~14	15~19
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

The price of this product is the price shown in the table multiplied by each material rate.(Round down to ten Cent.)

(Ex.) Part Number - D - V - T

PCEAV - 40 - 15 - 2

(Price in the table) x (Material Rate) = Standard Type € Unit Price

84,60 x 1.2 = 101,52 EUR ➡ 101,50 EUR

Standard Type

Material rate should be noted.

Part Number	T	D \ V	€ Unit Price 0	1~20	21~40	41~60	61~70
Type (Material Rate)	1 2	20					
		25					
		30					
		35					
		40					
		45					
		50					
PCEA (x1.0) PCEAV (x1.2)	5	20					
		25					
		30					
		35					
		40					
		45					
		50					
		55					
		60					
		65					
		70					
		75					
		80					
PCCES (x1.0)	3	20					
		30					
		40					
		50					
PCCESV (x1.2)	5	20					
		30					
		40					
		50					

Hole Charge

Drilling Type	Bolt Nominal N (Through Hole)
2H	
3H	
4H	

Pre-drilled Type Price = Standard Type € Unit Price + Hole Charge

(Ex.) Part Number - D - V - T - P.C.D - Bolt Nominal Diameter

PCEA2H - 45 - 0 - 2 - 30 - N4

(Standard Type € Unit Price) + (Hole Charge) = Pre-drilled Price

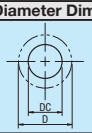
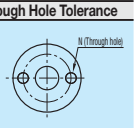
+ 22,00 = 86,60 EUR

Alterations

Part Number - D - V - T - (DC · PN)

PCEA - 50 - 20 - 5 - DC49

13 Days

Alterations	Outer Diameter Dimension	Through Hole Tolerance
		
Code	DC	PN
Spec.	Changes the D dimension. DC=1mm Increment DC<D It is required the distance between DC and V to be more than 5mm. 15≤DC≤79 Ex.) Changes D dimension 50 to 47. Ordering Code DC47	Alters Through Hole Tolerance. ±0.2→±0.05 Ex.) Alters tolerance in N4 to ±0.05 Ordering Code N4-PN
Price Adder	20,00	12,80 / hole

LED Lighting for Cabinetry

LED Lighting for Cabinetry







Product Name	Standard Type	Economy Type	Low Profile Type
Page	929	930	931



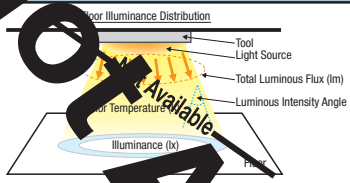






Wide Type	Embedding Type	Water-resistant Glass-tube Type	Large Spot Type
932	933	934	935







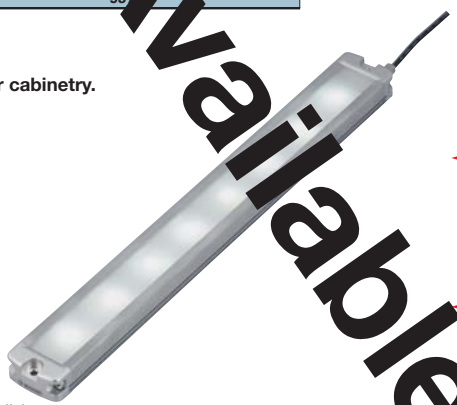
Compact Spot Type	Technical Data
936	937

For lights for image processing, refer to: P. 1-1713~1716

■Features of MISUMI Lighting for cabinetry.

Features (1)
Advanced design not offered by other companies!

Features (2)
Economical, of course!



Features (3)
Various shape patterns for installing to devises!

Features (4)
Applied Flicker-free Cover to prevent eye strains!
(Some items are excluded.)

Various advantages are afforded by using the LED lights.

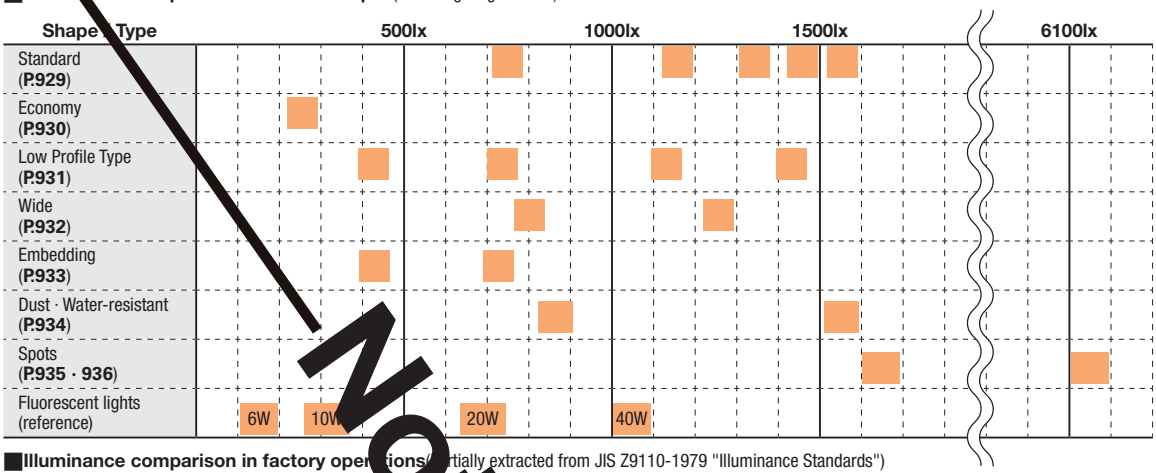
Item	Contents	Advantages	Benefit Cases
Long Life	life is approx. 40000 h. Approx. 13 years of life with 8hrs. of daily use (Lifetime is assumed to be the time until the light flux decreases to 70% of initial value.)	Replacement labor reduction.	Installation in high places or hazardous areas.
Lighting performance	Rarely not light suddenly. Less flickering similar to fluorescent lights	Replacement labor reduction.	Inspection process and work tables.
Vibration resistance.	Strong vibration resistance since there is no filament.	Labor reduction for replacing failed parts.	Transfer machines, vibration generating equipment, and machinery transportation uses.
Power Conservation	30 ~ 70% reduced power consumption.	Cost reduction	Effective not only for power-conserving machines but for various operational occasions.
Compact	Compact envelope does not occupy spaces as fluorescent lights.	Space saving	Space limited machines, installation inside compact cabinets.
RoHS-compliant	Fluorescent lights contain hazardous material such as mercury, but LED contains less than RoHS restricted mercury and lead.	Item selection time and design cost reduction	Export Machinery
Unlikely To Break	Surface is covered with resin, not with glass.	Hard to break compared to fluorescent lights.	Food processing machinery, medical machinery
Ultraviolet	LED light contains no ultraviolet.	UV photopolymer safe, insect repellent	Clean room, food processing machinery, medical equipment.

More LED lighting product variations will be expanded hereafter. Customer comments and requests are welcome.

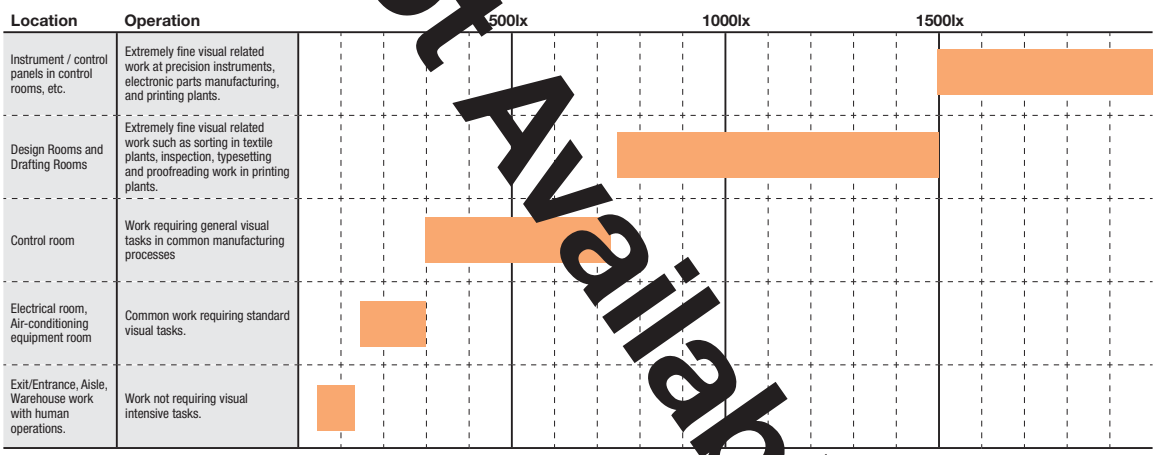
Not Available

LED Lighting for Cabinetry Selection Guideline

■Illuminance comparison based on shapes(Mounting height: 0.5m)



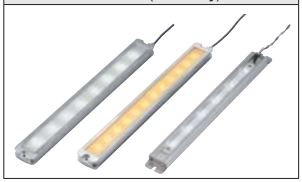
■Illuminance comparison in factory operations(Partially extracted from JIS Z9110-1979 "Illuminance Standards")



*Use twice the brightness for hazardous work.

■Features of Each Type

Standard (Economy)



As lighting devices, these types are sufficiently water and dust-resistant for uses in general environment.
The Standard Type in various sizes, and the Economy Type are offered..
General-purpose type compatible with MISUMI aluminum frame products.
☞P.929 · 930

Low Profile Type



Space saving low profile type in pursuant for its thinness. Best for space-savings and spots with limited headroom.
General-purpose type compatible with MISUMI aluminum frame products.
☞P.931

Embedding



Embed-mounting type for ceiling boards and walls.
As the power cable exits the housing's backside, unexposed cable designs are possible.
☞P.933

Wide



This type has a wide emission surface.
Effective in illuminating a localized wide area.
Compatible with MISUMI aluminum frame products.
☞P.932

Water-resistant Hard Glass-tube Type



Useable in harsh environments where water or oil splashes such as inside cleaning equipment or machine tools. Impact resistance is also in consideration with the use of hard glass tubes.
☞P.934

Spots (Large / Small)



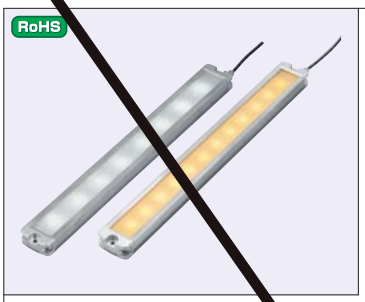
Type for illuminating parts of machinery and tips of work in machine tools. They can be used in harsh environments with water or oil splash.
Two types in different brightness are offered.
☞P.935, 936

Not Available

NEW

LED Lamp
-Standard Type-

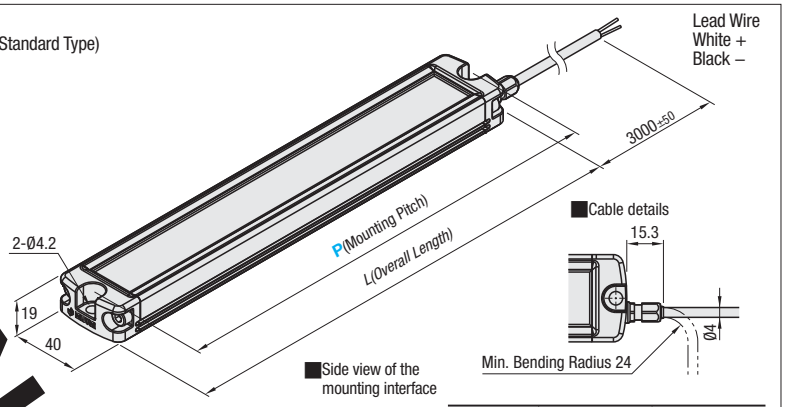
CAD Data





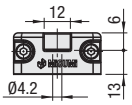


(Standard Type)



■Cable details

■Side view of the mounting interface

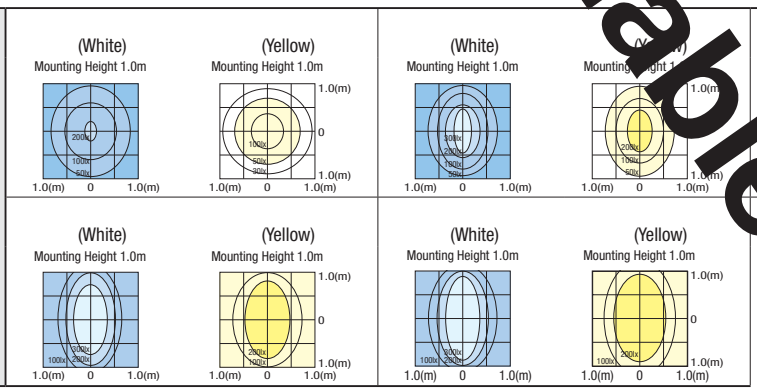


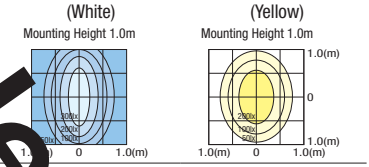
Part Names	M Material	S Surface Treatment
Main Body	Aluminum	Anodized
Surface Cover	Polycarbonate	Mist Surface Treatment
Screws on Ends	1.4301/X5CrNi18-10	-
Cable	PVC	-

Part Number		Color	L	Illuminance (Lux, lx) (White)		(Yellow)		Luminous Flux (Lumen, lm)	Input Voltage (V)	Input Current (mA)	Power Consumption (W)	Temperature Range (°C)	Color Temperature (K)	Degree of Protection (IP Code)	Lighting Angle	Mass (g)	W(White) € Unit Price	Volume Discount		Y(Yellow) € Unit Price	Volume Discount	
Type	P			lx/0.5m	lx/1m	lx/0.5m	lx/1m										Qty. 1~4	5~9	10~	Qty. 1~4	5~9	10~
(Standard Type)	350	W (White) Y (Yellow)	360	750	210	540	130	White 430 Yellow 290	DC24		White 10.8 Yellow 9.6	-10~45	White 5000 Yellow 2000	IP55	Approx. 110°	460						
	665		675	1180	360	680	220	White 860 Yellow 580								820						
	980		990	1330	400	840	240	White 1290 Yellow 870								1180						
	1295		1305	1480	440	910	260	White 1720 Yellow 1150								1540						
	1610		1620	1560	480	950	280	White 2150 Yellow 1440								1900						

For details of each item, refer to the glossaries of **P.937**.
For details of the wavelengths of luminous colors, refer to **P.938**
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in their colors and brightness, though they are of the same Part Numbers.

Illuminance Distribtion



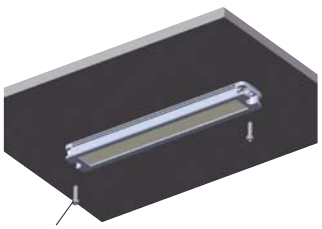


Order Example: Part Number - Color

Days to Ship: 6 Days P.88

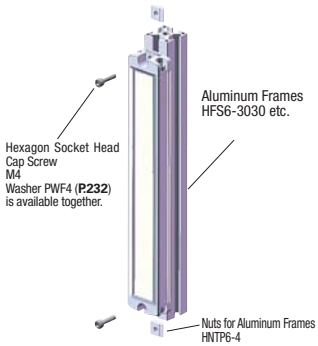
Example

■Mounting example to boards



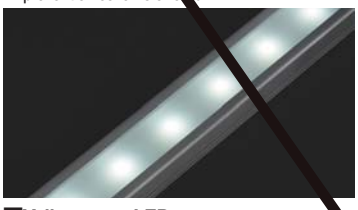
Apply tapping on the board side.
When machining through holes, provide nuts on the backside of the board.

■Mounting example to Aluminum Frames



■Flicker-prevention cover

To reduce the eyestrain of the operators, Flicker-prevention cover is offered.



■Yellow-type LED

Yellow-type LED does not include an optic wavelength range less than 500nm. Therefore, this type of LED is optimum for a clean room, for example, semiconductor factory using high-sensitive materials.
It is also effective to use this LED to prevent the insects from flying in as the wavelength that insects prefer is 500nm or less.

Not Available

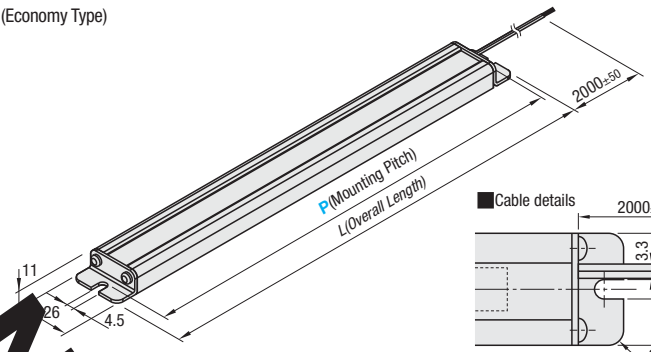
LED Lamp
-Economy Type-

CAD Data

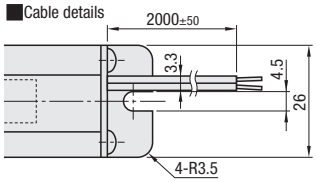




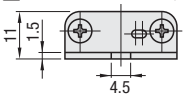
(Economy Type)



■Cable details



■Side view of the mounting interface

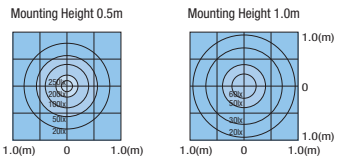


No.	Part Names	M Material	S Surface Treatment
(1)	Main Body	Aluminum	Anodized
(2)	Ends	1.4301/ X5CrNi18-10	-
(3)	Screws		-
(4)	Emission side	Silicon	-
(5)	Cable	PVC	-

Part Number		Color	L	Illuminance (Lux, lx)		Luminous Flux (Lumen, lm)	Input Voltage	Input Current (mA)	Consumption Electric Power (W)	Temperature Range (°C)	Color Temperature (Kelvin K)	Degree of Protection (IP Code)	Light Dispersion Angle	Mass (g)	W(White)	
Type	P			lx/0.5m	lx/1m										€ Unit Price	Volume Discount
															Qty. 1~9	10~
(Economy Type)	225	W (White)	234	260	67	185	24	130	3.1	0~40	6000	IP67	Approx. 110°	130		

For details of each item, refer to the glossaries of **P.937**.
For details of the wavelengths of the luminous colors, refer to **P.938**
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in luminous colors and brightness, though they are of the same Part Numbers.

Illuminance Distribution

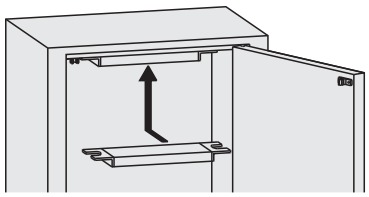


Order Example: Part Number - Color - W

Days to Ship: 6 Days P.88

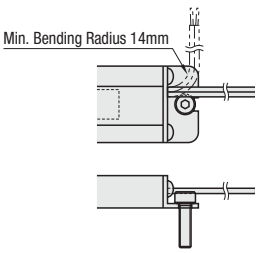
Example

■Suitable Locations



Suitable for tabletop device covers and small boxes. IP67 rating of the product renders applicable in small machinery environment where water splashes are present.

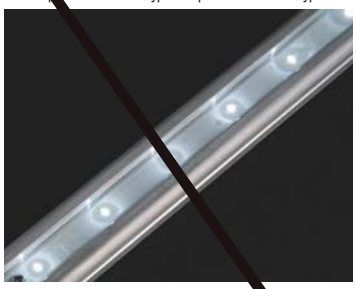
■Installation Example

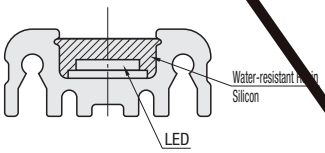


As the head of M4 screw interferers with the cable, avoid the cable while tightening the screws.

■About Emission Surface of the Economy Type

In order to improve the degree of protection (IP Rating) the LED Emission Side is molded with water-proof resin (silicon). This is a unique feature of this type compared to the other types.

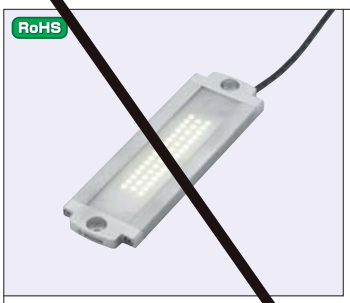




Not Available

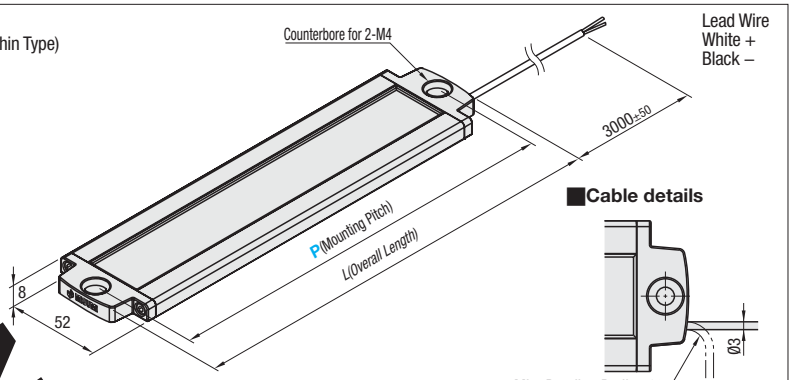
LED Lamp
-Low-profile Type-

CAD Data



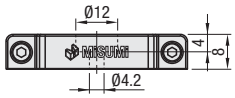


(Thin Type)



■Cable details

■Side view of the mounting interface

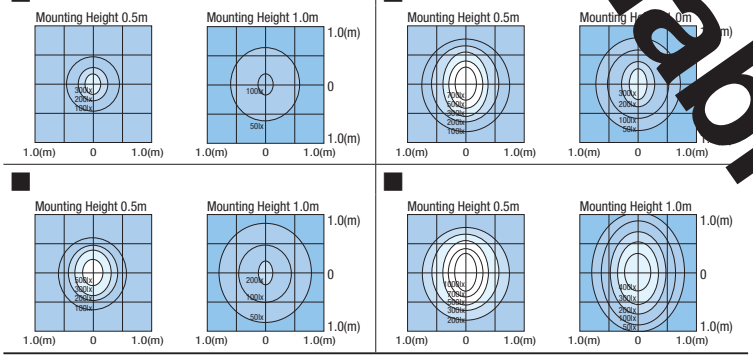


Part Names	Material	Surface Treatment
Main Body	Aluminum	Anodized
Surface Cover	Polycarbonate	Mist Surface Treatment
Screws on Ends	1.4301/X5CrNi18-10	-
Cable	PVC	-

Part Number Type	P	Color	L	Illuminance (Lux, lx) lx/0.5m	lx/1m	Luminous Flux (Lumen, lm)	Input Voltage (V)	Input Current	Consumption Electric Power (W)	Temperature Range (°C)	Color Temperature (Kelvin, K)	Degree of Protection (IP Code)	Light Dispersion Angle	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount 5~9	10~
(Thin Type)		(White)	166	410	110	215	DC24	17	3.1	-10~45	5000	IP50	Approx. 110°	170			
			286	720	220	430		30	6.2					280			
			406	1120	330	645		390	9.4					390			
			526	1430	430	860		5	12					500			

For details of each item, refer to the glossaries of **P.937**.
For details of the wavelength of the luminous colors, refer to **P.938**
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in their colors and brightness, though they are of the same Part Numbers.

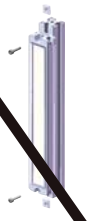
Illuminance Distribtion



Order Example: Part Number - Color

Days to Ship: 6 Days P.88

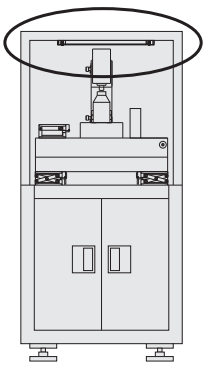
■Installation Example to Aluminum Frames



Use the dedicated nuts when installing on Aluminum Frame slots.

Example

■Thin Type is effective where headroom over the machine is limited.



■Emission side of each type

Thin Type



Standard Type **(P.929)**



Economy Type **(P.930)**



Rows of many compact LED elements are used for Thin Type.
For emission sides of other Types, refer to the photos above.

Not Available

NEW

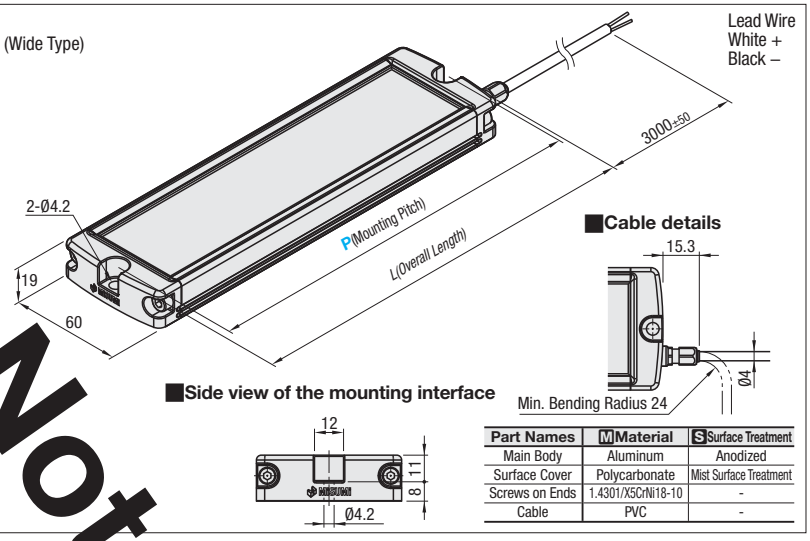
LED Lamp
-Wide Type-

CAD Data

RoHS





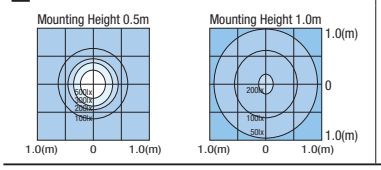


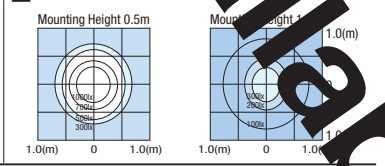
Part Names	Material	Surface Treatment
Main Body	Aluminum	Anodized
Surface Cover	Polycarbonate	Mist Surface Treatment
Screws on Ends	1.4301/X5CrNi18-10	-
Cable	PVC	-

Part Number Type	P	Color	L	Illuminance (Lux, lx) lx/0.5m	lx/1m	Luminous Flux (Lumen lm)	Input Voltage (V)	Input Current	Consumption Electric Power	Temperature Range (°C)	Color Temperature (Kelvin K)	Degree of Protection (IP Code)	Light Dispersion Angle	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount 5~9	10~
(Wide Type)		(White)	200	810	210	395	DC24	490	11.7	-10~45	5000	IP55	Approx. 130°	360			
			360	1260	380	790			23.3					570			

For details of each item, refer to the glossaries of **P.937**.
For details of wavelengths of the luminous colors, refer to **P.938**
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in colors and brightness, though they are of the same Part Numbers.

Illuminance Distribtion





Order Example: Part Number - Color

Days to Ship: 6 Days P.88

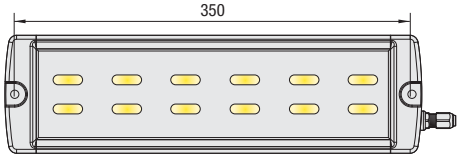
Example

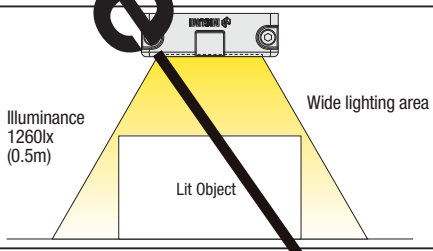
Differences between Wide Type and Standard Type

As the LED light is highly directional, the Wide Type is recommended for lighting wider areas or higher illuminance desired in the space-savings.

Wide Type

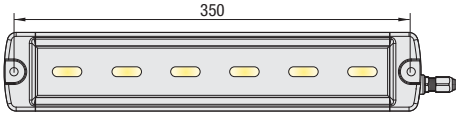
2-row LEDs for light source.

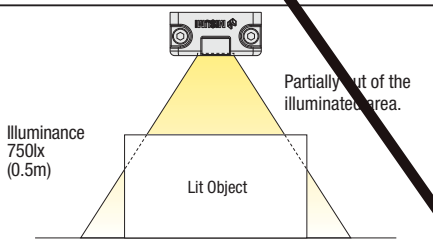




Standard Type

1-row LEDs for light source.





For details of LED with narrower lighting deviation angle and higher illuminance, see Spotlight Type on **P.935**.

Not Available

LED Lamp
-Embedding Type-

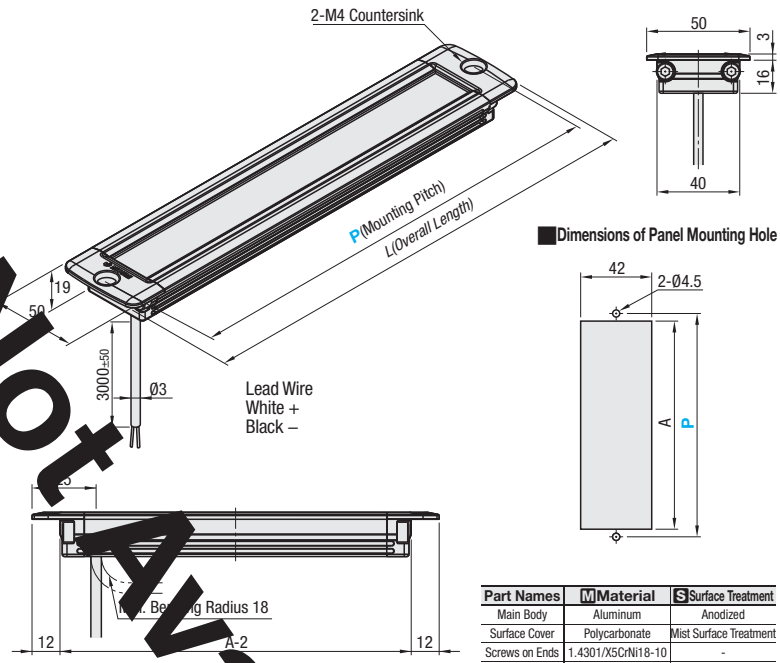
CAD Data

RoHS





(Embedding Type)



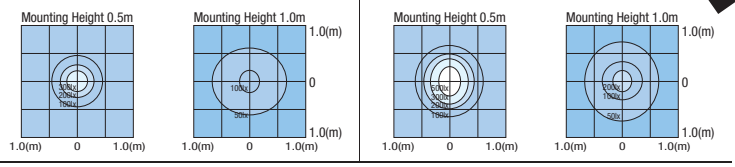
■Dimensions of Panel Mounting Hole

Part Names	M Material	S Surface Treatment
Main Body	Aluminum	Anodized
Surface Cover	Polycarbonate	Mist Surface Treatment
Screws on Ends	1.4301/X5CrNi18-10	-
Cable	PVC	-

Part Number		Color	L	A	Illuminance (Lux)lx)		Luminous Flux (Lumen lm)	Input Voltage (V)	Input Current (mA)	Consumption Power (W)	Temperature Range (°C)	Color Temperature (Kelvin K)	Degree of Protection (IP Code)	Light Dispersion Angle	Mass (g)	€ Unit Price	Volume Discount	
Type	P				lx/0.5m	lx/1m										Qty. 1~4	5~9	10~
(Embedding Type)	200	W (White)	215	193	410	110	210	DC24	240	[illegible]	-10~[illegible]	5000	IP55	Approx. 110°	290			
	360		375	353	710	220	420		480	11.2					495			

For details of each item, refer to the glossaries of **P.937**.
For details of the wavelengths of the luminous colors, refer to **P.938**
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in their colors and brightness, though they are of the same Part Numbers.

Illuminance Distribtion



Order Example: Part Number - Color
- W

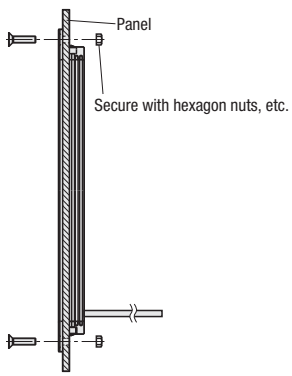
Days to Ship: 6 Days P.88

Example

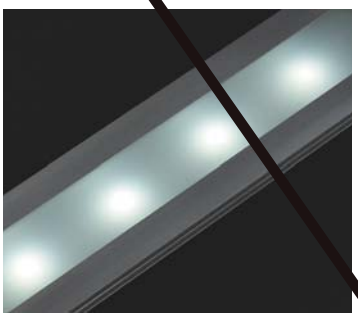
■Example of Mounting to Panels



■Side view



■Flicker-prevention cover
To reduce operators' eyestrain, a flicker-prevention cover is offered.



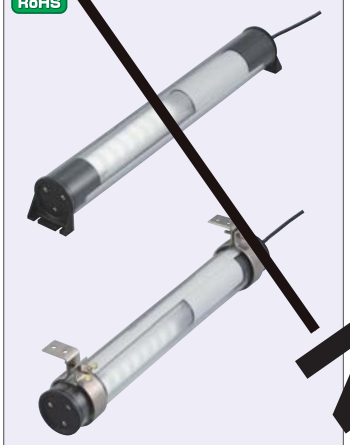
Not Available

LED Lamp

-Water-resistant Hard Glass-tube Type-

CAD Data

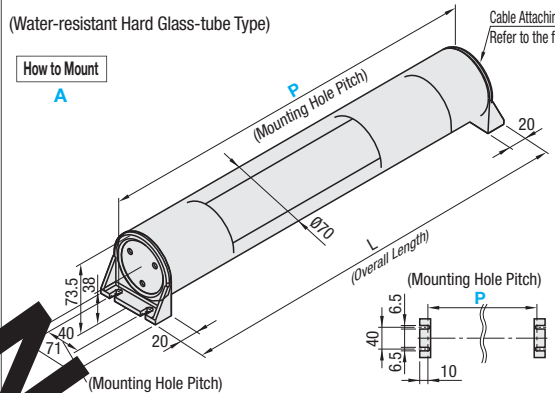
RoHS

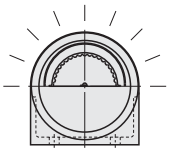




(Water-resistant Hard Glass-tube Type)

How to Mount A

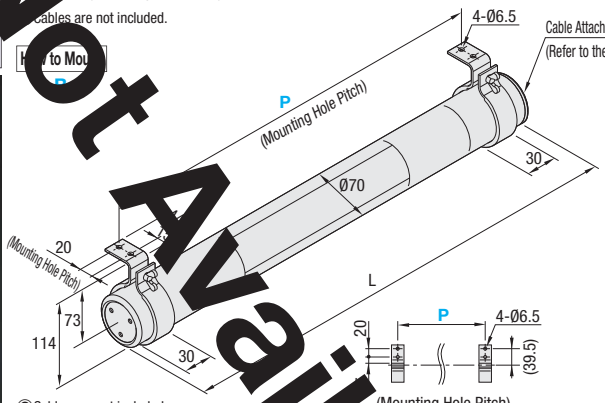




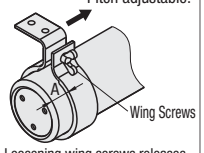
For mounting method A, the emission side is the reverse of the installation side.
When using mounting method B, the body can be rotated and fixed at the position desired, by loosening the wing screws for mounting brackets.

Cables are not included.

How to Mount B



Cables are not included.

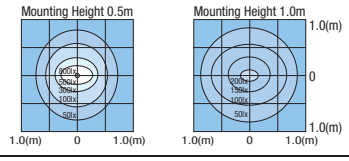


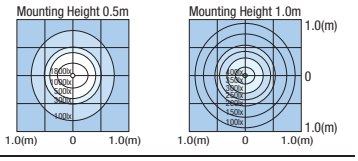
Loosening wing screws releases the mounting brackets from clamped state so the mounting pitch can be adjusted.
Give at least 20mm clearance for A.
When the mounting brackets is fixed within 20mm from the end, the load is applied to the glass tube ends and may cause breakage.

Part Number / Type	How to Mount	P	L	Color	Illuminance (Lux)lx lx/0.5m	lx/1m	Luminous Flux (Lumen, lm)	Input Voltage (V)	Input Current (mA)	Consumption Electric Power (W)	Temperature Range (°C)	Color Temperature (Kelvin)	Degree of Protection (IP)	Lighting Angle	Applicable Cable Diameter	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount 5~9	10~
(Water-resistant Hard Glass-tube Type)	A	535	545	(White)	870	221	800	DC24 ±10%	700	10	0~40	6500	IP	120	Ø7 ~ Ø8.5	2200			
		720	730		1555	418	1600		1400	20						3500			
	B	435 (equal to or less than)	515		870	221	800		700	10						2700			
		620 (equal to or less than)	700		1555	418	1600		1400	20						4000			

For details of each item, refer to the glossaries of **P.937**.
For details of the wavelengths of the luminous colors, refer to P.
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in their colors and brightness, though they are the same Part Numbers.

Illuminance Distribtion



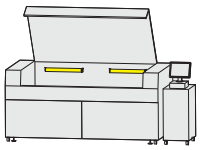


Order Example: Part Number - How to Mount - P - A - 720

Days to Ship: 6 Days P.88

Example

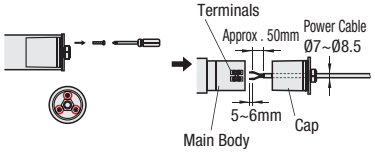
■Example of Application with Machine Tools



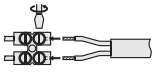
■Example of Installing Cables

Take off 3 screws marked with red circles.

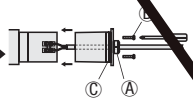
Take off the cap and thread the power cable. Pull out the LED assembly from the glass tube until the terminals come out.



Insert the leads into the terminal. Then tighten them with a flat-head screwdriver. (Fix the leads as not to come off when hand pulled lightly.)



Step (1)
Internal structure of the hexagon nut (A) is a gasket seal, and the nut clamps on the power cable Ø7 to Ø8.5 dia. when it is tightened.
Step (2)
Return the LED assembly back to the glass tube and then fit the cap to the glass tube.
Step (3)
Use 3 screws (B) to assemble back to the original condition. Be sure to tighten the screws (B) until it is secure when hand pulled.

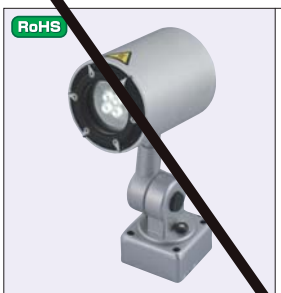


Too much tightening of screws (B) may cause break the glass tube.
Tighten moderately as the O-Ring (C) squashes about 3mm.

Not Available

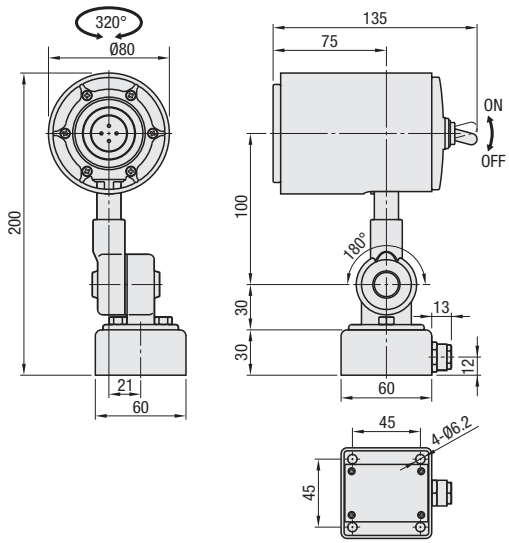
LED Lamp
-Large Spot Type-

CAD Data





(Large Spot Type)

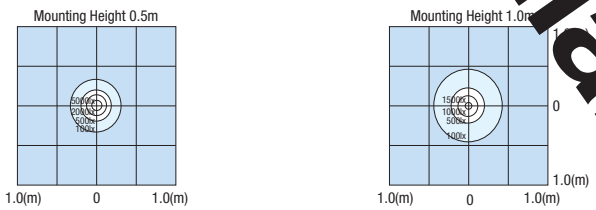


Cables are not included.

Part Number		Color	Illuminance (Lux)lx		Luminous Flux (Lumen, lm)	Input Voltage (V)	Input Current (mA)	Color Temperature (Kelvin, K)	Degree of Protection (IP)	Lighting Angle	Applicable Cable Diameter	Mass (g)	Hardness	€ Unit Price	Volume Discount	
Type	No.		lx/0.5m	lx/1m										Qty. 1~4	5~9	10~
(Large Spot Type)	1	White	6120	1572	400	DC24 ±10%	350	6500	IP65 (Head Case Only)	20°	Ø7 ~ Ø8.5	1800	Small Button-head Screw M6-35			

For details of each item, refer to the glossaries of **P.937**.
For details of the wavelengths of the luminous colors, refer to **P.938**
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in luminous colors and brightness, though they are of the same Part Numbers.

Illuminance Distribtion

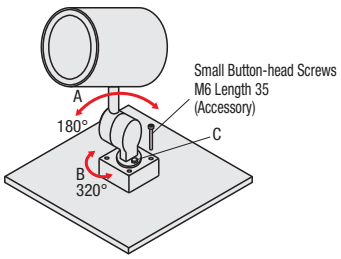


Order Example: Part Number

Days to Ship: 6 Days P.88

Example

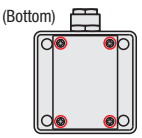
■Swiveling / Installing Method



- Swiveling in A direction can be facilitated by a firm push of a hand. The light stays at the position where the hand is released.
- Loosen a hexagonal nut at C to swivel the light in direction B.
- For fixing to mating materials, use the screws included or hexagon socket cap screws provided by customers.

■Example of Installing Cables

(1)



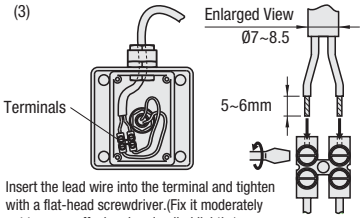
Take off 4 screws marked with red circles as shown on the bottom to open the cover.
(The cover has a gasket on the backside. Be sure not lose the gasket.)

(2)



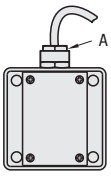
Thread the power cable of Ø7~Ø8.5.

(3)



Insert the lead wire into the terminal and tighten with a flat-head screwdriver.(Fix it moderately not to come off when hand pulled lightly.)

(4)



Inside of the hexagon nut (A) is of a gasket structure, and the nut clamps the power cable Ø7 to Ø8.5 dia. when tightened. Water-resistant feature is achieved by this clamping.
Step (2) Close the cover and tighten 4 screws.

Not Available

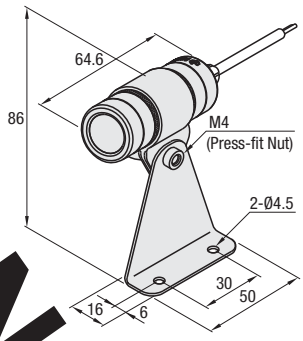
LED Lamp
-Compact Spot Type-

CAD Data

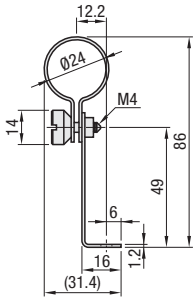




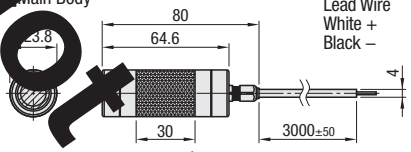
(Compact Spot Type)



■Bracket



Main Body



Lead Wire
White +
Black –

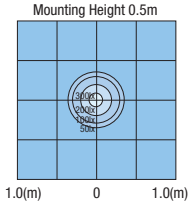
Part Names	Material	Surface Treatment
Main Body	Aluminum	Anodized
Lens	Polycarbonate	-
Cable	PVC	-
Bracket	1.4301/ X5CrNi18-10	-
Knurled Screw		-

Part Number		Color	Illuminance (Lux)lx		Luminous Flux (Lumen lm)	Voltage (V)	Consumption Electric Power (W)	Temperature Range (℃)	Color Temperature (Kelvin, K)	Degree of Protection (IP)	Lighting Angle	Mass (g)	€ Unit Price	Volume Discount	
Type	No.		lx/0.5m	lx/1m									Qty. 1~4	5~9	10~
(Compact Spot Type)	1	White	400	110	60	DC24	1.2	-10~45	5000	IP67	Approx. 62°	120			

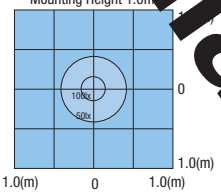
For details of each item, refer to the glossaries of **P.937**.
For details of the [illegible] of the luminous colors, refer to **P.938**
For order and installation, confirm "About using" section on **P.938**
As the LED elements vary on their luminous colors and luminance, they may be slightly different in the [illegible] brightness, though they are of the same Part Numbers.

Illuminance Distribtion

Mounting Height 0.5m



Mounting Height 1.0m

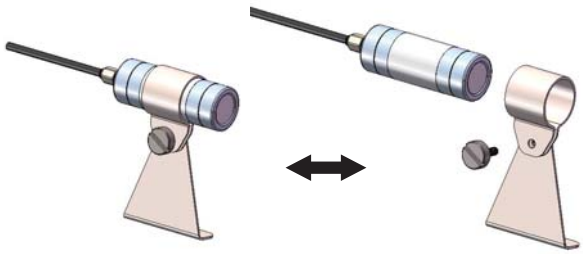


Order Example — Part Number

Days to Ship — 6 Days P.88

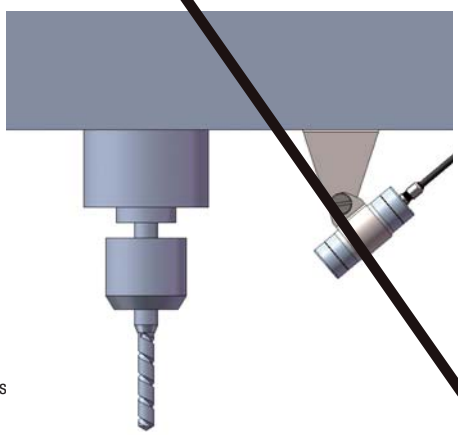
Example

■Method for Attaching / Detaching Brackets



The LED Light can be easily attached to and detached from the bracket with knurled screws

■Application Example



Best for lighting drill tips and other spot lighting uses.

Not Available

Technical Data
-Glossaries-

Not Available

LED

LED (Light Emitting Diode) is a type of semiconductor element which illuminates when a electrical current is applied.
LED is recently used as lights for traffic signals, large vision displays, and illuminations. LED consumes less power, approx. 1/3 ~1/10 and has longer life approx. 10 ~20 times, compared to incandescent lamps. LEDs are ideally suited for power conservation and replacement labor reduction schemes. Abbreviation for Light Emitting Diode

Illuminance

It indicates the brightness of the surface lit by the light source.
Larger the value, the brighter the area.
Illuminance value varies depending on the mounting height. The catalog lists two measurements of mounting heights, 0.5m and 1.0m. Use them for reference.
The unit is Lux (lx).

Total Luminous Flux

This represents the amount of light emitted from the light source to all directions. Larger the value, the brighter the light.
The unit is Lumens (lm).

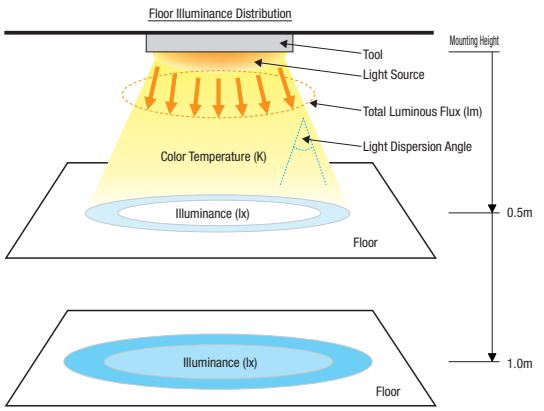
Light Distribution Angle

This is the angle of light spread emitted from the light source.
Larger the value, the wider the area of illumination.
Smaller the value, the narrower the range of illumination while the illuminance will be higher.
The light source with narrower light distribution angle is best for spot lighting tool blade tips.

Illuminance Distribution

It indicates the brightness spread of the surface lit by the light source.
The area directly below is bright, and the brightness gradually decreases as the distance increases. Refer to check for the brightness of the light spread.
The brightness may be felt variably by the eyes, depending on the mounting height or conditions of use.

Illuminance Distribution Image



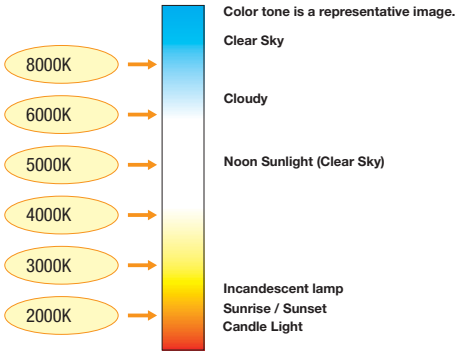
Light Emission Spectrum

This represents the wavelength component and light strength emitted from the light source.
See next page for details.

Color Temperature

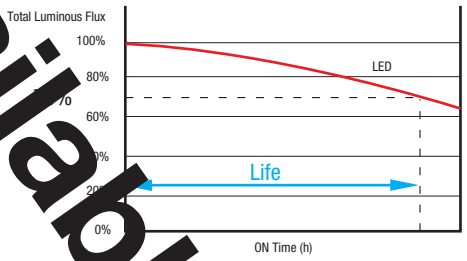
This is a quantitative measure of visible light color that the light source emits. Use as a reference for expressing the light colors.
The unit is Kelvin (K).

Color Temperature Diagram



Operating Life

LED will not suffer filament burnouts as incandescent lamps, but its light outputs will gradually decrease due to degradation of material used.
The life is defined as a time it takes for the Total Luminous Flux to decreases to 70% of the initial value.



Degree of Protection IP Code

The IP is an abbreviation for "International Protection". This is the degree of protection of electrical equipment against ingress of water and solid foreign objects (dust) established by International Electrotechnical Commission (IEC.)

International Protection **IP**

The Second Character
(Degree of Protection 0~8 against Ingress of Water)

The First Character
(Degree of Protection 0~6 against Ingress of Solid Foreign Objects)

The First Character	Contents
0	Non-Protected
1	Protected against solid objects 50mm or more in size
2	Protected against solid objects 12.5mm or more in size
3	Protected against solid objects 2.5mm or more in size
4	Protected against solid objects 1.0mm or more in size
5	Ingress of some dust does not impede satisfactory operations of the equipment.
6	Dust will not ingress.

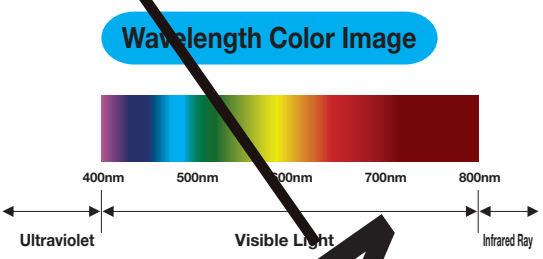
The Second Character	Contents
0	Non-Protected
1	Dripping water (vertically falling drops) shall have no harmful effect.
2	Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.
3	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.
4	Water splashing against the enclosure from any direction shall have no harmful effect.
5	Water projected by a nozzle against enclosure from any direction shall have no harmful effects.
6	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects.
7	Submerged in water at specified pressure and duration shall have no ill-effects.
8	The equipment is suitable for continuous submersion in water.

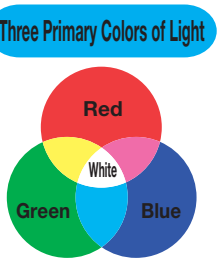
Technical Data

-Wavelength of Lights and Radiation Spectrum / Notes-

Basic Information on Wavelength of Light

The light (electromagnetic wave) wavelengths are visualized in the following color/frequency spectrum images.
The wavelength which human eyes can see (visible light) ranges in approx. 400~800nm.
The visible spectrum is composed of the three primary colors (red / green / blue). Human eyes sense the light as white as the three primary colors are compounded.



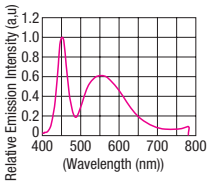


The following MISUMI LED Lighting product based emission spectrum graphs show the emitted wavelengths and intensities.
Refer to the data to avoid undesired effects in environments.

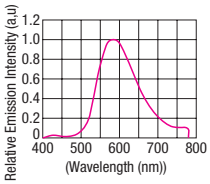
List of Emission Spectrums of Products

- LED lights does not contain harmful ultraviolet (less than 400nm) or near-ultraviolet materials and human bodies.
- The yellow LED containing the ideal 595nm for clean room applications does not contain wavelengths of 500nm or less.
- For the Standard Type, select a LED color depending on the purpose.

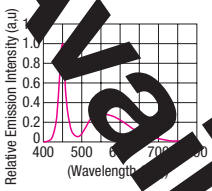
Standard Type (White)



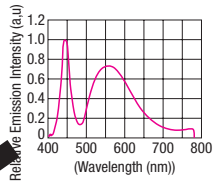
Standard Type (Yellow)



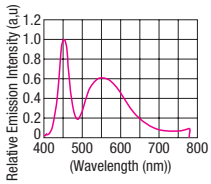
Economy Type



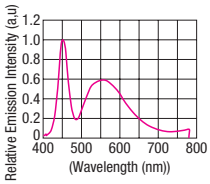
Low Profile Type



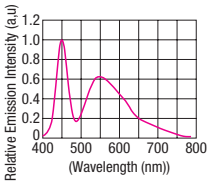
Wide Type



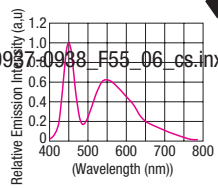
Embedding Type



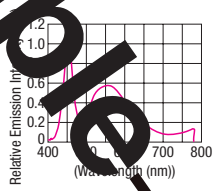
Water-resistant Hard Glass-tube Type



Large Spot Type



Compact Spot Type



0937-0938_F55_06_cs.inx

Not Available

Notes on Usage

⚠ Warning

- Do not connect to devices with light varying adjustments or power supply. (Cause for breakages and burnouts)
- Be sure to turn off power when mounting, removing or cleaning. (Cause for electrical shocks)
- Do not cover with paper or cloth. (Cause for fire)
- Never disassemble or modify the fixture. (Cause for fire and electrical shocks)

⚠ Note

- Do not touch while the fixture is ON, and just after turning off. (Cause for burns)
- Do not look directly at the light emitter while the fixture is ON. (Cause for eye damages)
- Do not apply impacts or scratches. (Cause for breakages)
- Use in locations which fulfill environmental usage conditions. (Cause for breakages)
- Be sure to mount the light securely. (Cause of fall)
- If soiled, wipe off with a dry cloth. Do not use volatile organic solvents such as paint thinner, alcohol and benzene. (Cause for breaks and color changes)
- Do not use in the environment with exposure to volatile organic solvents and corrosive gases. (Cause for breakages)

Cautions For Use

- The LED elements may vary on their colors and brightness, though they are of the same Part Numbers.
- Illuminance, total luminous flux and illuminance distribution values are actual meaturements as tested, and not guaranteed by the manufacturer. Use them only for reference only.
- Color temperature is only for reference.
- Mount the fixtures to metal objects with good heat dissipation efficiency, such as aluminum frames or steel walls.
- For wiring, be sure to turn the power off before work and avoid miswiring.
- Be sure to connect correctly as the power supply has polarity (+ and -). The white cable is connected to + side, while black cable is connected to - side.
- Input voltage and current must be within the range of specifications.
- The temperature and humidity of the environment must be within the range of specifications.

Casters / Adjustment Pads

Casters/ Adjustment Pads



Product Name	-Economy Casters-	Casters	-Angle Type-	Casters
Page	943	944	944	945



-Electrically Conductive · Stainless Steel Type-	-Light · Medium Load Type-	-Medium Load Type-	-Swivel Lockable Type-	-Double Lockable Casters-	-Medium · Heavy Load-
946	947	948	949	949	950



Casters -Low Profile Type-	-Ultra Low Profile-	-Medium to Heavy Load Type-	-Heavy Load Type-	-Super Heavy Load Type-	-Super Heavy Load Low Profile · Lightweight Type-
951	952	953	953	954	954



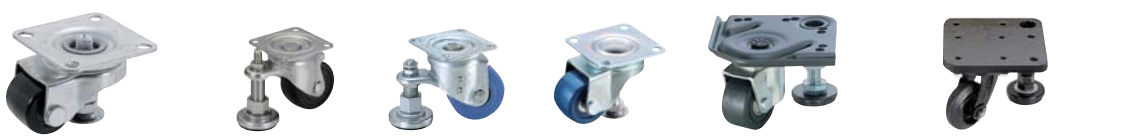
-Screw Fitting · Electrically Conductive Type-	-Screw Fitting Type-	-Screw Fitting Type-	-Screw Fitting Type-	-Low Profile Type-	Ball Casters
955-956	957	958	958	959	959



Resin Casters	Caster Side Mount Plate	-Dual Wheel Casters-	-Dual Wheel, Medium Load-
960	960	961~963	964



-Heavy Load Type-	-Heavy Load, Stainless Steel Type-	Casters with Level Adjusters	-Lightweight Type-	-Antivibration Type-	-Space Saving Type-	Casters with Adjustment Pads -Light Load Type-
964	964	965	965	965	966	966



-Medium Load Type-	-Integrated Heavy Load Type-	-Heavy Load Type-	-Large Diameter Wheel-	Casters & Adjustment Pads Assembly	With Integrated Plate and Adjustment Pads-Wheel Material Selectable-
967	967	968	968	969	970

Information

Rubber Feet previously offered are now available with new specifications. **P.449**










Vibration Insulating Casters	Casters for Clean Environment	Cast Frame Casters-Standard Type-	-Trailer Use Type-	-Heavy Load Type-	Replacement Wheels for Casters
971	972	973	973	974	975









Wheel Shafts	Grooved Wheels	Caster Holders	Floor Stoppers	Floor Stoppers	Adjustment Pads-Standard Type-	Adjustment Pads -Nonslip Type-
976	976	976	977	978	979	980








-Fixed Type-	- 2-Hole Type -	Adjustment Pads -Space Saving Type-	Economy Adjustment Pads	-Heavy Load Type-	-Heavy Load / Hand Wheel Type-
981	981	981	981	982	982









-Antivibration Type-	Attachments for Antivibration	Fixing Plates for Adjustment Pads	Fixing Plates for Adjustment Pads -Thick Type-	Fixing Nuts	Protection Caps	Adjustment Pads -Space Saving Type-
983	983	984	984	984	984	985



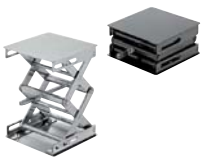





-Rotary Type-	-Rotary Short Type-	-Female Thread Socket Type-	-Rotary Type-	Adjustment Feet -Resin Rubber Type-	Rubber Base Adjustment Pads
986	986	986	987	987	988







Antivibration Pads	Antivibration Mounts -Standard Type-	Table-Top Bases	-Separate / Knurled Type-	Lifting Units -Standard Type-
989	990	991	991	992




Foot Jack Bolts	Anchor Brackets -Standard Type-	-Ribbed Type-	Seating Plates -Standard Type-
993	995	995	996

Casters
-Guide-

■Caster Selection Table

Allowable Load / Specification	Light Load	Light / Medium Load	Medium Load	Low Profile	Medium - Heavy Load	Heavy Load	Super Heavy Load	Super Heavy Load Type	Properties
	80~400N	300~1800N	800~3000N	1600~3200N	3000N	3000~6000N	4000~9000N	~15000N	
Direct Mount Plate (Plate Mount)									Commonly-used casters directly mounted with plates on carriages and machines.
	P.944	P.947	P.949	P.951	P.953	P.953	P.954	-	
Screw Fitting (Screw-in Mount)									Just screw into pipes, frames, etc., to mount
	P.955	P.955	P.957	P.959	-	-	-	-	
With Adjustment Pad (With Adjuster)									Integrated pads secure the Casters on the floor.
	P.965	P.965	P.966	P.964	P.968	P.970	P.970	-	
Dual Wheels (Dual Wheels)									Dual Wheel Type excellent in swivel and capable of making small turns
	P.961~963	P.964	-	-	-	P.964	-	-	
Vibration Absorption (Vibration Damping)									Good vibration absorption and less dust generation during moving. Best use for clean environments.
	P.971	P.972	-	-	-	-	-	-	
Casting (Cast Frame)									The type with high durability in harsh environments compared to the press-formed caster products.
	-	-	-	-	-	-	P.973	P.974	

■Comparison of Wheel Performance(◎ = Excellent, ○ = Good, △ = Questionable, × = Poor)

Item	Synthetic Rubber	Urethane Rubber	MC Nylon	Nylon(White)	Phenol	Special Reinforced Plastic	Conductive Rubber	Conductive MC Nylon	PEEK	Casting
Abrasion Resistance	◎	◎	◎	○	○	△	◎	◎	○	◎
Oil Resistance	△	○	◎	◎	◎	○	△	◎	◎	◎
Water Resistance	◎	○	◎	◎	○	○	◎	◎	○	○
Cost	◎	○	△	◎	△	○	○	△	△	○
Noise	◎	○	△	×	△	△	◎	△	△	×
Allowable Load	△	◎	◎	△	◎	◎	△	◎	◎	◎
Moving Resistance	△	○	◎	○	◎	○	△	◎	○	○
Rubber Hardness Shore A	70±5	90±5	-	-	-	-	75±5	-	-	-
Operation Temperature	-5 ~ 60°C	-20 ~ 80°C	-20 ~ 120°C	-10 ~ 120°C	-40 ~ 180°C	-20 ~ 80°C	-5 ~ 60°C	-20 ~ 120°C	-50 ~ 250°C	-40 ~ 200°C
Features	Natural rubber SBR, BR etc. are combined in the ideal formulas and are the most standard type as general wheels.	Excellent in abrasion and oil resistance. Low starting and running resistance.	Excellent in oil resistance and load resistance. Low starting and running resistance.	Excellent in oil resistance and water resistance. Low starting and running resistance.	Excellent in oil, heat and load resistance. Low starting resistance.	Wider footprint than conventional wheels, and suitable for heavy loads. Relatively low cost.	SBR rubber compounded with a larger amount of carbon black content, which works as earthing.	Antistatic grease is sealed. Ideal for environments where dust adhesion is prohibited.	Excellent in heat resistance. Available for use at high temperature.	Excellent in abrasion, heat and corrosion resistance.

■Cautions on Caster Use

1. Allowable Load

The allowable loads shown in the tables in the catalog indicate the limit load that can be transported by human power on a flat surface. Calculate loaded weight, then select a caster with proper allowable load. Even when 4 casters are used, total load might be supported at 3 points, therefore limit of total load is generally calculated by the following formula.

(Ex.) Using 4 Casters
Limit of Total Load=Allowable Load of One Caster x 4 pcs. X 0.8
Caution When different sizes of casters are used in combination, the calculation should be based on the caster with the lowest load capacity.

2. Operating Speed

Operating speed should be walking speed or slower in intermittent usage. Avoid powered pulling (except for some casters) and continuous operation that may cause heat generation.

Wheel Diameter	Operating Speed
75mm or less	2km/h or less
100mm or less	4km/h or less

3. Stoppers

Note that the performance may degrade without user attention due to wear and damages from long-term operation.
In general, braking power depends on material of wheel.
To ensure safe use, use wheel stops, floor stoppers etc.

4. Operating Environment

It is assumed that the casters are used in normal temperature.(except some casters)
Avoid unusual environment that might be affected by high temperature, low temperature, high humidity, acidic, alkaline, salt, solvent, oil, seawater and chemical products, etc.

5. How to Mount

(1) Please install so that the mounting plane becomes horizontal.
(2) For swivel type, please install with its turning axle vertical.
(3) For fixed casters, install them so that they become parallel mutually.
(4) Mount firmly with proper bolts and nuts.
(5)To install screwed-on casters, tighten the screw's hexagon part with the proper torque. Excessive torque may strain and damage the axis.
(Reference: Proper Torque for Thread Dia. 12mm is 20 ~ 50N•m)

6. Points of Casters Selection

Load : Selection must be based on loading weight.

Wheel Diameter : The bigger, the more movable. Good for traveling on roughness or deference in level.

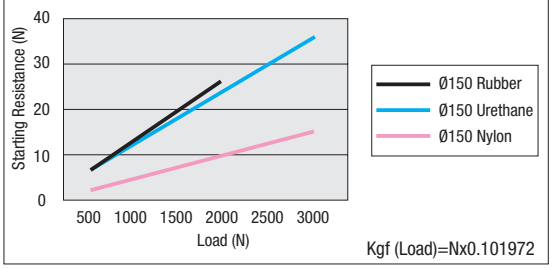
Wheel Material : Selection must be based on material properties.

Rubber Wheels — The most general wheel material. Soft operational feel and smooth running. Economical, not oil resistant, and the black rubber wheels may stain floor surfaces.

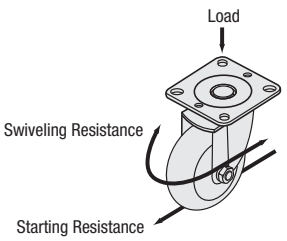
Urethane Wheels — Compared with rubber, higher hardness with good starting property. Oil resistant. Does not stain the floor.

Nylon Wheels — High hardness and smooth movement with no deflection. Disadvantages are floor scratching, noise, and due to its minimal deflection, larger moving resistance on rough surface.

Comparison of Swiveling-starting Resistance for Different Wheel Materials (Road Surface: Measured on Steel Plate)



The above data are for reference.

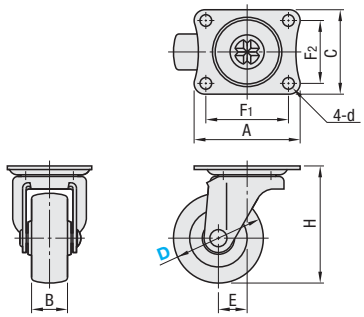


Economy Casters / Casters
-Light Load-

Price Reduction
Up to 20%



CNROJ



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Bright Chrome Plating	Urethane (Black) · Polypropylene · PP (White)	Incorporated	None

Body	Part Number Type	Part Number D	Wheel Material	H	A	C	F1	F2	d	B	r	E	Allowable Load (N) U	Allowable Load (N) P	Mass (g) U	Mass (g) P	€ Unit Price U	€ Unit Price P
Swivel Type	CNROJ	50	U(Urethane) P(Polypropylene)	65	59	47	46	35	6	22	48	21	300	300	250	150		
		75		93	70	58	55	42	8	27	66	27	500	500	580	270		

Of general-purpose plastics, polypropylene exhibits excellent chemical resistance and strength (bending) with light-weight.

Order Example: Part Number CNROJ75 - Wheel Material U

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~99	100~299
Rate	€ Unit Price	20%

Please request a quotation for orders of 300 or more identical pieces.

Light Load Type

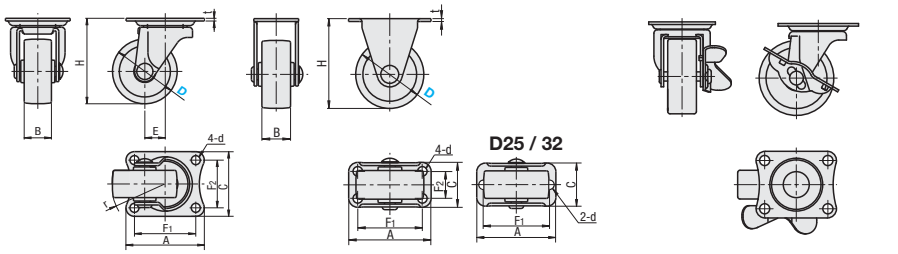
RoHS



(Rubber)

(Urethane)

Swivel Type **CLGJ** Fixed Type **CLGK** Swivel + with Stopper **CLGS**



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) · Nylon (White) · Urethane (Brown) · EN-JL 1040/EN-GJL-250 (Gray)	Incorporated	None

Body Type	Part Number Type	Part Number D	Wheel Material	H	A	C	F1	F2	d	B	r	E	t	Allowable Load (N) Rubber	Allowable Load (N) Nylon	Allowable Load (N) Urethane	Allowable Load (N) Casting	Mass (g) Rubber	Mass (g) Nylon	Mass (g) Urethane	Mass (g) Casting
Swivel Type	CLGJ	25	R(Rubber) N(Nylon) U(Urethane) G(Casting)	35	35	30	28	23	4.2	12	21	8	1.6	80	100	100	120	35	30	40	53
		32		42	38	32	30	24		14	27	10	1.6	120	180	180	200	50	40	50	68
		38		50	46	38	36	28	5.3	17	32	12	1.6	200	280	280	300	80	75	80	116
		50		65	59	47	46	35	6.5	20	42	16	2	300	380	380	400	140	110	119	213
		65		80	70	58	55	42	8.8	25	53	19	2.3	400	550	550	600	245	180	195	450
		75		90						26	58			500	650	650	700	290	195	215	555
Fixed Type	CLGK	25		35	36	18	29	-	4.2	12	-	-	1.6	80	100	100	120	25	23	31	47
		32		42		20				14			1.6	120	180	180	200	38	30	40	58
		38		50	46	25	36	15	5.3	17			1.6	200	280	280	300	63	48	52	106
		50		65	58	40	45	25	6.5	20			2	300	380	380	400	130	95	110	220
		65		80	70	47	55	28	8.8	25			2.3	400	550	550	600	240	175	190	395
		75		90						26				500	650	650	700	290	195	215	530
Swivel + Stopper Type	CLGS	50		65	59	47	46	35	6.5	20	44	16	2	300	380	380	500	165	135	145	420
		65		80	70	58	55	42	8.8	25	58	19	2.3	400	550	550	600	280	215	230	485
		75		90						26	58			500	650	650	700	325	230	250	590

Order Example: Part Number CLGJ38 - Wheel Material R

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99
Rate	€ Unit Price	20%

Please request a quotation for orders of 100 or more identical pieces.

Part Number Type	Part Number D	€ Unit Price Rubber	€ Unit Price Nylon	€ Unit Price Urethane	€ Unit Price Casting
CLGJ	25				
	32				
	38				
	50				
	65				
	75				
CLGK	25				
	32				
	38				
	50				
	65				
	75				
CLGS	50				
	65				
	75				

RoHS

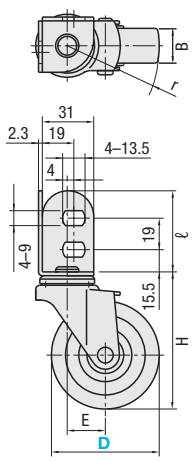


(Angle Mounting Type)

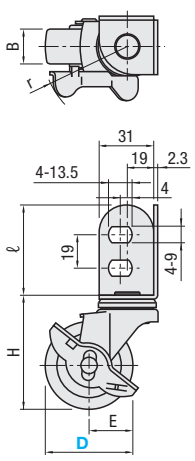


(Angle Mounting Stopper Type)

CNGA



CNGAS



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black)	Incorporated	None

Mount Type	Part Number Type	D	Wheel Material	H	MxP	ℓ	B	t	B	E	r	Allowable Load (N)	Mass (g)	€ Unit Price Rubber	€ Unit Price Nylon
With Angle	CNGA	50	R (Rubber)	65	-	51	-	-	20	22	47	300	200		
		65		82					21	23	56		270		
		75		92						27	65	400	310		
With Angle Stopper Type	CNGAS	50	N (Nylon)	65	-	51	-	-	20	22	49	300	210		
		65		82					21	23	56		285		
		75		92						27	65	400	330		

Order Example: Part Number CNGA50 - Wheel Material R

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~29	30~49	50~99
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

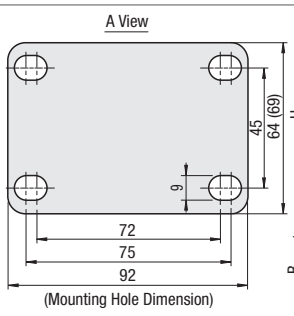
Compatible Type Casters

RoHS









Swivel Type **CSPJ** Fixed Type **CSPK** Stopper Type **CSPJS**

The plate size and pitch are used for all different types and sizes of Casters.
Dimensions in ( ) are applicable to CSPK only.
r indicates the swivel radius of the wheel and turning radius of the pedal.

Type	Body M Material	Body S Surface Treatment	Wheel M Material (Color)	Bearings Swiveling	Bearings Wheel
CSPJ CSPK CSPJS	1.0320/St.22	Trivalent Chromate	Rubber (Gray)	Incorporated	Incorporated

Body	Part Number Type	D	Wheel Material	H	B	r	t	E	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Type	CSPJ	75	R(Rubber)	93	25	65	2.3	25	600	416	
		100		130	32	83	3.5	30	1200	982	
		125		157	32	101		35	1600	1071	
		150		190		118		40		1187	
Fixed Type	CSPK	75		93	25	-	2.3	-	600	317	
		100		130	32		2.5		1200	786	
		125		157	32				1600	802	
		150		190						957	
Swivel with Stopper Type	CSPJS	75		93	25	77	2.3	25	600	492	
		100		130	32	98	3.5	30	1200	1147	
		125		157	32	114		35	1600	1287	
		150		190		119		40		1414	

Order Example: Part Number CSPJ125 - Wheel Material R

Days to Ship: 6 Days P.87

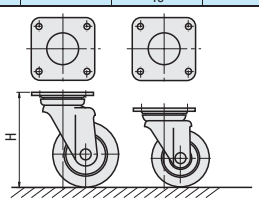
Price

Volume Discount (Round down to one Cent.) P88

Qty.	1~29	30~39	40~49	50~100
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example



- The same mounting plate standard is applicable for all types and sizes.
- No need to change mating hole pitches when changng in caster height (H) and loads

Casters

NEW

Price Reduction
Average 5%

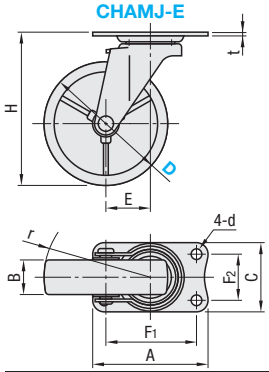
Load Rating 300~1600N
Plate Mount

CAD Data

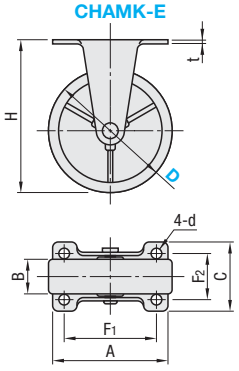
RoHS



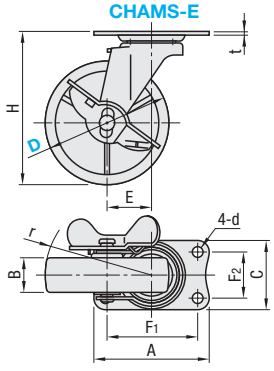
Swivel
CHAMJ-E



Fixed
CHAMK-E



Swivel + With Stopper
CHAMS-E



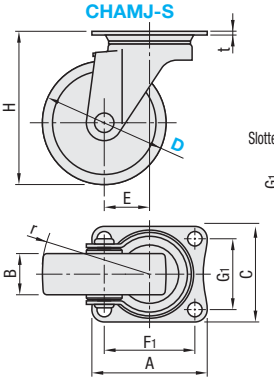
Body		Wheel	Bearings	
Material	Surface Treatment	Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) · Urethane (Brown) · Nylon (White)	Incorporated	None

Body Type	Part Number Type	D	Wheel Material	H	A	C	F1	F2	d	E	r	B R	B U	B N	t	Allowable Load (N) R	Allowable Load (N) U	Allowable Load (N) N	Mass (g) R	Mass (g) U	Mass (g) N	€ Unit Price Rubber	€ Unit Price Urethane	€ Unit Price Nylon
Swivel Type	CHAMJ-E	50	R (Rubber)	65	70	42	56	28	6.5	22	47	20	21	21	2	300	380	400	180	165	150			
		65		82						23	56						400		250	200	190			
		75		92						27	65	21				400	450	500	285	215	200			
		100		122	100	58	82	40	8.8	31	82	25	28	25	2.3	500	600	600	600	465	420			
Fixed Type	CHAMK-E	50	U (Urethane)	65	70	42	56	28	6.5	-	-	20	21	21	2	300	380	400	140	120	110			
		65		82													400		195	145	135			
		75		92								21				400	450	500	230	160	145			
		100		122	100	58	82	40	8.8			25	28	25	2.3	500	600	600	505	345	325			
Swivel with Stopper Type	CHAMS-E	50	N (Nylon)	65	70	42	56	28	6.5	22	47	20	21	21	2	300	380	400	205	185	170			
		65		82						23	56						400		285	215	215			
		75		92						27	65	21				400	450	500	320	250	230			
		100		122	100	58	82	40	8.8	31	82	25	28	25	2.3	500	600	600	670	525	475			

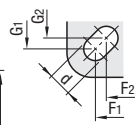
RoHS



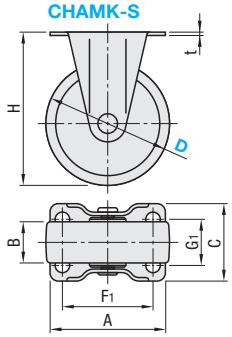
Swivel
CHAMJ-S



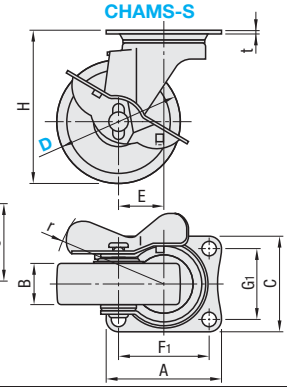
D100/125/150
Slotted Holed Enlarged View



Fixed
CHAMK-S



Swivel + With Stopper
CHAMS-S



Body		Wheel	Bearings	
Material	Surface Treatment	Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) · Urethane (D50 · 65 · 75 Brown, D100 · 125 · 150 Gray) · Nylon (White)	Incorporated	None

Body Type	Part Number Type	D	Wheel Material	H	A	C	F1	F2	G1	G2	d	E	r	B R	B U	B N	t	Allowable Load (N) R	Allowable Load (N) U	Allowable Load (N) N	Mass (g) R	Mass (g) U	Mass (g) N	€ Unit Price Rubber	€ Unit Price Urethane	€ Unit Price Nylon
Swivel Type	CHAMJ-S	50	R (Rubber)	70	70	58	55	-	42	-	8.8	27	53	28	25	28	2.3	500	600	600	325	305	290			
		65		85									61	25		25				700	375	325	310			
		75		93								28	66		26			600	700	800	420	345	325			
		100		132	90	90	71	68	71	68	11	32	83	32	32	32	3.2	1200	1000	1200	920	790	770			
		125		168	102	102	80	75	80	75		40	105	38	40	40		1500	1300	1500	1505	1465	1315			
		150		190									115	40				1600	1400	1600	1710	1585	1490			
Fixed Type	CHAMK-S	50	U (Urethane)	70	70	47	55	-	28	-	8.8	-	-	28	25	28	2.3	500	600	600	195	175	160			
		65		85										25		25				700	250	200	185			
		75		93											26			600	700	800	295	220	200			
		100		132	110	75	90	80	50	45	11			32	32	32	2.6	1200	1000	1200	740	610	585			
		125	N (Nylon)	168	136	100	112	100	53	56				38	40	40	3.0	1500	1300	1500	1135	1090	945			
		150		190	137	93								40			2.6	1600	1400	1600	1290	1160	1100			
Swivel with Stopper Type	CHAMS-S	50		70	70	58	55	-	42	-	8.8	27	67	28	25	28	2.3	500	600	600	345	335	310			
		65		85									68	25		25				700	430	375	350			
		75		93								28			26			600	700	800	470	380	360			
		100		132	90	90	71	68	71	68	11	32	86	32	32	32	3.2	1200	1000	1200	1005	875	850			
		125		168	102	102	80	75	80	75		40	108	38	40	40		1500	1300	1500	1690	1650	1505			
		150		190									115	40				1600	1400	1600	1875	1750	1700			

Order Example

Part Number	-	Wheel Material
CHAMJ-S65	-	R
CHAMS-E75	-	U

Days to Ship **6 Days** P87

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~49	50~99	100~199
Rate	€ Unit Price	10%	15%

For orders larger than indicated quantity, please request a quotation.

Casters

-Electrically Conductive · Stainless Steel Type-

Load Rating 300~1800N Plate Mount

CAD Data

RoHS



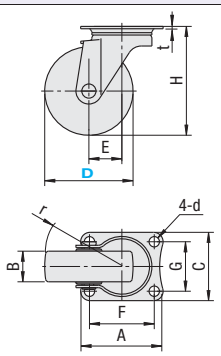
(Rubber)

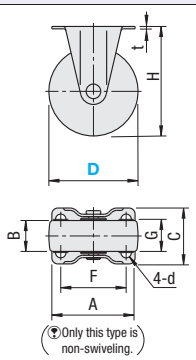


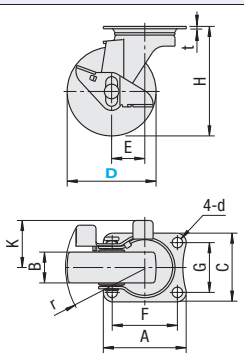
(Urethane Wheel)



(Rubber)

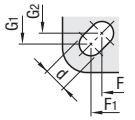






r indicates the swivel radius of wheel.

Stainless Steel



Type	Body		Wheel		Bearings	
	Material	Surface Treatment	Material (Color)		Swiveling	Wheel
CRJDG · CRKDG · CRSDG	1.0320/St.22	Trivalent Chromate	Conductive Rubber (Black)		Incorporated	None
CSRJDG · CSRKDG · CSRSDG	1.4301/X5CrNi18-10					
CSMJU · CSMKU · CSMSPU	1.4301/X5CrNi18-10	Barrel Grinding (p.1581)	Rubber (Black)			Only for D dimensions 100 · 125 · 150
			Urethane (Gray)			Only for D dimensions 150
			Nylon (White)			

■Electrically Conductive Wheel Type

Body	Part Number			B	H	A	C	r		K		F	d	t	E	G	Allowable Load (N)	Mass (g)	€ Unit Price	
	Steel	Stainless Steel	D					Steel	Stainless Steel	Steel	Stainless Steel								Steel Type	Stainless Steel Type
Swivel Type	CRJDG	CSRJDG	50	20	65	70	42	47	47	-	-	56	6.5	2	22	28	300	190		
			65	25	85		58	61	61			55	8.8	2.3	27	42	500	370		
			75		93			66	66						28		600	420		
			100		122	100		82	82			82			31	40	500	600		
Fixed Type	CRKDG	CSRKDG	50	20	65	70	42	-	-	-	-	56	6.5	2	-	28	300	140		
			65	25	85		47					55	8.8	2.3			500	250		
			75		93												600	290		
			100		122	100	58					82				40	500	510		
Stopper Type	CRSDG	CSRSDG	50	20	65	70	42	51	51	32	31	56	6.5	2	22	28	300	210		
			65	25	85		58	67	67	43	40	55	8.8	2.3	27	42	500	430		
			75		93			68	68						28		600	470		
			100		122	100		82	82	44	43	82			31	40	500	670		

■Stainless Steel Casters

Body	Part Number		Wheel Material	B			H	A	C	F1	F2	d	t	E	G1	G2	K	r	Allowable Load (N)			Mass (g)	€ Unit Price		
	Type	D		R (Rubber)	U (Urethane)	N (Nylon)													Rubber Wheels	Urethane Wheels	Nylon Wheels		Rubber Wheels	Urethane Wheels	Nylon Wheels
Swivel Type	CSMJU	75	R (Rubber)*1	25	26	25	93	70	58	55	-	8.8	2.3	28	42	-	-	66	600	700	800	390			
		100		29	32	32	132	90	90	71	68	11	3	32	71	68	-	82	800	1000	1000	950			
		125		32			168	102	102	80	75			36	80	75		99	1000	1200	-	1230			⊠
		150		40	40	40	190							40				115	-	1800	1600	1500	⊠		
Fixed Type	CSMKU	75	U (Urethane)	25	26	25	93	70	47	55	-	8.8	2.3	-	28	-	-	-	600	700	800	270			
		100		29	32	32	132	110	75	90	80	11	3		50	45			800	1000	1000	720			
		125		32			168	140	94	112	100				53	56			1000	1200	-	1180			⊠
		150		40	40	40	190	102	102	80	75				80	75			-	1800	1600	1290	⊠		
Stopper Type	CSMSPU	75	N 5,5	25	26	25	93	70	58	55	-	8.8	2.3	28	42	-	43	68	600	700	800	430			
		100		29	32	32	132	90	90	71	68	11	3	32	71	68	55	86	800	1000	1000	1060			
		125		32			168	102	102	80	75			34	80	75	54	97	1000	1200	-	1340			⊠
		150		40	40	40	190							40			65	115	-	1800	1600	1720	⊠		

*1 R (Rubber) Type of D dimension 150 is not available for swivel, fixed and stopper types.

*2 N (Nylon) Type of D dimension 125 is not available for swivel, fixed and stopper type.

Order Example

Part Number	-	Wheel Material
CRJDG100		
CSMKU125	-	U

Days to Ship

CRJDG · CRKDG · CRSDG: 6 Days P.87

Other than those above: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Add. Spec. Casters - Light · Medium Load Type

Price Reduction
Up to 12%

Load Rating 80~1600N
Plate Mount

CAD Data

■Casters used for small / medium-size carriages.

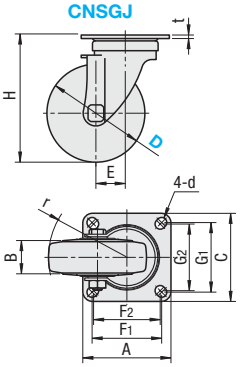
RoHS


(Rubber Wheel)

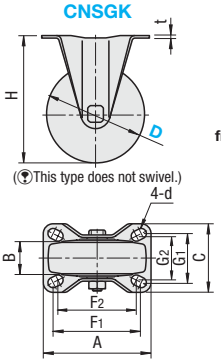

(Urethane Wheel)


(Nylon Wheel)

Swivel Type
CNGJ
CNSGJ

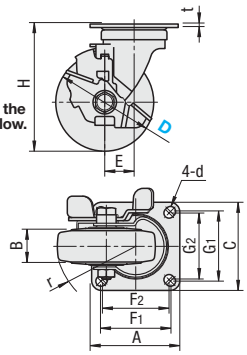


Fixed Type
CNGK
CNSGK

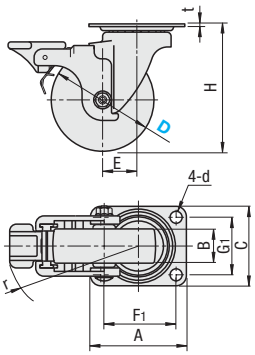

(This type does not swivel.)

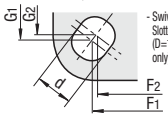
Swivel with Stopper Type
CNGS50 / 65 / 75 / 100 / 125 / 150
CNSGS100 / 125 / 150

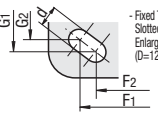
➡ Refer to the figure below.



CNSGS65 / 75







Type	Body		Wheel	Bearings	
	M Material	S	M Material (Color)	Swiveling	Wheel
CNG_	1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) / Urethane (Brown) / Nylon (White)	Incorporated	Provided for D100 / 125 / 150
CNSG_	1.4301	Barrel Grinding (p.1581)			

(D100 Nylon wheel has no bearing in the wheel.
(D25 and 38 rubber wheel color is gray.

Body Type	Part Number Type	D	Wheel Material	H	A	C	F_1	F_2	G_1	G_2	d	E	r	B	t Steel	t Stainless Steel	Allowable Load (N) Rubber Wheels	Urethane Wheels	Nylon Wheels	Mass (g) Rubber	Urethane	Nylon
Swivel Type	CNGJ (Steel) CNSGJ (Stainless Steel)	25	R (Rubber) U (Urethane) N (Nylon)	35	35	30	28		23		4.2	9	24	13	1.5	-	80	-	100	36	-	37
		38		50	46	38	36		28		5.3	13	34	18			200		280	74		75
		50		65	59	47	46	-	35	-	6.5	16	46	21 (**20)	2		500		600	170		140
		65		85	70	58	55		42		8.8	25	59	25	2.3	2	500	700	700	370	310	300
		75		93									65				600	800	800	390	330	320
		100		130	90	90	71	68	71	68	10.5	30	84	32 (*29)	2.9	3	1200	1200	1200	1055	930	900
		125		165	102	102	80	75	80	75	11	35	103	38 (*35)	4	4	1500	1500	1500	1600	1500	1350
		150		190								40	120	40 (**35)			1600	1600	1600	1835	1750	1680
Fixed Type	CNGK (Steel) CNSGK (Stainless Steel)	25		35	37	19	29		-		4.2			13	1.5	-	80	-	100	30	-	31
		38		50	46	25	36		15		5.3			18			200		280	51		52
		50		65	58	44	45	-	25	-	6.5			21 (**20)	2		500		600	130		110
		65		85	70	52 (***47)	55		28		8.8	-	-	25	2.3	2	500	700	700	260	200	190
		75		93													600	800	800	280	220	190
		100		130	110	70	90	80	50	45	10.5			32 (*29)	2.6	2.5	1200	1200	1200	770	645	615
		125		165	140	80	112	100	56	53	11			38 (*35)	4		1500	1500	1500	1100	1000	850
		150		190										40 (**35)			1600	1600	1600	1400	1315	1245
Swivel with Stopper Type	CNGS (Steel) CNSGS (Stainless Steel)	50		65	59	47	46		35		6.5	16	56	21 (**20)	2	-	500	-	600	220	-	190
		65		85	70	58	55	-	42	-	8.8	25	99	25	2.3	2	500	700	700	420	360	350
		75		93													600	800	800	450	390	380
		100		130	90	90	71	68	71	68	10.5	30	102	32 (*29)	2.9	3	1200	1200	1200	1220	1095	1065
		125		165	102	102	80	75	80	75	11	35	125	38 (*35)	4	4	1500	1500	1500	1735	1635	1485
		150		190								40	128	40 (**35)			1600	1600	1600	2045	1950	1890

(**) indicates dimensions for nylon wheels, (*) for urethane wheels and (***) for CNSGK. (CNGK25 has 2 mounting holes.

Order Example

Part Number	-	Wheel Material
CNGJ100	-	U

Days to Ship

- CNGJ · CNGK · CNGS
6 Days P.87

- CNSGJ · CNSGK · CNSGS
8 Days

- Directions of Stoppers

Front view of → in the above drawing.


CNGS50
CNSGS100
CNSGS125
CNSGS150


CNGS65
CNGS75
CNGS100
CNGS125
CNGS150

Price

Volume Discount (Round down to one Cent.) P.88

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	€ Unit Price Steel Rubber	Steel Urethane	Steel Nylon	Stainless Steel Rubber	Stainless Steel Urethane	Stainless Steel Nylon
CNGJ (Steel) CNSGJ (Stainless Steel)	25						
	38						
	50						
	65						
	75						
	100						
	125						
	150						
CNGK (Steel) CNSGK (Stainless Steel)	25						
	38						
	50						
	65						
	75						
	100						
	125						
	150						
CNGS (Steel) CNSGS (Stainless Steel)	50						
	65						
	75						
	100						
	125						
	150						

Add. Spec. Casters - Medium Load Type

Load Rating 800~4000N Plate Mount

CAD Data

RoHS



(Rubber Wheel)

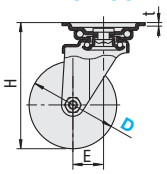


(Urethane Wheel)

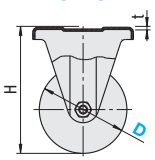


(Monomer Casting Nylon Wheel)

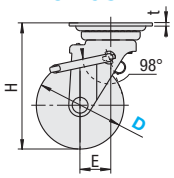
Swivel Type CMGJ



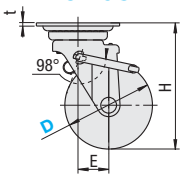
Fixed Type CMGK

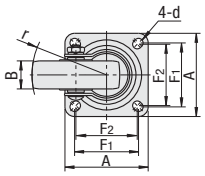


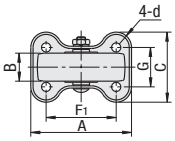
Stopper Type CMGS



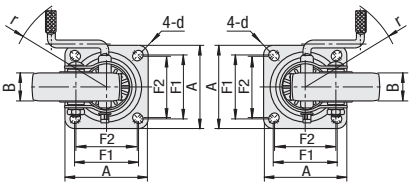
CMGS-L





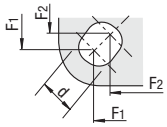


(This type does not swivel.)



r indicates the swivel radius of the wheel and turning radius of the pedal.

Slotted Hole d Close-up (CMGJ · CMGS)



Type	Body		Wheel	Bearings	
	M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
CMGJ · CMGK CMGS · CMGS-L	1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) · Urethane (Blue) · Monomer Casting Nylon (Blue) · Antistatic Rubber (Black) Non-Carbon Antistatic Urethane (Yellow)	Incorporated	Incorporated

Body Type	Part Number Type	D	Wheel Material	H	A	C	F1	F2	G	d	E	(r)	B (*)	t	Allowable Load (N) -R	-U	-N	-T	-K	Mass (g) -R	-U	-N	-T	-K	€ Unit Price -R	-U	-N	-T	-K
Swivel Type	CMGJ	75	R (Rubber) U (Urethane) N (Monomer Casting Nylon) t (Antistatic Rubber) K (Non-Carbon Antistatic Urethane)	100	81		63	-		9.5	28	66	32	2.3	800	1200	1200	800	1200	560	650	560	560	520					
		100		144	95		73	70		10.5	35	85	32 (34)	3.6	1200	1700	1800	1200	1700	1060	1240	1130	1060	1010					
		130		177	105	-	82	79	-		40	105	38 (42)	4	1800	2600	2700	1800	2600	2000	2210	2040	2000	2310					
		150		198	120		93	87		11	45	120	42 (44)		2000	3000	3000	2000	3000	2340	2620	2400	2340	2630					
		200		250	140		115	105			58	163	45 (42)	4.5	2500	3700	4000	-	-	4020	4180	4130	-	-					
Fixed Type	CMGK	75		100	95	71	63		40	9.5			32	2.3	800	1200	1200	800	1200	490	550	490	490	440					
		100		144	115	80	80		45	10.5			32 (34)		1200	1700	1800	1200	1700	830	1010	920	830	770					
		130		177	138	90	100	-	56	11	-	-	38 (42)	2.9	1800	2600	2700	1800	2600	1600	1870	1640	1600	1870					
		150		198									42 (44)		2000	3000	3000	2000	3000	1900	2190	1980	1900	2190					
		200		250	152	100	112		63				45 (42)	4	2500	3700	4000	-	-	3350	3540	3460	-	-					
Swivel with Stopper Type	CMGS CMGS-L	75		100	81		63	-		9.5	28	89	32	2.3	800	1200	1200	800	1200	620	710	620	620	580					
		100		144	95		73	70		10.5	35	110	32 (34)	3.6	1200	1700	1800	1200	1700	1170	1350	1240	1170	1080					
		130		177	105	-	82	79	-		40		38 (42)		1800	2600	2700	1800	2600	2180	2390	2220	2180	2390					
		150		198	120		93	87		11	45	130	45 (42)	4	2000	3000	3000	2000	3000	2520	2800	2580	2520	2800					
		200		250	140		115	105			58		-		2500	3700	-	-	-	4250	4410	4360	-	-					

No D200 is provided for CMGS-L. (*)D100, 130 and 150 are for N wheel dimensions. D200 is for U wheel dimensions.

Order Example

Part Number	-	Wheel Material
CMGS130	-	U

Days to Ship

6 Days P87

- T (Antistatic Rubber) · K (Non-Carbon Antistatic Urethane)

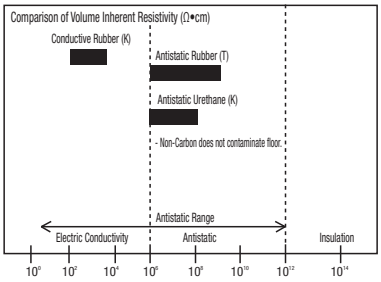
8 Days

Price

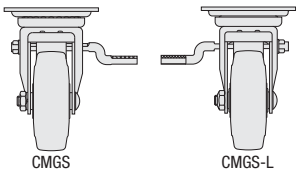
Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.



Example



When used side by side, levers are located symmetrically. (inside · outside)

Casters Swivel Lockable Type / Double Lockable Casters

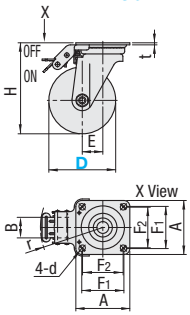
Load Rating 500~3000N Plate Mount

CAD Data

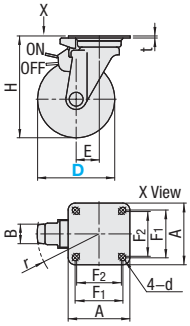
Swivel Lockable Type RoHS



CMGJV100 130



CMGJV150



CMGJV150

ON (Fixed)



OFF (Swivel)



For 100 and 130, ON/OFF positions are opposite to above.

-Positions can be switched between swiveling and fixed (swivel lock) by lever operation.

r indicates the swivel radius of the pedal.

Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/ St.22	Trivalent Chromate	Synthetic Rubber (Black) · Urethane (Blue) Monomer Casting Nylon (Blue)	Incorporated	Incorporated

Part Number Type	D	Wheel Material	B (*)	H	A	r	F1	F2	d	t	E	Allowable Load (N) -R	-U	-N	Mass (g) -R	-U	-N	€ Unit Price -R	-U	-N
CMGJV	100	R (Rubber)	32 (34)	144	95	120	73	70	10.5	3.6	35	1200	1700	1800	1400	1580	1470			
	130	U (Urethane)	38 (42)	177	105	125	82	79	11	4.0	40	1800	2600	2700	2200	2410	2240			
	150	N (Monomer Casting Nylon)	42 (44)	198	120	124	93	87			45	2000	3000	3000	2710	2990	2770			

*: the dimension for the N as Wheel Material.

Order Example: Part Number CMGJV130 - Wheel Material N

Days to Ship: 6 Days P.87

- CMGJV only: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

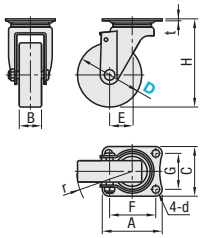
For orders larger than indicated quantity, please request a quotation.

RoHS

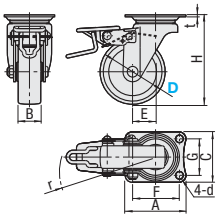


Plate Mounting Type

CMTW



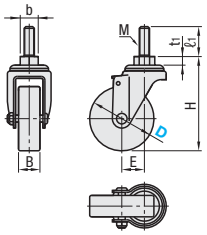
CMTWS



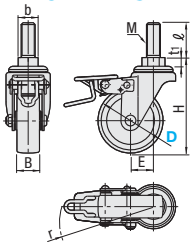
Operating the stopper locks wheeling and swiveling simultaneously, preventing skidding.

Screw Fitting Type

CMTWN



CMTWNS



t1 part (10mm thickness) can be tighten with an off-the-shelf wrench.

Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/ St.22	Trivalent Chromate	Synthetic Rubber (Black) / Urethane (Brown) · Elastomer (Gray)	Incorporated	None

Elastomers can be disposed together with the wheels.

Plate Mounting Type

Body	Part Number Type	D	Wheel Material	H	A	C	F	G	d	E	r	t	B R	B U	B E	Allowable Load (N) R	U	E	Mass (g) R	U	E	€ Unit Price R	U	E
Swivel Type	CMTW	75	R (Rubber) U (Urethane) E(Elastomer)	103	70	58	55	42	8.8	26	65	2.3	27	26	27	600	700	500	430	415	420			
		100		132						29	80			28		600	600	500	605	525	510			
With Swivel StopperType	CMTWS	75		103	70	58	55	42	8.8	26	104	2.3	27	26	27	600	700	500	530	515	520			
		100		132						29	95			28		600	600	500	705	625	610			

Screw Fitting Type

Body	Part Number Type	D	Wheel Material	H	M (Coarse)	B	t1	ℓ	E	r	B R	B U	B E	Allowable Load (N) R	U	E	Mass (g) R	U	E	€ Unit Price R	U	E
Screw-in Type	CMTWN	75A	R (Rubber) U (Urethane) E(Elastomer)	110	12	21	10	35	26	65	27	26	27	600	700	500	405	395	400			
		75B			16	23	10	40									440	425	435			
		100A		138	12	21	10	35	29	80	27	28	27	600	600	500	555	470	460			
		100B			16	23	10	40									590	505	495			
Swivel Screw-in with Stopper Type	CMTWNS	75A		110	12	21	10	35	26	104	27	26	27	600	700	500	505	495	500			
		75B			16	23	10	40									440	525	535			
		100A		138	12	21	10	35	29	95	27	28	27	600	600	500	655	570	560			
		100B			16	23	10	40									690	605	595			

Order Example: Part Number CMTW75 - Wheel Material R; CMTW100 - U

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters
-Medium · Heavy Load-

Load Rating 785～3923N
Plate Mount

CAD Data

■Medium Load

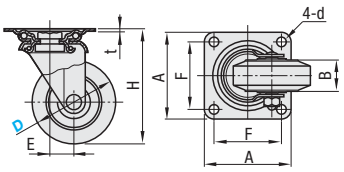


RoHS
Part Number
Not compliant with RoHS

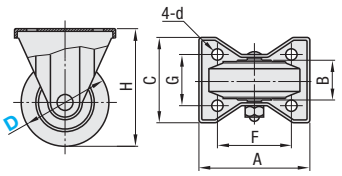
Type			Body		Wheel*	Bearings
Swivel	Fixed	with Stopper	M Material	S Surface Treatment	M Material (Color)	
CJM	CKM	CTM	1.0320/St.22	Bright Chrome Plating	Synthetic Rubber (Black)	Incorporated
	CKMS	CTMS	1.4301/X5CrNi18-10	-		
	CKMUC	CTMUC	1.0320/St.22	Bright Chrome Plating	Urethane Rubber (Green)	
CJMU	CKMU	CTMU	1.4301/X5CrNi18-10	-		
CJMM	CKMM	CTMM	1.0320/St.22	Bright Chrome Plating	MC Nylon (Blue)	
CJMMS	CKMMS	CTMMS	1.4301/X5CrNi18-10	-		

Wheel part of Stainless Steel Type is 1.0320/St.22 (Bright Chrome Plating).

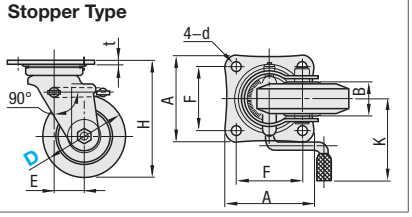
Swivel Type



Fixed Type



Stopper Type



Body	D	(Wheel) Rim Width B	H	A	C	F	d	E	G	K	t	Braking Torque (kg-cm)	Allowable Load (N) Synthetic Rubber Wheel	Urethane Rubber Wheel	MC Nylon Wheel 1.0320/St.22 Body	MC Nylon Wheel Body
Swivel Type	75	32	101	84	-	63	9.5	22	-	-	3.2	-	785	980	1667	2353
	100		144	96		71	10.5	35			4.5		1275	1470	2549	3529
	130	40	178	107		80	11.0	40					1765	2451	3530	4903
Fixed Type	75	32	101	95	72	63	9.5	-	40	-	-	-	785	980	1667	2353
	100		144	115	80	80	10.5		45				1275	1470	2549	3529
	130	40	178	138	93	100	11.0		56				1765	2451	3530	4903
Stopper Type	75	32	101	84	-	63	9.5	22	-	70	3.2	75	785	980	1667	-
	100		144	96		71	10.5	35		90	4.5	90	1275	1470	2549	3529
	130	40	178	107		80	11.0	40		95		120	1765	2451	3530	4903

Kgf (Load)=Nx0.101972

Body	Synthetic Rubber Wheel Part Number Type	D	€ Unit Price	Urethane Rubber Wheel Part Number Type	D	€ Unit Price	MC Nylon Wheel Part Number Type	D	€ Unit Price
Swivel Type	CJM	75			75		CJMM	75	
		100			100			100	
		130			130			130	
	(Stainless Steel)	75		CJMU (Stainless Steel)	75		CJMMS (Stainless Steel)	75	
		100			100			100	
		130			130			130	
Fixed Type	CKM	75		CKMUC	75		CKMM	75	
		100			100			100	
		130			130			130	
	CKMS (Stainless Steel)	75		CKMU (Stainless Steel)	75		CKMMS (Stainless Steel)	75	
		100			100			100	
		130			130			130	
Stopper Type	CTM	75			75			75	
		100		CTMUC	100		CTMM	100	
		130			130			130	
	CTMS (Stainless Steel)	100		CTMU (Stainless Steel)	100		CTMMS (Stainless Steel)	100	
		130			130			130	

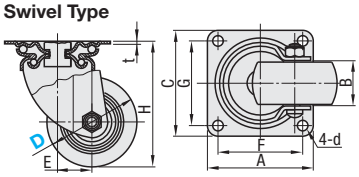
■Heavy Load Type

RoHS

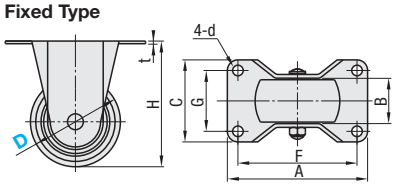


Type		Body		Wheel	Bearings
Swivel	Fixed	M Material	S Surface Treatment	M Material (Color)	
CJH	CKH	1.0320/St.22	Trivalent Chromate	Special Reinforced Plastic (Black)	Incorporated
CJHB	CKHB			MC Nylon (Blue)	

Swivel Type



Fixed Type



■Swivel Type

Part Number Type	D	CJH B (Wheel Mount Width)	CJHB B (Wheel Mount Width)	H	A	C	F	G	d	E	t	Allowable Load N	€ Unit Price CJH	€ Unit Price CJHB
CJH CJHB	*50	28	29	68	70	54	54	36	6.5	25	2.3	1569		
	65	38	39	92	90	90	71	71	10.5	30	3.2	2942		
	75			106								3923		

■Fixed Type

Part Number Type	D	CKH B (Wheel Mount Width)	CKHB B (Wheel Mount Width)	H	A	C	F	G	d	t	Allowable Load N	€ Unit Price CKH	€ Unit Price CKHB
CKH CKHB	*50	28	29	68	80	50	66	36	6.5	2.3	1569		
	65	38	39	92	111	67	91	47	10.5	3.2	2942		
	75			106	123	72	103	52			3923		

*Only CJH50 and CKH50 have no bearings.

Kgf (Load)=Nx0.101972

Order Example
Part Number
CJM75
CJH75

Days to Ship
- CJM · CKM · CTM (3rd day shipping for D130) · CJH · CKH
6 Days
P.87
- Others
8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~100
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters
-Low Profile Type-

Load Rating 1600~3200N Plate Mount

CAD Data

RoHS

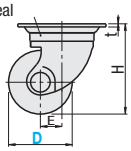

Swivel

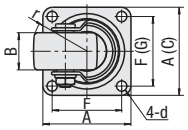

Fixed



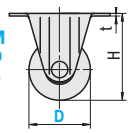
Swivel + With Stopper

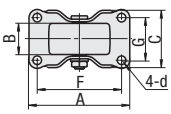
Swivel Type
Steel CHJF, CHJFM
Stainless Steel CHJFD, CHJFS



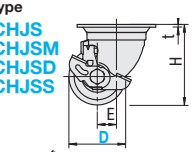


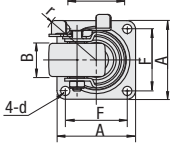
Fixed Type
Steel CHJK, CHJKM
Stainless Steel CHJKD, CHJKS



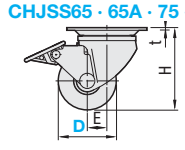


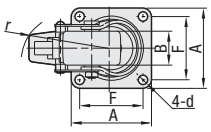
Stopper Type
Steel CHJS, CHJSM
Stainless Steel CHJSD, CHJSS





CHJSS65 · 65A · 75 · 75A





Steel

Type			D	Wheel	Body		Bearings
Swivel	Fixed	Stopper		M Material	Material	S Surface Treatment	Wheel Bearings
CHJF	CHJK	CHJS	50	Special Reinforced Plastic (Black)	1.0320/ St.22	Trivalent Chromate	Incorporated
			50A				-
			50S				Incorporated
			65A				
			75A				
			65	Phenol (Black)			
			75				
CHJFM	CHJKM	CHJSM	50A	MC Nylon (Blue)			-
			65				Incorporated
			75				
CHJFD	CHJKD	CHJSD	50A	Conductive MC Nylon (Black)			-
			65				Incorporated
			75				

Stainless Steel

Part Number		Body		Wheel	Seal	Bearings	
Type	D	M Material	S Surface Treatment	M Material (Color)	M Material	Swiveling	Wheel
CHJFS, CHJKS, CHJSS	50	1.4301/ X5CrNi18-10	Barrel Grinding (p.1581)	Special Reinforced Plastic (Black)	Urethane	Incorporated	Incorporated
	50A						-
	65			Phenol (Black)			
	65A			Special Reinforced Plastic (Black)			Incorporated
	75A						
	75			Phenol (Black)			

There is no CHJSS50.

Steel

Body Type	Part Number Type	D	H	B	A	C	F	G	d	t	E	r	Allowable Load (N) Plastic	Phenol	MC Nylon	Electrical Conductivity MC Nylon	Mass (g)
Swivel	CHJF (Plastic · Phenol)	50	68	28	64	-	50	-	6.5	2.3	25	51	1600	-	-	-	340
		*50A													1600	1600	
	CHJFM (MC Nylon)	*50S			70	54	54	36							-	-	
		65	92	38	90	-	71	-	10.5	3.2	22	57	-	3000	3000	3000	870
	CHJFD (Conductive MC Nylon)	65A											3000	-	-	-	
		75	106									61	-	3200	3200	3200	970
		75A											3200	-	-	-	
Fixed	CHJK (Plastic · Phenol)	50	68	28	80	50	66	36	6.5	2.3	-	-	1600	-	-	-	200
		*50A													1600	1600	
	CHJKM (MC Nylon)	65	92	38	111	70	91	47	10.5	3.2			-	3000	3000	3000	615
	CHJKD (Conductive MC Nylon Wheel)	65A											3000	-	-	-	
		75	106		123	72	103	52					-	3200	3200	3200	725
		75A											3200	-	-	-	
Swivel + with Stopper	CHJS (Plastic · Phenol)	*50A	68	28	64		50		6.5	2.3	25	65	1600	-	1600	1600	380
	CHJSM (MC Nylon)	65	92	38	90	-	71	-	10.5	3.2	22	67	-	3000	3000	3000	960
	CHJSD (Conductive MC Nylon Wheel)	65A											3000	-	-	-	
		75	106										-	3200	3200	3200	1050
		75A											3200	-	-	-	

Stainless Steel

Body Type	Part Number Type	D	H	B	A	C	F	G	d	t	E	r	Allowable Load (N) Plastic	Phenol	Mass (g) Plastic	Phenol
Swivel	CHJFS	50	68	28	64	-	50	-	6.5	2	25	51	1200	-	290	-
		*50A														
		65	92	38	90	-	71	-	10.5	3	22	57	-	2300	-	810
		65A											2300	-	810	-
		75	106									61	-	2500	-	910
		75A											2500	-	910	-
Fixed	CHJKS	50	68	28	80	50	66	36	6.5	2	-	-	1200	-	180	-
		50A														
		65	92	38	111	70	91	47	10.5	3			-	2300	-	580
		65A											2300	-	580	-
		75	106		123	72	103	52					-	2500	-	620
		75A											2500	-	620	-
Swivel + with Stopper	CHJSS	50A	68	28	64		50		6.5	2	25	65	1200	-	330	890
		65	92	38	90	-	71	-	10.5	3	22	94	-	2300	-	-
		65A											2300	-	890	-
		75	106										-	2500	-	990
		75A											2500	-	990	-

*50 A of CHJFS has no bearing in the wheel.

* 50A and 50S have no bearings in wheels. * 50S type can be served as a replacement caster for aluminum frame HAJCHP on **P.705**

Price

Volume Discount (Round down to one Cent.) **P.87**

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Steel

Body Type	D	Standard € Unit Price CHJF · CHJK · CHJS (Plastic · Phenol)	CHJFM · CHJKM · CHJSM (MC Nylon)	CHJFD · CHJKD · CHJSD (Conductive MC Nylon)
Swivel	50			
	50A			
	50S			
	65			
	65A			
	75			
	75A			
Fixed	50			
	50A			
	65			
	65A			
	75			
	75A			
Swivel + with Stopper	50A			
	65			
	65A			
	75			
	75A			

Stainless Steel

Body Type	Part Number Type	D	€ Unit Price CHJFS · CHJKS · CHJSS (Plastic · Phenol)
Swivel	CHJFS	50	
		*50A	
		65	
		65A	
		75	
		75A	
Fixed	CHJKS	50	
		50A	
		65	
		65A	
		75	
		75A	
Swivel + with Stopper	CHJSS	50A	
		65	
		65A	
		75	
		75A	

*50 A of CHJFS has no bearing in the wheel.

Order Example — Part Number: CHJFS65A

Days to Ship — -CHJF · CHJK · CHJS: 6 Days (Section): 8 Days

Casters
-Ultra Low Profile / Lightweight-

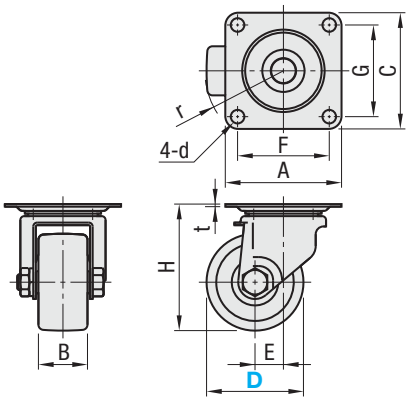
Load Rating 3000N Plate Mount

CAD Data

RoHS



Part Number		Body		Wheel	Seal	Bearings	
Type	D	M Material	S Surface Treatment	M Material (Color)	M Material	Swiveling	Wheel
CGJF CGJFM CGJFD	65	1.0320/St.22 Specialty Steel	Trivalent Chromate	Phenol (Black)	None	Incorporated	Incorporated
	65A			Special Reinforced Plastic (Black)			
	75A						
	75			Phenol (Black)			



Body Type	Part Number Type	D	H	B	A	C	F	G	d	t	E	r	Allowable Load (N) Plastic	Phenol	MC Nylon	Electrical Conductivity MC Nylon	Mass (g)	€ Unit Price CGJF (Plastic · Phenol)	CGJFM (MC Nylon)	CGJFD (Conductive MC Nylon)
Swivel	CGJF (Plastic / Phenol) CGJFM (MC Nylon) CGJFD (Conductive MC Nylon)	65	88	38	90	90	71	71	10.5	2	22	57	-	3000	3000	3000	750			
		65A											3000	-	-	-				
		75	98									61	-	3000	3000	3000	850			
		75A											3000	-	-	-				

Order Example

Part Number
CGJF65A

Days to Ship

8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Features

- Weight savings



- Mounting Height (Lower Profile)



- Lower profile than casters of the same specs.
- Same in load capacity.

Heavy Load Caster mass generally becomes greater due to its thick plates.
-Thinner special steel-made plates (half the conventional product thickness) contribute to weight saving, compared with the conventional types on **P.951**
- Low Profile Casters contribute to reducing product overall weight down from conventional Heavy Load Casters.

Casters
-Medium Load · Heavy Load-

Load Rating 3000~6000N
Plate Mount

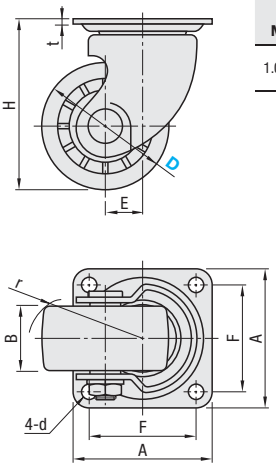
CAD Data

■ Medium - Heavy Load Type

RoHS



CSHN-S



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Reinforced Plastic (Black)	Incorporated	Incorporated

Body Type	Part Number Type	Part Number D	Wheel Material	H	A	F	d	E	r	B	t	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel	CSHN-S	50	H (Reinforced Plastic)	79	82	63	8.8	22	49	38	3.2	3000	700	
		65		90					56				750	
		75		100					61				850	

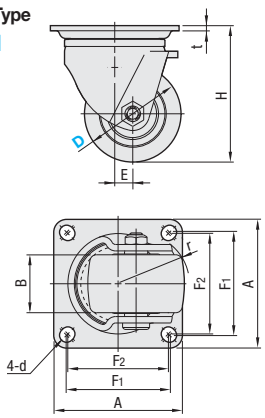
■ Heavy Load Type

RoHS

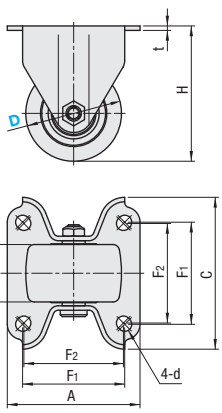




Swivel Type
CSHN



Fixed Type
CSHK



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Reinforced Nylon (Black)	Incorporated	Incorporated

Body Type	Part Number Type	Part Number D	Wheel Material	H	B	A	C	F_1	F_2	d	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel	CSHN	65	N (Reinforced Nylon)	92	45	100	-	80	78	11	4	14	50	6000	1700	
		75		106									55		1850	
Fixed	CSHK	65		92	45	104	119	80	78	11	4	-	-	6000	1300	
		75		106											1560	

Order Example

Part Number	-	Wheel Material
CSHN-S75	-	H
CSHN65	-	N

Price

Days to Ship: 8 Days

■ Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters -Super Heavy Load Type ·
Super Heavy Load Low Profile · Lightweight Type-

Load Rating 4000~6000N Plate Mount

CAD Data

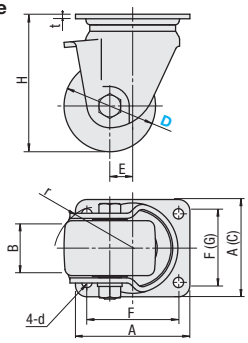
■ Super Heavy Load Type RoHS



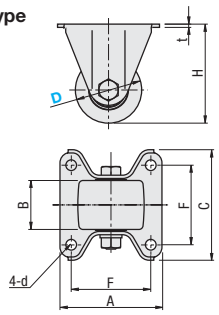


Type		Body: M Material	Body: S Surface Treatment	Wheel: M Material (Color)	Seal: M Material	Bearings: Swiveling	Bearings: Wheel
CKZJ / CKZK	50	1.0320/ St.22	Trivalent Chromate	Reinforced Plastic (Black) Phenol (Black) MC Nylon (Blue) Conductive MC Nylon (Black)	Poly-propylene	Incorpo-rated	Incorporated (Double Ball Bearing)
CKZJ / CKZK	65·75						Incorporated (Needle Bearing)
CKZJ	80·100			MC Nylon (Black)			

Swivel Type

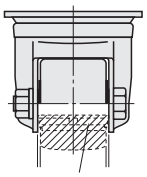


Fixed Type



The dimensions in ( ) are for D80 and 100.

Example



Needle Bearing

Excels in load capacity as needle bearings are used for wheel bearings.

Body Type	Part Number: Type	Part Number: D	Wheel Material	B	H	A	C	F	G	d	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price -H	-P	-N	-D
Swivel Type	CKZJ	50	H (Reinforced Plastic) P (Phenol) N (MC Nylon) D (Conductive MC Nylon)	38	79	84	-	64	-	8.5	3.2	12	47	4000	820				
		65		48	97	100		78		10.5	4.5	14	54	5000	1540				
		75			107									6000	1625				
		*80			120		85	80	60	9		20	63	8000	1680				
		*100			140	150	110	121	59	13			72	9000	2160				
Fixed Type	CKZK	50		38	79	85	90	64	-	8.5	3.2	-	-	4000	550				
		65		48	97	100	108	78		10.5				5000	1000				
		75			107									6000	1060				

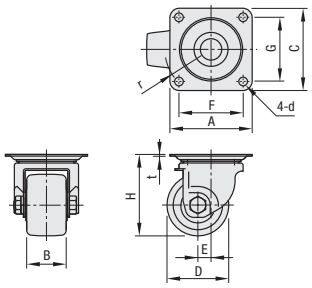
*Wheel material for D80 and 100 type is N(MC nylon) only. D80 and 100 type can also be pulled by a powered mover if the operational speed is under 2km/h.

■ Low Profile · Lightweight Type RoHS





Part Number: Type	Part Number: D	Body: M Material	Body: S Surface Treatment	Wheel: M Material (Color)	Seal: M Material	Bearings: Swiveling	Bearings: Wheel
CGZJ	50	1.0320/St.22 Specialty Steel	Trivalent Chromate	Phenol (Black) MC Nylon (Blue) Conductive MC Nylon (Black)	None	Incorporated	Incorporated
	65						
	75						



Body Type	Part Number: Type	Part Number: D	Wheel Material	B	H	A	C	F	G	d	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price -P	-N	-D
Swivel Type	CGZJ	50	P (Phenol) N (MC Nylon) D (Conductive MC Nylon)	38	74	84	84	64	64	8.5	2	14	43	3000	800			
		65		48	89	100	100	78	78	10.5		16	54	4000	1000			
		75			99								58	5000	1100			

Order Example

Part Number
CKZJ65-P

Days to Ship

CKZJ · CKZK: 6 Days
Other than listed left.: 8 Days

Price

■ Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■ Features

- Weight savings



- Mounting Height (Lower Profile)



- Lower profile than casters of the same specs.
- Same in load capacity.

Heavy Load Caster mass generally becomes greater due to its thick plates.
- CGZJ type saves weight with a thinner special steel-made plate than conventional types. (half the conventional product thickness)
- Low Profile Casters contribute to reducing product overall weight down from conventional Heavy Load Casters.

Casters
-Screw Fitting Type-

Load Rating 250～600N
Screw-in Mount

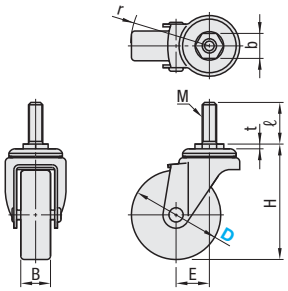
CAD Data

RoHS

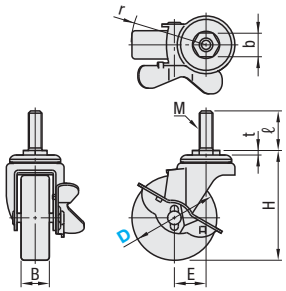




CSTUN



CSTUNS



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Rubber (Black)	Incorporated	None

Body	Part Number Type	Part Number D	Wheel Material	H	M (Coarse)	b	t	ℓ	r	B	E	Allowable Load (N)	Mass (g)	€ Unit Price
Screw-in Type	CSTUN	50A	R (Rubber)	74	12	21	4.8	35	53	28	27	500	335	
		50B			16	23		40						
		65A		89	12	21	4	35	61	25		500	390	
		65B			16	23		40						
		75A		97	12	21		35	66		28	600	430	
		75B			16	23		40						
With Screw-in Stopper	CSTUNS	50A		74	12	21	4.8	35	67	28	27	500	360	
		50B			16	23		40						
		65A		89	12	21	4	35	68	25		500	375	
		65B			16	23		40						
		75A		97	12	21		35			28	600	485	
		75B			16	23		40						

Order Example: Part Number CSTUN75B - Wheel Material R

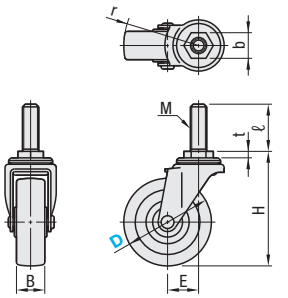
Days to Ship: 8 Days

RoHS

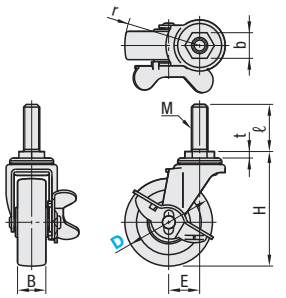




CLTUN



CLTUNS



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Rubber (Black)	Incorporated	None

Body	Part Number Type	Part Number D	Wheel Material	H	MxP	b	t	ℓ	r	B	E	Allowable Load (N)	Mass (g)	€ Unit Price
Screw-in Type	CLTUN	40	R (Rubber)	59	12x1.25	19	4	14	41	17	21	250	150	
		50		68					47	20	22	300	170	
		65A		85	12x1.75			35	56	21	23		231	
		65B			12x1.25			14						
		75A		95	12x1.75			35	65		27	400	295	
		75B			12x1.25			14						
With Screw-in Stopper	CLTUNS	40		59	12x1.25	19	4	14	50	17	21	250	175	
		50		68					49	20	22	300	198	
		65A		85	12x1.75			35	57	21	23		285	
		65B			12x1.25			14						
		75A		95	12x1.75			35	65		27	400	325	
		75B			12x1.25			14						

Order Example: Part Number CLTUN65A - Wheel Material R

Days to Ship: 6 Days P.87

Casters

-Stainless Steel · Electrically Conductive Wheel Type-

Price Reduction
Up to 50%

Load Rating 500～800N
Screw-in Mount

CAD Data

■Stainless Steel Casters RoHS

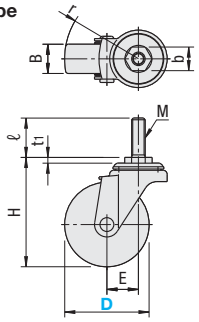


(Nylon Wheel)

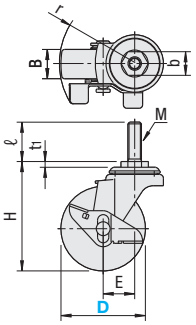


(Urethane Wheel)

Screw-in Type CSMNU



Screw-in with Stopper Type CSMNSU



Body		Wheel	Bearings
M Material	S Surface Treatment	M Material	
1.4301/X5CrNi18-10	Barrel Grinding (p.1581)	Rubber (Black)	-
		Urethane (Gray)	-
		Nylon (White)	-

r indicates the swivel radius of wheel.
CSMNU and CSMNSU have no bearings.

Body	Part Number Type	Part Number D	Wheel Material	H	M	b	t1	ℓ	r	B R · N (Rubber) (Nylon)	B U (Urethane)	E	Allowable Load (N) Rubber Wheels	Allowable Load (N) Urethane Wheels	Allowable Load (N) Nylon Wheels	Mass (g)	€ Unit Price Rubber Wheels	€ Unit Price Urethane Wheels	€ Unit Price Nylon Wheels
Screw-in Type	CSMNU	50	R (Rubber) U (Urethane) N (Nylon)	74	12	21	5.1	35	53	28	25	27	500	600	600	305			
		65		89					61	25					700	360			
		75A		97	12	21		35	66		26	28	600	700	800	400			
		75B			16	23		40								430			
		100A		126	12	21		35	82		28	31	500	600	600	550			
		100B			16	23		40								580			
With Screw-in Stopper	CSMNSU	50		74	12	21		35	67	28	25	27	500	600	600	335			
		65		89					68	25					700	410			
		75A		97	12	21		35	68		26	28	600	700	800	440			
		75B			16	23		40								470			
		100A		126	12	21		35	82		28	31	500	600	600	620			
		100B			16	23		40								650			

Order Example: Part Number CSMNU75A - Wheel Material R

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Electrically Conductive Wheel Type RoHS

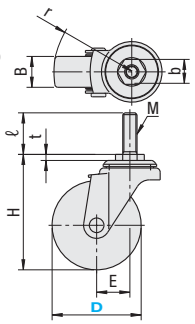


(Screw-in)

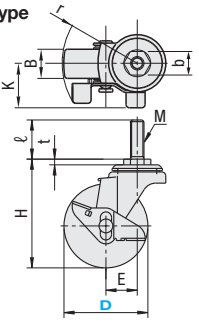


(With Screw-in Stopper)

Screw-in Type CRMNU CSMSNU (Stainless Steel)



Screw-in with Stopper Type CRMNSU CSMSNSU (Stainless Steel)



Type	Body M Material	Body S Surface Treatment	Wheel M Material (Color)	Bearings Swiveling	Bearings Wheel
CRMNU · CRMNSU	1.0320/St.22	Trivalent Chromate	Conductive Rubber (Black)	Incorporated	None
CSMSNU · CSMSNSU	1.4301/X5CrNi18-10	Electrolityc Polishing			

Body	Part Number Steel	Part Number Stainless Steel	D	B	H	E	r Steel	r Stainless Steel	K Steel	K Stainless Steel	M	b	t Steel	t Stainless Steel	ℓ	Allowable Load (N)	Mass (g)	€ Unit Price Steel Type	€ Unit Price Stainless Steel Type
Screw-in Type	CRMNU	CSMSNU	50	20	68	22	47	47	-	-	12	19	4.8	4.5	35	300	200		
			65A	25	89	27	61	61			12	21	4.0	5.1	35	500	390		
			65B								16	23			40	500	420		
			75A		97	28	66	66			12	21			35	600	430		
			75B								16	23			40	600	460		
			100A		126	31	82	82			12	21			35	500	580		
			100B								16	23			40	500	610		
With Screw-in Stopper	CRMNSU	CSMSNSU	50	20	68	22	49	49	32	31	12	19	4.8	4.5	35	300	220		
			65A	25	89	27	70	66	43	43	12	21	4.0	5.1	35	500	440		
			65B								16	23			40	500	470		
			75A		97	28	71	68			12	21			35	600	480		
			75B								16	23			40	600	510		
			100A		126	31	82	82	44	43	12	21			35	500	650		
			100B								16	23			40	500	680		

For screw-in type, please use pipe insert wrench (P811) and dedicated wrench (web available).

Order Example: Part Number CSMSNU65B

Days to Ship: CRMNSU 6 Days P87 / Other than listed left. 8 Days

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters
-Screw Fitting Type-

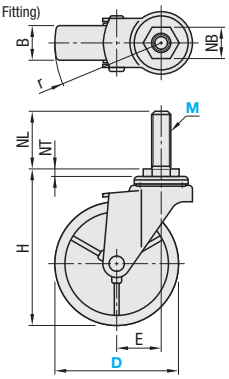
Load Rating 300~1200N Screw-in Mount

CAD Data

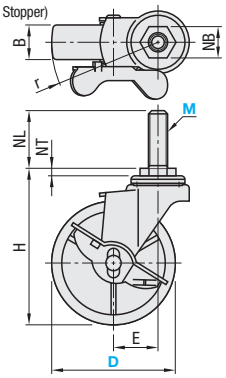
RoHS



HSGN
(Swivel Screw Fitting)



HSGNS
(Swivel Screw Fitting + with Stopper)



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) · Urethane (Brown) · Nylon (White)	Incorporated	None

Body	Part Number Type	Part Number D	M (Coarse)	Wheel Material	H	Wheel Width B R	Wheel Width B U	Wheel Width B N	E	NB	NT	NL	r	Allowable Load (N) -R	Allowable Load (N) -U	Allowable Load (N) -N	Mass (g) -R	Mass (g) -U	Mass (g) -N	€ Unit Price -R	€ Unit Price -U	€ Unit Price -N
Swivel Screw Fitting Type	HSGN	50	8	R (Rubber) U (Urethane) N (Nylon)	68	20	21	21	22	14	4.8	14	47	300	380	400	195	175	165			
			12							19									165			
		65	12		85	21	21	21	23			35	56		400		270	220	210			
		75	12		95				27				65	400	450	500	310	240	225			
		100	12		126	25	28	25	31	21	4	40	82	500	600	600	585	435	405			
			16							23												
Swivel Screw Fitting with Stopper Type	HSGNS	50	8		68	20	21	21	22	14	4.8	14	49	300	380	400	220	200	190			
			12							19												
		65	12		85	21	21	21	23			35	57	300	400		305	255	235			
		75	12		95				27				65	400	450	500	340	275	250			
		100	12		126	25	28	25	31	21	4	40	82	500	600	600	650	620	585			
			16							23												

Order Example: Part Number HSGN75 - M 12 - Wheel Material U

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Screw-in Type

RoHS

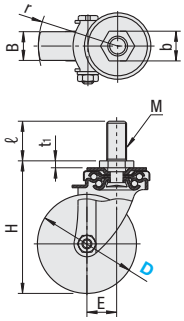


(Urethane Wheel)

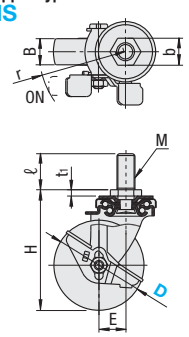


(Nylon Wheel)

Screw-in Type
CMGN



Screw-in with Stopper Type
CMGNS



r indicates the swivel radius of the wheel and turning radius of the pedal.

Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black) · Urethane (Brown) · Nylon6 (White)	Incorporated	N/A for D75 only

Body Type	Part Number Type	Part Number d	Wheel Material	B*2	H	M (Coarse)	b	t1	ℓ	E	r	Allowable Load (N) Rubber Wheels	Allowable Load (N) Urethane Wheels	Allowable Load (N) Nylon Wheels	Mass (g) Rubber	Mass (g) Urethane	Mass (g) Nylon	€ Unit Price Rubber	€ Unit Price Urethane	€ Unit Price Nylon
Screw-in Type	CMGN	75	R (Rubber) U (Urethane) *1 N (Nylon)	25	97	16	23	4	40	25	63	600	-	800	476	-	390			
		100		29 (32)	134	20	30	7		30	80	1200	1200	1200	1026	1474	1000			
Swivel Screw-in with Stopper Type	CMGNS	75		25	97	16	23	4	40	25	72	600	-	800	523	-	445			
		100		29 (32)	134	20	30	7		30	98	1200	1200	1200	1133	1690	1100			

*1: Urethane wheels are available for D100 only. *2: For rubber wheel, B dimension is ( ).

Order Example: Part Number CMGN75 - Wheel Material R

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 6 Days P.87

Casters
-Screw Fitting Type-

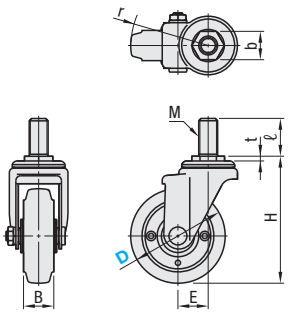
Load Rating 300～1200N
Screw-in Mount

CAD Data

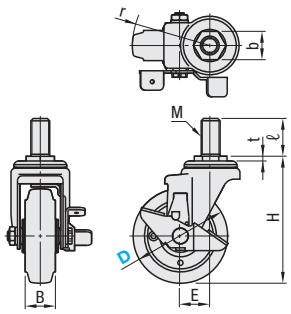
RoHS



CSJTN



CSJTNS



Body		Wheel	Bearings	
MMaterial	SSurface Treatment	MMaterial (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Rubber (Black)	Incorporated	Incorporated

Body	Part Number Type	Part Number D	Wheel Material	H	M (Coarse)	b	t	ℓ	r	B	E	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Screw-in Type	CSJTN	100A	R (Rubber)	134	16	23	4.7	40	82	32	32	1200	880	
		100B			20	30	5						810	
		125A		166	16	23	4.7		95				1025	
		125B			20	30	5						950	
Swivel Screw-in with Stopper Type	CSJTNS	100A		134	16	23	4.7	40	86	32	32	1200	965	
		100B			20	30	5						840	
		125A		166	16	23	4.7		95				1115	
		125B			20	30	5						1040	

Order Example: Part Number CSJTN100B - Wheel Material R

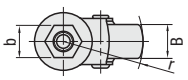
Days to Ship: 8 Days

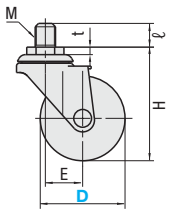
RoHS



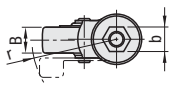
(Screw Fitting)

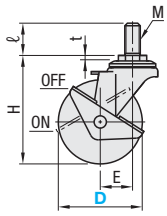
CNGN





CNGNS





Body		Wheel	Bearings	
MMaterial	SSurface Treatment	MMaterial (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Synthetic Rubber (Black)	Incorporated	None

All types swivel.

Mount Type	Part Number Type	Part Number D	Wheel Material	H	B	MxP	ℓ	B	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price
Screw Fitting	CNGN	40	R (Rubber)	59	18	12x1.25	14	19	4	20	42	300	140	
		50		67	20					22	49	350	160	
		65		84		12x1.75	25			25	60		230	
		75		96						30	72	400	280	
Screw Fitting + with Stopper	CNGNS	40		59	18	12x1.25	14	19	4	20	54	300	150	
		50		67	20					22	56	350	170	
		65		84		12x1.75	25			25	67		245	
		75		96						30	73	400	275	

Order Example: Part Number CNGN50 - Wheel Material R

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~29	30~49	50~99
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Casters / Ball Casters

-Low Profile Type-

Load Rating 900~1600N Screw-in Mount

CAD Data

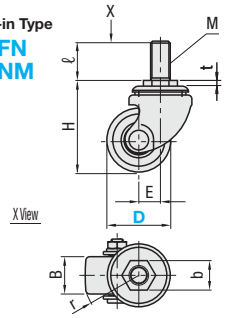
Features: Low installation height and low gravity center. Can be used for conveying heavy objects.

RoHS

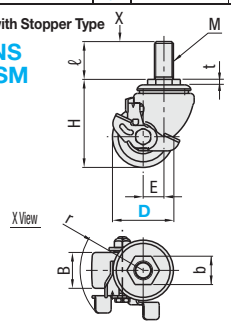


Type		D	Wheel	Body		Bearings Wheel Bearings
Screw Fitting	Screw Fitting + Stopper		M Material	Material	S Surface Treatment	
CHJFN	CHJFNS	50A	Special Reinforced Plastic (Black)	1.0320/ St.22	Trivalent Chromate	-
		50B				Incorporated
		65A				
		65B				
		75A				
		75B				
CHJNM	CHJNSM	50A	MC Nylon (Blue)			-
		50B				Incorporated
		65A				
		65B				
		75A				
		75B				

Screw-in Type
CHJFN
CHJNM



Screw-in with Stopper Type
CHJFNS
CHJNSM



r indicates the swivel radius of the wheel and turning radius of the pedal.

Body Type	Part Number Type	D	ℓ (Thread Length)	M (Coarse)	H	B	b	t	E	r	Allowable Load (N) Plastic	Allowable Load (N) MC Nylon	Mass (g)
Swivel + Screw-in	CHJFN (Plastic) CHJNM (MC Nylon)	*50A	40	16	74	28	23	7.9	25	51	1000	1000	390
		*50B		20									430
		65A		16	93	38	30	5.8	22	57	1500	1500	620
		65B		20									650
		75A		16	107					61	1600	1600	760
		75B		20									790
Swivel + Screw-in + with Stopper	CHJFNS (Plastic) CHJNSM (MC Nylon)	*50A	80	16	74	28	23	7.9	25	65	1000	1000	430
		*50B		20									470
		65A		16	93	38	30	5.8	22	67	1500	1500	680
		65B		20									710
		75A		16	107						1600	1600	830
		75B		20									860

Body Type	D	€ Unit Price CHJFN · CHJFNS (Plastic)	€ Unit Price CHJNM · CHJNSM (MC Nylon)
Swivel + Screw-in	50A		
	50B		
	65A		
	65B		
	75A		
	75B		
Swivel + Screw-in with Stopper	50A		
	50B		
	65A		
	65B		
	75A		
	75B		

* 50A and 50S have no bearings in the wheels.

For ℓ=80: Price in the table above + 12,00 EUR
(Ex.) CHJFN50A -40 12,00 EUR
CHJFN50A-80 16,20 EUR

Order Example: Part Number CHJNM65A - 40

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

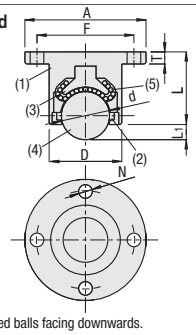
For orders larger than indicated quantity, please request a quotation.

Ball Casters

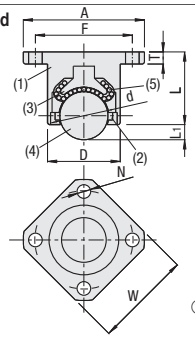
RoHS



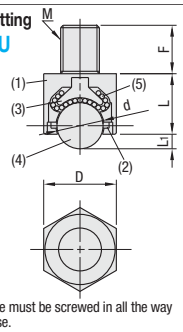
Round Flanged
CHBM



Square Flanged
CHBF



Screw Fitting
CHBU



Can be used balls facing downwards.

CHBU type must be screwed in all the way to the base.

Type	(1) Body M Material	(1) Body S Surface Treatment	(2) Dust Proof Seal M Material	(3) Strike Plates M Material	(3) Strike Plates H Hardness	(4) Main Balls M Material	(4) Main Balls H Hardness	(5) Sub Balls M Material	(5) Sub Balls H Hardness
CHBM · CHBF · CHBU	1.1191/C45E	Electroless Nickel Plating	Felt	1.7242/16CrMo4	50HRC~	1.3505/100Cr6	55HRC~	1.3505/100Cr6	55HRC~

Body Type	Part Number Type	Part Number No.	D	L	A	W	M	F	N	L_1	d	T	Allowable Load (N)	Mass (g)	€ Unit Price
Round Flanged	CHBM	40	24	24	40	-	-	32	4.5	5	15.875	4	900	165	
		50	30	28	50			40	5.5	6	19.05	5	1100	180	
		60	38	37	60			49	6.5	8	25.4	6	1200	190	
Square Flanged	CHBF	40	24	24	40	32	-	32	4.5	5	15.875	4	900	160	
		50	30	28	50	40		40	5.5	6	19.05	5	1100	170	
		60	38	37	60	48		49	6.5	8	25.4	6	1200	185	
Screw Fitting	CHBU	12	24	21	-	-	12	20	-	5	15.875	-	900	170	
		16	30	25			16	25		6	19.05		1100	185	
		20	38	34			20	30		8	25.4		1200	195	

Order Example: Part Number CHBF50

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example

Resin Caster / Caster Side Mount Plate

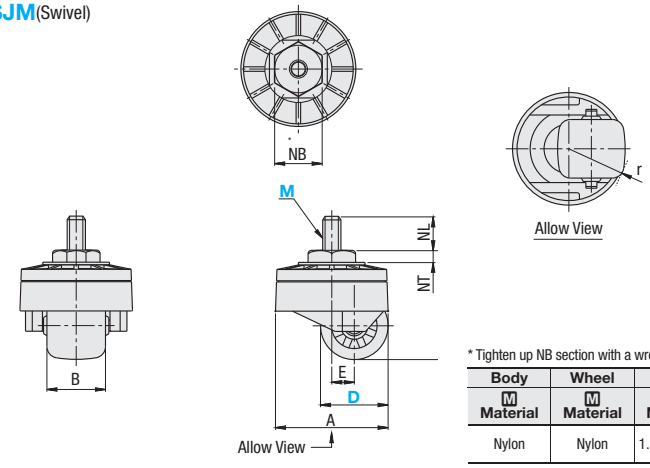
Load Rating 300N Screw-In Mount

CAD Data

Resin Casters RoHS



CSJM(Swivel)



* Tighten up NB section with a wrench for firm fastening.

Body		Wheel	Thread	
M	Material	M Material	M Material	S Surface Treatment
Nylon		Nylon	1.1191/C45E	Trivalent Chromate

Body Type	Part Number Type	D	M	Wheel Material	H	A	B	Mounting screws NB	NT	NL	r	E	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Type	CSJM	18	8	N(Nylon)	34	50	20	13	3	14	21	10	300	60	
		30			46		26				26			75	

Order Example: Part Number CSJM30 - M 8 - Wheel Material N

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days

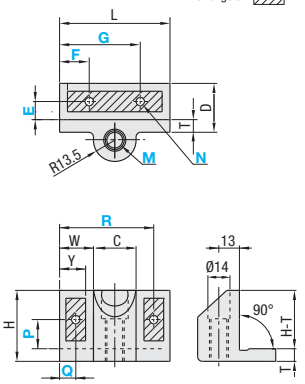
Caster Side Mount Plate RoHS



For Aluminum Frame Type, please see P.710

CPHM

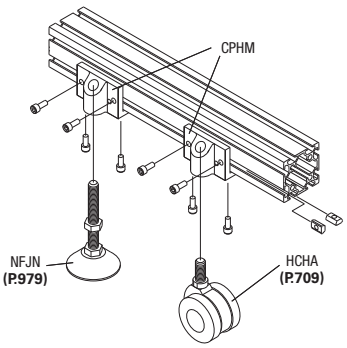
Please specify through-hole locations in the range of



Hole Type	Through Hole
Code	N
Shape	
Machining Specification	Dimension / Nominal Diameter: N 5 6; d 6 7

M Material: EN AC-46100 S Surface Treatment: Baked Finish (Silver)

Example



Caster Side Mount Plate

Part Number Type	M (Coarse)	N (Through Hole) Selection	Drilling Position 0.5mm Increment E	F	G	P	Q	R	L	W	H	T	D	Y	C	Mass (g)	€ Unit Price
CPHM	10	5 6	8~15	8~28	42~62	8~29	7~13	57~63	70	21.5	45	8	31	16	27	135	
	12																

Order Example: Part Number CPHM10 - N 5 - E E12 - F F25.5 - G G46.5 - P P28 - Q Q13 - R R58

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~29	30~49	50~99
Rate	€ Unit Price	5%	10%

⊗Not available for CMHU and CMHD For orders larger than indicated quantity, please request a quotation.

Dual Wheel Casters

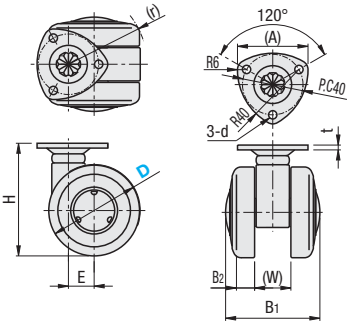
Load Rating 400~1200N Dual Wheels

CAD Data

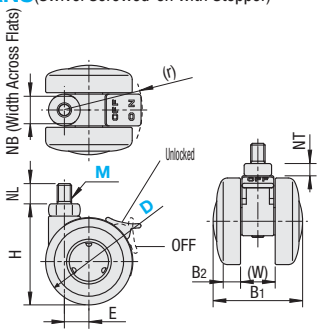
Design Casters RoHS



CHAM(Swivel)
CHAS(Stopper)



CHAN (Swivel Screwed-on)
CHANS(Swivel Screwed-on with Stopper)



Shaft		Wheel
M Material	S Surface Treatment	M Material (Color)
1.0320/St.22	Trivalent Chromate	Nylon (Black)

1 package includes 4 pieces. Note quantity when ordering.

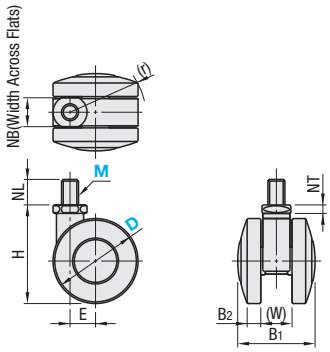
Body Type	Part Number Type	Part Number D	Wheel Material	H	B1	B2	(W)	Mounting Plates (A)	Mounting Plates d	r	t	E	Allowable Load (N)	Mass (g)	€ Unit Price (4pc. packed set)
Swivel Type	CHAM	50	N (Nylon)	62	62	12	24	46.6	5.5	50	3.2	17	1000	210	
		60		74						54			1200	240	
Stopper Type	CHAS	50		62						52			1000	220	
		60		74						56			1200	250	

Body Type	Part Number Type	Part Number D	M	Wheel Material	H	B1	B2	(W)	Mounting screws NB	Mounting screws NT	Mounting screws NL	r	E	Allowable Load (N)	Mass (g)	€ Unit Price (4pc. packed set)
Swivel Screwed-on Type	CHAN	50	8	N (Nylon)	58	62	12	24	19	8	14	50	17	1000	170	
		60	8 10		70							54		1200	200	
Swivel Screwed-on Stopper Type	CHANS	50	8		58							52		1000	180	
		60	8 10		70							56		1200	210	

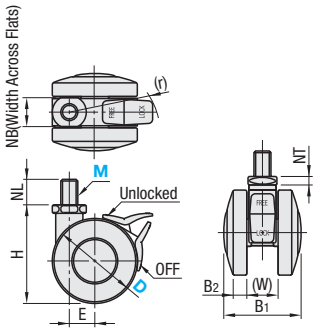
RoHS



CTBMR



CTBMS



Shaft		Wheel
M Material	S Surface Treatment	M Material (Color)
JIS SWCH	Trivalent Chromate	Nylon (Black)

Body Type	Part Number Type	Part Number D	M (Coarse)	H	B1	B2	(W)	Mounting screws NB	Mounting screws NT	Mounting screws NL	r	E	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Screw-in Type	CTBMR	40	8 10	46	42	7	18	14	5	15	38	14	400	67	
		60	10 12	69	46	8		17			51	18	800	126	
Swivel Screw-in Stopper Type	CTBMS	40	8 10	46	42	7		14			42	14	400	70	
		60	10 12	69	46	8		17			55	18	800	129	

Order Example

Part Number - M - Wheel Material

CHAM60 - N
CHAN50 - 8 - N
CTBMR40 - 8

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99	100~199
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- CTBMR • CTBMS: 6 Days P.87
- Other than listed left.: 8 Days

Dual Wheel Casters

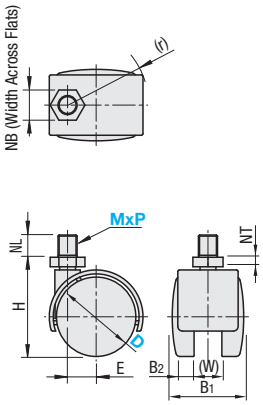
Load Rating 200~1176N Dual Wheels

CAD Data

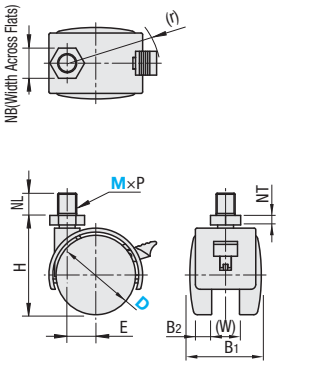
RoHS



CTGMR



CTGMRS



Shaft		Wheel
M Material	S Surface Treatment	M Material (Color)
JIS SWCH	Trivalent Chromate	Nylon (Black)

Body Type	Part Number Type	D	M	P	H	B1	B2	(W)	Mounting screws NB	NT	NL	r	E	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Screw-in Type	CTGMR	40	8	1.25	50	41	10	16	13	4	15	43	14.5	200	60	
		50	12	1.25	63	45	11	18	19	6	14	51	18	300	100	
Swivel Screw-in Stopper Type	CTGMRS	40	8	1.25	50	41	10	16	13	4	15	47	14.5	200	65	
		50	12	1.25	63	45	11	18	19	6	14	62	18	300	105	

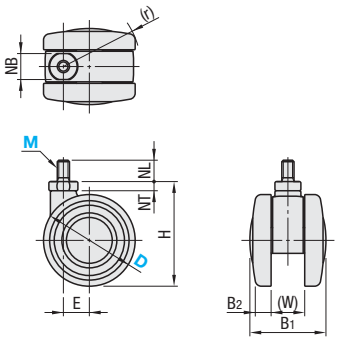
Order Example: Part Number CTGMR40 - M 8

Days to Ship: 6 Days P.87

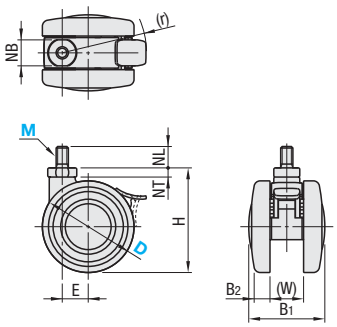
RoHS



CTEJN



CTEJNS



Shaft		Wheel
M Material	S Surface Treatment	M Material (Color)
JIS SWCH	Trivalent Chromate	Elastomer (Black)

Body Type	Part Number Type	D	M	H	B1	B2	(W)	Mounting screws NB	NT	NL	r	E	Allowable Load (N)	€ Unit Price
Swivel Screw-in Type	CTEJN	40	8 10	43	44	12	20	14	5	12 (19)	39	15	392	
		50	8 10 12	58	49	14	21	17	6	14	45.5	17	588	
		60	8 12	69							50.5	17	980	
		75A	12	85	64	19	27	21	8	22	63	20	1176	
		75B	16							25				
Swivel Screw-in Stopper Type	CTEJNS	40	8 10	43	44	12	20	14	5	12 (19)	42	15	392	
		50	8 10 12	58	49	14	21	17	6	14	49	17	588	
		60	8 12	69							55	17	980	
		75A	12	85	64	19	27	21	8	22	70.5	20	1176	
		75B	16							25				

* Dimensions in ( ) are applied to M10.

Order Example: Part Number CTEJNS50 - M 10

Price

Days to Ship: 6 Days P.87

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99	100~199
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

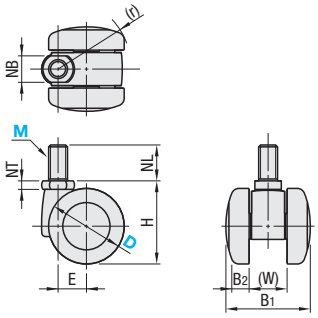
Dual Wheel Casters

Load Rating 200~588N Dual Wheels

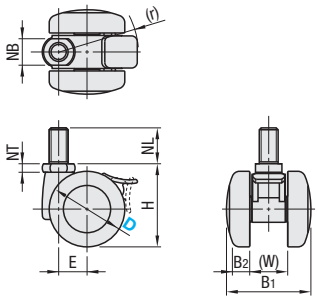
RoHS



CTYNB



CTYNBS



Shaft		Wheel
M Material	S Surface Treatment	M Material (Color)
JIS SWCH	Trivalent Chromate	Nylon (Black)

Body Type	Part Number Type	D	M	H	B_1	B_2	(W)	Mounting screws NB	NT	NL	r	E	Allowable Load (N)	€ Unit Price
Swivel Screw-in	CTYNB	40	10	44	44	12	20	14	5	19	39	15	392	
		50	12	57.5	49	9.5	21	17	6	22	46	17	588	
Swivel Screw-in + Stopper	CTYNBS	40	10	44	44	12	20	14	5	19	42	15	392	
		50	12	57.5	49	9.5	21	17	6	22	48	17	588	

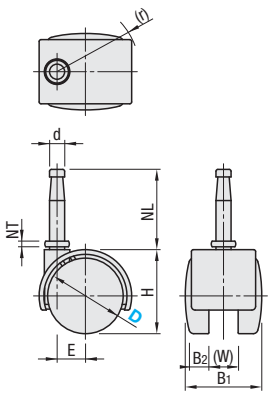
Order Example: Part Number CTYNBS40 - M 10

Days to Ship: 6 Days P.87

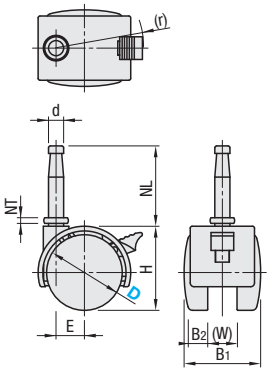
RoHS



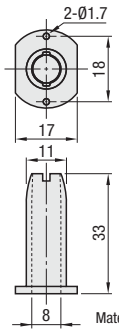
CPNB



CPNBS



Insert Socket (Included)



Material: Nylon

Shaft		Wheel
M Material	S Surface Treatment	M Material (Color)
JIS SWCH	Trivalent Chromate	Nylon (Black)

Body Type	Part Number Type	D	H	B_1	B_2	(W)	Mounting Section d	NT	NL	r	E	Allowable Load (N)	Mass (g)	€ Unit Price
Pin Type	CPNB	40	49	41	10	16	8	3	38	43	15	200	65	
		50	60	45	11	18		4		51	18	300	95	
Pin Type With Stopper Type	CPNBS	40	49	41	10	16		3		47	15	200	70	
		50	60	45	11	18		4		57	18	300	100	

Order Example: Part Number CPNB40

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99	100~199
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

1 package of Design Casters includes 4 pieces.

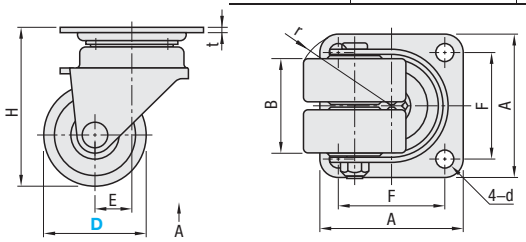
Days to Ship: 6 Days P.87

■Medium Load RoHS

CWM-P



Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Nylon (Black)	Incorporated	None



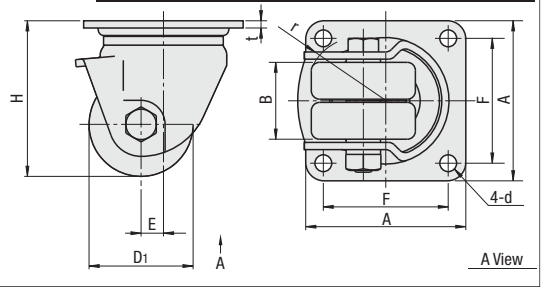
Body Type	Part Number Type	Part Number D	Wheel Material	H	A	F	d	E	r	B	t	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Type	CWM-P	38	N(Nylon)	64	70	52	8.8	18	44	46	2.6	1200	450	
		50		77					49			1500	470	

■Heavy Load -Steel- RoHS

CWMJ

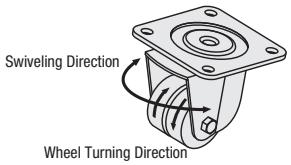


Body		Wheel	Bearings	
M Material	S Surface Treatment	M Material (Color)	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	MC Nylon (Blue)	Incorporated	Incorporated



Example

- Dual wheel casters exhibit better load bearing and swiveling than single wheel.



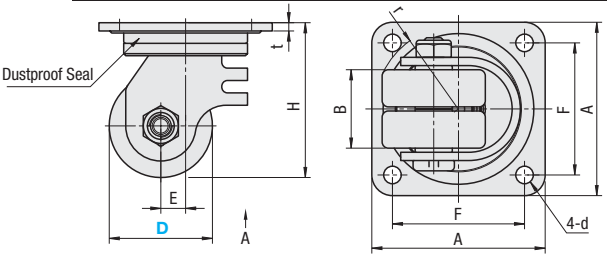
Body Type	Part Number Type	Part Number No.	Wheel Material	H	D_1	B	A	F	d	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel Type	CWMJ	50	N(MC Nylon)	75	42	38	84	64	8.5	3.2	12	49	4000	812	
		65		93	57	48	100	78	10.5	4.5	14	57	5000	1530	
		75		102	65								6000	1620	

■Heavy Load -Stainless Steel- RoHS

CWG



Body		Wheel	Seal	Bearings	
M Material	S Surface Treatment	M Material (Color)	M Material	Swiveling	Wheel
1.4301/ X5CrNi18-10	-	Monomer Casting Nylon (Blue) Conductive MC Nylon (Black)	Polyacetal	Incorporated	Incorporated



Body Type	Part Number Type	Part Number D	Wheel Material	H	B	A	F	d	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price Monomer Casting Nylon	€ Unit Price Conductive MC Nylon
Swivel Type	CWG	50	N(Monomer Casting Nylon) D(Conductive MC Nylon)	75	38	84	64	8.5	4.0	12	43	4000	760		
		65		93		100	78	10.5		15	54	5000	1060		
		75		102							58	6000	1120		

Order Example

Part Number	-	Wheel Material
CWM-P38	-	N
CWMJ50	-	N
CWG50	-	D

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- CWG: 6 Days P.87
- CWM-P · CWMJ: 8 Days

Casters with Level Adjusters

-Lightweight · Antivibration Type-

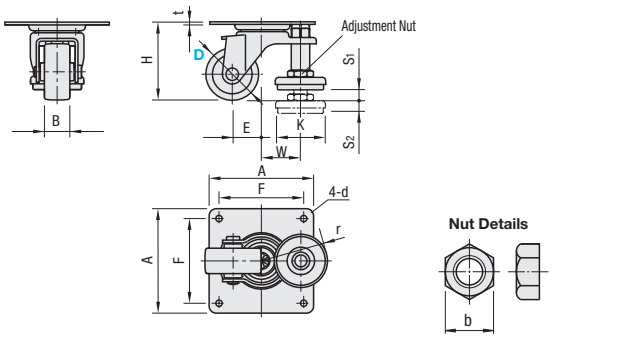
Load Rating 300~981N With Adjuster

CAD Data

-Ultra Light Load Type-



CMAZ



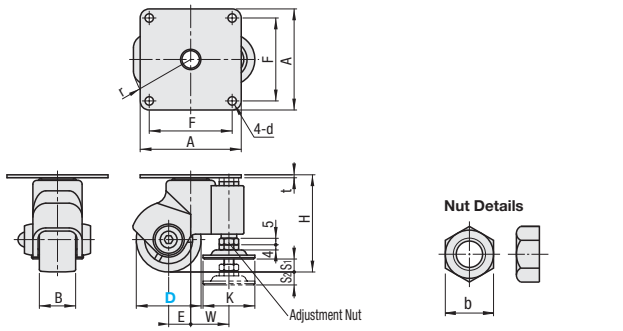
Body		Wheel	Adjuster		Bearings	
M Material	S Surface Treatment	M Material	M Material	S Surface Treatment	Swiveling	Wheel
1.0320/St.22	Trivalent Chromate	Nylon (Black)	1.0038/S235JR	Trivalent Chromate	Incorporated	None

Body Type	Part Number Type	D	Wheel Material	H	A	F	d	t	r	B	E	Adjustment Pad S1	S2	K	W	b	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel	CMAZ	40	N (Nylon)	60	78	64	6.5	2	49	21	20	9	9.5	37	30	17	300	295	
		50		65													400	310	

-Lightweight Type- RoHS



CMJZ



Body	Wheel	Top Plate		Adjuster		Bearings	
M Material	M Material	M Material	S Surface Treatment	M Material	S Surface Treatment	Swiveling	Wheel
Reinforced Nylon	Nylon	1.0320/St.22	Trivalent Chromate	1.0038/S235JR	Trivalent Chromate	Incorporated	None

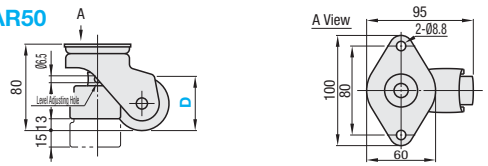
Body Type	Part Number Type	D	Wheel Material	H	B	A	F	d	t	E	r	Adjustment Pad S1	S2	K	W	B	Allowable Load (N)	Mass (g)	€ Unit Price
Swivel	CMJZ	50	N (Nylon)	75	28	78	64	6.5	2.6	17	50	10	10	40	29.5	17	600	420	
		65		93	25	92	75	8.5		27	66		20		31	19	700	550	
		75		98								15	15					560	

-Antivibration Type-

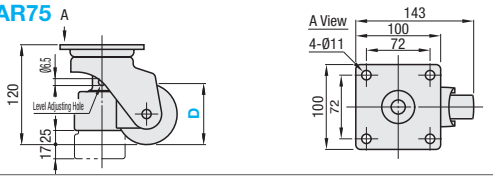


Type	Body M Material	Body S Surface Treatment	Wheel M Material	Adjuster M Material	Bearings
CLAR	1.0320/St.22	Zinc Plating	Nylon 6	Oil Resistant Rubber	None

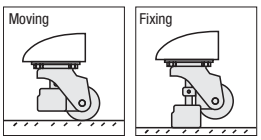
CLAR50



CLAR75



How to Use



To Mobilize: Insert a screwdriver into level adjusting hole and turn counterclockwise.

To Immobilize: Insert a screwdriver into level adjusting hole and turn clockwise.

Level Adjustment: Adjustable within ranges of: 15mm for CLAR50, and 17mm for CLAR75.

Kgf (Load)=Nx0.101972

Part Number Type	D	Allowable Load N	€ Unit Price
CLAR	50	588	
	75	981	

Order Example: Part Number CMAZ40 / CMJZ65 / CLAR50 - Wheel Material N / N

Days to Ship: CMAZ 6 Days P.87 | CMJZ · CLAR 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters with Level Adjusters

-Space Saving · Light Load Type-

Load Rating 1000~2100N With Adjuster

CAD Data

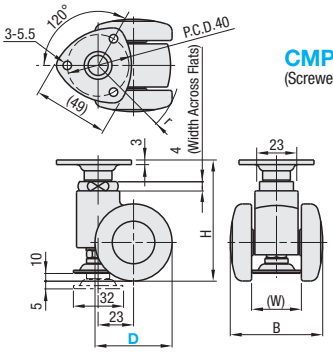
-Space Saving Type- RoHS



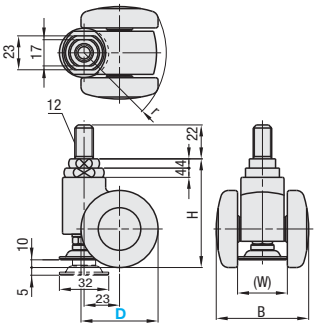
Type	Body	Wheel	Adjuster	
	M Material	M Material	M Material	S Surface Treatment
CMPAD CMPAN	Nylon	Nylon	1.0038/S235JR	Trivalent Chromate

(1) Tighten t1 nut to lock the main body thread.
(2) The t2 nut can be used to adjust the height of the pad.

CMPAD
(Plate Fixed Type)



CMPAN
(Screwed-on Type)



Body	Part Number		Wheel Material	H	B	(W)	(r)	Allowable Load (N)	Mass (g)	€ Unit Price
	Type	D								
Swivel	CMPAD	50	N (Nylon)	83	62	34	54	1000	270	
		60		88	69	37	61		290	

Body	Part Number		Wheel Material	H	B	(W)	(r)	Allowable Load (N)	Mass (g)	€ Unit Price
	Type	D								
Swivel + Screwed-on	CMPAN	50	N (Nylon)	76	62	34	54	1000	240	
		60		81	69	37	61		250	

-Light Load Type- RoHS



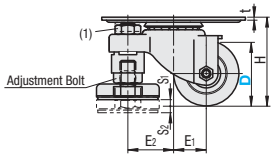
Type	Body		Wheel	Adjuster	Bearings	
	M Material	S Surface Treatment	M Material	M Material	Swiveling	Wheel
CMAF	1.0320/St.22	Black Chromate	Phenol	Neoprene Rubber	Incorporated	Incorporated

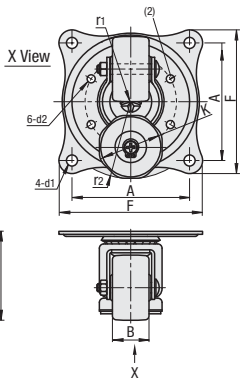
How to fix casters from swiveling
(1) Turn the nut marked (1) UP until it contacts the upper plate.
(2) After step (1), the caster can be fixed from rotating by pinning from the upper side of the plate.

Installation Method
(1) Lower the adjusting bolt to a desired height.
(2) Turn the nut (1) UP and fix a location.
(Recommended Pin Diameter)

D50 Ø6 Full Length 20
65 Ø8 Full Length 25
75 Ø8 Full Length 35

The pin is not included.





Part Number		Wheel Material	B	H	F	A	K	S1	S2	d1	d2	t	E1	E2	r1	r2	Allowable Load (N)	€ Unit Price
Type	D																	
CMAF	50	F (Phenol)	28	68	110	90	50	5	5	8.5	6.2	2.3	25	35	53	61	1500	
	65		36	92	144	125		10	10	10.5	8.2	3.2	25	49	61	75	2000	
	75			106									28		69		2100	

Order Example

Part Number	-	Wheel Material
CMPAD50	-	N
CMAF65	-	F

Days to Ship

CMAF · CMPAN: 6 Days P.87

CMPAD: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters with Level Adjusters

-Medium Load · Integrated Heavy Load Type-

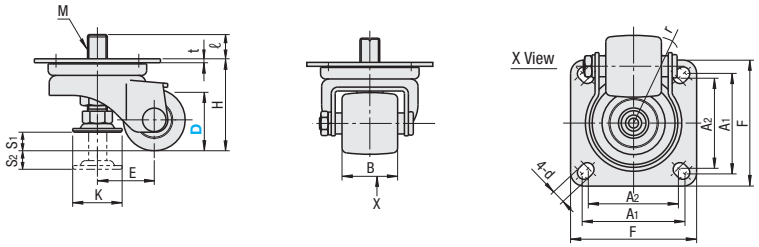
Load Rating 2500~4000N With Adjuster

CAD Data

-Medium Load Type- RoHS



Type	Body		Wheel	Adjuster		Bearings	
	M Material	S Surface Treatment	M Material	M Material	S Surface Treatment	Swiveling	Wheel
CMAS	1.0330/DC01	Trivalent Chromate	Reinforced Nylon	1.0038/S235JR	Trivalent Chromate	Incorporated	Incorporated

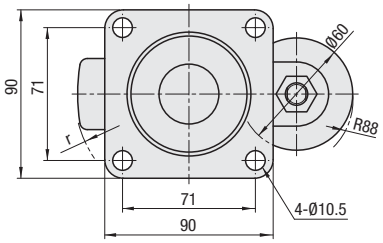


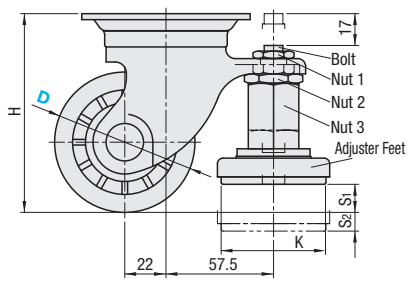
Part Number		Wheel Material	H	F	A1	A2	K	S1	S2	M	ℓ	d	t	B	E	r	Allowable Load (N)	€ Unit Price
Type	D																	
CMAS	50	F (Reinforced Nylon)	74	102	80	75	40	15	15	16	19.6	11	3.2	45	46	70	2500	
	65		95								18.8				51	82		

-Integrated Heavy Load Type- RoHS

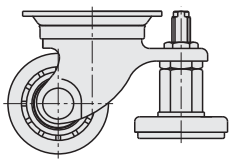


Type	Body		Wheel	Adjuster	Bearings (Caster)
	M Material	S Surface Treatment	M Material	M Material	
CGAN	1.0330/DC01	Trivalent Chromate	Special Reinforced Plastic MC Nylon * Conductive MC Nylon	Body: 1.0038/S235JR Rubber: Neoprene Rubber	Incorporated

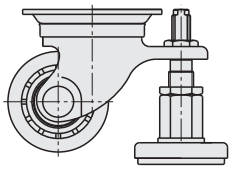




<Adjuster Fixing Process>



1. Raise the bolt until contacts the bottom of the equipment body, while the nut 3 being held.
2. Fix the bolt with nut 1.



3. Adjust the height of adjuster foot with nut 3.
4. Secure the adjuster foot with nut 2.

The integrated structure of caster and adjuster provides excellent durability.

Part Number		Wheel Material	H	S1	S2	K	r	Allowable Load N	€ Unit Price		
Type	D								P	M	D
CGAN	65	P (Reinforced Plastic) M (MC Nylon) d (Conductive MC Nylon)	92	10	8	56	56	3000			
	75		106	15	10		61	4000			

* Specific Volume Resistivity of Conductive MC Nylon 10^2 ~ $10^4\Omega$ · cm or less

Order Example

Part Number	-	Wheel Material
CMAS65	-	F
CGAN75	-	P

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

-CMAS 6 Days P.87

- CGAN 8 Days

Casters with Level Adjusters

-Heavy Load Type · Large Diameter Wheel Type-

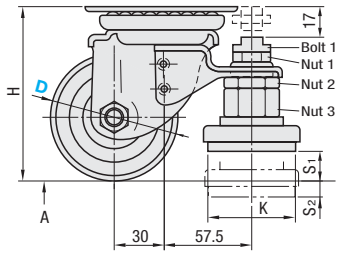
Load Rating 2942~3923N With Adjuster

CAD Data

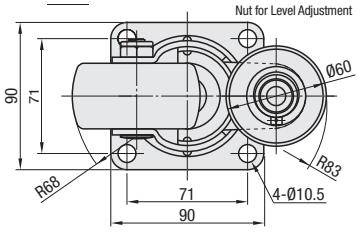
-Heavy Load Type- RoHS



Type	Body		Wheel	Adjuster	Bearings (Caster)
	M Material	S Surface Treatment	M Material	M Material	
CLAN	1.0330/DC01	Trivalent Chromate	Special Reinforced Plastic	Neoprene Rubber	Incorporated
CLAM			MC Nylon		



A View



<Adjuster Fixing Process>

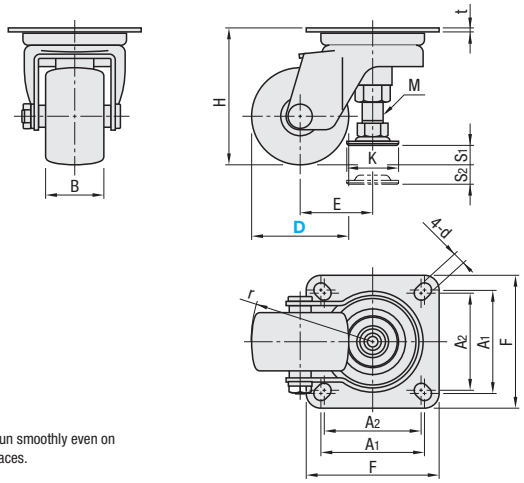
- Bolt 1:
Raise the bolt until lightly contacts the bottom of the equipment body.
- Nut 1:
Nut for Fixing the Bolt 1
- Nut 2:
Nut for Fixing the Adjuster Feet
- Nut 3:
Nut for Level Adjustment

Part Number Type	D	H	S1	S2	K	Allowable Load N	€ Unit Price CLAN	€ Unit Price CLAM
CLAN CLAM	65	92	10	8	56	2942		
	75	106	15	10		3923		

-Large Diameter Wheel- RoHS



Type	Body		Wheel	Adjuster		Bearings	
	M Material	S Surface Treatment	M Material	M Material	S Surface Treatment	Swiveling	Wheel
CDAN	1.0330/DC01	Trivalent Chromate	MC Nylon	1.0038/S235JR	Trivalent Chromate	Incorporated	Incorporated



Larger diameter wheels run smoothly even on gratings and uneven surfaces.

Part Number Type	D	Wheel Material	H	F	A1	A2	K	S1	S2	M	d	t	B	E	r	Allowable Load (N)	€ Unit Price
CDAN	75	M (MC Nylon)	120	140	115	105	40	15	15	16	11.5	4.5	45	56	95	3000	
	100		145											65	116		

Order Example

Part Number	-	Wheel Material
CLAN65 CDAN75	-	M

Days to Ship 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Price List	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Casters & Adjustment Pads Assembly

-Mounting Hole Configurable Type-

Load Rating 588~4902N With Adjuster

CAD Data



RoHS

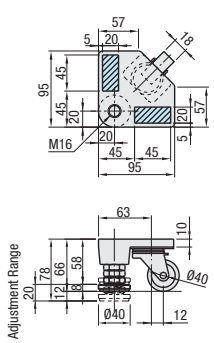
Part No.	Wheel
Type	Material (Color)
HCFTF	Nylon (Gray)
HCFTFM	MC Nylon (Blue)
HCFTFD	Conductive MC Nylon (Black)

** HCFTF500 is phenol (black).
** HCFTFD250 and 350 is gray.

No.	Body		Jack Bolt		Pad
	Material	Surface Treatment	Material	Surface Treatment	Material
60 130	EN AC-46100/ G-AlSi12Cu	Black Paint	1.0038/ S235JR	Trivalent Chromate	EPDM
250 350	1.0330/DC01	Trivalent Chromate (Black)			
500	EN-JS 1040/EN-GJS400	Black Paint			

* Pad is not included with No.500 type.

No.60



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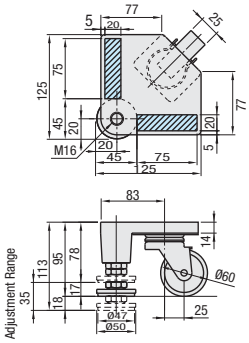

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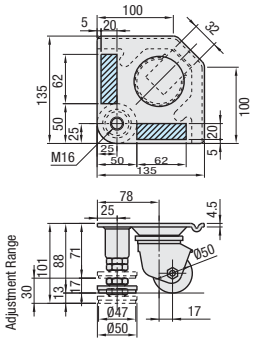

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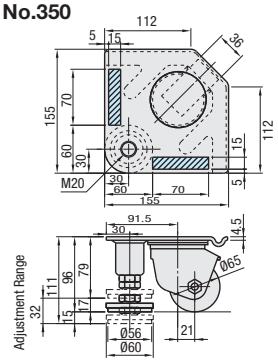
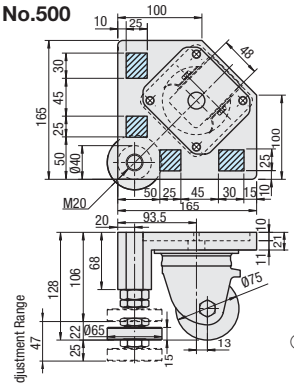


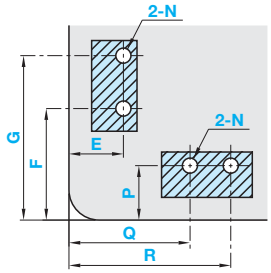
No.500



Top plates for products with conductive MC nylon wheels are made of aluminum alloy.

(1) Section…2 mounting hole drilling locations (Only No.500 has one mounting hole)

(2) Drilling Specifying Method



Specify within



Hole Type	Through Hole				
Code	N				
Shape					
Machining Specification	Dim.	Nominal Diameter			
	N	5	6	8	10
	d	6	7	9	11

Part Number		N (Nominal Ø)	Drilling Position 1mm Increment		Allowable Load		Mass
Type	No.	Selection	E · P	F · G · Q · R	kgf	N	(g)
HCFTF	60	5 6	(5+N/2) ~ (25-N/2)	(45+N/2) ~ (90-N/2)	60	588	600
HCFTF HCFTFM HCFTFD	130	6 8 10		(45+N/2) ~ (120-N/2)	130	1275	1100
HCFTF HCFTFM	250			(50+N/2) ~ (112-N/2)	250	2451	1445
HCFTFD	350		(5+N/2) ~ (20-N/2)	(60+N/2) ~ (130-N/2)	350	3432	2170
HCFTF HCFTFM HCFTFD	500	8 10	(10+N/2) ~ (35-N/2)	(50+N/1) ~ (75-N/1) (120+N/1) ~ (150-N/1)	500	4902	5600

Order Example

Part Number	-	N	-	E	-	F	-	G	-	P	-	Q	-	R
HCFTF130	-	6	-	E18	-	F55	-	G80	-	P20	-	Q55	-	R70

Days to Ship: 8 Days

Price

No.	HCFTF		HCFTFM		HCFTFD	
	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
	Qty. 1 ~ 9	10~20	Qty. 1 ~ 9	10~20	Qty. 1 ~ 9	10~20
60						
130						
250						
350						
500						

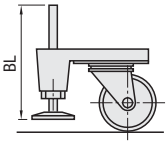
For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	N	-	E	-	F	-	G	-	P	-	Q	-	R	-	(BL)
HCFTF130	-	6	-	E18	-	F55	-	G80	-	P20	-	Q80	-	R70	-	BL150

Alterations	Adjustment Pad Height									
Code	BL100					BL150				
Specification	Type	No.	Height from Floor Standard	Height from Floor After Change	Price Adder	Type	No.	Height from Floor Standard	Height from Floor After Change	Price Adder
	HCFTF	60	78	132		HCFTF	60	78	178	
		130	113	152			130	113	200	
	HCFTFM	250	101	145		HCFTFM	250	101	191	
	HCFTFD	350	111	150		HCFTFD	350	111	200	
		500	-	-			500	150	210	

*The height from the floor can be increased by using a taller adjusting pad. However, the adjustment pad will protrude from the plate surface.



Casters with Integrated Plate and Adjustment Pads

Load Rating 1500~3600N With Adjuster

CAD Data

-Wheel Material Selectable-

CAZL

RoHS



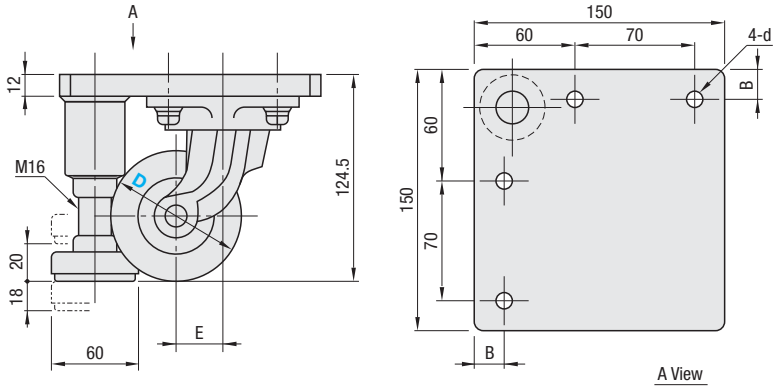
Wheel material is selectable.

-MC Nylon Wheel Type-

CAL75



Type	Body	Wheel	Plate		Adjustment Pads
	M Material	M Material	M Material	S Surface Treatment	M Material
CAZL	EN-GJS/GGG	Rubber Urethane FCD	EN-GJS/GGG	Baked Finish (Black)	1.0038/S235JR Rubber: Neoprene Rubber
CAL75		MC Nylon		Coating (Green)	



■Wheel Material Selectable Type

Part Number		Wheel Material	E	B	d	Allowable Load N				€ Unit Price			
Type	D					R (Rubber)	U (Urethane)	M (MC Nylon)	Z (Casting)	R (Rubber)	U (Urethane)	M (MC Nylon)	Z (Casting)
CAZL	75	R (Rubber) U (Urethane) M (MC Nylon) Z (Casting)	25	20	9	1500	2500	3000	3600				

■MC Nylon Wheel Type

Part Number	D	E	B	d	Allowable Load N	€ Unit Price
CAL75	75	26	20	9	3528	

Order Example

Part Number	-	Wheel Material
CAZL75 CAL75	-	R

Price

■Volume Discount (Round down to one Cent.) P.87

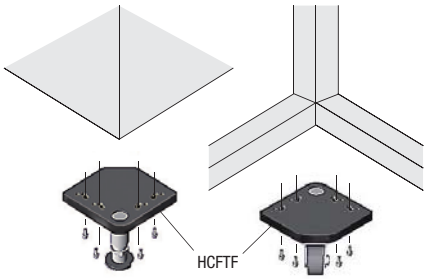
Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

8 Days

Example

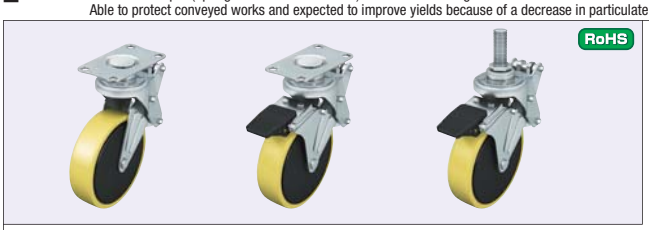


Specify mounting hole positions in accordance with frame sizes. For Aluminum Frame Type, please see P.703

Vibration Insulating Casters

CAD Data

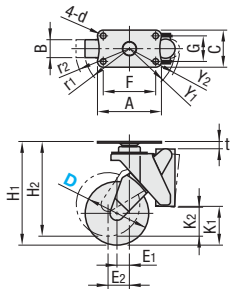
Features: Vibration Damper (Spring with Built-in Urethane) absorbs vibration generated when the caster is traveling over steps and grating surfaces.
Able to protect conveyed works and expected to improve yields because of a decrease in particulate generation volume in a clean room.



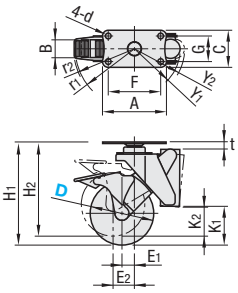
RoHS

Body		Wheel		Bearings	
M Material	S Surface Treatment	M Material	Specific Volume Resistivity	Swiveling	Wheel
1.4301/ X5CrNi18-10	Barrel Grinding (p.1581)	Antistatic Urethane	10^8~$10^9\Omega \cdot cm$	Incorporated	Incorporated

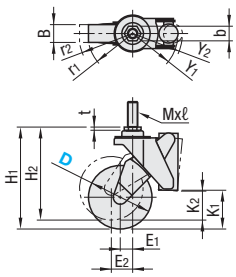
CMPR
(Plate Type)



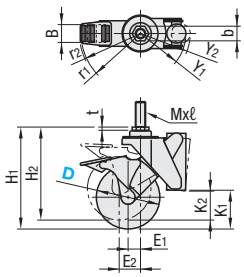
CMPRS
(Plate Type)



CMPG
(Screw-in Type)



CMPGS
(Screw-in Type)



Body Type	Part Number Type	Part Number D	Wheel Material	H Stroke H1 (max.)	H Stroke H2 (min)	A	C	F	G	d	E_1	E_2	r_1	r_2	Y_1	Y_2	K_1	K_2	B	t	*Nominal Load (N)	Mass (g)	€ Unit Price Qty. 1~19	Volume Discount 20~49
Swivel	CMPR	100	S (Antistatic Urethane)	162	148	100	58	82	40	8.8	20	34	71	85	71	78	61	46	28	2.5	300	1100		
		125		180	166						25	39	89	103	77	83	77	62	32			1258		
Swivel + with Stopper	CMPRS	100		162	148	100	58	82	40	8.8	20	34	95	94	71	78	61	46	28	2.5	300	1212		
		125		180	166						25	39	110	110	77	83	77	62	32			1381		

* Nominal Load should be selected within the range of the applicable load (carriages + Load) appropriate to the allowable load ratings. For use of 4 pcs.: Applicable Load = Nominal Load x 4 pcs. x Safety Ratio (0.5 ~ 1.0)

Body Type	Part Number Type	Part Number D	Wheel Material	H Stroke H1 (max.)	H Stroke H2 (min)	Mounting screws M (Coarse)	ℓ	B	E_1	E_2	r_1	r_2	Y_1	Y_2	K_1	K_2	B	t	*Nominal Load (N)	Mass (g)	€ Unit Price Qty. 1~19	Volume Discount 20~49
Swivel Screw Fitting	CMPG	100	S (Antistatic Urethane)	160	146	16	40	23	20	34	71	85	71	78	61	46	28	5	300	1062		
		125		178	164				25	39	89	103	77	83	77	62	32			1218		
Swivel Screwed Fitting + With Stopper	CMPGS	100		160	146	16	40	23	20	34	95	94	71	78	61	46	28	5	300	1174		
		125		178	164				25	39	110	110	77	83	77	62	32			1341		

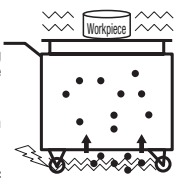
For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number CMPR100 - Wheel Material S

Days to Ship: 8 Days

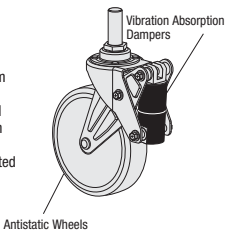
Yield problems expected with the conventional wheels

(1) Particulate generation of a conveyor machine due to vibration transmission
When work is being conveyed into a clean room, casters are travelling over steps or grating surfaces and vibrations from the floor are transmitted to the cart. Vibrations not only cause dusts from the casters and the cart but possibly transmitting impacts on important work.
(2) Particles generated due to vibrations
Vibrations by casters traveling lift dusts around the floor surface and down flow air system may not be able to control the particle amounts.
(3) Anti-static Countermeasures
Dusts adhering to the rubber / urethane wheels of conventional casters, which accumulates static electricity generated by friction between wheels and the floor and may cause a spark discharge.



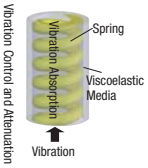
Feature of Vibration Dampers

-Protects transported equipment by absorbing and damping vibrations from the floor .
-Controls particulate generation caused by vibrations, and improves production yields.
-Prevents static electricity from generated by the floor with antistatic wheels.



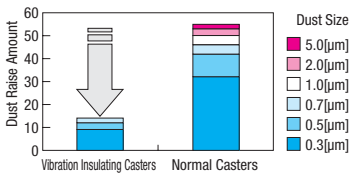
Basic Structure of Vibration Damper

The damper is of a double layer structure of a spring within a viscoelastic member. Shocks received by the caster while going over stepped terrain are absorbed by the spring, then dampened by the viscoelastic member.
New mechanism provides solutions for conventional spring-loaded casters with insufficient vibration damping, and urethane type with degradation-inducing durability losses. Also excellent in safety with no damping gas leaks.



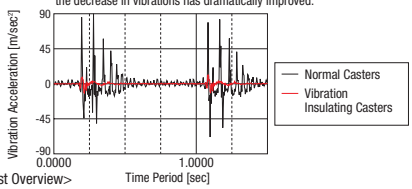
Particulate Generation Comparison

Particle volume is reduced to one-fourth1/4.



Effect of Vibration Absorption

Compared with normal casters, the decrease in vibrations has dramatically improved.



<Test Overview>

Casters	CMPG100-S (Vibrations Insulating Caster) Urethane Wheel Diameter Ø100 (Normal Casters)
Testing Instrument	JIS B 8923 Compliant with Casters for Industrial Use
Protrusion	Semicircle R = 2.5mm
Protrusion Intervals	per 1m
Load	201N
Running Speed	4km/h

Specific Volume Resistivity of Wheels

10^0	10^2	10^4	10^6	10^8	10^{10}	10^{12}	10^{14}
			Antistatic Urethane 10^8~$10^9\Omega$•cm				
Electric Conductivity			Antistatic Performance			Insulation	

Rubber Wheel $10^{15}\sim \Omega$•cm

Functional Comparison by Damper Type

(Research by MISUMI)

Damper Type	Shock Absorption	Vibration Transmission Time	Allowable Load	Safety	Service Life
No Damper (Normal Caster)	X	X	◎	○	○
Spring	○	X	Δ	○	Δ
Urethane Cushioned	○	Δ	Δ	Δ	X
Shock Absorber	○	○	Δ	X	Δ
* Vibration Dampers	○	◎	○	○	○

Casters for Clean Environment

Load Rating 800~1000N
Vibration Damping

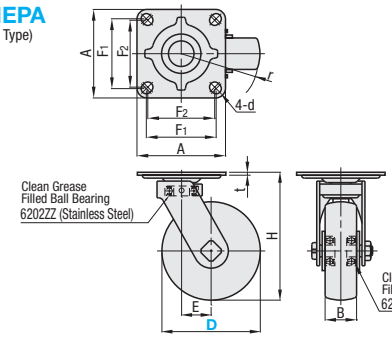
CAD Data



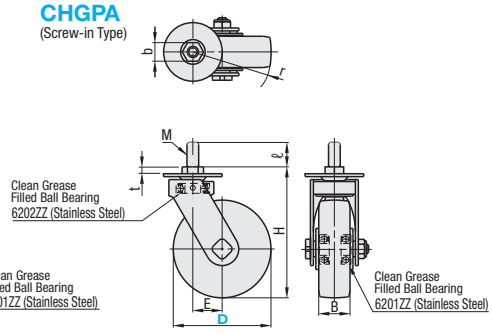
RoHS

Body		Wheel		Bearing Shield	Bearings	
M Material	S Surface Treatment	M Material (Color)	Specific Volume Resistivity	M Material	Swiveling	Wheel
1.4301/ X5CrNi18-10	Electrolityc Polishing	Urethane (Blue) Antistatic Urethane (Yellow) Conductive MC Nylon (Black)	1010 or More 107~109 102~104	Stainless Steel (Austenite)	Incorporated	Incorporated

CHEPA
(Plate Type)



CHGPA
(Screw-in Type)



Body Type	Part Number Type	Part Number D	Wheel Material	H	B	A	F1	F2	d	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price U	€ Unit Price S	€ Unit Price D
Swivel	CHEPA	75	U (Urethane) S (Antistatic Urethane) d (Conductive MC Nylon)	118	38	90	71	68	10.5	3	30	70	1000	1200			
		100		130	32							83		1350			

Body Type	Part Number Type	Part Number D	Wheel Material	H	B	Mounting screws M (Coarse)	Mounting screws ℓ	Mounting screws B	t	E	r	Allowable Load (N)	Mass (g)	€ Unit Price U	€ Unit Price S	€ Unit Price D
Swivel + Screw Fitting	CHGPA	75	U (Urethane) S (Antistatic Urethane) d (Conductive MC Nylon)	122	38	12	25	19	7	30	70	800	1100			
		100		134	32						83		1250			

For orders larger than indicated quantity, please request a quotation.

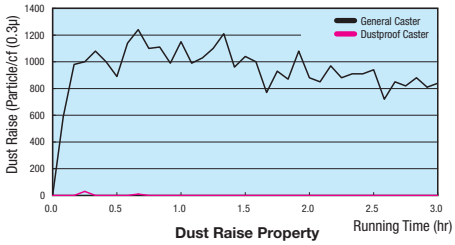
Order Example: Part Number CHEPA75 - Wheel Material U

Days to Ship: 8 Days

Antistatic Urethane (OCTRON) Wheel Properties

- Because of the antistatic effect, sparks and high-frequency noises are prevented.
- Conventional anti-static caster wheels may exhibit varying electrical resistivity depending on measured location on wheels, but the OCTRON urethane wheels have uniform resistivity regardless of the measured location, being effective in a wide voltage range.
- Due to lower hardness than ordinary urethane wheels (shore A67), vibration and noise on grating floor decreases.
- Because carbon black is not used, there is no contamination to the floor or dispersion of carbon to products.

Particle Generation Comparison (0.3 μm or more)



Dust Raise Property

Grease Performance Table

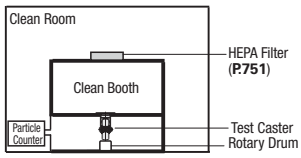
	Item	Conditions	Unit	Measurement Method	Low Particulate Generation Type G Type
Grease Performance	Thickener	-	-	-	Lithium Type
	Base Oil	-	-	-	Mineral Oil + Synthetic Hydrocarbon Oil
	Base Oil Kinetic Viscosity	40°C	mm²/s	JIS K2220 5.19	30
		100°C			-
	Worked Penetration	-	-	JIS K2220 5.3	207
	Dropping Point	-	°C	JIS K2220 5.4	200
	Evaporation Amount	99°Cx22hr	wt%	-	1.40%
	Oil Separation	100°Cx24hr	wt%	JIS K2220 514	0.8%
	Operation Temperature	In Air	°C	-	-10~80

Product Name:LG2 (made by NSK) with less particle generation is suitable for clean environments. Also, excellent in corrosion resistance.

‹Evaluation Test Outline›

<Evaluation Conditions>

Casters	CMGN75-R (General Caster + Rubber Wheel Type) CHEPA75-S (Clean Caster + Antistatic Wheel Type)
Running Time	2km/hr
Ambience	Inside Clean Booths (Class10)
Temperature	23°C
Humidity	40%
Particle Counter	Made by Rion Co. Ltd. 237B (Laser Type)



Cast Frame Casters

-Standard Type · Trailer Use Type-

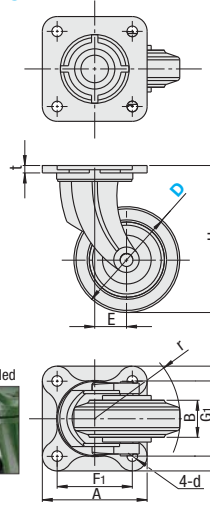
Load Rating 700~8300N
Cast Frame

CAD Data

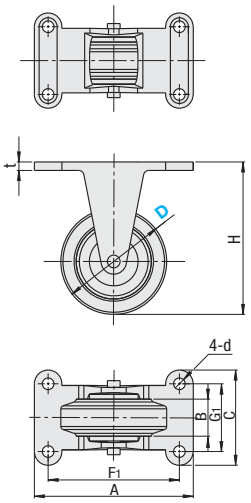


RoHS

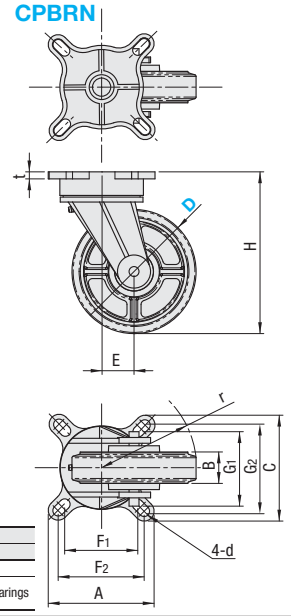
Swivel Type
CPBR-CPBR-B



Fixed Type
CPBK-CPBK-B



Trailer Use Type
CPBRN



CPBRN Only
Grease nippled



Type	Body	Wheel	Bearings	
	Material	Material (Color)	Swiveling	Wheel
CPBR · CPBK	EN-JS 1040/ (Coating)	Synthetic Rubber (Black) Urethane (Red) Iron: EN-JS 1040 (Green)	With Ball Bearings	None
CPBR-B / CPBK-B	EN-GJS400		With Ball Bearings	With Radial Bearings
CPBRN			Thrust and Radial Bearing	

Body Type	Part Number Type	D	Wheel Material	B (Wheel Width) R · Z (Rubber) · (Casting)	B (Wheel Width) U (Urethane)	H	A	C	F1	F2	G1	G2	d	t	E	r	Allowable Load (N) Rubber	Urethane	Casting	Mass (g) Rubber	Urethane	Casting
Swivel Type	CPBR (Without Bearing) CPBR-B (With Bearing)	75	R (Rubber) U (Urethane) Z (Casting)	32	30	112.5	91	91	65		65		11	7	25	70	700	1400	1400	1150	1300	1350
		100		35	33	144	99	99	71		71				30	85	1000	2100	1900	1650	1750	1850
		125		38	36	175	110	110	80		80			8	35	105	1500	2800	2800	2950	3050	3250
		150		40	38	198	120	120	90	-	90	-			40	120	1800	3500	3500	3650	3750	4050
		200		44	42	250	148	148	112		112		14	10	50	155	2200	4900	4900	5300	5700	6200
		250		48	46	300	180	180	140		140			12	60	190	3000	6500	6500	8600	10100	10300
		300		50	48	350	204	204	160		160				65	220	3500	8300	8300	11600	13000	13000
Fixed Type	CPBK (Without Bearing) CPBK-B (With Bearing)	75		32	30	112.5	95	57	75		-		11	8			700	1400	1400	850	1000	1050
		100		35	33	144	105	70	80		45						1000	2100	1900	1450	1550	1650
		125		38	36	175	125	81	100		56						1500	2800	2800	2300	2400	2600
		150		40	38	198	130	86		-		-			-	-	1800	3500	3500	2900	3000	3300
		200		44	42	250	142	93	112		63		14	9			2200	4900	4900	4100	4500	5000
		250		48	46	300	190	88	160		60			10			3000	6500	6500	5700	7200	7400
		300		50	48	350	206	92	175								3500	8300	8300	7500	9800	8900
Trailer Use/ Swivel Type	CPBRN (With Thrust Bearing)	100		35	33	140	112	112	71	90	71	90	10	8	35	85	1000	2100	1900	2280	2650	2750
		150		40	38	195	129	129	90	105	90	105	12		45	120	1800	3500	3500	4290	4900	5400
		200		44	42	250	146	146	112	120	112	120		9	55	155	2200	4900	4900	6510	7300	7800
		250		48	46	300	176	176	134	144	134	144	15	10	65	190	3000	6500	6500	11000	12300	12400

Order Example

Part Number	-	Wheel Material
CPBR100	-	R
CPBK-B150	-	Z

Days to Ship: **8 Days**

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

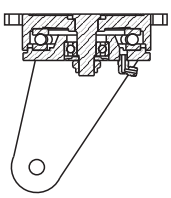
Rotational torque

D	Rotational Torque(N) CPBR (Standard Type)	Rotational Torque(N) CPBRN (Trailer Use Type)	Test Load (N)
100	186	146	1000
150	318	212	1800
200	329	228	2200
250	554	422	3000

Above values are for reference only.



<Test Overview>



<Structure of thrust bearing>

As opposed to the standard casters with a simplified structure with ball bearings in grooves, the Trailer Use Type has preloading thrust bearings for better swiveling characteristics, and can be towed by powered tractor devices.

Part Number Type	D	Standard € Unit Price CPBR · CPBK Without Bearing R (Rubber)	U (Urethane)	Z (Casting)	CPBR-B · CPBK-B With Bearing R (Rubber)	U (Urethane)	Z (Casting)	CPBRN With Bearing R (Rubber)	U (Urethane)	Z (Casting)
CPBR (Without Bearing) CPBR-B (With Bearing) CPBRN (Trailer Use Type)	75									
	100									
	125									
	150									
	200									
	250									
	300									
CPBK (Without Bearing) CPBK-B (With Bearing)	75									
	100									
	125									
	150									
	200									
	250									
	300									

Features

- Compared with iron casters, excellent in durability, and can be used to move heavy objects in severe conditions.

Operating Environment

- Washing with water or soaking in seawater may result in oxidation and corrosion.
- Exposure to acid, salt, alkali and other chemicals or oil may cause deterioration.
- Please use within the temperature range of -5 ~ 60°C.

Caution

- The maximum load cannot be sustained if the road surface is severely uneven.
- Avoid traction by motor power (except for Trailer Use Type).
- The caster should be fastened firmly to prevent rattling.
  Ex.) When thread diameter is M12, the proper torque is 220 ~ 500Kgf/cm.
- Load must be applied vertical to the caster.

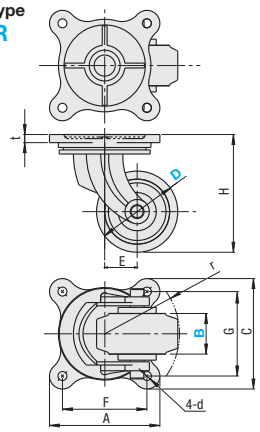
Cast Frame Casters
-Heavy Load Type-

Load Rating 1400~15000N Cast Frame

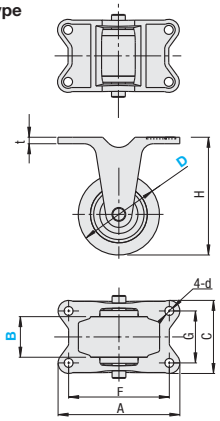
CAD Data



Swivel Type
CSTBR



Fixed Type
CSTK



Type	Body	Wheel	Bearings	
	Material	Material (Color)	Swiveling	Wheel
CSTBR · CSTK	EN-JS 1040/EN-GJS400 (Coating)	Synthetic Rubber (Black) · Urethane (Red) · Iron: EN-JS 1040 (Green)	With Ball Bearings	With Radial Bearings

Swivel Type

Part Number Type	D	Wheel Material	B (Wheel Width) R (Rubber)	U (Urethane)	Z (Casting)	H	A	C	F	G	d	t	E	r	Mass (g) Rubber	Urethane	Casting
CSTBR	100	R (Rubber) U (Urethane) Z (Casting)	50 65	50	-	145	136	136	104	104	11	10	40	94	4400	3950	-
	125				50 65	178	142	142	110	110			45	110	6300	6200	6850
	150		50 65 75	50 65 75	50 65 75	205	161	161	125	125	14	11	50	129	7400	7550	8900
	200		50 65 75 90	50 65 75 90	75	260	172	172	136	136			60	164	11800	15100	-
	250		65 75 90	65 75 90	65 75	315	195	195	155	155	15	13	65	194	17050	17850	-
	300		75 90 100	75 90 100	75	365 (**360)	210 (*212)	210 (*212)	170	170	16	14	75 (***70)	228	26500	29000	33900

(?)** When B (width of wheel) is 100, then 360. (?)*When B (width of wheel) is 100, then 212. (?)***When B (width of wheel) is 100, then 70.

Fixed Type

Part Number Type	D	Wheel Material	B (Wheel Width) R (Rubber)	U (Urethane)	Z (Casting)	H	Mounting Dimensions R (Rubber) A	C	F	G	U (Urethane) A	C	F	G	Z (Casting) A	C	F	G	d	t	Mass (g) Rubber	Urethane	Casting
CSTK	100	R (Rubber) U (Urethane) Z (Casting)	50	50	-	145	150	99	124	64	150	99	124	64	-	-	-	-	11	8	3450	2900	-
			65	-	-		150	103	125	78	-	-	-	-	-	-	-	-					
	125		50	50	50	178	166	90	140	64	166	90	140	64	166	90	140	64		9	4950	-	5500
			65	-	65		165	104	140	78	-	-	-	-	165	104	140	78					
	150		50	50	50	205	188	98	152	64	188	98	152	64	188	98	152	64	14	10	6300	6700	8150
			65	65	65		188	113	152	78	188	113	152	78	188	113	152	78					
			75	75	75		188	121	152	86	188	121	152	86	188	121	152	86					
	200		50	50	-	260	209	99	174	64	209	99	174	64	-	-	-	-			9050	12350	10300
			65	65	-		209	115	174	78	209	115	174	78	-	-	-	-					
			75	75	75		209	120	174	86	209	120	174	86	209	120	174	86					
			90	90	-		209	136	174	100	209	136	174	100	-	-	-	-					
	250		65	65	65	315	220	114	184	78	220	114	184	78	220	114	184	78	15	12	12300	13050	13750
			75	75	75		220	122	184	86	220	122	184	86	220	122	184	86					
			90	90	-		220	138	184	102	220	138	184	102	-	-	-	-					
	300		75	75	75	*365	230	123	194	86	230	123	194	86	230	123	194	86					
			90	90	-		230	138	194	102	230	138	194	102	-	-	-	-	16		21350	23850	16650
			100	100	-		232	192	192	151	232	192	192	151	-	-	-	-					

(?)* When B (width of wheel) is 100, then 360.

Order Example

Part Number		Wheel Material		Width
CSTBR125	-	R	-	50
CSTK200	-	U	--	75

Days to Ship: **8 Days**

Price

Volume Discount (?)Round down to one Cent.) P.87

Qty.	1~29	30~49	50~99
Rate	€ Unit Price	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

Body Type	Part Number Type	D	B	€ Unit Price R (Rubber)	U (Urethane)	Z (Casting)
Swivel Type	CSTBR	100	50			
			65			
		125	50			
			65			
		150	50			
			65			
			75			
		200	50			
			65			
			75			
			90			
		250	65			
			75			
			90			
		300	75			
			90			
			100			

Body Type	Part Number Type	D	B	€ Unit Price R (Rubber)	U (Urethane)	Z (Casting)
Fixed Type	CSTK	100	50			
			65			
		125	50			
			65			
		150	50			
			65			
			75			
		200	50			
			65			
			75			
			90			
		250	65			
			75			
			90			
		300	75			
			90			
			100			

Allowable Load

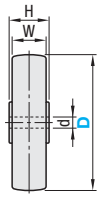
Part Number Type	D	Width B	Allowable Load (N) R (Rubber)	U (Urethane)	Z (Casting)
CSTBR (Swivel) CSTK (Fixed)	100	50	1400	3400	-
		65	1800	-	-
	125	50	1800	4000	4000
		65	2200	-	4700
	150	50	2000	4250	4250
		65	2500	5900	5900
		75	3100	7200	7200
	200	50	2700	6500	-
		65	3200	7200	-
		75	3800	8800	8800
		90	5000	10000	-
	250	65	4000	9000	9000
		75	4700	10500	10500
		90	5800	12500	-
	300	75	5400	12100	12100
		90	6200	13500	-
		100	9000	15000	-

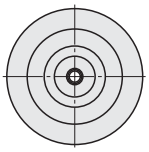
Replacement Wheels for Casters

CAD Data

GYUL







Material: Rubber (Black)

Integrated-bearing None

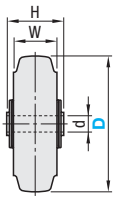
Part Number Type	D	d	H	W	Allowable Load (N)	Mass (g)	€ Unit Price 1~
GYUL	25	4.7	14	12	80	7	
	32	5.2	16	14	120	23	
	38	6.2	20	17	200	28	
	40	6.2	21	17	200	29	
	50	6.2	24	20	300	54	

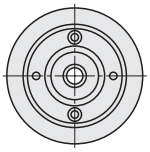
Order Example: Part Number GYUL38

Days to Ship: 6 Days P.87

GYUW







Material: Rubber

Integrated-bearing Incorporated

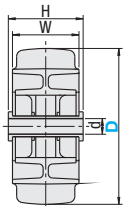
Part Number Type	D	d	H	W	Allowable Load (N)	Mass (g)	€ Unit Price
GYUW	130	12	56	40	1800	571	
	150				2000	749	
	150A	20			2000	890	

Order Example: Part Number GYUW150A

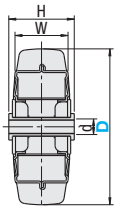
Days to Ship: 6 Days P.87



RMNA75 (Rubber Wheel)

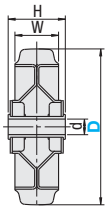


RMNA100 (Rubber Wheel)

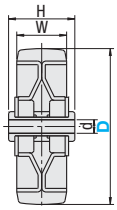


Material: Synthetic Rubber (Black)
With bearings

RMNA130 · 150 · 200 (Rubber Wheel)

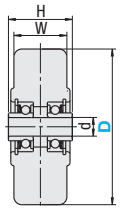


RNTB (Urethane Wheel)



Material: Urethane Rubber (Blue)
With bearings

RVA (Monomer Casting Nylon Wheel)



Material: Monomer Cast Nylon (Blue)
With bearings

Part Number Type	D	d	H	W	Allowable Load (N)	Mass (g)	Applicable Casters	€ Unit Price
RMNA (Rubber)	75	10	36	32	800	200	CMGJ CMGK CMGS (P.948)	
	100	12	42		1200	410		
	130	20	52	38	1800	750		
	150		55	42	2000	1000		
	200			45	2500	1750		
RNTB (Urethane)	75	10	35	32	1200	290		
	100	12	42		1700	590		
	130	20	52	38	2600	960		
	150		55	42	3000	1280		
	200				5000	2060		
RVA (Monomer Casting Nylon)	75*	10	35.6	32	3600	200		
	100	12	41	34	5200	480		
	130	20	52	42	8400	790		
	150		55	44	10000	1060		

Order Example: Part Number RNTB130

Days to Ship:
- RMNA: 6 Days P.87
- RNTB · RVA: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Monomer Casting Nylon
In comparison with conventional nylon etc., it is superior in molecular weight and crystallinity, and excels in mechanical properties, friction and chemical resistance.

Not compatible with Screw-in type casters (CMGN and CMGNS).
*: Only for RVA 75, collars (2 pieces) are included with the shaft part.

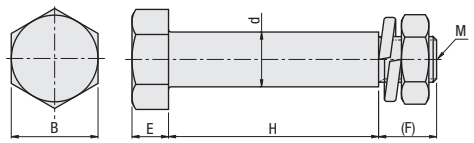
Wheel Shafts / Grooved Wheels / Caster Holders

CAD Data

Wheel Shafts RoHS

KCRB





Components	M Material	S Surface Treatment
Shaft	JIS SWCH	Trivalent Chromate
Nut (1 pc.)	JIS Class 3	
Spring Washer (1 pc.)	JIS B1251	

Part Number Type	No.	d	H	B	(F)	M	E	€ Unit Price
KCRB	75	10	38.3	17	10	8	7	
	100	12	46	19	12.7	10	8	
	130	20	55.9	30	19.3	14	13	
	150		60		17.3			

Order Example — Part Number: KCRB130

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

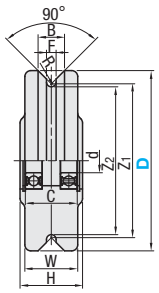
Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

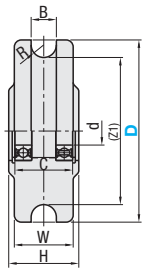
Grooved Wheels RoHS



V Groove Type RVAB



U Groove Type RVAU



* Bearing Accuracy JIS B 1514 0 Class
Bearings (2pcs.) are press-fit.

Type V Groove	Type U Groove	M Main Material	M Retaining Ring
RVAB	RVAU	MC Nylon	Spring Steel
		Conductive MC Nylon	

Groove Shape	Part Number Type	D	Wheel Material	d	R	Groove Depth Z1	Groove Depth Z2	F	H	W	B	C	Bearing (2 pcs.)	Allowable Load (N)	Mass (g)	€ Unit Price M(MC Nylon)	€ Unit Price D(Conductive MC Nylon)
V Groove	RVAB	75	M(MC Nylon) D(Conductive MC Nylon)	10	2.5	59	55	5	36	32	16	29.3	6200ZZ	3530	210		
		100		12		83	79		38	34	17	31	6201ZZ	5099	360		
		130		20	4	109	104	8	50	42	21	41.2	6004ZZ	8238	740		
		150				128	123		52	44	22	43.2	6204ZZ	9807	870		
U Groove	RVAU	75	M(MC Nylon) D(Conductive MC Nylon)	10	8	59	-	-	36	32	16	29.3	6200ZZ	3530	210		
		100		12	8.5	83	-	-	38	34	17	31	6201ZZ	5099	360		
		130		20	10.5	109	-	-	50	42	21	41.2	6004ZZ	8238	740		
		150			11	128	-	-	52	44	22	43.2	6204ZZ	9807	870		

Order Example — Part Number: RVAB75 - M

Days to Ship: 8 Days

Price

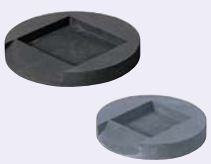
Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~49
Rate	€ Unit Price	5%

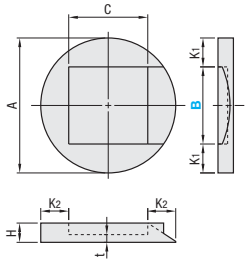
For orders larger than indicated quantity, please request a quotation.

MC nylon stands for Monomer Cast nylon MonoCast®. Monomer nylon MonoCast® is a registered trademark of Nippon Polypenco Ltd.

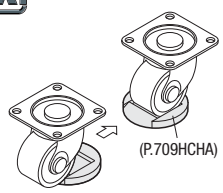
Caster Holders RoHS

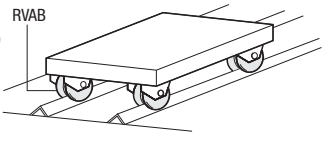


Type	M Material	H Hardness
CMHU	EPDM (Gray)	Shore A80
CMHD	Conductive Rubber (Black)	



Example





Roll casters up the slope of CMHU until stop position is reached.

Part Number Type	B	A	C	H	K1	K2	t	Allowable Load (N)	Applicable Caster Wheel Width (Reference)	Mass (g)	€ Unit Price CMHU	€ Unit Price CMHD
CMHU CMHD (Conductive Rubber)	30	60	33	10	15	13.5	4	8000	28	30		
	40	70	41			14.5			38	35		
	50	80	43			18.5			48	45		

Order Example — Part Number: CMHU50

Days to Ship: 6 Days P.87

Floor Stoppers

CAD Data

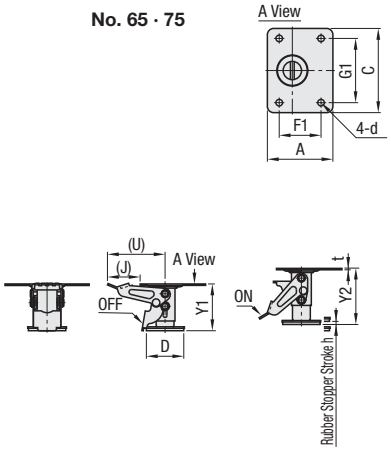
■Auxiliary parts used to stop carriage temporarily.

■Space Saving Type

RoHS



No. 65 · 75



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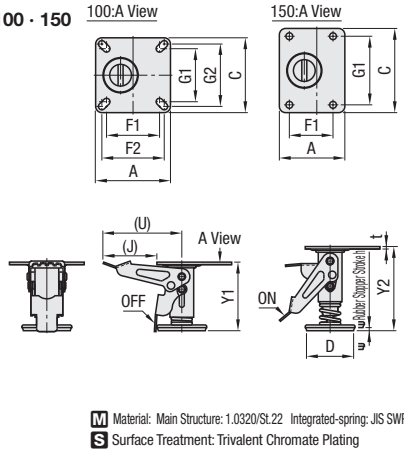


M Material: Main Structure: 1.0320/St.22 Integrated-spring: JIS SWP-A
S Surface Treatment: Trivalent Chromate Plating

Part Number Type	No.	Mounting Height	Stroke Y1 (min)	Stroke Y2 (max.)	D	Mounting Plate Dimensions A	C	F1	F2	G1	G2	d	t	h	(U)	(J)	Push Force N	Mass (kg)	€ Unit Price
FLOCK	65	85	75	90	60	105	135	67	-	103	-	10.5	2.3	5	93	53	200	0.7	
	75	90	80	95														0.8	
	100	130	115	135	75	120	120	85	100	85	100	11	4	10	127	87		1.2	
	150	160	145	165		105	135	70	-	110	-							1.3	

Order Example Part Number FLOCK100

Days to Ship 6 Days P.87

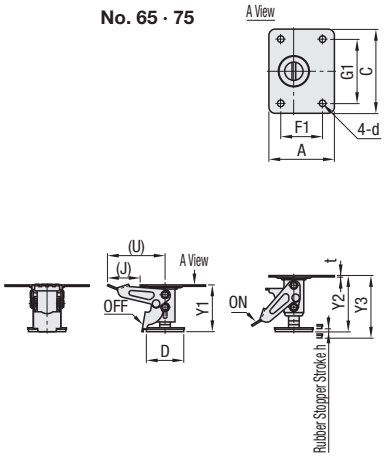
■Height-adjustable Type

RoHS



Ⓟ Design Rights Reistration applied for

No. 65 · 75



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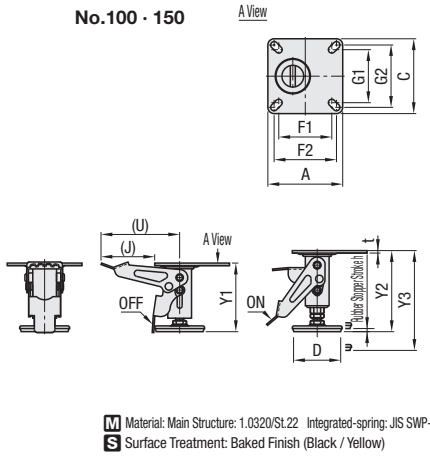


M Material: Main Structure: 1.0320/St.22 Integrated-spring: JIS SWP-A
S Surface Treatment: Baked Finish (Black / Yellow)

Part Number Type	No.	Mounting Height	Stroke Y1 Released	Stroke Locked (Adjustment range) Y2 (min)	Y3 (max.)	D	Mounting Plate Dimensions A	C	F1	F2	G1	G2	d	t	h	(U)	(J)	Push Force N	Mass (kg)	€ Unit Price
FLOCKZ	65	85	75	90	95	60	105	135	67	-	103	-	10.5	2.3	5	93	53	200	0.7	
	75	90	80	95	106														0.8	
	100	130	115	135	145	75	120	120	85	100	85	100	11	4	10	127	87		1.2	
	150	160	145	165	200													250	1.3	

Order Example Part Number FLOCKZ75

Price

Days to Ship 6 Days P.87

■Volume Discount Ⓟ Round down to one Cent. P.87

Qty.	1~29	30~39	40~49	50~99
Rate	€ Unit Price	5%	10%	18%

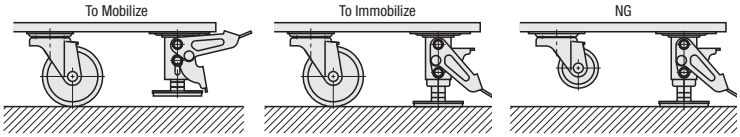
Ⓟ For orders larger than indicated quantity, please request a quotation.

■Features

- Carriage firmly grips floor and is locked in place with spring force.
- New product FLOCK has a less-protruded pedal and saves space, compared with FLOK.
- New product FLOCKZ has the industry's first height-adjuster, and allows mounting height adjustments within certain ranges.

■Cautions

-This product alone is not designed to lift carriages and supported objects.
For carried loads, please refer to the allowable load of casters used with.



Example



CFSK31 was discontinued in April 2010. FLOCK150 is provided as an alternative.

CAD Data

RoHS



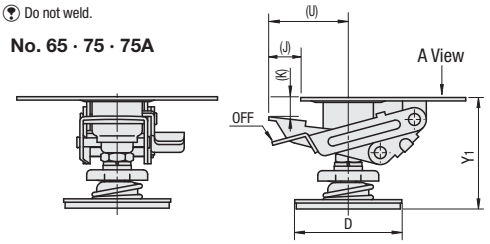
Type	Material	Surface Treatment	Built-in Spring
FLOK	1.0320/St.22	Trivalent Chromate	JIS SWP-B ~1.0600
FLOKS	1.4301/X5CrNi18-10	-	1.4301/X5CrNi18-10-WPB

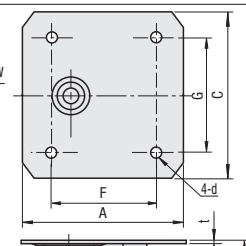
Load

Regardless of the carrier's weight or load, the spring cushion built in the stopper firmly grips floor with a constant force. For movable load, please refer to the allowable load of the caster. Carriages cannot be off the ground.

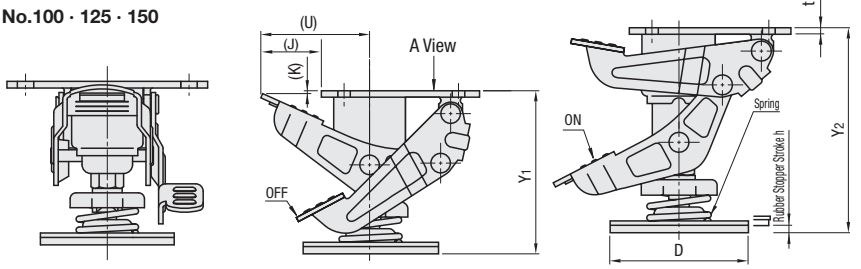
Do not weld.

No. 65 · 75 · 75A





No.100 · 125 · 150



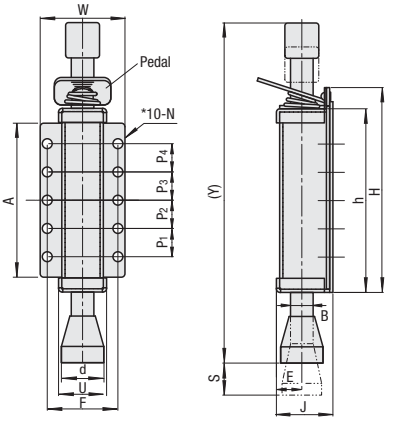
Part Number Type	No.	Mounting Height	Stroke Y1 (min)	Stroke Y2 (max.)	D	Mounting Plate Dimensions A	C	F	G	d	t	h	(K)	(U)	(J)	Spring Constant Kgf·mm FLOK	FLOKS	Mass (kg)	€ Unit Price FLOK	FLOKS
FLOK FLOKS (Stainless Steel)	65	85	75	90	60	105	135	67	103	10.5	2.3 (**2.0)	5	22.4	45	23	1.81	1.58	1.1		
	75	92 (93)	82.5	97.5														1.2		
	75A	106 (*102)	96 (*92)	111 (*107)														1.2		
	100	130	110	135	90			70	110	11	4.5		2.4	73	41	3.09	2.73	1.4		
	125	165	145	170														1.5		
	150	190	170	195														1.5		

(*)The dimensions of FLOKS75A are indicated in ().(**)is dimension for FLOKS.

Floor Locks RoHS



FLOR
FLORS
(Stainless Steel)



4-N for No.70,
6-N for No.100

Type	Material	Surface Treatment	Built-in Spring	Pad
FLOR	1.0320/St.22	Trivalent Chromate	JIS SWP-B ~1.0600	EPDM
FLORS	1.4301	-		Conductive Rubber

ex Example



- Stepping on the pedal unlocks to allow stroke adjustments.
- Pushing the upper pad down to floor activates instant-locking.
- In "unlocked" state, mount it with 25 ~ 30mm of space between the floor and the lower pad.
- Choose any one of mounting holes to be firmly fixed in place with bolts, etc.

Part Number Type	No.	Stroke (S)	(Y)	H	h	W	A	Mounting Dimensions P1	P2	P3	P4	F	N	B	d	U	J	E	Spring Constant N/mm{Kgf/mm}	Mass (g)	€ Unit Price FLOR	FLORS
FLOR FLORS	70	30	160	85	70	40	60	45	-	-	-	30	5.5	10	20	24	34	15	6.91{0.704}	270		
	100		210	115	100	60	80	35	35	-	-	50	7.0	16	30	34	40	18		620		
	130	34	240	145	130		110	20	20	20	20									770		

Order Example — Part Number: FLOK125, FLOR70

Days to Ship: -FLOK · FLOKS 6 Days P.87; -FLOR · FLORS 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~29	30~39	40~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Adjustment Pads
-Standard Type-

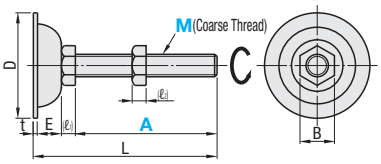
Price Reduction

CAD Data



RoHS

NFJN
NFJNS (Stainless Steel)
NFJNF



M	D	(ℓ1)	(ℓ2)	E	B	t
5	30	3.5	4	5.4	8	1.6
6		4	5		10	
8	38	5.5	6.5	11	13	
10		7	8		17	
12	60	8	10	18	19	2.0
16	75	10	13	20	24	
20		13	16		30	

Type	M Material	S Surface Treatment
NFJN	1.0038/S235JR equivalent	Trivalent Chromate
NFJNF		
NFJNS	1.4301/ X5CrNi18-10	Electrolityc Polishing

Screw shafts can turn independently of the base, and tilt by 3 to 5 degrees.

■A Dimension Configurable

Part Number		L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price	
Type	M-A		NFJN · NFJNS		NFJN	NFJNS
NFJN ‹Stainless› NFJNS	5 - 30	40.5	1.5	15		
	5 - 60	70.5		19		
	6 - 40	51	2.1	21		
	6 - 80	91		28		
	8 - 50	68.1	3.9	50		
	8 -100	118.1		65		
	10 - 75	94.6	4.3	88		
	10 -100	119.6		100		
	12 - 75	103	4.9	166		
	12 -100	128		184		
	12 -125	153		200		
	12 -150	178		219		
	16 - 75	107	5.9	287		
	16 -100	132		317		
	16 -130	162		356		
	16 -150	182		383		
	16 -180	212		422		
	20 -100	135	8.8	493		
	20 -130	163		557		
	20 -150	183		605		
	20 -180	213		671		

■A Dimension Configurable

Part Number		A 10mm Increment	L	€ Unit Price
Type	M			
NFJNF	10	80~200	A+19.6	
	12	80~250	A+28	
	16	80~300	A+32	
	20	110~300	A+35	

Tips of screws are painted.

Order Example: Part Number - A
NFJN12-100
NFJNF10 - 80

Days to Ship
NFJN · NFJNS: 6 Days / 2 Days P.87
NFJNF: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

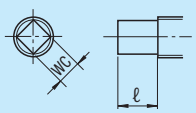
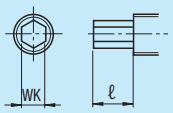
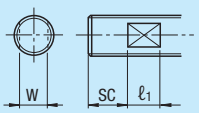
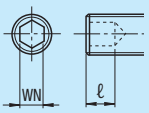
Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

Alterations: Part Number - (WC · WK · SC · WN) — 8 Days
NFJN16-75 - WC

For NFJN only.

No plating on alteration applied sections.

Alterations	Square Chamfering	Hexagonal Chamfering	Wrench Flat	Hex Wrench Socket Machining
				
Code	WC	WK	SC	WN
Spec.	Ordering Code WC Applicable when M≥10	Ordering Code WK Applicable when M≥10	Ordering Code SC Applicable when M≥10	Ordering Code WN Applicable when 20≥M≥10
Price Adder	5,00	5,00	5,00	5,00

M	WC	ℓ
10	6	10
12	8	
16	10	12
20	12	13.5

M	WK	ℓ
10	6	10
12	8	
16	10	
20	13	

M	W	ℓ1	ℓ
10	8	8	20
12	10	10	
16	13		
20	17		

M	WN	ℓ
10	4	5
12	5	6
16		
20	8	8

Adjustment Pads
-Non-slip Type · PVC Rubber Type-

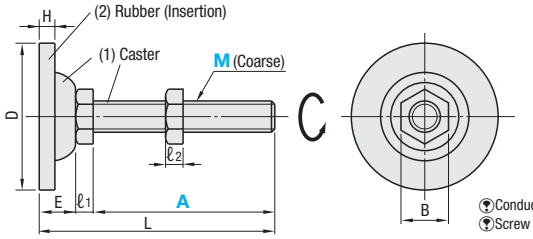
Price Reduction

CAD Data

■Non-slip Type RoHS



Body	Type	(1) Body		(2) Rubber Part	
		M Material	S Surface Treatment	M Material (Color)	H Hardness
Steel	FJGN	1.0038/ S235JR equivalent	Trivalent Chromate	Elastomer (Black)	-
	FJGM			Neoprene Rubber (Black)	Shore A70
				Non-migration Chloroprene Rubber (Gray)	
				Conductive Rubber (Black)	
				PVC (Dark blue)	
Stainless Steel	FJGNS	1.4301/ X5CrNi18-10	Electrolityc Polishing	Elastomer (Black)	-
	FJGMS			Neoprene Rubber (Black)	Shore A70
				Non-migration Chloroprene Rubber (Gray)	
				Conductive Rubber (Black)	



M	D	ℓ1	ℓ2	E	B	H
8	45	5.5	6.5	15	13	6
10		7	8		17	6
12	70	8	10	23	19	7
16	80	10	13	25	24	8
20		13	16		30	

Conductive Rubber Specific Volume Resistivity 102 ~ 104 Ω · cm

Screw shaft turns independently of the base and tilts slightly

Part Number		FJGM · FJGMS	L	Vertical Allowable Load (kN)	Mass (g)	€ Unit Price									
Type	M-A	Rubber Material				FJGN	FJGM				FJGNS	FJGMS			
							R	C	D	S		R	C	D	S
FJGN FJGM FJGNS (Stainless Steel) FJGMS (Stainless Steel)	8- 50	R (Rubber) C (Non-migration Chloroprene Rubber) D (Conductive Rubber) S (PVC)	70.5	3.9	50										
	8-100		120.5		70										
	10- 75		97	4.3	91										
	10-100		122		103										
	12- 75		106	4.9	178										
	12-100*		131		196										
	12-125*		156		212										
	12-150		181		231										
	16- 75		110	5.9	301										
	16-100*		135		331										
	16-130*		165		370										
	16-150		185		397										
	16-180*		215		436										
	20-100*		138	6.8	148										
	20-130*		168		173										
	20-150		188		194										
	20-180*		218		220										

No selectable rubber material for FJGN and FJGNS. (Elastomer is used) *PVC rubber applicable sizes

Order Example

Part Number	-	Rubber Material
FJGM16 - 75	-	R

Days to Ship

FJGN · FJGNS · FJGM: 6 Days P.87 2 Days

Others: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

Adjustment Pads / Economy Adjustment Pads

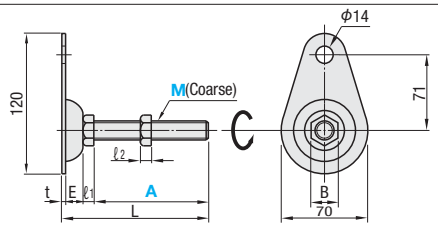
Price Reduction
Up to 30%

CAD Data

■Fixed Type RoHS



FJKN
FJKNS
(Stainless Steel)



Screw shaft turns independently of the base and tilts slightly

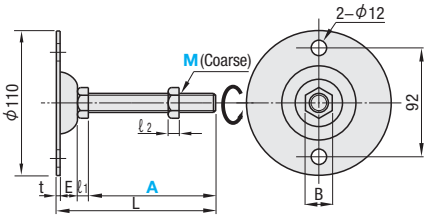
M	ℓ1	ℓ2	E	B	t
10	7	8	18	17	2
12	8	10		19	
16	10	13		24	
20	13	16		30	

Type	M Material	S Surface Treatment
FJKN	1.0038/S235JR or equivalent	Trivalent Chromate
FJKNS	1.4301/X5CrNi18-10	Electrolityc Polishing

■2-Hole Type RoHS



FJWN
FJWNS
(Stainless Steel)



Screw shaft turns independently of the base and tilts slightly

M	ℓ1	ℓ2	E	B	t
10	7	8	22.5	17	2
12	8	10		19	
16	10	13		24	
20	13	16	21.5	30	

Type	M Material	S Surface Treatment
FJWN	1.0038/S235JR or equivalent	Trivalent Chromate
FJWNS	1.4301/X5CrNi18-10 equivalent	Electrolityc Polishing

■Fixed Type

Part Number Type	M-A	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price FJKN	€ Unit Price FJKNS
FJKN / FJKNS (Stainless Steel)	10-75	102	4.3	186		
	10-100	127		204		
	12-75	103	4.9	211		
	12-100	128		229		
	12-125	153		245		
	12-150	178		264		
	16-75	105	5.9	307		
	16-100	130		337		
	16-130	160		376		
	16-150	180		403		
	16-180	210		442		
	20-100	133	8.8	509		
	20-130	163		571		
	20-150	183		613		
	20-180	213		674		

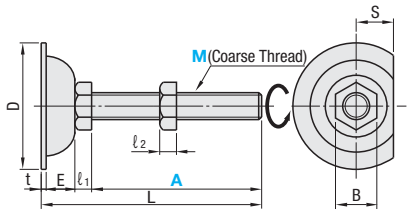
■2-Hole Type

Part Number Type	M-A	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price FJWN	€ Unit Price FJWNS
FJWN / FJWNS (Stainless Steel)	10-75	107	4.3	239		
	10-100	132		251		
	12-75	107.5	4.9	276		
	12-100	132.5		294		
	12-125	157.5		310		
	12-150	182.5		329		
	16-75	109.5	5.9	377		
	16-100	134.5		407		
	16-130	164.5		446		
	16-150	184.5		473		
	16-180	214.5		512		
	20-100	136.5	8.8	587		
	20-130	166.5		653		
	20-150	186.5		690		
	20-180	216.5		752		

■Adjustment Pads -Space Saving Type- RoHS



NFJNCT



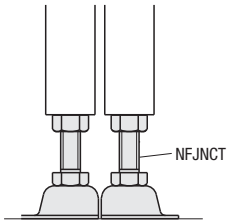
Screw shaft turns independently of the base and tilts slightly

M	D	S	ℓ1	ℓ2	E	t	B
8	38	17	5.5	6.5	11	1.6	13
10			7	8	11		17
12	60		8	10	18	2.0	19
16	75		10	13	20		24

M Material: 1.0038/S235JR or equivalent
S Surface Treatment: Trivalent Chromate

Part Number Type	M-A	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
NFJNCT	8-50	68.1	0.98	47	
	8-100	118.1		62	
	10-75	94.6		85	
	10-100	119.6		97	
	12-75	103		156	
	12-100	128		174	
	12-125	153		190	
	12-150	178		209	
	16-75	107		267	
	16-100	132		297	
	16-130	162		336	
	16-150	182		363	
	16-180	212		402	

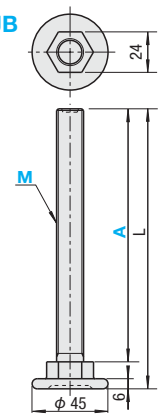
Example



■Economy Adjustment Pads RoHS



MAJB



The screw and the pad are one piece.

M Material: 1.0303/C4C S Surface Treatment: Trivalent Chromate

Part Number Type	M-A	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
MAJB	16-75	91	3.7	200	
	16-150	166		297	

Order Example

Part Number
FJWN12-150
NFJNCT12-100
MAJB16-75

Days to Ship

- FJKN · FJKNS · FJWN · MAJB: 6 Days P.87
- FJWNS: 8 Days
- NFJNCT: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Adjustment Pads

-Heavy Load Type · Hand Wheel Type-

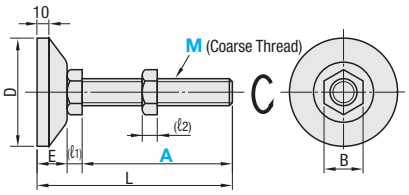
Price Reduction

CAD Data



RoHS

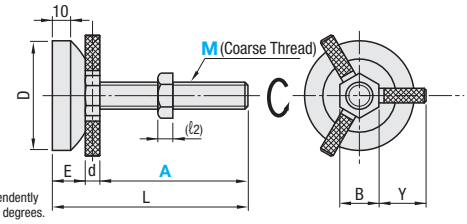
Heavy Load Type
FJFN
FJFNS
FJFNB (Fine Pitch 1.5)
FJFNF



M	D	(ℓ1)	(ℓ2)	E	B
10	60	7	8	18	17
12		8	10		19
16		10	13		24
20		13	16		30
24	70	16	19	20	36

Type	M Material	S Surface Treatment
FJFN	1.0038/S235JR or equivalent	Trivalent Chromate
FJFNF		
FJFNB		
FJFNH		
FJFNS	1.4301/ X5CrNi18-10 quivalent	-

Hand Wheel Type
FJFNH



Screw shafts can turn independently of the base, and tilt by 3 to 5 degrees.

■A Dimension Selectable

Part Number Type	M-A	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price FJFN	FJFNS	FJFNB
FJFN FJFNS (Stainless Steel) FJFNB (Fine pitch 1.5 is only applicable for *marked items)	10-75	100	10	319			
	10-100	125		330			
	12-75	101	13	339			
	12-100	126		357			
	12-125	151		376			
	12-150	176		393			
	16-75	103	16.6	436			
	16-100	128		446			
	16-130	158		505			
	16-150	178		532			
	16-180	208		571			
	*20-100	131	39.2	626			
	*20-130	161		692			
	*20-150	181		729			
	*20-180	211		800			
FJFN FJFNB	*24-130	166	49.4	1100			
	*24-180	216		1250			

For M20 and M24, fine thread is applicable.

Kgf (Load)=Nx0.101972

■A Dimension Configurable

Part Number Type	M	A 10mm Increment	L	€ Unit Price
FJFNF	10	80~200	80~200	
	12	80~250	80~250	
	16	80~300	A+28	
	20	110~300	110~300	

Tips of screws are painted.

■Hand Wheel Type

Part Number Type	M-A	L	d	Y	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
FJFNH (with hand wheel)	10-75	100	6	25	10	329	
	10-100	125				340	
	12-75	101	7	26	13	349	
	12-100	126				367	
	12-125	151				386	
	12-150	176				408	
	16-75	103	8	27	16.6	451	
	16-100	128				461	
	16-130	158				520	
	16-150	178				547	
	16-180	208				586	

Order Example

Part Number	-	A
FJFN10-75		
FJFNF20	-	150
FJFNH16-100		

Alterations

Part Number	-	(WC · WK · SC · WN)
FJFN12-150	-	WC

8 Days

Days to Ship

- FJFN · FJFNS: 6 Days / 2 Days — P.87
- Other than listed left.: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

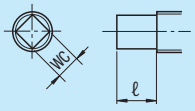
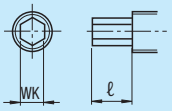
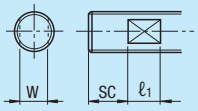
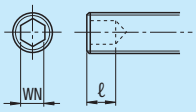
Qty.	1~49	50~99
Rate	€ Unit Price	10%

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

For FJFN only.

No plating on alteration applied sections.

Alterations	Square Chamfering	Hexagonal Chamfering	Wrench Flat	Hex Wrench Socket Machining
				
Code	WC	WK	SC	WN
Spec.	Ordering Code WC Applicable when M≥10	Ordering Code WK Applicable when M≥10	Ordering Code SC Applicable when M≥10	Ordering Code WN Applicable when 20≥M≥10
Price Adder	5,00	5,00	5,00	5,00

WC

M	WC	ℓ
10	6	10
12	8	
16	10	12
20	12	13.5

WK

M	WK	ℓ
10	6	10
12	8	
16	10	
20	13	

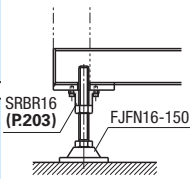
SC

M	W	ℓ1	
10	8	8	20
12	10	10	
16	13		
20	17		

WN

M	WN	ℓ
10	4	5
12	5	6
16		
20	8	8

Example



Adjustment Pads / Antivibration Attachments

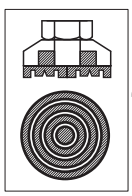
-Antivibration Type-

CAD Data

RoHS

FJFNV FJFNVC (Non-migration Rubber Type)





Details of Rubber Part

Type	(1) Body		(2) Rubber Part	
	M Material	S Surface Treatment	M Material	H Hardness
FJFNV	EN JL 1040/EN-GJL-250 (Screw · Nut 1.0038/S235JR)	Trivalent Chromate	Chloroprene Rubber	Shore A70 (M10·12) Shore A90 (M16)
FJFNVC			Non-migration Chloroprene Rubber (gray)	

Part Number Type	M-A	L	D	T	ℓ1	ℓ2	E	B	Vertical Load Range (kN)	Mass (g)	€ Unit Price FJFNV	€ Unit Price FJFNVC
FJFNV FJFNVC	10-75	100	60	8	7	8	18	17	2.0~7.0	322		
	10-100	125								333		
	12-75	101			8	10		19	3.0~10.0	342		
	12-100	126								360		
	12-125	151								379		
	12-150	176								395		
	16-75	103			10	13		24	3.5~12.0	438		
	16-100	128								449		
	16-130	158								508		
	16-150	178								536		
	16-180	208								574		

Order Example: Part Number FJFNV16 -75

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

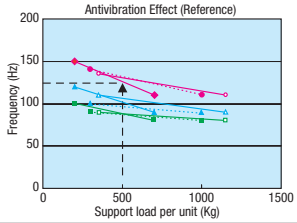
For orders larger than indicated quantity, please request a quotation.

Antivibration Effect

This product antivibration effects (vibration transmissibility) heavily depend on applied loads and frequency of supported objects (natural frequency). The graph on the right shows anticipated antivibration effects of this product calculated from frequencies of supported objects.

How to Select

(1)Calculations of Applied Load per Unit
Ex) When an object of 2000 kg is supported by 4 points, 2000/4=500(kgf)
(2) Natural Frequency of the Object is investigated. Frequency=Number of Vibrations per Second
Ex) When motor speed is 7200rpm, 7200(rpm)/60(s)=120(Hz)
(1)With data obtained (1) and (2) plotted on the graph, applicable screw diameter (M) and vibration transmissibility under the condition are found.



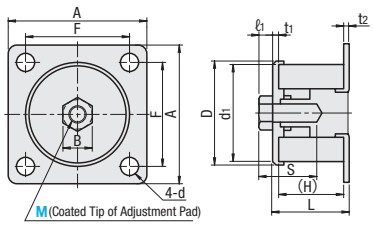
Nominal Tr (vibration transmissibility)
M10 1/30 M12 1/3
M10 1/10 M16 1/30
M10 1/3 M16 1/10
M12 1/30 M16 1/3
M12 1/10

Ex. If FJFNV10 is selected with 500kgf per-foot supported load, 125Hz or more vibration transmissibility is reduced to thirtieth at most.

RoHS

KMBU KMBS





Part Number		M Material	S Surface Treatment	H Hardness
KMBU	Plate	1.0330/DC01	Trivalent Chromate	-
	Body	1.1191/C45E		
	Damper	Chloroprene Rubber	-	Shore 60
KMBS	Plate	1.4301/X5CrNi18-10	-	-
	Body			
	Damper	Chloroprene Rubber		Shore 60

Part Number Type	M	Damper Hardness	Body L	D	d1	(H)	S	t1	B	ℓ1	Fixing Plate A	F	t2	d	Vertical Load (kN)	Mass (g)	€ Unit Price KMBU	€ Unit Price KMBS
KMBU KMBS	6	N	42	45	40	37	28	3.5	10	3.5	80	60	2.3	8.5	1	260		
	8		43	55	50		30		13	5					1.5	340		
	10		44	60	55		31		17	6			3.2	10.5	2	420		
	12			72	67		32		19	7	100	80			2.5	630		
	*16		44.5	88	83		33		24	10	115	90	4	12.5	3	1000		
	*20		45	103	98		34	4	30	12					3.5	1220		

*M16 and 20 are available for KMBU only.

Order Example: Part Number KMBU10 - Damper Hardness N

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Features

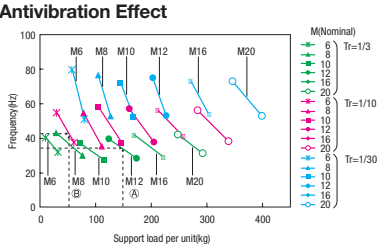
- Suitable for vibration countermeasures for vibratory equipment and machinery.
- Can be used as general leveling mounts up to 5° inclination.
- Damper will not stain floor since not in contact with the floor.

How to Select

Antivibration effects of antivibration material (vibration transmissibility) heavily depend on applied loads and frequency of supported objects (natural frequency). The graph on the right shows anticipated antivibration effects of products calculated from frequencies of supported objects.

(1)Calculations of Applied Load per Attachment
Ex) When an object of 600 kg is supported by 4 attachments
600/4=150 (kgf)
(2)Natural Frequency of the Object is evaluated.
Frequency=Number of Vibrations per Second
Ex) When the motor speed is 1800rpm
1800 (rpm)/60 (s)=30 (Hz)
With data obtained (1) and (2) plotted on the graph, appropriate type of the attachment and vibration transmissibility under above condition are found.

Antivibration Effect

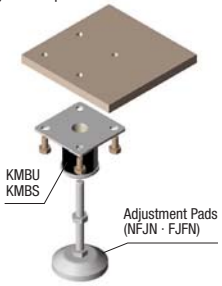


Ex. (A)
If KMBU(S)12 is selected with supported load to be 150kg per foot, transmissibility for vibrations above 30Hz is reduced to 1/3 or less.
Ex.(B)If KMBU(S)6 is selected with supported load to be 50kg per foot, transmissibility for vibrations above 40Hz is reduced to 1/10 or less.

All values are calculated, and not guaranteed.

Example

Equipment vibrations are suppressed by the damper effect.



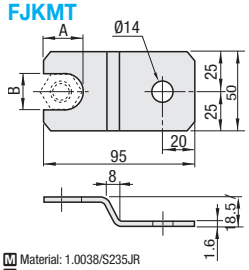
Adjustment Pad Fixing Plates / Fixing Nuts / Protection Caps

CAD Data

■Economy Type

FJKMT





M Material: 1.0038/S235JR
S Surface Treatment: JIS STKM Bright Chromate Plating

Part Number Type	No.	A	B	L	€ Unit Price 20 ~ 99 pcs
FJKMT	12	22.5	19.3	95	
	16	25	24.5		
	20	28	31.0		

Order Example: Part Number FJKMT12

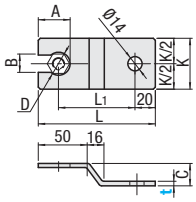
Days to Ship: 6 Days P.87

■For Adjustment Pads Fixing Plates -Thick Type-

RoHS

Steel: **AJPNF** **AJKNF**
Stainless Steel: **AJPNFS** **AJKNFS**





Type	M Material	S Surface Treatment
AJPNF · AJKNF	1.0038/S235JR	Trivalent Chromate
AJPNFS · AJKNFS	1.4301/ X5CrNi18-10	-

Plate thickness may vary up to -10%.

Part Number Type	No.	t Plate Thickness	D	A	B	K	C	L	L1	Applicable Adjustment Pads	€ Unit Price Stainless Steel	Stainless Steel
AJPNF (Steel)	16	4.5	29	37.5	17	50	28.5	115	72	NFJN16		
		6					30					
AJPNFS (Stainless Steel)	20	4.5	36	45.5	21	60	28.5	125	77.5	NFJN20		
		6					30					
AJKNF (Steel)	16	4.5	29	37.5	17	50	24.5	115	72	FJFN16		
		6					26					
AJKNFS (Stainless Steel)	20	4.5	36	45.5	21	60	24.5	125	77.5	FJFN20		
		6					26					

Order Example: Part Number AJPNF20 - t 4.5

Days to Ship: 6 Days P.87

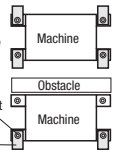
Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example

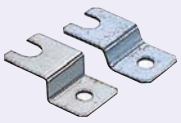


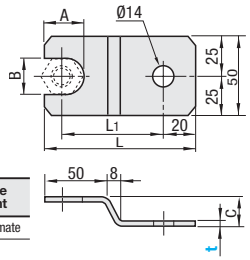
Fixing Plates may not be usable at 4 locations depending on equipment and machine conditions. Thick type prevents disengage and displacement, and produces the optimal effects with the fewest fixing plates.

■For Adjustment Pads Fixing Plate

RoHS

Steel: **FJKPF** **FJKPN** **FJKPG**
Stainless Steel: **FJKPFS** **FJKPNS** **FJKPGS**





Type	M Material	S Surface Treatment
FJKP_	1.0038	Trivalent Chromate
FJKP_S	1.4301	-

Part Number Type	No.	t Thickness FJKP_	FJKP_S	A	B	C	L	L1	Applicable Adjustment Pads	€ Unit Price FJKP_	FJKP_S
FJKPF (Steel)	12	2 3.2	2	22.5	19	22	95	65	NFJN12 (P.979)		
	12L						130	100			
FJKPFS (Stainless Steel)	16			25	24	24	95	65	NFJN16 (P.979)		
	16L						130	100			
	20			28	30		95	65	NFJN20 (P.979)		
	20L						130	100			
FJKPN (Steel)	12	2 3.2	2	22.5	19	20	95	65	FJFN12 (P.982)		
	12L						130	100			
FJKPNS (Stainless Steel)	16			25	24		95	65	FJFN16 (P.982)		
	16L						130	100			
	20			28	30		95	65	FJFN20 (P.982)		
	20L						130	100			
FJKPG (Steel)	12	2 3.2	2	22.5	19	25	95	65	FJGN12 (P.980)		
	12L						130	100			
FJKPGS (Stainless Steel)	16			25	24	27	95	65	FJGN16 (P.980)		
	16L						130	100			

For conventional products FJKPN and FJKPNS, t=2 when t dimension is not specified.

Order Example: Part Number FJKPN16 - t 3.2

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

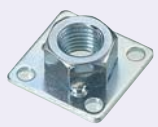
Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

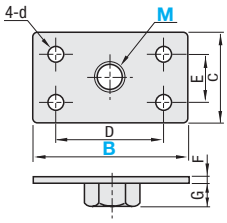
For orders larger than indicated quantity, please request a quotation.

■For Adjustment Pads Fixing Nuts

RoHS

FJTP





■Features

Hexagon nuts do not fall off as they are swaged on.

M Material: 1.0038/S235JR
S Surface Treatment: Trivalent Chromate Plating

Part Number Type	M (Coarse)	B	C	D	E	F	G	d	€ Unit Price
FJTP	12	40	40	28	28	2	9	6	
		60		42	22			8	
	16	50	50	36	36	3.2	12		
		80		56	26				
	20	50		36	36		17.5		
		80		56	26				

Order Example: Part Number FJTP16 - B 80

Days to Ship: 6 Days P.87

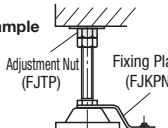
Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example

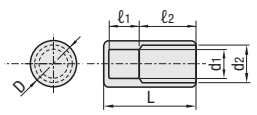


■For Adjustment Pads Protection Caps

RoHS

AJCP





20 pcs. per package

M Material: EPDM

Part Number Type	No.	Color	D	L	d1	d2	ℓ1	ℓ2	Applicable Screw Size (Coarse)	€ Unit Price 1 ~ 9 Pkgs.	Volume Discount 10~20
AJCP	8	B (Black)	11	35	5.5	7	10	20	M6 · 8		
	12		16.5		9.5	11.5			M10 · 12		
	20		24.5		15.5	19.5			M16 · 20		

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number AJCP12 - Color B

Days to Ship: 8 Days

Example

- Can be used to protect exposed threaded portions.
- Select according to size of M threads.
- Easy installation due to its flexibility.

Tips with Adjustment Pads



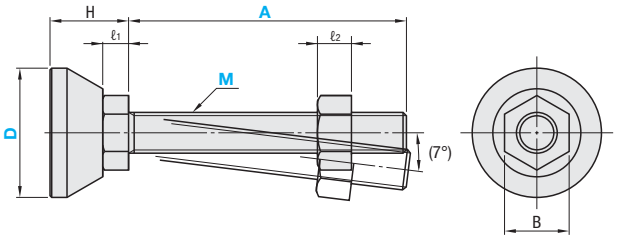
Adjustment Pads -Space Saving Type-

CAD Data

■ Pads (D dimensions) are more compact than the conventional Adjustment Pads.

RoHS





Screw shafts turns.

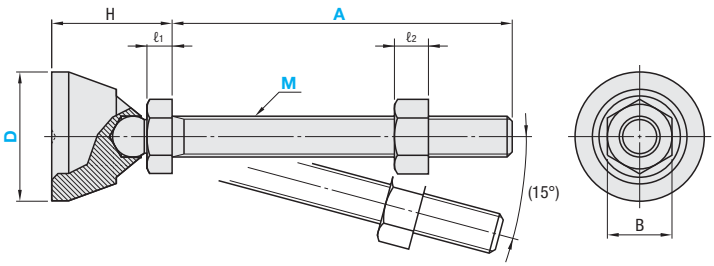
M Material: 1.0038/S235JR or equivalent
S Surface Treatment: Trivalent Chromate Plating

Part Number Type	D	M (Coarse)	A			H	ℓ1	ℓ2	B	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
HNFJN	28	8	20	50	100	17.7	5.2	6.5	13	6.5	48	
	38	12	30	80	100	23	7.4	10	19	13	55	
	48	8	20	50	100	20.7	5.2	6.5	13	6.5	77	
		12	30	80	100	23	7.4	10	19	13	90	
	58	8	20	50	100	20.7	5.2	6.5	13	6.5	121	
		12	30	80	100	23	7.4	10	19	13	133	

■Rotary Type

RoHS





Screw shafts turns.

M Material: 1.0038/S235JR or equivalent
S Surface Treatment: Trivalent Chromate Plating

Part Number Type	D	M (Coarse)	A			H	ℓ1	ℓ2	B	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
HNFJR	28	8	20	50	100	28.2	5.2	6.5	13	6.5	50	
	38	12	30	80	100	35.4	7.4	10	19	13	59	
	48	8	20	50	100	33.2	5.2	6.5	13	6.5	73	
		12	30	80	100	35.4	7.4	10	19	13	85	
	58	8	20	50	100	33.2	5.2	6.5	13	6.5	115	
		12	30	80	100	35.4	7.4	10	19	13	129	

Order Example

Part Number	-	M	-	A
HNFJR48	-	12	-	80

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99
Rate	€ Unit Price	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

6 Days P.87

Adjuster Feet

-Rotary Type · Female Thread Socket Type-

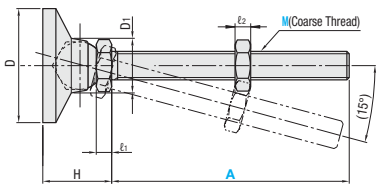
CAD Data

■Rotary Type

RoHS



LEMNT (Steel)
LEMNS (Stainless Steel)



Type	Pad		Thread · Nut	
	M Material	S Surface Treatment	M Material	S Surface Treatment
LEMNT	1.1191/C45E	Trivalent Chromate	1.0038/S235JR or equivalent	Trivalent Chromate
LEMNS	1.4301/X5CrNi18-10	-	1.4301/X5CrNi18-10	-

Tiltable 15° in all 360° directions.

Part Number Type	M-A	D	D_1	H	ℓ_1	ℓ_2	B	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price LEMNT	€ Unit Price LEMNS
LEMNT (Steel)	10-75	32	21	22	6	8	17	11.0	342		
	10-100								351		
	12-75	48	23	29	7.5	10	19	16.0	378		
	12-100								390		
LEMNS (Stainless Steel)	16-100	64	27	32	10	13	24	28.3	430		
	16-130								445		

Order Example: Part Number → LEMNT16-130

Days to Ship: - LEMNT: 6 Days P.87; - Others: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

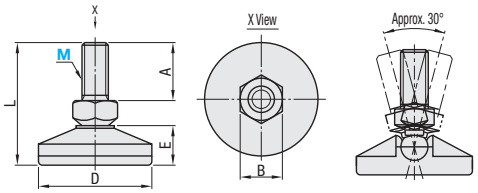
For orders larger than indicated quantity, please request a quotation.

■Rotary Short Type

RoHS



FJRP



Thread
M Material: JIS STKM
S Surface Treatment: Trivalent Chromate Plating

	M Material
Body	1.4301/X5CrNi18-10
Bottom	Polyamide

Example

When a leg has an angle



When floor surface is curved

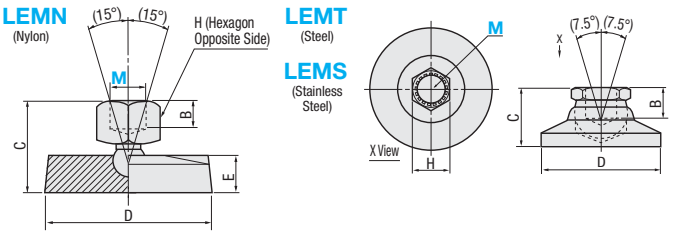


■Female Thread Socket Type

RoHS

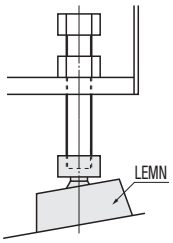


LEMN (Nylon)
LEMT (Steel)
LEMS (Stainless Steel)



Type	M Material	S Surface Treatment	Socket	S Surface Treatment
LEMN	Nylon Plastic	-	1.0718/9SMnPb28	Electroless Nickel Plating
LEMT	JIS STKM for Mechanical Structure	Electroless Nickel Plating		
LEMS	1.4305/X10CrNiS18-9	-	1.4305/X10CrNiS18-9	-

Example



Part Number Type	M (Coarse)	A	L	D	B	E	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
FJRP	6	14	31	25	8	9.7	0.59	11	
	8	19	37.5	30	10	11.2	1.08	21	
	10	20	42.5	40	13	13.7	1.57	38	
	12	25	51	50	17	16	3.14	70	

Part Number Type	M (Coarse)	B	C	D	E	H	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
LEMN (Nylon)	10	9.5	39.0	50	18	16	15.9	17.1	
	12	12.7	41.0			19			
	16	14.2	44.5			22			

Part Number Type	M (Coarse)	H	C	D	B	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price LEMT	€ Unit Price LEMS
LEMT (Steel) LEMS (Stainless Steel)	6	10	14	19	4	3.1	17		
	8	13	18	25	8	4.1	34		
	10	17	22	32	10	15.4	65		
	12	19	29	48	11	20.5	167		
	16	22	32	64	11	24.6	354		

Order Example: Part Number → LEMN10

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Kgf (Load)=Nx0.101972

Adjuster Feet

-Rotary Type · Resin Rubber Type-

Price Reduction

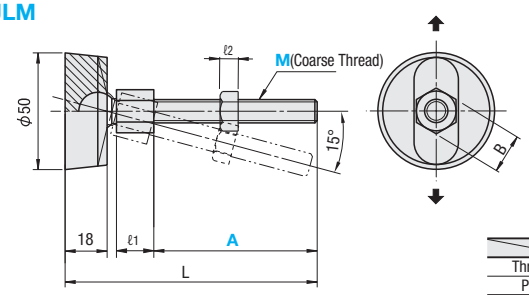
CAD Data

■Rotary Type

RoHS



FJLM



To use under proper load, please incline the threads to these sides ➡

	Material	Surface Treatment
Thread	1.1191/C45E	Trivalent Chromate
Pad	Nylon Plastic	-

Part Number Type	M-A	L	ℓ1	ℓ2	B	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price
FJLM	10-70	100	8	8	17	0.21	21	
	10-100	130					23	
	12-60	92	10	10	19	0.14	39	
	12-70	102					41	
	12-100	132					44	
	16-80	115	13	13	24	0.32	63	
	16-100	135					67	
	16-130	165					75	

Order Example: Part Number FJLM10-100

Days to Ship: 8 Days

■Resin Rubber Type

RoHS



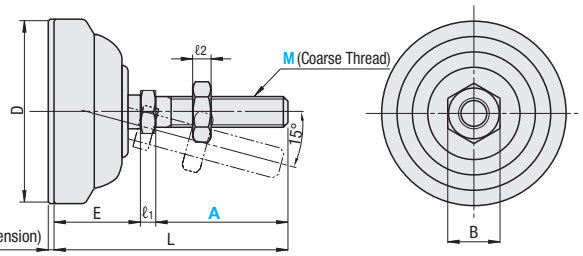
Steel
AJPD
AJPDR (With Rubber)

Stainless Steel
AJPDS
AJPDSR (With Rubber)

Close-up of pad bottom and rubber pad.
Use the Rubber Pad Type in full ground contact will be less slippery.



Tiltable 15° in all 360° directions.



Type	Pad Material	Thread · Nut Material	Thread · Nut Surface Treatment	Rubber Material	Rubber Hardness
AJPD	Reinforced Polyacetal	1.0038/S235JR or equivalent	Trivalent Chromate	-	-
AJPDR				Nitrile Rubber	Shore A70
AJPDS		1.4301/ X5CrNi18-10	-	-	-
AJPDSR				Nitrile Rubber	Shore A70

Part Number Type	M-A	L	D	ℓ1	ℓ2	E	B	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price AJPD	AJPDR	AJPDS	AJPDSR
Steel AJPD AJPDR(With Rubber) Stainless Steel AJPDS AJPDSR(With Rubber)	10-70C	95	40	6	8	19	17	3.0	76				
	10-100C	125							79				
	12-70C	98		7.5	10	20	19		108				
	12-100C	128							110				
	16-100C	130		10	13		24		130				
	10-70D	96	50	6	8	20	17		182				
	10-100D	126							185				
	12-60D	89.5		7.5	10	21.5	19		200				
	12-70D	99.5							210				
	12-100D	129.5							220				
	16-80D	111.5		10	13		24		265				
	16-130D	161.5							280				
	12-70E	104	60	7.5	10	26	19		260				
	12-100E	134							265				
	16-70E	106		10	13		24		290				
	16-100E	136							295				
	16-150E	186							300				
	20-100E	139		12.5	16	27	30	6.0	320				
	20-150E	189							342				
	20-180E	219							356				

Order Example: Part Number AJPD12-100C

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- AJPD: 6 Days / 2 Days
- Others: 8 Days / 2 Days

P.87

Rubber Base Adjustment Pads

CAD Data



Body	Type	(1) Body M Material	(1) Body S Surface Treatment	(2) Rubber Part M Material (Color)	(2) Rubber Part H Hardness
Steel Type	FJSN	1.0038/ S235JR	Electrodeposited Coating (Black)	Neoprene Rubber (Black)	Shore A80
	FJSM			Silicon (White)	Shore A70
				Polyacetal (White)	-
				Non-migration Chloroprene Rubber (Gray)	Shore A70
				Conductive Rubber (Black)	Shore A70
Stainless Steel Type	FJSNS	1.4301/ X5CrNi18-10	Electrolityc Polishing	Neoprene Rubber (Black)	Shore A80
	FJSMS			Silicon (White)	Shore A70
				Polyacetal (White)	-
				Non-migration Chloroprene Rubber (Gray)	Shore A70
				Conductive Rubber (Black)	Shore A70

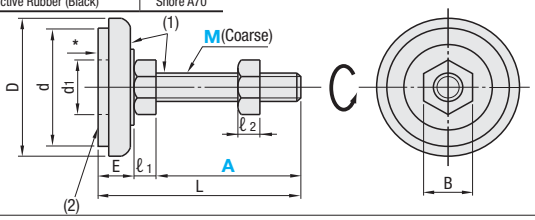
M	D	d	d1	ℓ1	ℓ2	E	B
8	40	35.5	10	5.5	6.5	13.5	13
10				7	8		17
12	50	45.5	15	8	10	16	19
16	60	55.5	20	10	13	17	24
20				13	16		30

For polyacetal hardness, refer to Resin Plate Characteristics Table (**P.859**)

Specific Volume Resistivity of Conductive Rubber 10^2 ~ $10^4\Omega$-cm

*Anti-slip circular groove is only provided for polyacetal type.

Screw shaft turns independently of the base and tilts slightly



Steel

Part Number Type	M-A	FJSM Rubber Material Selectable	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price FJSN	FJSM S (Silicon)	FJSM P (Polyacetal)	FJSM C (Chloroprene)	FJSM D (Conductive Rubber)
FJSN FJSM (Rubber Selectable)	8- 60	S (Silicon · White) P (Polyacetal · White) C (Non-migration Chloroprene Rubber · Gray) D (Conductive Rubber · Black)	79	4.0	80					
	10- 50		70.5		110					
	10- 75		95.5		135					
	12- 70		94	4.2	160					
	12-100		124		190					
	16- 70		97	4.4	290					
	16-100		127		340					
	20-100		130		440					
	20-130		160		510					

Rubber type is not selectable for FJSN (neoprene rubber only).

Stainless Steel

Part Number Type	M-A	FJSMS Rubber Material Selectable	L	Allowable Vertical Load (kN)	Mass (g)	€ Unit Price FJSNS	FJSMS S (Silicon)	FJSMS P (Polyacetal)	FJSMS C (Chloroprene)	FJSMS D (Conductive Rubber)
FJSNS FJSMS (Rubber Selectable)	8- 60	S (Silicon · White) P (Polyacetal · White) C (Non-migration Chloroprene Rubber · Gray) D (Conductive Rubber · Black)	79	4.0	80					
	10- 50		70.5		110					
	12- 70		94	4.2	160					
	16- 70		97	4.4	290					
	20-100		130		440					
	20-130		160		510					

Rubber type is not selectable for FJSNS (neoprene rubber only).

Order Example

Part Number	-	Rubber Material
FJSN12-100		
FJSM12-100	-	S

Days to Ship

- FJSN · FJSM: 6 Days P.87
- FJSNS · FJSMS: 8 Days

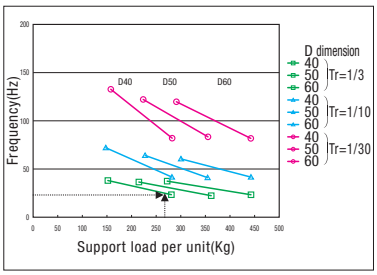
Price

Volume Discount (Round down to one Cent.) **P.87**

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

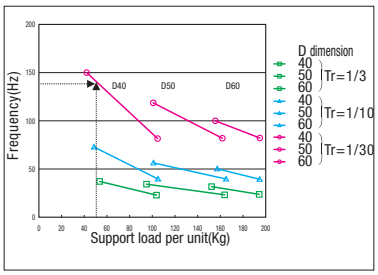
For orders larger than indicated quantity, please request a quotation.

Antivibration Effect of Neoprene Rubber



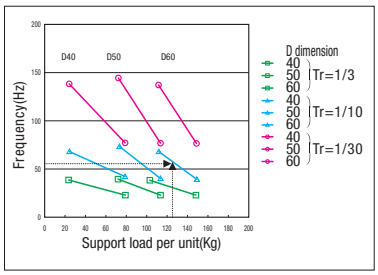
Ex. When FJSN10-75 is selected with 260Kg per-foot supported load, 25Hz or more vibration transmissibility is reduced to one-third or less.

Antivibration Effect of Silicone Rubber



Ex. When FJSM10-75-S is selected with 50Kg per-foot supported load, 140Hz or more vibration transmissibility is reduced to 1/30 or less.

Antivibration Effect of Non-migration Chloroprene · Electrically Conductive Rubber



Ex. When FJSMS16-70-D is selected with 130Kg per-foot supported load, 60Hz or more vibration transmissibility is reduced to 1/10 or less.

Antivibration data are not available for polyacetal type as it is resin.

Figures shown above are all calculated values and not guaranteed.

Antivibration Pads

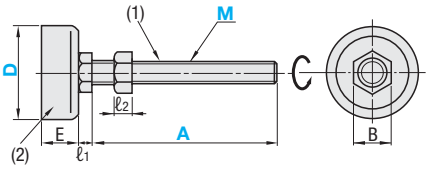
CAD Data

■Light Load Type

RoHS



FBF
FBFM
FBFS (Stainless Steel)



Type	(1) Body		(2) Rubber Part	
	M Material	S Surface Treatment	M Material (Color)	H Hardness
FBF	1.0038/ S235JR or equivalent	Trivalent Chromate	Chloroprene Rubber (Black)	Hs70
FBFM			Non-staining Chloroprene Rubber / Conductive Rubber (Black)	
FBFS	1.4301/ X5CrNi18-10	-	Chloroprene Rubber (Black)	

*Conductive rubber has an identification mark on the back side.

Part Number Type	D	M (Coarse)	A	FBFM Rubber Material	ℓ1	ℓ2	E	B	Vertical Load Range (kN)	Static Compression Spring Constant (kN/mm)
FBF / FBFM / FBFS (Stainless Steel)	33	8	30 50	C (Non-Staining Chloroprene Rubber · Gray)	4.5	6.5	12	13	0.4~0.59	0.49±15%
		10	30 50 70		6.0	8.0		17		
	40	10	30 50 70	D (Conductive Rubber, Black)			15		0.44~0.88	0.69±15%
		12	50 70 100		8.0	10.0		19		

Rubber type is not selectable for FBF and FBFS. (Chloroprene rubber only)

Order Example

Part Number	-	M	-	A	-	Rubber Material
FBF33	-	10	-	50		
FBFM40	-	12	-	100	-	C

Days to Ship

- FBF: 6 Days P.87
- FBFM · FBFS: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

D	M (Coarse)	€ Unit Price A30 FBF	A30 FBFM	A30 FBFS	A50 FBF	A50 FBFM	A50 FBFS	A70 FBF	A70 FBFM	A70 FBFS	A100 FBF	A100 FBFM	A100 FBFS
33	8												
	10												
40	10												
	12												

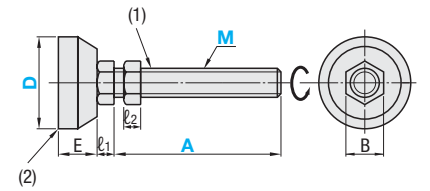
■Heavy Load Type

RoHS



FBR
FBRM
FBRS (Stainless Steel)

Non-staining Chloroprene Rubber · Gray



Type	(1) Body		(2) Rubber Part	
	M Material	S Surface Treatment	M Material (Color)	H Hardness
FBR	1.0038/ S235JR or equivalent	Trivalent Chromate	Chloroprene Rubber (Black)	Hs70
FBRM			Non-staining Chloroprene Rubber / Conductive Rubber (Black)	
FBRS	1.4301/ X5CrNi18-10	-	Chloroprene Rubber (Black)	

*Conductive rubber has an identification mark on the back side.

Part Number Type	D	M (Coarse)	A	FBRM Rubber Material	ℓ1	ℓ2	E	B	Vertical Load Range (kN)	Static Compression Spring Constant (kN/mm)
FBR / FBRM / FBRS (Stainless Steel)	60	12	70 100 130	C (Non-staining Chloroprene Rubber · Gray)	8	10	25	19	1.47~2.94	2.94±15%
		16	70 100 130 150 180		10	13		24		
		20	100 130 150 (180)		13	16		30		
	70	16	70 100 (130) 150 (180)		10	13	29	24	2.45~4.41	4.41±15%
		20	100 (130) (150) (180)		13	16		30		
	90	16	(70) 100 130 (150) (180)		10	13	32	24	2.94~6.37	6.37±15%
		20	100 130 (150) (180)		13	16		30		
FBR	100	16	70 100 130 150 180	D (Conductive Rubber · Black)	10	13	35	24	3.43~6.86	7.35±15%
		20	100 130 150 180		13	16		30		
	120	16	70 100 150 180		10	13	37	24	5.88~11.76	10.29±15%
		20	100 130 150 180		13	16		30		

Order Example

Part Number	-	M	-	A	-	Rubber Material
FBR60	-	16	-	100		
FBRM60	-	16	-	100	-	C

Days to Ship

- FBR · FBRS: 6 Days P.87
- FBRM: 8 Days

A dimension in ( ) are not available for FBRS. M12 is available for FBR only. Rubber type is not selectable for FBR and FBRS. (Chloroprene rubber only) kgf (Load)=Nx0.101972

D	M (Coarse)	€ Unit Price A70 FBR	A70 FBRM	A70 FBRS	A100 FBR	A100 FBRM	A100 FBRS	A130 FBR	A130 FBRM	A130 FBRS	A150 FBR	A150 FBRM	A150 FBRS	A180 FBR	A180 FBRM	A180 FBRS
60	12															
	16															
	20															
70	16															
	20															
90	16															
	20															
100	16															
	20															
120	16															
	20															

Anti vibration Mounts

-Standard Type · Economy Type-

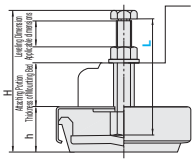
CAD Data

The exterior of Economy Type is designed for workability. Economy Type has the same antivibration function as Standard Type.
For round type, turn the thread tip to adjust height. For square type, turn the handle to adjust height.

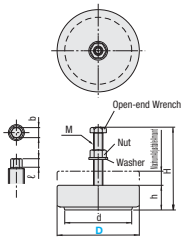


Type	Housing		Bolt		Rubber	
	M Material	S Surface Treatment (Color)	M Material	S Surface Treatment	M Material (Color)	H Hardness
KFJH · KFEH	1.0330/DC01	Baked Melamine Finish (Black)	1.0038/ S235JR	Trivalent Chromate	Chloroprene Rubber (Black)	Shore A75
KFJM · KFEM	EN-JL 1040/ EN-GJL-250	Melamine Baked Finish (Gray)				

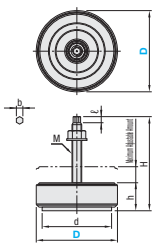
ex Example



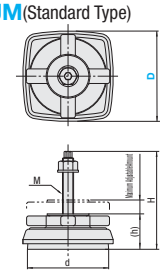
KFJH(Standard Type)



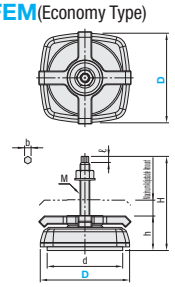
KFEH(Economy Type)



KFJM(Standard Type)



KFEM(Economy Type)



Type	Part Number Type	D	L	H	(H)	d	M	Tip Dimension of Screw B	Tip Dimension of Screw ℓ	Max Adjustable Amount (mm)	Mounting Flange Thickness (mm)	Spring Constant (kN/mm)	Vertical Allowable Load (kN)	KFJH · KFJM € Unit Price	KFJH · KFJM Volume Discount	KFEH · KFEM € Unit Price	KFEH · KFEM Volume Discount
														Qty. 1 ~ 9	10~30	Qty. 1 ~ 9	10~30
Round	KFJH (Standard Type) KFEH (Economy)	100	90 120 200	L+17	35	78	12	8	7.5	22	L-62	23.0	15.0				
		140		L+21	42	114	16	10	8.5	24	L-71	46.0	30.0				
		190	120 200	L+28	54	158	20	12		27	L-84	62.0	40.0				
Square	KFJM (Standard Type) KFEM (Economy)	110	85 200	L+30	47	97	12	8	7.5	15	L-40	3.7	2.8				
		130	110 200	L+31	51	117	16	10	8.5	20	L-50	7.4	6.0				
		160	110 200	L+41	65	146				24	L-55	14.7	12.0				
		200	130 220	L+47	76	185	20	12		27	L-65	23.0	18.0				

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	L
KFJH140	-	120
KFEM160	-	200

Days to Ship: 8 Days

Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

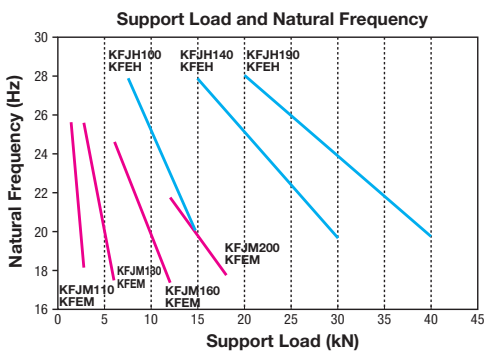
How to Select

(1)Calculate applied load per antivibration mount.
Ex) When an object of 40KN load is supported by 4 supporting points
40kN/4=10kN

(2) Frequency for supported object
As the frequency is the number of vibration per second,
Ex)when motor speed is 3000rpm
3000/60(s)=50Hz
Select an antivibration mount with natural frequency less than 1/2 the frequency of vibration sources (motors, etc.).
50/2=25Hz

If the vibration is square root of 2x or less, it is within the range of resonance. Please select again.

(3)The natural frequency can be found by following along the mount's applied load axis to reach the intersections with the graph lines of respective part numbers.
Ex) In the case of motor with 10KN and 50Hz, when KFJM160 is selected, the natural frequency will be 20Hz. In the case KFJH100 is selected, the natural frequency will be 25Hz.

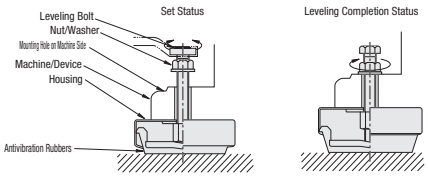


Example

1 Jack up the machines and devices (sling up) to place the Mounts under the holes. For KFJM and KFEM type, place a level washer on the Mounts, and lower the machines and devices)
2 Insert leveling bolt after attaching the nut and washer into the mount from top side.
3 Turn the leveling bolt with a wrench to adjust the level of the machine.
(For KFJM and KFEM turn the handle with a tool to adjust level of the machine.)
4 After horizontal level has been obtained, tighten the nut and washer.

To prevent concentration of load, adjust each mount in sequence in small amounts to level.
For KFJM, the leveling will be smoother if grease is applied on the contact surface of the handle and the level washer.

KFJH Type
KFEH



KFJM Type
KFEM

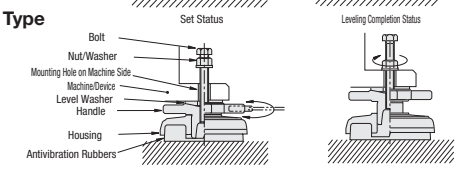


Table-Top Bases

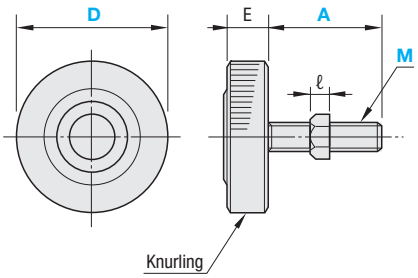
CAD Data

Table-Top Bases RoHS



Screws and pads are one-piece.

NFB



M Material: PP Resin (Pad)
1.0038/S235JR (Threads)
S Surface Treatment: Trivalent Chromate

Part Number Type	D	M Coarse	A	ℓ	E	Allowable Load (kN)	€ Unit Price
NFB	20	5	14 18 23 28	4	7	0.7	
		6	17 22 27 32	5		1.0	
	30	6	17 22 27 32	5	8	1.2	
		8	21 26 31 36	6.5		1.8	
	40	8	21 26 31 36	6.5	9.5	2.0	
		10	25 30 35 40	8		2.1	

Order Example

Part Number	-	M	-	A
NFB30	-	6	-	27

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

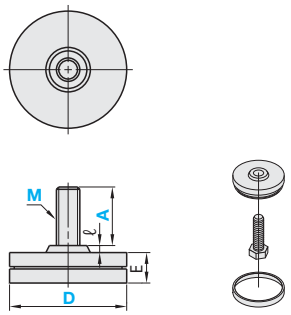
Days to Ship

6 Days P.87

Table-Top Bases RoHS



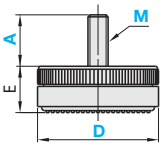
KFB (Separate Type)



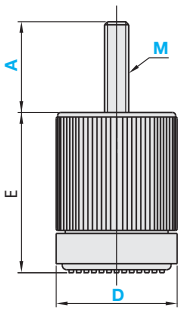
Separable threads and pad are convenient for disposal.

KFBR (Knurled Type)

D=40A / 50A / 60



D=40B · 50B



Type	M Material Body	M Material Bottom	M Material Bolt	S Surface Treatment Bolt
KFB	ABS Resin	-	JIS SWRM	Trivalent Chromate
KFBR	Polyamide	Polyurethane		

Part Number Type	D	M (Coarse)	A	ℓ	E	Allowable Load (kN)	Mass (g)	€ Unit Price
KFB	40	8	25	2	11	0.28	24	
	50	10		3	13		28	
	60	12			15		30	
KFBR	40A	8	24	-	23	0.58	35	
	40B	8	32		54	0.78	71	
	50A	10	25.5		24		58	
	50B	10	32		54		114	
	60	10	26		24		68	

Order Example

Part Number	-	M	-	A
KFB50	-	10	-	25

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~49	50~99	100~199
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

6 Days P.87

Lifting Units

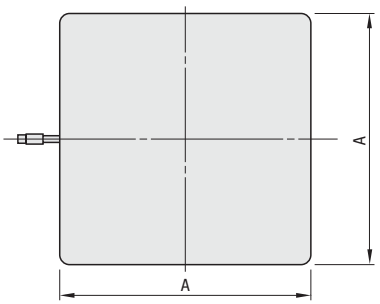
CAD Data

RoHS

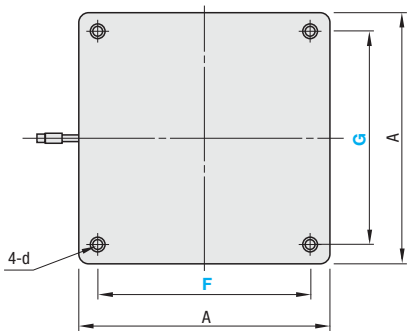


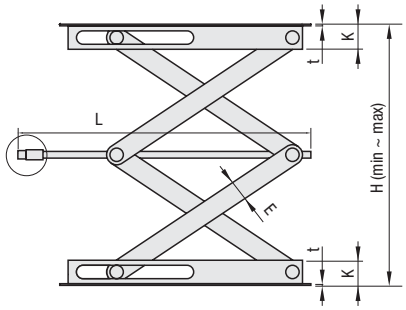


Standard Type
JFCK
JFCKB(Black)

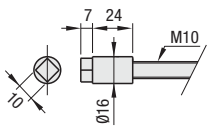


Hole Type
JFCN
JFCNB(Black)





Tip Enlarged View



A handle with a square hole can be used on the end MBCH (**P.1013**).

JFCN and JFCNB have mounting holes 4-d on both top and bottom surfaces.

Type		Material	Surface Treatment
Standard Type	Hole Type		
JFCK	JFCN	1.1191/C45E	Trivalent Chromate
JFCKB	JFCNB		Trivalent Chromate (Black)

Part Number		Pre-drilled Hole Type JFCN · JFCNB 1mm Increment		d	Stroke (H)		A	K	E	L	t	Static Allowable Load (kN)	Mass (g)	€ Unit Price			
														Standard Type		Hole Type	
Type	No.	F	G		min	max								JFCK	JFCKB	JFCN	JFCNB
Standard Type JFCK JFCKB(Black) Hole Type JFCN JFCNB(Black)	15	30~100	30~60	4.5	95	247	150	26.6	19	177	1.6	0.49	2220				
	20	30~150	30~100		106	334	200			227			3080				
	25	30~200	30~150		128	432	250	32.3		276	2.3		4960				

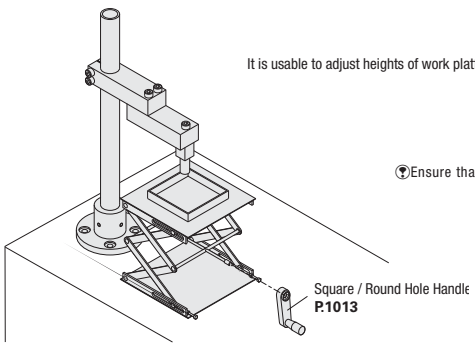
For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	F	-	G
JFCK20 JFCNB25	-	188	-	140

Days to Ship: **8 Days**

Example



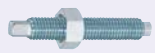
It is usable to adjust heights of work platform etc.

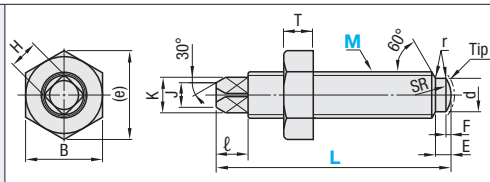
Ensure that no loads are applied while lifting or lowering.

Foot Jack Bolts

■Tip SR Square Chamfered

RoHS





Coarse · Fine

Type		M Material	H Hardness (Tip Induction Hardening)	S Surface Treatment
L Dimension Fixed	L Dimension Selectable			
FJKB	FJKBF	1.1191/ C45E	50~56HRC	Trivalent Chromate
FJKBB(Fine)	-			
FJKBS	-	1.4301/ X5CrNi18-10	-	-

■Tip SR Square Chamfered Type

Part Number Type	M (xP) Coarse	M (xP) Fine	ℓ	d	E	F	H	SR	J	K	r	B	(e)	T	Allowable Load (kN)	Mass (g)
FJKB	12(x1.75)	-	10	8	6	1	8	8	8	10	0.5	19	21.9	10	23.6	75
FJKBS(Stainless Steel)	16(x2.0)	-	12	13		1.6	10	14	10	13	1.0	24	27.7	13	44.0	171
FJKBF	20(x2.5)	20(x1.5)	13.5	15	6.5	2	12	16	12	16		30	34.6	16	68.6	252
FJKBB(Fine)	24(x3.0)	24(x1.5)	14	18	8	2.5	14	18	14	18	1.2	36	41.6	19	98.8	436
FJKBB(Fine)	-	30(x1.5)	16	22	10	3	17	24	16	25	1.2	46	53.1	24	123.3	680

■L Dimension Fixed Type

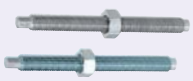
Part Number Type	M (xP) Coarse	M (xP) Fine	L	€ Unit Price FJKB	FJKBS	FJKBB
FJKB	12(x1.75)	-	80			
FJKBS(Stainless Steel)	16(x2.0)	-	98			
FJKBB(Fine)	20(x2.5)	20(x1.5)	100			
	24(x3.0)	24(x1.5)	112			
FJKBB(Fine)	-	30(x1.5)	130			

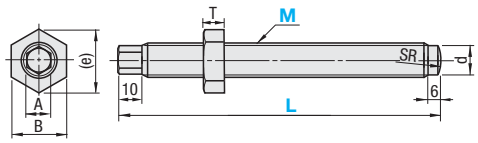
■L Dimension Selectable Type

Part Number Type	M (xP)	L	€ Unit Price
FJKBF	12(x1.75)	60 100	
	16(x2.0)	80 100 120	
	20(x2.5)	120	

■Tip SR Hexagon Chamfered

RoHS





Coarse

Type		M Material	H Hardness (Tip Induction Hardening)	S Surface Treatment
L Dimension Fixed	L Dimension Selectable			
FJKC	FJKCF	1.1191/ C45E	-	Trivalent Chromate
FJKCS	-	1.4301/ X5CrNi18-10	-	-

■Tip SR Hexagon Chamfered Type

Part Number Type	M (xP)	A	B	d	SR	(e)	T	Allowable Load (kN)	Mass (g)
FJKC	12(x1.75)	8	19	8	8	21.9	10	7.1	100
FJKCF	16(x2.0)	10	24	13	14	27.7	13	9.8	200
FJKCS (Stainless Steel)	20(x2.5)	13	30	15	16	34.6	16	21.0	300

■L Dimension Fixed Type

Part Number Type	M (xP)	L	€ Unit Price FJKC	FJKCS
FJKC	12(x1.75)	136		
FJKCS(Stainless Steel)	16(x2.0)			
	20(x2.5)			

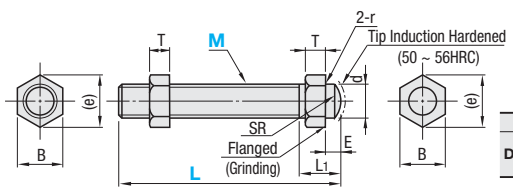
■L Dimension Selectable Type

Part Number Type	M (xP)	L	€ Unit Price
FJKCF	12(x1.75)	60 80 100	
	16(x2.0)	80 100 120	
	20(x2.5)	100 120	

■Flanged Tip SR

RoHS





Coarse

Type		M Material	H Hardness (Tip Induction Hardening)	S Surface Treatment
L Dimension Fixed	L Dimension Selectable			
-	FJKF	1.1191/ C45E	50~56HRC	Trivalent Chromate

■Flanged Tip SR Type

Part Number Type	M (xP)	L	L1	d	E	(e)	SR	r	B	T	Allowable Load (kN)	Mass (g)	€ Unit Price
FJKF	12(x1.75)	60 80 100	20	12	6	21.9	10	1	19	10	23.6	110	
	16(x2.0)	80 100 120	25	16	8	27.7	14	2	24	13	44.0	210	
	20(x2.5)	100 120	34	20	10	34.6	16	2	30	16	68.6	315	

Order Example

Part Number	-	L
FJKB12		
FJKCF16	-	80

Days to Ship

6 Days P.87

Price

■Volume Discount (?Round down to one Cent.) P.87

Qty.	1~19	20~39	40~49
Rate	€ Unit Price	5%	10%

?For orders larger than indicated quantity, please request a quotation.

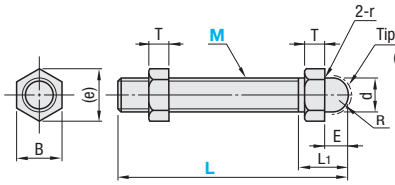
NEW

CAD Data

■Flanged Tip Sphere

RoHS





Coarse

Type		M Material	H Hardness (Tip Induction Hardening)	S Surface Treatment
L Dimension Fixed	L Dimension Selectable			
-	FJKM	1.1191/ C45E	50~56HRC	Trivalent Chromate

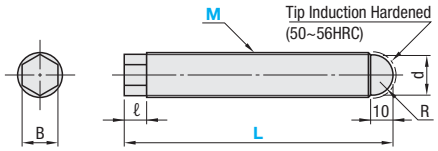
■Flanged Tip Sphere Type

Part Number Type	M (xP)	L	L_1	d	E	(e)	R	r	B	T	Allowable Load (kN)	Mass (g)	€ Unit Price
FJKM	12(x1.75)	60 80 100	24	12	12	21.9	6	1	19	10	23.6	115	
	16(x2.0)	80 100 120	30.5	16	13.5	27.7	8	2	24	13	44.0	215	
	20(x2.5)	100 120	36.5	20	14.5	34.6	10	2	30	16	68.6	320	

■Tip Sphere Hexagon Chamfered

RoHS





Fine

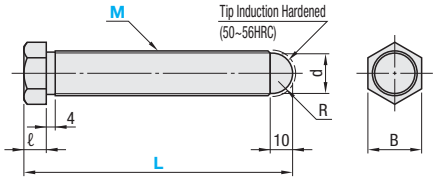
Type		M Material	H Hardness (Tip Induction Hardening)	S Surface Treatment
L Dimension Fixed	L Dimension Selectable			
FJKMR	-	1.1191/ C45E	50~56HRC	Trivalent Chromate

Part Number Type	M (xP)	L	d	R	ℓ	B	Allowable Load (kN)	Mass (g)	€ Unit Price
FJKMR	16(x1.5)	100	14	7	10	13	44.0	150	
	20(x1.5)		18	9		16	68.6	250	
	24(x1.5)	103	20	10	13	18	98.8	300	

■Tip Sphere Head Cap

RoHS





Fine

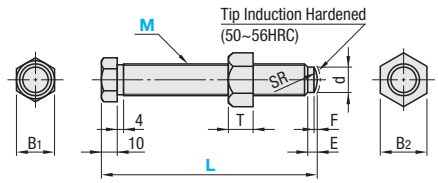
Type		M Material	H Hardness (Tip Induction Hardening)	S Surface Treatment
L Dimension Fixed	L Dimension Selectable			
FJKMB	-	1.1191/ C45E	50~56HRC	Trivalent Chromate

Part Number Type	M (xP)	L	d	R	ℓ	B	Allowable Load (kN)	Mass (g)	€ Unit Price
FJKMB	16(x1.5)	100	14	7	10	21	44.0	150	
	20(x1.5)		18	9		24	68.6	250	
	24(x1.5)	103	20	10	13	27	98.8	300	

■Tip SR Head Cap

RoHS



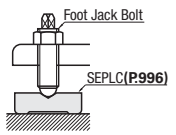


Coarse

Type		M Material	H Hardness (Tip Induction Hardening)	S Surface Treatment
L Dimension Fixed	L Dimension Selectable			
-	FJKBA	1.1191/ C45E	50~56HRC	Trivalent Chromate

Part Number Type	M (xP)	L	d	SR	B_1	B_2	E	F	T	Allowable Load (kN)	Mass (g)	€ Unit Price
FJKBA	12(x1.75)	80 100	9	10	18	18.7	6	1	9.8	7.1	100	
	16(x2.0)	100 120	13	12	21	23.7		2	12.5	9.8	200	
	20(x2.5)		16	17	24	29.4			15.6	21.0	300	

ex



Part Number - L

FJKM16 - 100
FJKMR20
FJKMB24
FJKBA12 - 80

6 Days P.87

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~39	40~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

NEW

Anchor Brackets

-Standard Type · Ribbed Type-

Price Reduction
Up to 20%

CAD Data

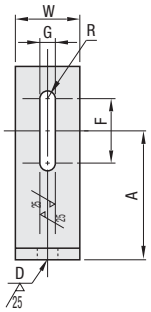
■Standard Type

RoHS

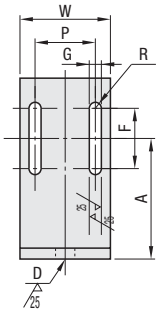


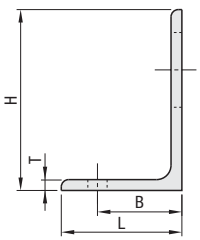
Type		Shape	M Material	S Surface Treatment
Without Gusset	With Gusset			
STYS	-	Single	1.0038/S235JR	Black Oxide
STTS				Trivalent Chromate
STYD	SYDR	Double		Black Oxide
STTD	STDR			Trivalent Chromate

Single
STYS
STTS

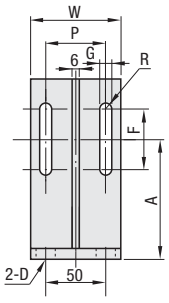


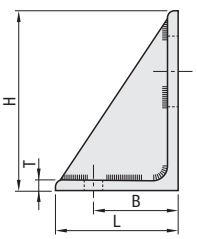
Double
STYD
STTD





With Gusset
SYDR
STDR





Body	Part Number Type	No.	H	L	T	W	D Hole Dia.	D Applicable Screw	B	A	F	G Slotted Hole	G Applicable Screw	R	P	€ Unit Price STYS · STYD	€ Unit Price STTS · STTD	€ Unit Price SYDR · STDR
Single	Black Oxide **STYS** Trivalent Chromate **STTS**	10	100	75	7	45	12	M10	60	60	50	12	M10	6	-			
		12	150	100	9	50	16	M12	70	100								
		16	200	90		55	18	M16		120	60	14	M12	7				
Double	Black Oxide **STYD**(Without Gusset) **SYDR**(With Gusset) Trivalent Chromate **STTD**(Without Gusset) **STDR**(With Gusset)	10	100	75	7	70	12	M10	50	60	50	10	M8	5	45			
		12	150	100	9	75	16	M12	70	100					50			
		16	200	90		80	18	M16		120	60	12	M10	6	55			

Order Example — Part Number: STYS12

Days to Ship — -STYS12 · STYD12: 6 Days P.87

-Other than listed left.: 8 Days — Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

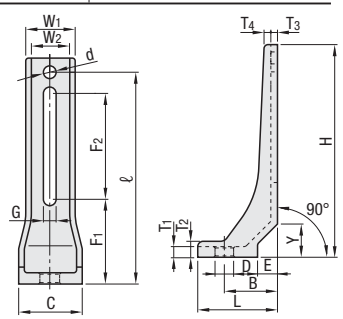
■Ribbed Type

RoHS

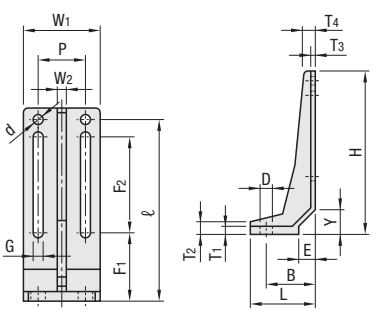


Type	M Material	S Surface Treatment
STRS	1.1191/C45E	Black Baked Finish
STRW		
STRZ		Electroless Nickel Plating (Silver)
STRZW		

STRS(Black)
STRZ(Silver)



STRW(Black)
STRZW(Silver)



Type	No.	H	L	C	T1	T2	T3	T4	W1	W2	d Hole Dia.	d Applicable Screw	B	F1	F2	G Slotted Hole	G Applicable Screw	d	P	ℓ	Y	E	€ Unit Price STRS · STRW	€ Unit Price STRZ · STRZW
Single **STRS**(Black) **STRZ**(Silver)	8	125	50	40	6	10	4	5	30	23	12	M8	35	50	50	7	M6	7	-	115	20	12		
	10	160	60	45	8	12	5	5	35	27	14	M10	40	60	75	9	M8	9		150	25	15		
	12	200	72	55	10	15	6	5	45	35	16	M12	50	70	100	11	M10	11		188	30	18		
Double **STRW**(Black) **STRZW**(Silver)	10	150	60	-	8	12	5	10	65	8	14	M10	40	50	60	9	M8	9	30	140	25	15		
	12	200	80		10	15	6	15	80	10	16	M12	60	70	100	11	M10	11	50	188	30	20		

Order Example — Part Number: STRS12

Days to Ship — 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

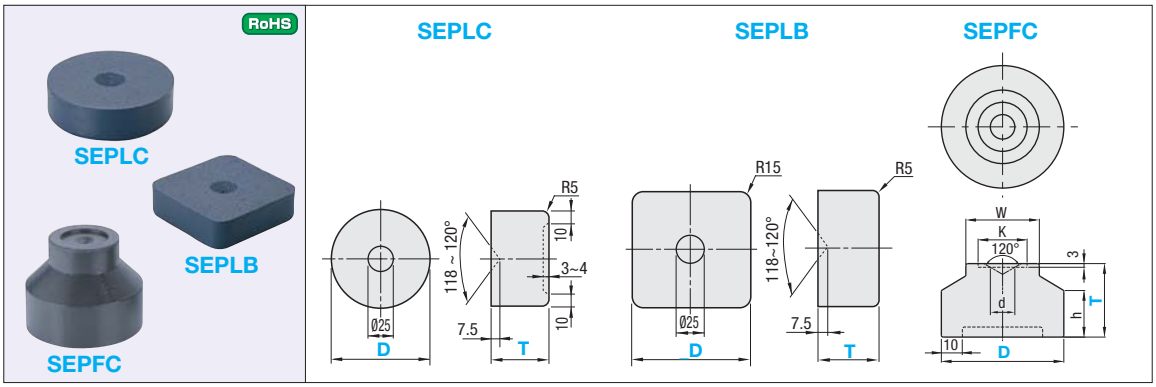
Qty.	1~9	10~19	20~39	40~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Seating Plates

-Round · Square · Thick Type-

CAD Data



Part Number Type	D	T	Reference Allowable Load kN	Mass (g)	€ Unit Price
SEPLC	60	20	5.6	360	
		30	14.8	560	
	80	20	5.6	600	
		30	14.8	990	
		50	46.2	1720	
	100	20	5.6	950	
		30	14.8	1560	
		50	46.2	2680	

Part Number Type	D	T	Reference Allowable Load kN	Mass (g)	€ Unit Price
SEPLB	80	20	10.8	880	
		30	24.5	1310	
		50	68.5	2260	
	100	20	10.8	1350	
		30	24.5	2050	
		50	68.6	3400	
	150	20	10.8	3210	
		30	24.5	4620	

Part Number Type	D	T	K	d	W	h	Reference Allowable Load kN	Mass (g)	€ Unit Price
SEPFC	80	60	30	20	60	30	10	1650	
	100	80	40			38		3250	
	120	100	42			70	12	6450	
	150	150			70	80	20	12900	

Order Example

Part Number	-	T
SEPLC60	-	20
SEPLB80	-	30
SEPFC100	-	80

Days to Ship

6 Days P.87

8 Days

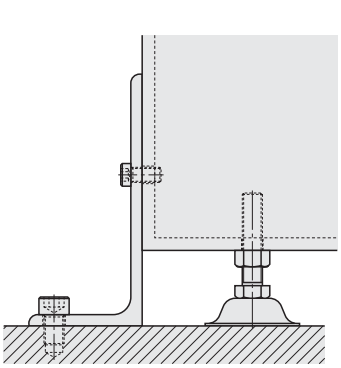
Price

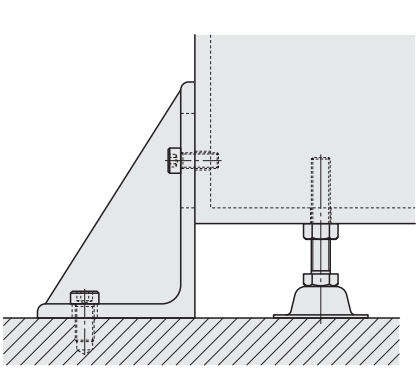
■Volume Discount (Round down to one Cent.) P.87

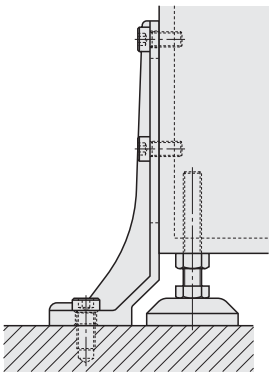
Qty.	1~24	25~49	50~99	100~199
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example







Levers · Handwheels · Knobs

Levers / Handwheels/ Knobs



Product Name	Clamp Levers -Baking Finish-	Stainless Steel	Miniature Clamp Levers	Flat Clamp Levers	Y-shaped Clamp Levers	Wing-Shaped Clamp Levers	Clamp Levers with Captured Washers
Page	999	1000	1001	1001	1002	1002	1002



Push Button Clamp Levers	Clamp Levers with Pad · with SR Tip	Resin Clamp Levers	Resin Clamp Levers	Miniature Resin Clamp Levers	Push Type Resin Clamp Levers
1003	1003	1004	1004	1004	1005



Secured Resin Clamp Levers	Ratcheting Clamping Levers	Quick Levers	Flat Tension Levers	-Hexagon Socket Head-
1005	1006	1006	1007	1007



Tension / Disengaging Tension Levers	Fixed Levers	-Offset Levers-	Ball Knobs	Grips - Non-rotating
1008	1008	1009	1009	1010



Stainless Steel Grips - Non-rotating · Rotating	Ergonomic Grips - Non-rotating · Rotating	Grips - Capped - Rotating	Grips - Tapered - Rotating	Grips with Hexagon Socket - Rotating	Grips - Rotating - Folded
1010	1010	1010	1011	1011	1011



Flat-folding Grips - Rotating	Miniature Grips - Rotating	Miniature Stainless Steel Grips - Rotating	Ball Knobs - Rotating	Handles with Square Bore - Folded	Handles with Square / Round Bore
1012	1012	1012	1012	1013	1013



Crank Handles	Plastic Offset Handwheels	Solid Disk Handwheels	Adjusting Collars	Folding Handwheels
1013	1014	1015	1015	1016



Addition





Addition



Flat Handwheels	Five Spoked Handwheels	Two Spoked Handwheels	Aluminum · Stainless Steel Handwheels - Knurled
1016	1017	1018	1019













Knurled Knobs	Thick Knurled Knobs	Knurled Knobs with Captured Washers	Stepped Knob - Not Knurled	Large Ø Knurled Knobs	Small Ø Knurled Knobs	Hexagon Socket Knurled Knobs
1020	1020	1021	1021	1021	1021	1022











Price Reduced
Up to 21%



Checker Knurled Knobs	Drop-proof Knurled Knobs	Knurled Knobs with Tip Pads	Knurled Knobs - with H.S.C.S	Knurled Knobs -Slit-	Knurled Knob Screws · SR Tip
1022	1022	1023	1023	1023	1024











Addition



Knurled Clamp Knobs	Checker Knurled Clamp Knobs	Stainless Steel Knobs	Knurled Knob Screws with Captured Washers	Knurled Knob Screws with Tip Pads	Plastic Clamp Knobs	Knurled Knobs
1025	1025	1025	1026	1026	1026	1027















Plastic Knurled Handwheels	Knurled Knobs -Diamond Cut Type-	Large Ø Knurled Knobs	Mushroom Shaped Knobs	Butterfly Shaped Knobs	Wing Knobs	Three Lobed Knobs
1027	1028	1028	1029	1029	1029	1029



Price Reduced
Up to 25%









Price Reduced
Up to 62%



Price Reduced
Up to 62%





Star Knobs	Cross Knobs	Five Lobed Knobs	Six Lobed Knobs	Seven Lobed Knobs	Super Knobs	Adjustment Screws with Knobs	Push-fit Knobs - Knurled
1030	1030	1030	1030	1031	1031	1031	1031





Hook	Drop-prevention Chains for Knobs
1032	1032

Clamp Levers
-Baked Paint Finish-

Price Reduction
Average 10%

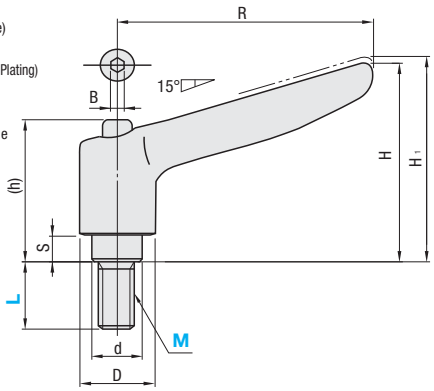
CAD Data

RoHS

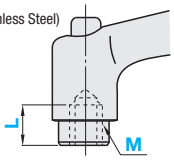


Type		L dimensions	Lever		Screws		Spring
Male Thread	Female Thread		M Material	S Surface Treatment	M Material	S Surface Treatment	M Material
CLDM	CLDF	L dimensions Selection	Zinc Die Casting	Baked Paint Finish	1.0718/9SMnPb28	Black Chromate	1.4301/ X5CrNi18-10 -WPB
CLMD	CLDFM				1.1191/C45E	Electroless Nickel Plating	
CLMS	CLFS				1.4305/ X10CrNiS18-9	-	
CLMSF	-	L Dimension Configurable					

Male Thread
CLDM
(Thread: Black Chromate)
CLMD
(Thread: Electroless Nickel Plating)
CLMS
(Thread: Stainless Steel)
L Dimension Configurable
CLMSF
(Thread: Stainless Steel)



Female Thread
CLDF
(Thread: Black Chromate)
CLDFM
(Thread: Electroless Nickel Plating)
CLFS
(Thread: Stainless Steel)



M	R	H	H1	(h)	S	D	d	No. of Serrated Teeth	B	Max. Load Fmax. (N)			Max. Tightening Force Pmax. (kN)			Reference Mass (g)	
										1.0718/ 9SMnPb28	1.4305/ X10CrNiS18-9	1.1191/ C45E	1.0718/ 9SMnPb28	1.4305/ X10CrNiS18-9	1.1191/ C45E	Male Thread	Female Thread
4	45	35	38.5	25.8	4	13	10	16	3	55	48	80	2.0	1.8	3.0	33	31
5										74	65	108	3.3	2.9	4.8	34	31
6										126	110	184	4.7	4.1	6.8	40	30
8	63.5	45	48.5	32.3	7	17.5	14	20	4	217	189	316	8.6	7.5	12.5	70	73
10	78.5	54	58	37.6	8	21	16	24	4	347	303	507	13.6	11.8	19.8	152	113
12	93	67.5	71.5	45.6	14	24	19	28	4	511	446	746	19.8	17.2	28.9	220	174

Part Number Type	M	L Selection	Lever Color	€ Unit Price CLDM	CLMD	CLMS
Male Thread CLDM CLMS CLMD	4	(8) 12 16 20 25 *(32)	B(Black) M(Orange) S(Silver Gray) R(Red) Y(Yellow)			
	5	(8) 12 16 20 25 32 *(40)				
	6	(8) 12 16 20 25 32 (40) *(50)				
	8	16 20 25 32 40 (50)				
	10	20 25 32 40 50 (63)				
	12	25 32 40 50 (63)				

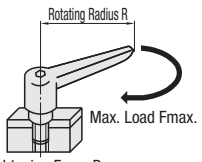
*marked units have incomplete thread section 10mm or less, others 3.5mm or less.
Dimensions in ( ) are available only for CLDM. *marked items are only applicable for S (silver gray).

Part Number Type	M	L Dimension Configurable Specify in 1mm Increment	Lever Color	€ Unit Price
L Dimension Configurable CLMSF	4	12~25	B(Black) M(Orange) S(Silver Gray) R(Red) Y(Yellow)	
	5	12~32		
	6	12~32		
	8	16~40		
	10	20~50		
	12	25~50		

Part Number Type	M	L	Lever Color	€ Unit Price CLDF	CLDFM	CLFS
Female Thread CLDF CLFS CLDFM	4	7	B(Black) M(Orange) S(Silver Gray) R(Red) Y(Yellow)			
	5					
	6					
	8	10				
	10	14				
	12	17				

Example

Load Direction of Clamp Lever



Order Example

Part Number	-	L	-	Lever Color
CLDM8	-	40	-	B
CLDF8	-	10	-	S

Days to Ship

• CLMSF
8 Days | 2 Days

Price

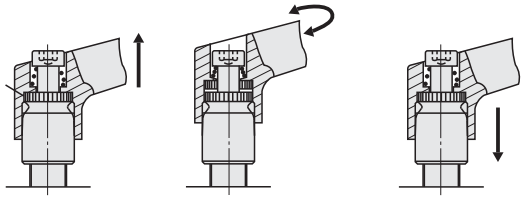
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

How to Use



(1)Pull up the lever to disengage the serrations. The clamp is unlocked.
(2)Turn the unlocked lever to desired position.
(3)Release the lever, the return spring automatically engages serrations and locks again.

Clamp Levers
-Stainless Steel-

CAD Data

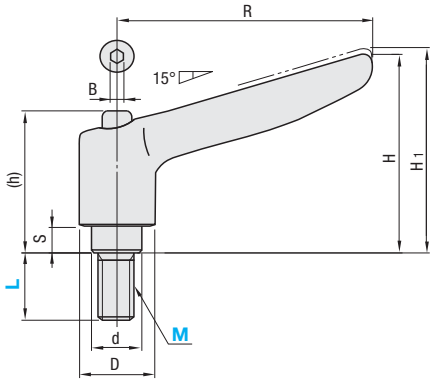
RoHS



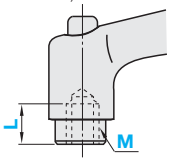
Type		Lever		Screws	Spring
Male Thread	Female Thread	M Material	S Surface Treatment	M Material	M Material
SCLDM	SCLDF	1.4308/G-X6CrNi18-9 (Stainless Cast Steel)	Buff Polished	1.4305/ X10CrNiS18-9	1.4301/ X5CrNi18-10 -WPB
CLCM	CLCF	Zinc Die Casting	Chrome Plating · Chrome over Satin Nickel		
CLCMD	-		Copper Plating+Nickel Plating		

Chrome over satin nickel is a non-gloss finish.
CLCMD has a label for identification.

Male Thread
SCLDM
(Stainless Steel)
CLCM
(Thread: Stainless Steel)
CLCMD
(Thread: Stainless Steel)



Female Thread
SCLDF
(Stainless Steel)
CLCF
(Thread: Stainless Steel)



M	R	H	H1	(h)	S	D	d	No. of Serrated Teeth	B	Max. Load Fmax. (N)	Max. Tightening Force Pmax. (kN)	Reference Mass (g) Male Thread	Reference Mass (g) Female Thread
4	45	35	38.5	25.8	4	13	10	16	3	48	1.8	33	31
5										65	2.9	34	31
6										110	4.1	40	30
8	63.5	45	48.5	32.3	7	17.5	14	20	4	189	7.5	70	73
10	78.5	54	58	37.6	8	21	16	24	4	303	11.8	152	113
12	93	67.5	71.5	45.6	14	24	19	28	4	446	17.2	220	174

■Buff Finished (Stainless Steel)

Part Number Type	M	L Selection	€ Unit Price
Male Thread SCLDM	4	12 16 20 25	
	5	12 16 20 25 32	
	6	12 16 20 25 32	

Part Number Type	M	L	€ Unit Price
Female Thread SCLDF	4	7	
	5		
	6		

■Chrome Plating · Chrome over Satin Nickel

Part Number Type	M	L Selection	Lever Color	€ Unit Price
Male Thread CLCM	4	12 16 25	C (Chrome Plating) SC (Chrome over Satin Nickel Plating)	
	5	12 16 20 25 32		
	6	12 16 20 25 32		
	8	16 20 25 32 40		
	10	20 25 32 40 50		
	12	25 32 40 50		

Part Number Type	M	L	Lever Color	€ Unit Price
Female Thread CLCF	5	7	C (Chrome Plating) SC (Chrome over Satin Nickel Plating)	
	6			
	8	10		
	10	14		
	12	17		

■Copper Plating+Nickel Plating

Part Number Type	M	L Selection	Lever Color	€ Unit Price
Male Thread CLCMD	4	12 16 20 25	NC (Copper Plating + (Nickel Plating)	
	5	12 16 20 25 32		
	6	12 16 20 25 32		

Since CLCMD is nickel-plated over the copper base, the lever part is antistatic.

Order Example

Part Number	-	L	-	Lever Color
CLCM8	-	20	-	
CLCMD6	-	25	-	NC

Price

Days to Ship

- SCLDM · SCLDF · CLCM · CLCF: 6 Days P.87
- CLCMD: 8 Days

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Miniature Clamp Levers / Flat Clamp Levers

CAD Data

Miniature Clamp Levers

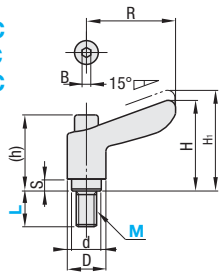
RoHS



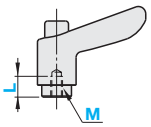
Type		Lever		Screws		Spring
Male Thread	Female Thread	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material
CLDMC	CLDFC	Zinc Die Casting	Baked Paint Finish	1.1191/C45E	Black Oxide	1.4301
CLMSC	CLFSC			1.4305	-	
CLCMC	CLCFC		Chrome Plating · Chrome over Satin Nickel			

(T)Chrome over satin nickel is a non-gloss finish

Male Thread
CLDMC
CLMSC
CLCMC



Female Thread
CLDFC
CLFSC
CLCFC



M	R	H	H1	(h)	S	D	d	No. of Serrated Teeth	B	Max. Load Fmax. (N) 1.4305	Max. Load Fmax. (N) 1.1191/C45E	Max. Tightening Force Pmax. 1.4305	Max. Tightening Force Pmax. 1.1191/C45E	Reference Mass (g) Male Thread	Reference Mass (g) Female Thread
4	30	29	32.5	25.8	4	13	10	16	3	48	80	1.8	3.0	25	23
5										65	108	2.9	4.8	26	24
6										110	184	4.1	6.8	32	30
8	42	40	43.5	32.3	7	17.5	14	20	4	189	316	7.5	12.5	60	-

Part Number Type	M	L € Unit Price	Lever Color CLDMC·CLMSC	Lever Color CLCMC	€ Unit Price CLDMC	CLMSC	CLCMC
Male Thread CLDMC CLMSC CLCMC	4	*8 12 16 20 25	B (Black) M (Orange) S (Silver Gray) *R (Red) *Y (Yellow)	C (Chrome Plating) SC (Chrome over Satin Nickel Plating)			
	5	*8 12 16 20 25 32					
	6	*8 12 16 20 25 32					
	*8	16 20 25 32					⊗

Part Number Type	M	L	Lever Color CLDFC · CLFSC	Lever Color CLCFC	€ Unit Price CLDFC	CLFSC	CLCFC
Female Thread CLDFC CLFSC CLCFC	4	7	B (Black) M (Orange) S (Silver Gray) R (Red) Y (Yellow)	C (Chrome Plating) SC (Chrome over Satin Nickel Plating)			
	5						
	6						

⊗*Red and yellow are not available for M8 and L8 size levers. ⊗M8 is not applicable for *CLCMC.

Features: Suitable for use without interfering when upper space is narrow.

Flat Clamp Levers

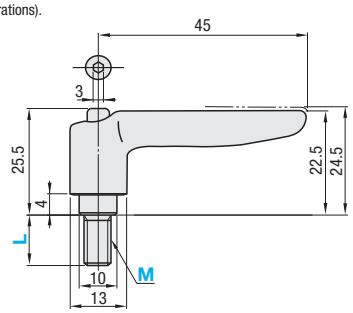
RoHS



Type	Lever M Material	Lever S Surface Treatment	Screws M Material	Screws S Surface Treatment	Spring M Material
CLDMT	Zinc Die Casting	Electrostatic Coating	1.1191/C45E	Black Oxide	1.4301
CLMST			1.4305	-	

(T)16 teeth (serrations).

Male Thread
CLDMT
CLMST



Part Number Type	M	L	Lever Color	Max. Load Fmax. (N) 1.4305	Max. Load Fmax. (N) 1.1191·C45E	Max. Tightening Force Pmax. 1.4305	Max. Tightening Force Pmax. 1.1191/C45E	Reference Mass (g)	€ Unit Price CLDMT	CLMST
CLDMT CLMST	4	12 16 20 25	B (Black) M (Orange) S (Silver Gray)	48	80	1.8	3	33		
	5	12 16 20 25 32		65	108	2.9	4.8	34		
	6	12 16 20 25 32		110	184	4.1	6.8	40		

Order Example

Part Number	-	L	-	Lever Color
CLDMC4	-	12	-	M
CLDMT4	-	16	-	M

Days to Ship **6 Days** P.87

Price

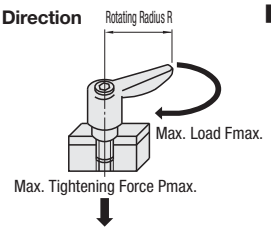
Volume Discount ((T)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

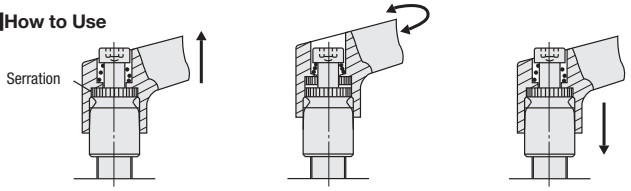
(T)For orders larger than indicated quantity, please request a quotation.

Example

Load Direction



How to Use



(1)Pull up the lever to disengage the serrations. The clamp is unlocked.

(2)Turn the unlocked lever to desired position.

(3)Release the lever, the return spring automatically engages serrations and locks again.

Y-shaped Clamp Levers · Wing-shaped Clamp Levers · Clamp Levers with Captured Washers

CAD Data

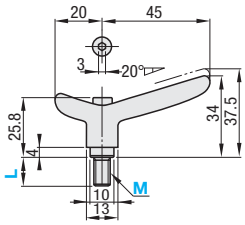
■Y-shaped Clamp Levers RoHS



Type	Lever		Screws		Spring
	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material
CLDMY	Zinc Die Casting	Baked Paint Finish	1.1191/C45E	Black Oxide	1.4301
CLMSY			1.4305	-	

(T)16 teeth (serrations).

Male Thread
CLDMY
CLMSY



Part Number Type	M	L	Lever Color	Max. Load Fmax. (N) 1.4305	Max. Load Fmax. (N) 1.1191/C45E	Max. Tightening Force Pmax. 1.4305	Max. Tightening Force Pmax. 1.1191/C45E	Reference Mass (g)	€ Unit Price CLDMY	€ Unit Price CLMSY
CLDMY CLMSY	4	(12) 16 (20) 25	B (Black) M (Orange) S (Silver Gray)	48	80	1.8	3	40		
	5	(12) 16 20 25 32		65	108	2.9	4.8	40		
	6	12 16 20 25 32		110	184	4.1	6.8	41		

⊗Dimensions in ( ) are not available for CLDMY.

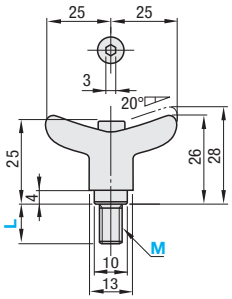
■Wing-shaped Clamp Levers RoHS



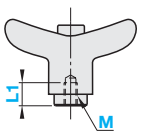
Type		Lever		Screws		Spring
Male Thread	Female Thread	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material
CLDMCH	CLDFCH	Zinc Die Casting	Electrostatic Coating	1.1191/C45E	Black Oxide	1.4301
CLMSCH	-			1.4305	-	

(T)16 teeth (serrations).

Male Thread
CLDMCH
CLMSCH



Female Thread
CLDFCH



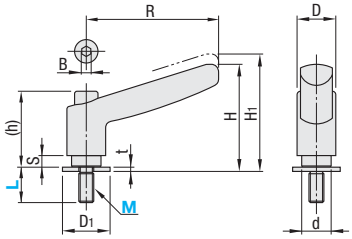
Part Number Type	M	L (Threads)	L1 (Female Thread)	Lever Color	Max. Load Fmax. (N) 1.4305/X10CrNiS18-9	Max. Load Fmax. (N) 1.1191/C45E	Max. Tightening Force Pmax. (kN) 1.4305/X10CrNiS18-9	Max. Tightening Force Pmax. (kN) 1.1191/C45E	Reference Mass (g) Male Thread	Reference Mass (g) Female Thread	€ Unit Price Male Thread CLDMCH	€ Unit Price Male Thread CLMSCH	€ Unit Price Female Thread CLDFCH
Male Thread CLDMCH CLMSCH Female Thread CLDFCH	4	12 16 20 25	7	B(Black) M(Orange) S(Silver Gray)	48	80	1.8	3	32	29			
	5	12 16 20 25 32			65	108	2.9	4.8	33	29			
	6	12 16 20 25 32			110	184	4.1	6.8	34	29			

■Clamp Levers with Captured Washers RoHS



Type	Lever		Screws		Spring	Flat Washer	
	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material	M Material	S Surface Treatment
CLDMST	Zinc Die Casting	Baked Paint Finish	1.0718	Black Chromate	1.4301/X5CrNi18-10-WPB	1.1191/C45E	Electroless Nickel Plating

CLDMST



Part Number Type	M	L	Lever Color	R	H	H1	(h)	S	D	d	D1	t	No. of Serrated Teeth	B	Max. Load Fmax. (N)	Max. Tightening Force Pmax. (kN)	Reference Mass (g)	€ Unit Price
CLDMST	6	12 16 20 25 32	B (Black)	45	36.5	40	25.8	4	13	10	16	1.5	16	3	95	3.6	39	
	8	16 20 25 32 40		63.5	47	50.5	32.3	7	17.5	14	22	2	20	4	171	6.8	90	
	10	20 25 32 40 50		78.5	56.5	60.5	37.6	8	21	16	28	2.5	24	4	221	10.8	182	
	12	25 32 40 50		93	70.5	74.5	45.6	14	24	19	35	3	28	4	277	16.1	227	

Order Example

Part Number	-	L	-	Lever Color
CLDMY4	-	16	-	S
CLDMCH4	-	12	-	M
CLDFCH6	-	7	-	B
CLDMST6	-	25	-	B

Days to Ship: 6 Days P.87

Price

Volume Discount (T)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

(T)For orders larger than indicated quantity, please request a quotation.

Clamp Levers with Push Button / with Pad / with SR Tip

CAD Data

Features: Serrations can be disengaged easily by pushing the screw head.

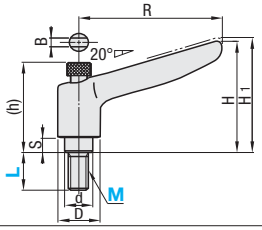
Push Button Clamp Levers

RoHS

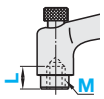


Type		Lever		Screws		Spring
Male Thread	Female Thread	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material
CLDMP	CLDFP	Zinc Die Casting	Electrostatic Coating	1.1191	Black Oxide	1.4301-WPB
CLMSP	-			1.4305	-	
SCLMSP		1.4308 (Stainless Cast Steel)	Buff Polished	1.4305		

Male Thread
CLDMP
CLMSP
SCLMSP
(Stainless Steel)

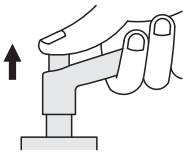


Female Thread
CLDFP



Example

How to Use



The projection at the head of the screw makes it easy to disengage the serrations.

M	R	H	H1	(h)	S	D	d	No. of Serrated Teeth	B	Max. Load Fmax. (N)		Max. Tightening Force Pmax.		Reference Mass (g)
										1.4305	1.1191	1.4305	1.1191	Male Thread
4	45	33	35.5	30	4	13	10	16	3	48	80	1.8	3.0	40
5										65	108	2.9	4.8	40
6										110	184	4.1	6.8	41
8	63	45.5	49	38	7	17.5	14	20	4	189	316	7.5	12.5	70

Part Number Type	M	L	Lever Color Selectable for CLDMP and CLMSP only	€ Unit Price SCLMSP	CLDMP	CLMSP
Male Thread SCLMSP CLDMP CLMSP	4	16 20 25	B(Black) M(Orange) S(Silver Gray)			
	5	12 16 20 25 32				
	6	12 16 20 25 32				
	*8	16 20 25 32 40				

Part Number Type	M	L	Lever Color	€ Unit Price CLDFP
Female Thread CLDFP	4	7	B(Black) M(Orange) S(Silver Gray)	
	5			
	6			
	8			

⊗* M8 is not available for SCLMSP.

Clamp Levers with Pad · Clamp Levers with SR Tip

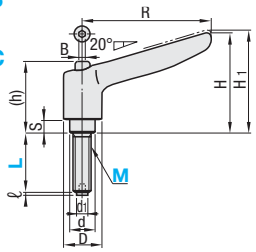
RoHS



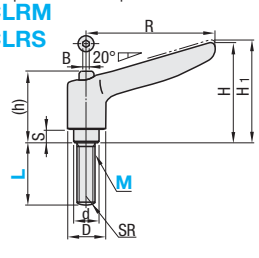
Type		Shape	Screws		Pad (Only Clamp Levers with Pad)	Spring	Lever	
Clamp Levers with SR Tip		Clamp Levers with Pad	M Material	S Surface Treatment			M Material	S Surface Treatment
CLRM		CLWBP	1.0718/9SMnPb28	Black Chromate	Polyacetal (White)	1.4301-WPB	Zinc Die Casting	Select from the followings
CLRS		CLWP	1.4305/X10CrNiS18-9	-				
-		CLWBC	1.0718/9SMnPb28	Black Chromate	Free-cutting Brass (CW614N/CuZn39Pb3)			
		CLWC	1.4305/X10CrNiS18-9	-				

Chrome over satin nickel is a non-gloss finish.

Clamp Levers with Pad
CLWBP
CLWP
CLWBC
CLWC

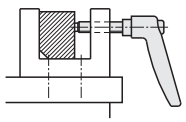


Clamp Levers with SR Tip
CLRM
CLRS



Example

How to Use



M	R	H	H1	(h)	S	D	d	d1	SR	ℓ	No. of Serrated Teeth	B	* Max. Load Fmax. (N)	* Max. Tightening Force Pmax. (kN)	Reference Mass (g)
5	45	35	38.5	25.8	4	13	10	3	5	1	16	3	74	3.3	34
6								4	6				126	4.7	40
8	63.5	45	48.5	32.3	7	17.5	14	6	8	2	20	4	217	8.6	70
10	78.5	54	58	37.6	8	21	16	8	10		24		347	13.6	152

*Max. load and max. tightening force indicate axial force for the screws (M). Pads may break if tightened to the same clamping strength.
The Clamp Lever with SR Tip has less contact area with work piece; therefore misalignment can be avoided when tightening the screws.

Part Number Type		M	L	Lever Color	€ Unit Price CLWBP CLWBC	CLWP CLWC	CLRM	CLRS
With Pad CLWBP (Polyacetal) CLWP (Polyacetal) CLWBC (Free-Cutting Brass) CLWC (Free-Cutting Brass)	SR Tip CLRM CLRS	5	12 16 20 25 32	B (Black) M (Orange) S (Silver Gray) C (Chrome Plating) SC (Chrome over Satin Nickel Plating)				
		6	12 16 20 25 32					
		8	16 20 25 32 40					
		10	20 25 32 40					

Order Example

Part Number	-	L	-	Lever Color
CLDMP5	-	12	-	B
CLDFP4	-	7	-	M
CLWP8	-	20	-	M
CLRM10	-	20	-	S

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

6 Days P87

- CLWP-CLWC

8 Days Express A 5,00 EUR/piece P88

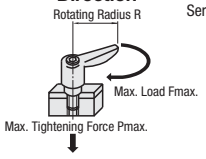
A Express Charge of 13,50 EUR for 3 or more identical pieces.

- CLWBP · CLWBC · CLRM · CLRS

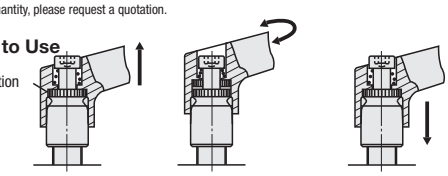
8 Days

Example

Load Direction



How to Use



(1)Pull up the lever to disengage the serrations. The clamp is unlocked.
(2)Turn the unlocked lever to desired position.
(3)Release the lever, the return spring automatically engages serrations and locks again.

Resin Clamp Levers / Miniature Resin Clamp Levers

Price Reduction

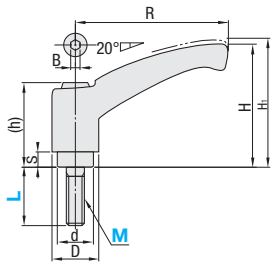
CAD Data

Resin Clamp Levers RoHS



Type	Lever	Screws		Spring
	M Material	M Material	S Surface Treatment	M Material
CLNP	Nylon 6 (Mat Black)	1.0715/9SMn28/L	Black Oxide	1.4301/X5CrNi18-10/WPB
CLSP		1.4305/X10CrNiS18-9	-	

Male Thread
CLNP
CLSP



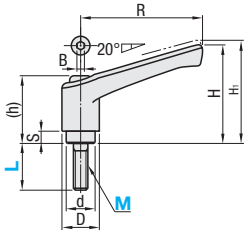
Part Number Type	M	L	R	H	H1	(h)	S	D	d	No. of Serrated Teeth	B	Max. Load Fmax. (N)	Max. Tightening Force Pmax. (kN)	Reference Mass (g)	€ Unit Price CLNP	€ Unit Price CLSP
CLNP CLSP	4	12 16 20 25	48	29.5	31.5	25.5	4	13	10	16	3	21	1.7	18		
	5	12 16 20 25 32										42	2.7			
	6	12 16 20 25 32 40										70	3.8	20		
	8	16 20 25 32 40 50	65	44.5	46.5	33.5	6	18	14	20	4	120	7	40		
	10	20 25 32 40 50	82	51.5	53.5	38	8	21	16	24		200	11	80		
	12	25 32 40 50	92	64	66	47	11	25	19	28	5	290	16	120		

Resin Clamp Levers RoHS

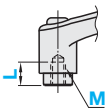


Type		Lever	Screws		Spring
Male Thread	Female Thread	M Material	M Material	S Surface Treatment	M Material
LNP	LNF	Nylon 6 (Mat Black)	1.0715/9SMn28/L	Black Oxide	1.4301/X5CrNi18-10/WPB

Male Thread
LNP



Female Thread
LNF



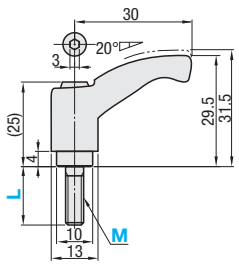
Part Number Type	M	L LNP	L LNF	R	H	H1	(h)	S	D	d	No. of Serrated Teeth	B	Max. Load Fmax. (N)	Max. Tightening Force Pmax. (kN)	Reference Mass (g) Male Thread	Reference Mass (g) Female Thread	€ Unit Price LNP	€ Unit Price LNF
Male Thread LNP Female Thread LNF	4	12 16 20 25	8	45	35.5	39	24.5	4.2	13	10	18	3	21	1.7	18	16		
	5	12 16 20 25 32											42	2.7				
	6	12 16 20 25 32 40											70	3.8	20	14		
	8	16 20 25 32 40 50	10	63	46.3	50.3	31	6.5	17.5	13.5	24	4	120	7	40	30		
	10	20 25 32 40 50	14	78	55.4	59.4	36	8	21	16	26		200	11	80	50		
	12	25 32 40 50	17	92	66	70	43	11	25	19	28	5	290	16	120	70		

Miniature Resin Clamp Levers RoHS



Type	Lever	Screws		Spring
	M Material	M Material	S Surface Treatment	M Material
CLNPC	Nylon 6 (Mat Black)	1.0715/9SMn28/L	Black Oxide	1.4301/X5CrNi18-10/WPB

Male Thread
CLNPC



Part Number Type	M	L	No. of Serrated Teeth	Max. Load Fmax. (N)	Max. Tightening Force Pmax. (kN)	Reference Mass (g)	€ Unit Price
Male Thread CLNPC	4	12 16 20 25	16	21	1.7	18	
	5	12 16 20 25 32		42	2.7		
	6	12 16 20 25 32 40		70	3.8	20	

Order Example

Part Number	-	L
CLNP4	-	12
LNP8	-	20
LNF10	-	14
CLNPC4	-	12

Days to Ship: 6 Days (P.87), 2 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

Push Button Resin Clamp Levers / Disengaging Resin Clamp Levers

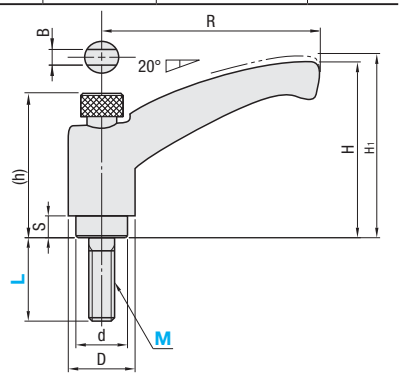
CAD Data

Push Bottom Resin Clamp Levers RoHS



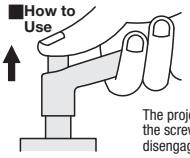
Type	Lever	Screws		Spring
	M Material	M Material	S Surface Treatment	M Material
CLNPP	Nylon 6 (Mat Black)	1.0715/9SMn28L	Black Oxide	1.4301/ X5CrNi18-10-WPB
CLSPP		1.4305/X10CrNiS18-9	-	

Male Thread
CLNPP
CLSPP



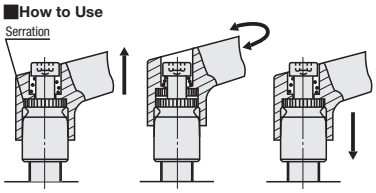
Example

How to Use



The projection at the head of the screw makes it easy to disengage the serrations.

How to Use



(1)Pull up the lever to disengage the serrations. The clamp is unlocked.

(2)Turn the unlocked lever to desired position.

(3)Release the lever, the return spring automatically engages serrations and locks again.

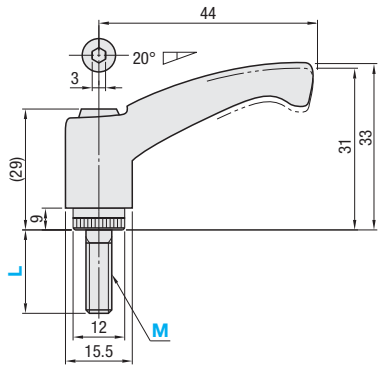
Part Number Type	M	L	R	H	H1	(h)	S	D	d	No. of Serrated Teeth	B	Max. Load Fmax. (N)	Max. Tightening Force Pmax. (kN)	Reference Mass (g)	€ Unit Price CLNPP	€ Unit Price CLSPP
Male Thread CLNPP CLSPP	4	20	48	29.5	31.5	33.5	4	13	10	16	1	21	1.7	18		
	5	12 16 20 25 32										42	2.7			
	6	12 16 20 25 32 40										70	3.8	20		
	8	16 20 25 32 40 50	65	44.5	46.5	43.5	6	18	14	20	1.5	120	7	40		
	10	20 25 32 40 50	82	51.5	53.5	50	8	21	16	24	1.5	200	11	80		
	12	25 40	92	64	66	60	11	25	19	28	2	290	16	120		

Disengaging Resin Clamp Levers RoHS

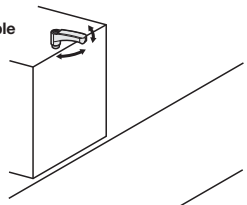


Type	Lever	Screws		Spring
	M Material	M Material	S Surface Treatment	M Material
CLNPA	Nylon 6 (Mat Black)	1.0715/9SMn28L	Black Oxide	1.4301/X5CrNi18-10-WPB

Male Thread
CLNPA

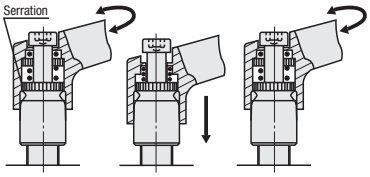


Example



Levers are in a free state at the home position and
(1) do not harm operators.
(2) lever will not come loose if accidentally turned.

How to Use



(1)The lever is unlocked. Turn the lever to the desired position.

(2)By pushing down the lever, the serrations are engaged and locked.

(3)By releasing the lever, the serration are disengaged by spring force and the lever is unlocked.

Part Number Type	M	L	No. of Serrated Teeth	Max. Load Fmax. (N)	Max. Tightening Force Pmax. (kN)	Reference Mass (g)	€ Unit Price
Male Thread CLNPA	4	12 20	16	21	1.7	18	
	5	12 16 20 25 32		42	2.7		
	6	12 16 20 25 32		70	3.8	20	

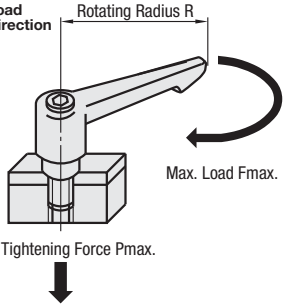
Order Example

Part Number	-	L
CLNPP4	-	12
CLNPA4	-	12

Days to Ship: 6 Days P.87

Example

Load Direction



Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

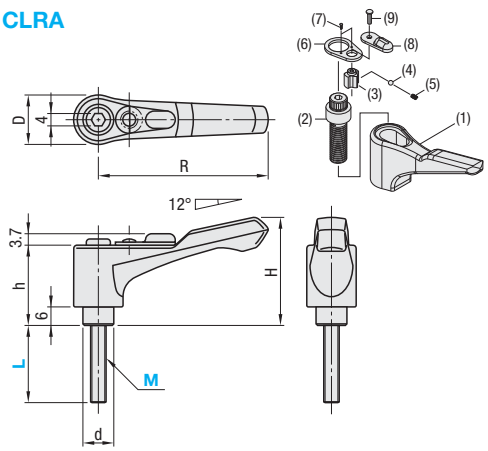
Ratchet Clamping Levers / Quick Levers

CAD Data

■Ratcheting Clamping Levers RoHS



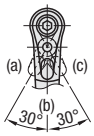
CLRA



Example

In Use	Ratchet Operation
(a) Clamp	Clamp the screw by right rotation of lever (rotates free in left direction)
(b) Clamped Status	Lever is free in both directions.
(c) Unclamp	Loosen the screw by left rotation of lever (rotes free in right direction)

· Direction of ratchet mechanism can be easily changed by switching the position of tab.
· By setting the switching tab to the (b)position after clamping, lever is released in both rotational directions and accidental loosening can be prevented.



	Material	Surface Treatment
(1) Lever	Zinc Die Casting	Electrostatic Coating
(2) Geared Screw	1.1191/C45E	Black Oxide
(3) Cam	1.7220/34CrMo4	Black Oxide
(4) Ball	1.3505/100Cr6	Nickel Plating
(5) Spring	JIS SWPA	Tempered / Rustproof Coated
(6) Cap	1.0330/DC01	Black Oxide
(7) Screw	1.0301/C10	Black Oxide
(8) Switch Handle	1.0330/DC01	Black Oxide
(9) Screw	1.0301/C10	Black Oxide

Part Number Type	M	L	Lever Color	R	H	h	D	d	Fmax. Max. Load (N)	Pmax. Max. Tightening Force (kN)	Reference Mass (g)	€ Unit Price
CLRA	5	16 25	B (Black)	55	35	26	17	10	108	4.8	61	
	6	20 32							184	6.8	63	
	8	25 40		68	45	33	18	14	316	12.5	101	
	10	32 50							507	19.8	112	

Order Example Part Number - L - Lever Color
CLRA 5 - 25 - B

Days to Ship 6 Days P.88

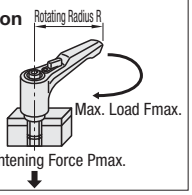
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

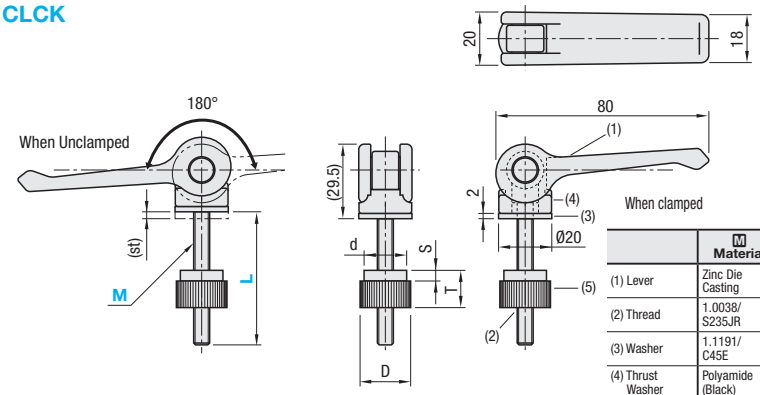
■Load Direction



■Quick Levers RoHS



CLCK



	Material	Surface Treatment
(1) Lever	Zinc Die Casting	Electrostatic Coating
(2) Thread	1.0038/S235JR	Electroless Nickel Plating
(3) Washer	1.1191/C45E	Electroless Nickel Plating
(4) Thrust Washer	Polyamide (Black)	-
(5) Knurled Clamp Knob	1.1191/C45E	Electroless Nickel Plating

Part Number Type	M	L	Lever Color	(st)	D	d	T	S	Reference Mass (g)	€ Unit Price
CLCK	5	30 40	B (Black)	2.6	16	14	12	4	122	
	6	40 50		2.6	19	16	14	4	136	
	8	50 60		2.6	24	20	17	5	170	

Tightening Force (N)	Lever Load (N)
1000	18
2000	36
3000	78

Order Example Part Number - L - Lever Color
CLCK 6 - 40 - B

Days to Ship 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

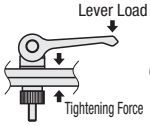
For orders larger than indicated quantity, please request a quotation.

Example

■Quick Levers

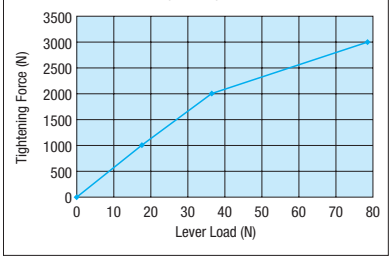


(1)Decide on the direction to which the lever is pushed down and adjust torque with the clamp knob.



(2)Push down the lever to clamp.

■Correlation between Tightening Force and Lever Load



Flat Tension Levers / Flat Tension Levers with Hexagon Socket Head Cap

CAD Data

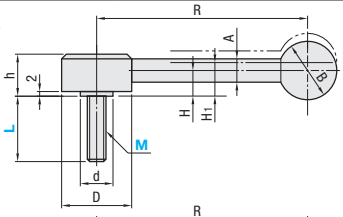
Flat Tension Levers



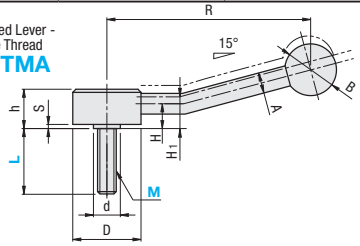
RoHS

Type		Shape	Levers · Threads		Grip
			M Material	S Surface Treatment	
LFTM	Standard Type	Male Thread	1.1191/C45E	Black Oxide (Black)	Phenol Resin (Black)
LFTMF		Female Thread			
LFTMA	Angled	Male Thread	1.0715/9SMn28		

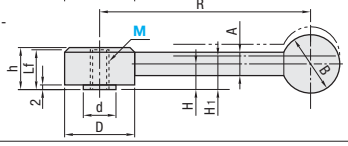
Standard Lever - Male Thread **LFTM**



Angled Lever - Male Thread **LFTMA**



Standard Lever - Female Thread **LFTMF**



Part Number Type	M	L (Male Thread Only)	Lf	R	H	H1	h	A	B	D	d	No. of Serrated Teeth	Fmax. Max. Load (N)	Pmax. Max. Tightening Force (kN)	Reference Mass (g) LFTM	Reference Mass (g) LFTMF	€ Unit Price LFTM	€ Unit Price LFTMF
Male Thread LFTM Female Thread LFTMF	8	30 40 50		18	100	12	16	19	10	25	33	13	22	120	10	185	160		
	10	30 40 50 60		21	130	13.5	17.5	22	12	30	41	19	26	180	16	340	300		
	12	30 40 50 60												300	23	350	300		
	16	40 50 60		27	150	17	22	28	14	35	45	23	36	660	43	580	450		

Part Number Type	M	L	R	H	H1	h	S	A	B	D	d	No. of Serrated Teeth	Fmax. Max. Load (N)	Pmax. Max. Tightening Force (kN)	Reference Mass (g)	€ Unit Price
Angled LFTMA	8	32 40 50	100	12.5	16.5	20.5	1.5	8	20	32	13.5	22	120	10	155	
	10	32 40 50 63	120	15	19	24.5	2	10	25	36	16	26	180	16	250	
	12	40 50 63	130	16	20.5	26.5		12	30	40	19		300	23	350	
	16	40 50 63	145	20	25	31.5			32	45	23	36	660	43	520	

Flat Tension Levers with Hexagon Socket Head Cap

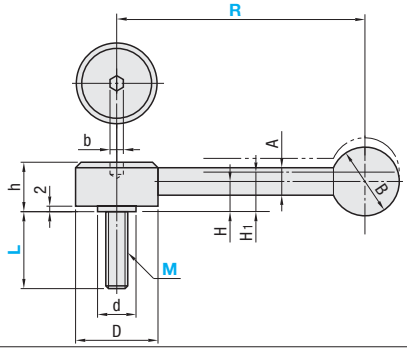


RoHS

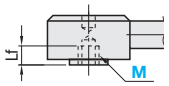
Type	R dimensions	Shape	Main Structures · Levers		Grip	
			M Material	S Surface Treatment	M Material	S Surface Treatment
LFTMR	R Dimension Fixed	Male Thread	1.1191/C45E	Cathodic Coating (Black)	Phenol Resin (Black)	-
LFTFRS		Female Thread	1.4305/X10CrNiS18-9	-	1.4301/X5CrNi18-10	Electrolityc Polishing
LFTFRF	R Dimension Configurable	Male Thread	1.1191/C45E	Cathodic Coating (Black)	Phenol Resin (Black)	-

R Dimension Fixed Male Thread **LFTMR**

R Dimension Configurable Male Thread **LFTMRF**



R Dimension Fixed Female Thread **LFTFRS**



Part Number Type	M	L (Male Thread Only)	R Fixed	R 10mm Increment (LFTMRF only)	Lf	H	H1	h	A	B	b	D	d	No. of Serrated Teeth	Fmax. Max. Load (N)	Pmax. Max. Tightening Force (kN)	Reference Mass (g) Steel	Reference Mass (g) Stainless Steel	€ Unit Price LFTMR	€ Unit Price LFTMRF	€ Unit Price LFTFRS
Male Thread LFTMR LFTMRF Female Thread LFTFRS	8	30 40 50	100	80~120	8	12	16	19	10	25	3	33	13	22	120	10	185	250			
	10	30 40 50 60	130	100~150	11	13.5	17.5	22	12	30	5	41	19	26	180	16	340	400			
	12	30 40 50 60													300	23	350	400			
	16	40 50 60	150	120~180	14	17	22	28	14	35		45	23	36	660	43	580	680			

Order Example

Part Number	-	L	-	R
LFTM 8	-	30		
LFTMF 8				
LFTMRF 8	-	30	-	110
LFTFRS 8				

Days to Ship

· Except R Dimension Configurable: 6 Days P.87

· LFTMRF (R Dimension Configurable): 8 Days

Price

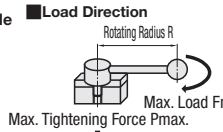
Volume Discount (Round down to one Cent.) P.87

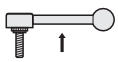
Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

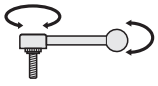
Example

Load Direction

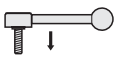




(1)Pull up the lever to disengage the serrations. The clamp is unlocked.



(2)Turn the unlocked lever to desired position.



(3)Release the lever, the return spring automatically engages serrations and locks again.

Tension Levers / Disengaging Tension Levers / Fixed Levers

CAD Data

Tension Levers RoHS

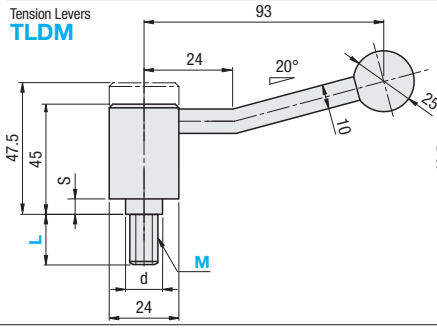


Disengaging Tension Levers RoHS

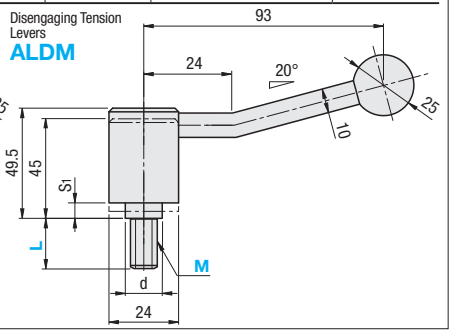


Type		Lever	Screws		Grip
Tension Lever	Disengaging Tension Lever	M Material	M Material	S Surface Treatment	M Material
TLDM	ALDM	1.1191/C45E	1.1191/C45E	Black Oxide	Phenol Resin

Tension Levers **TLDM**



Disengaging Tension Levers **ALDM**



Part Number Type	M	L	S	S_1	d	No. of Serrated Teeth	Fmax. Max. Load N	Pmax. Max. Tightening Force kN	Reference Mass (g)	€ Unit Price TLDM	€ Unit Price ALDM
TLDM ALDM	10	30 40 50	4	9	16	23	300	12	210		
	12	30 40 50 60	4	9	16	23	420	18	215		
	16	40 50 60	3	3	22	23	670	33	220		

Order Example: Part Number TLDM10 - L 30

Days to Ship: 6 Days P.87

Price

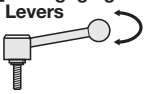
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

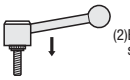
Example

Disengaging Tension Levers

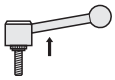


(1)The lever is unlocked. Turn the lever to the desired position.

Tension Levers P.1007



(2)By pushing down the lever, the serrations are engaged and locked.



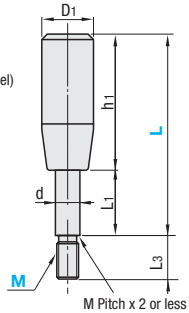
(3)By releasing the lever, the serration are disengaged by spring force and the lever is unlocked.

Fixed Levers RoHS

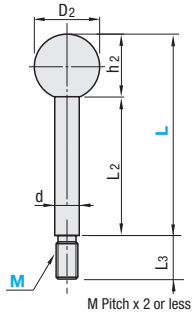


Type		Grip	Lever	
Grip Type	Ball Knob Type	M Material	M Material	S Surface Treatment
LRGN	LBG	(Black) Phenol Resin (Red) Melamine Resin	1.0718/9SMnPb28	Matt Chrome Plating
LRGB	LBGB			Black Oxide
LRGNS	LBGS		1.4305/X10CrNiS18-9	-

Grip Type
LRGN (Steel)
LRGB (Steel, Black)
LRGNS (Stainless Steel)



Ball Knob Type
LBG (Steel)
LBGB (Steel, Black)
LBGS (Stainless Steel)



Part Number Type	M (Coarse Thread)	L	Grip Color	L_3	d	LRGN · LRGB · LRGNS D_1	LRGN · LRGB · LRGNS H_1	LRGN · LRGB · LRGNS L_1	LBG · LBGB · LBGS D_2	LBG · LBGB · LBGS H_2	LBG · LBGB · LBGS L_2	Reference Mass (g)	€ Unit Price LRGN	LRGB	LRGNS	LBG	LBGB	LBGS
Grip Type LRGN LRGB LRGNS / Ball Knob Type LBG LBGB LBGS	6	63	R (Red) B (Black)	12	8	17	40	23	20	18	45	25						
		80						40			62	32						
		100						60			82	40						
	8	80		20	10	21	50	30	25	23	57	53						
		100						50			77	65						
		125						75			102	81						
	10	100		25	12	25	65	35	30	28	72	97						
		125						60			97	119						
		160						95			132	149						
	12	125		30	14	28	85	40	35	32	93	163						
		160						75			128	205						
		200						115			168	253						

The knob color for LRGB and LBGB is black only.

Order Example: Part Number LRGS6 - L 63 - Knob Color R; Part Number LRGB8 - L 100 - Knob Color B

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29	30~49
Rate	€ Unit Price	5%	10%	18%

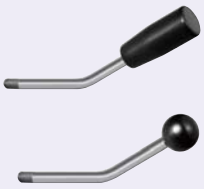
For orders larger than indicated quantity, please request a quotation.

Offset Levers - Ball Knobs

Price Reduction
Up to 66%

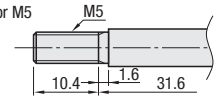
CAD Data

Offset Levers RoHS

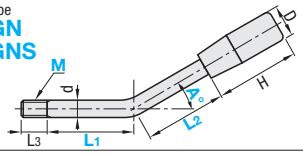


Type		Grip		Lever	
Grip Type	Ball Knob Type	M Material	S Surface Treatment	M Material	S Surface Treatment
LAGN	LAG	Phenol Resin (Black)		1.1191/C45E	Cathodic Coating (Black)
LAGNS	LAGS			1.4301/ X5CrNi18-10	-

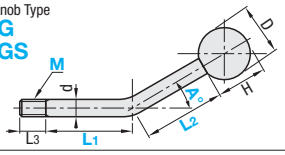
Tighten the nuts after positioning the lever.



Grip Type
LAGN
LAGNS



Ball Knob Type
LAG
LAGS



Part Number Type	M (Coarse Thread)	L1	L2	A° (Tolerance±2°)	L3	d	D LAGN · LAGNS	D LAG · LAGS	H LAGN · LAGNS	H LAG · LAGS	€ Unit Price LAGN	LAGNS	LAG	LAGS
Grip Type LAGN LAGNS	5	30	60	30	12	6	17	25	40	24				
	6													
Ball Knob Type LAG LAGS	8	30~100	60~100	30 45 60 90	15	8								
	10				20	10	21	30	50	29				
	12				25	12	25	35	65	34				

M5 and M6 are available for LAGN and LAG only.

Order Example

Part Number	L1	L2	A°
LAGN5	30	60	30
LAGS10	80	100	90

Days to Ship
- M5 · M6: 6 Days P.87
- M8 ~ M10: 8 Days

Price

Volume Discount (round down to ten Cent) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

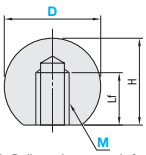
For orders larger than indicated quantity, please request a quotation.



RoHS

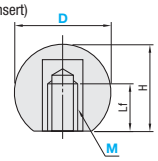
Type	Balls M Material	Balls S Surface Treatment	Screws M Material
PBA	(Black) Phenol Resin (Red) Melamine Resin	-	-
PCA		-	Brass (Insert)
BGW	EPDM (Mat Black)	-	Brass (Insert)
BKS	1.4301/X5CrNi18-10	Buff Polished	-
BKA	Aluminum Alloy	Polishing	-
BKAW		Clear Anodize	-
BKAB		Black Anodize	-

(Without Resin Insert)
PBA
(Stainless Steel)
BKS
(Aluminum)
BKA
BKAW
BKAB

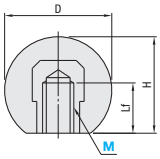


*Selectable D dimensions are only for Resin Type

(With Resin Insert)
PCA



(With rubber insert)
BGW



Resin (Black: Phenol · Red: Melamine)

Part Number Type	M (Coarse)	D	Knob Color	H	Lf PBA	Lf PCA	Mass (g) PBA PCA	PBA € Unit Price 1~20 pcs or more	PCA € Unit Price 1~20 pcs or more
PBA (No Insert) PCA (Brass Insert)	6	20	R (Red) B (Black)	18	10	10	7		
		25		23	10	10	15		
		30		28	16	10	20		
	8	20		18	10	10	7		
		25		23	12	12	15		
		30		28	16	12	30		
		35		32	16	12	40		
	10	30		28	18	15	30		
		35		32	18	15	40		
		40		37	18	15	55		
	12	40		37	18	15	50		

The default color will be black unless specified otherwise.

Order Example

Part Number	D	Knob Color
PBA12	40	R
PBA6	25	B
BGW6		
BKS3		
BKA10		

Days to Ship
6 Days P.87
2 Days

Price

- Rubber BGW

Volume Discount (round down to ten cent) P.87

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

- Stainless Steel · Aluminum · BKS · BKA · BKAW · BKAB

Volume Discount (round down to ten cent) P.87

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is not applicable to Resin Type PBA and PCA.

Rubber

Part Number Type	M (Coarse Thread)	D	H	Lf	Mass (g)	€ Unit Price
BGW	6	20	18	10	10	
	8	25	22.5	12.5	15	
	10	32	29	16	25	
	12	40	36	20	40	

Stainless Steel · Aluminum

Part Number Type	M (Coarse Thread)	D	H	Lf	Mass (g) BKS	Mass (g) BKA_	€ Unit Price BKS	BKA	BKAW	BKAB
Stainless Steel BKS Aluminum BKA BKAW BKAB	3	15	*13	*8	13	5				
	4	20	18	9.1	31	11				
	5	20	18	9.1	30	11				
	6	25	22.5	11	60	21				
	8	32	29	14.5	126	43				
	10	40	37	18	215	85				

* H dimension and Lf dimension for BKS M3 are 13.5 and 7 respectively.

Add. Spec.

Grips - Non-rotating · Stainless Steel Grips - Non-rotating - Rotating · Ergonomic Grips - Non-rotating - Rotating · Grips - Capped

Price Reduction
Up to 20%

CAD Data

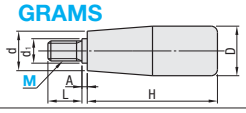
■Grips - Non-rotating

RoHS

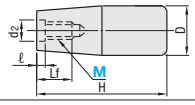


Type	Shape	Grip	Screws	
		M Material	M Material	S Surface Treatment
GRAM	Male Thread	Phenol	1.0718/9SMnPb28	Trivalent Chromate
GRAMS			1.4305/X10CrNiS18-9	-
GRAF	Female Thread		-	
GRAFC	Female Thread (Insert)	Nylon 6	1.1191/C45E	Trivalent Chromate

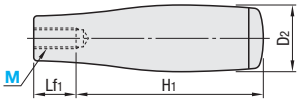
GRAM
GRAMS



GRAF



GRAFC



Part Number Type	M (Coarse Thread)	D	D2	d	d1	d2	A	ℓ	H	H1	L	Lf	Lf1	Mass (g) GRAM · GRAMS	Mass (g) GRAF	Mass (g) GRAFC	€ Unit Price GRAM	€ Unit Price GRAF	€ Unit Price GRAMS	€ Unit Price GRAFC
GRAM Male Thread	6	17	19	12	8	6.5	1.5	1.8	40	65	13	20	12	16	10	30				
GRAMS Stainless Steel · Male Thread	8	21	24	17	11	8.5	2	4.5	50	80	16	26	16	32	20	40				
GRAF Female Thread	10	25		20	13	10.5		5	65		20	33	20	61	37	45				
GRAFC Female Thread Type Insert	12	28	28	21	16	12.5	2.5		85	95	25	40	24	100	61	65				

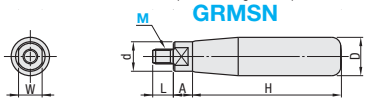
■Stainless Steel Grips - Non-rotating · Rotating

RoHS

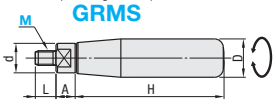


Type	Grip	M Material	S Surface Treatment
GRMSN	Standard	1.4301/X5CrNi18-10	Electrolityc Polishing
GRMS	Rotating		

(Non-rotating Handle)
GRMSN



(Rotating Handle)
GRMS



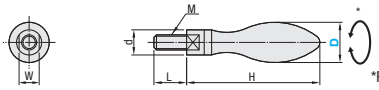
Part Number Type	M	D	d	H	L	W	A	Mass (g)	€ Unit Price GRMS	€ Unit Price GRMSN
Standard	5	10	8	39	6	6.5	6	25		
GRMSN	6	13	10	50	7	8	7	55		
Rotating	8	16	13	60	8	10	8	100		
GRMS	10	20	16	70	10	12	10	180		

■Ergonomic Grips - Non-rotating · Rotating

RoHS



Type	Mechanism	Grip M Material	Grip S Surface Treatment	Screws M Material	Screws S Surface Treatment
GRMHF	Standard	1.0038/S235JR	Chrome Plating	1.0038/S235JR	Chrome Plating
GRMK	Rotating	1.0038/S235JR			
GRMAK		EN AW-2024/AlCu4Mg1	Shot Blasted		
GRMKB		Polypropylene	-		



*Rotational Type Only

Part Number Type	D	M (Coarse Thread) GRMK · GRMKB · GRMHF	M (Coarse Thread) GRMAK	d	H Standard	H Rotating	W	L	Mass (g)	€ Unit Price Standard GRMHF	€ Unit Price Rotating GRMK	€ Unit Price Rotating GRMAK	€ Unit Price Rotating GRMKB
Standard GRMHF Rotating GRMK Steel GRMAK Aluminum GRMKB Resin	13	5	8	10	-	49	8	11	30				
	16	6			48.5	55	8	14	48				
	20	8		13	62.5	70.7	10	15.5	97				
	25	10	10	16	-	87.3	12	18	192				

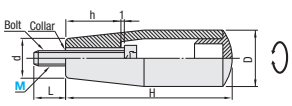
■Rotating Handles - With Cap

RoHS

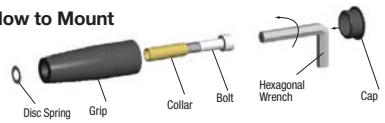


Type	Grip M Material	Screws M Material	Screws S Surface Treatment	A Accessory
GRM	Nylon6 (Black)	1.7220/34CrMo4	Trivalent Chromate	Disc Spring

Only Plastic grip rotates after attaching to a handwheel.



How to Mount



Part Number Type	M (Coarse Thread)	D	d	H	h	L	Mass (g)	€ Unit Price
GRM	5	18	13	55	18.5	10	25	
	6					13	30	
	8	26	20	85	33	15	60	
	10					20	100	

Order Example
Part Number
GRAM12
GRMS6
GRMK13
GRM5

Days to Ship
6 Days P.87

Price

■Volume Discount (round down to ten Cent) P.87

Quantity	1~9	10~19	20~29	30~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Add. Spec.

Grips - Tapered - Rotating / Grips with Hexagon Socket / Grips - Rotating - Folded

CAD Data

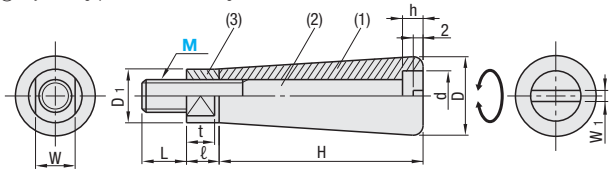
Grips - Tapered - Rotating

RoHS

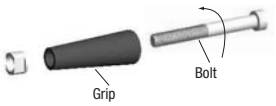


Type	(1) Grip	(2) Threads		(3) Nut	
	M Material	M Material	S Surface Treatment	M Material	S Surface Treatment
GRC	Nylon6 (Black)	JIS SWRM	Trivalent Chromate	1.0718/9SMnPb28	Chrome Plating

Only Plastic grip rotates after attaching to a handwheel.



How to Mount



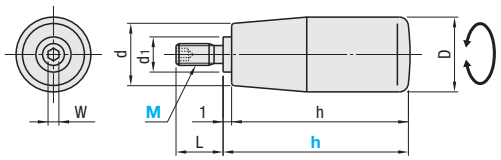
Part Number Type	M (Coarse Thread)	D	D1	d	H	h	ℓ	t	W	W1	L	Mass (g)	€ Unit Price
GRC	8	20	13	12	55	5.5	8	6.5	10	2	11	40	
	10	25	16	15	68		10	8	14		18	100	
	12	30	21	20	85	10	13	9.5	17	2.5	23	180	

Grips with Hexagon Socket

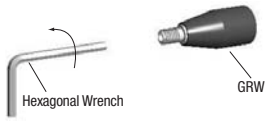
RoHS



Type	Grip	Screws	
	M Material	M Material	S Surface Treatment
GRW	Phenol	1.0711/9S20	Trivalent Chromate



How to Mount



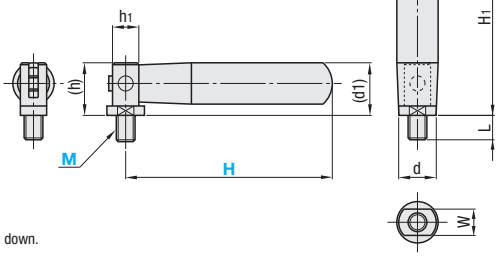
Part Number Type	M (Coarse)-H	D	d	d1	h	W	L	Mass (g)	€ Unit Price
GRW	6-28.5	14	11	8	28	3	10	13	
	6-42.5	18	15	10	40		12	29	
	6-52.5	21	17	10	50		13	42	
	8-40	20	17		39	4	12	24	
	8-55				54			44	
	10-67	23	20	12	66	5	16	74	
	10-75	23	20	12	74	5		77	

Grips - Rotating - Folded

RoHS



Type	Grip	Screws		Lock Nut	
	M Material	M Material	S Surface Treatment	M Material	S Surface Treatment
GRMBM	Nylon	1.1191/C45E	Chrome Plating	1.1191/C45E	Chrome Plating



To fold the lever, pull up and fold down.
Folding angle is 90°.

Part Number Type	M (Coarse Thread)	H	D	d	(h)	L	h1	H1	(d1)	W	Mass (g)	€ Unit Price
GRMBM	8	55	19	16	20	12.5	9	55.5	26.5	12	42	
		81	19	16	26	12.5	9	80	27		80	
	10	104	22	18	29	16	11	103.5	30.5	14	155	

Order Example

Part Number	-	H
GRC8		
GRW8	-	40
GRMBM8	-	55

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29	30~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

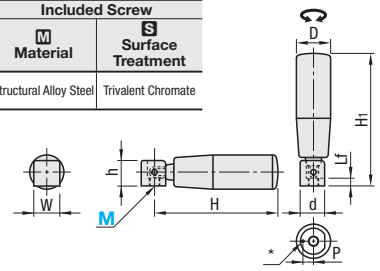
Flat-folding Grips - Rotating / Miniature Grips - Rotating / Miniature Stainless Steel Grips - Rotating / Ball Knobs - Rotating

CAD Data

Flat-folding Grips - Rotating RoHS



Type	Grip	Screws		Included Screw	
	M Material	M Material	S Surface Treatment	M Material	S Surface Treatment
GRMLM	Phenol Resin	1.0038/S235JR	Trivalent Chromate	Structural Alloy Steel	Trivalent Chromate



To fold the lever, pull up and fold down.
* There is a locating hole of Ø2.5 and 2.5mm in depth.

Part Number Type	M (Coarse Thread)	H	D	d	h	Lf	H1	W	P	Included Screw	Mass (g)	€ Unit Price
GRMLM	5	53	18	15.5	15	5	57	17	5.25	M5x10	55	
	6	80	23	18.5	19.5	6	87	20	6.5	M6x10	115	
	8	95	26	18.5	19.5	6	102	20	7	M8x14	137	

Order Example: Part Number GRMLM6

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29	30~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

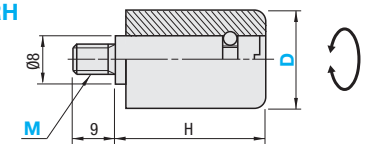
Miniature Grips - Rotating RoHS



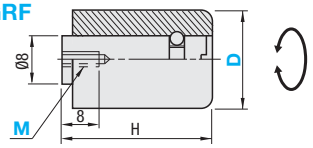
Type	Shape	Grip	Screws	
		M Material	M Material	S Surface Treatment
GRH	Male Thread	Nylon 6	1.0715/9SMn28L	Black Oxide
GRF	Female Thread			

Only Plastic grip rotates after attaching to a handwheel.

Male Thread
GRH



Female Thread
GRF



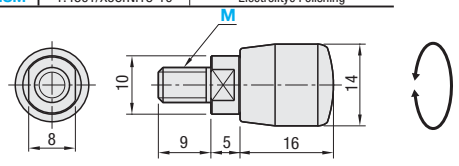
Part Number Type	M (Coarse)–D	Knob Color	H	Mass (g)	€ Unit Price
Male Thread GRH	6-13	B(Black) W(White)	18.8	13	
	6-14		20.8	14	
	6-16		23.8	16	

Part Number Type	M (Coarse)–D	Knob Color	H	Mass (g)	€ Unit Price
Female Thread GRF	5-13	B (Black)	18.8	8	
	5-14		20.8	9	
	5-16		23.8	10	

Miniature Rotating Stainless Steel Grips RoHS



Type	M Material	S Surface Treatment
GRMSM	1.4301/X5CrNi18-10	Electrolityc Polishing

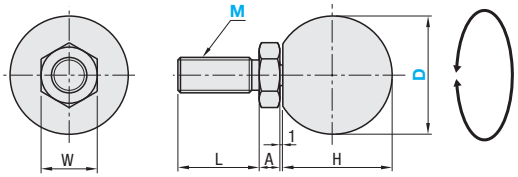


Part Number Type	M (Coarse Thread)	Mass (g)	€ Unit Price
GRMSM	6	21	

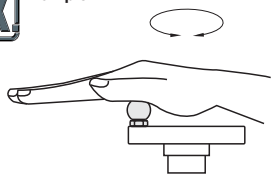
Ball Knobs - Rotating RoHS



Type	Balls	Screws	
	M Material	M Material	S Surface Treatment
PBG	Phenol Resin Brass (Insert)	1.0736/9SMn36	Electroless Nickel Plating



Example



Easy to rotate with a palm of hand due to its spherical body.

Part Number Type	M (Coarse Thread)	D	H	L	W	A	Mass (g)	€ Unit Price
PBG	6	20	18	7	10	3.6	12	
		25	23				17	
		30	28				25	
	8	20	18	8	13	5	19	
		25	23				25	
		30	28				33	
	10	30	28	10	17	6	49	

Order Example: Part Number - D - Knob Color

GRMLM5
GRH6 - 13 - W
GRF5 - 16 - B
GRMSM6
PBG8 - 25

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

NEW

Handles with Square Bore - Folded • Handles with Square Bore / Handles with Round Bore • Crank Handles

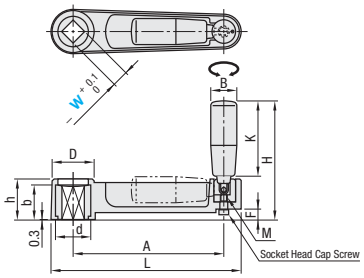
Price Reduction Up to 44%

CAD Data

Handles with Square Bore - Folded RoHS



Type	Body	Hub		Grip	Grip Thread		Included Screw	
	M Material	M Material	S Surface Treatment	M Material	M Material	S Surface Treatment	M Material	S Surface Treatment
SSCH	Reinforced Nylon (Glass Fibers Contained)	1.0038/ S235JR	Black Oxide	Phenol Resin	1.0038/S235JR	Trivalent Chromate	Structural Alloy Steel	Trivalent Chromate



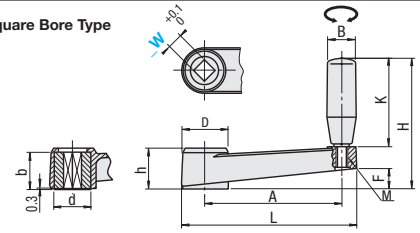
Part Number Type	W	L	A	H	h	D	K	F	M	B	d	b	Reference Mass (g)	€ Unit Price
SSCH	10	108	80	68	26	27.5	40	6	5	18	22	22	145	
	12	130	100	72	30	31	40	10	5	18	27	27	210	
	14	164.5	130.5	102.5	35	36.2	65.3	9	6	23	30	30	310	
	17	198.5	161	122.5	40	40.5	80.3	12	8	26	34	34	420	

Handles with Square • Round Bore RoHS

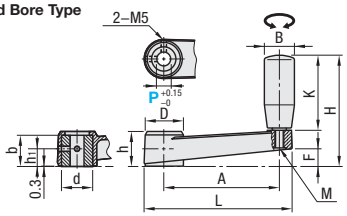


Type		Hub		Body	Screws	Grip	Grip Threads	
Square Hole	Round Bore	M Material	S Surface Treatment	M Material	M Material	M Material	M Material	S Surface Treatment
MBCH	MBCR	1.0038/S235JR	Black Oxide	Reinforced Nylon (Glass Fibers Contained)	Brass (Insert)	Phenol Resin	1.0038/S235JR	Trivalent Chromate
MBCHS	-	1.4301/X5CrNi18-10	-					

Square Bore Type



Round Bore Type



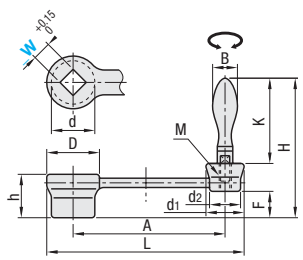
Part Number Type	W	P	L	A	H	h	D	K	F	M	B	d	b	h1	Reference Mass (g)	€ Unit Price Square Hole MBCH	€ Unit Price Square Hole MBCHS	€ Unit Price Round Bore MBCR
Square Hole	8	8	85.5	64.5	63	23	24.5	40	10	6	22	18	19	10	76			
MBCH (Insert: Steel)	10	10	105	80	76	26	27.5	50	13.5			22	22	11.5	102			
MBCHS (Insert: Stainless Steel)	12	12	128	100	94.5	30	31	64.5	14.5	8	26	27	27	14.5	184			
Round Bore	14	-	161.5	130.5	114.5	35	36.2	79.5	19			30	30	-	259			
MBCR (Insert: Steel)	17	-	196	161	128.5	40	40.5	88.5	22	10		34	34	-	369			

Crank Handles RoHS

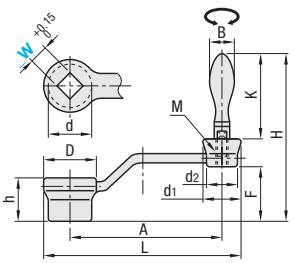


Type		M Material	S Surface Treatment
Straight	Offset		
NSCH	NOCH	EN-JL 1030/EN-GJL-200	Electrostatic Coating

Straight



Offset



Part Number Type	W	L	A	H NSCH	H NOCH	h	D	d	d1	d2	K	F NSCH	F NOCH	M	B	Reference Mass (g)	€ Unit Price NSCH	€ Unit Price NOCH
Straight NSCH Offset NOCH	8	86	63.5	75	94	22	27	22	18	14	49	13	32	5	13	105		
	10	105	79	85	103	24	30	25	22	17	55	15	33	6	16	150		
	12	128	98	105.7	126.7	28	34	28	26	20	70.7	17	38	8	20	230		
	14	162	128	123.3	147.3	30	40	33	28	22	87.3	17	41	10	25	360		
	17	198	159.5	128.3	157.3	34	45	37	32	25	87.3	21	50			510		
	19															500		
	22	212	170	129.3	160.3	36	50	40	34	27		22	53	10		680		

Order Example — Part Number: SSCH10, MBCH10, NSCH8

Days to Ship — 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Plastic Offset Handwheels

Add. Spec.

Price Reduction Up to 38%

CAD Data

Plastic Offset Handwheels

RoHS

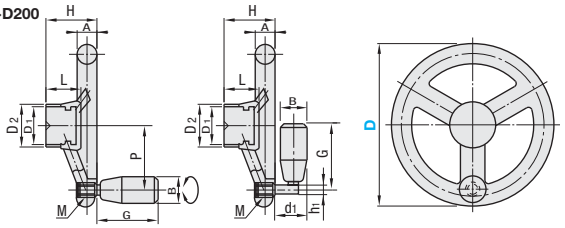
Inner Ø Shaft Bore Shape	Type: Stationary Handles	Type: Folding Grips	Type: Without Grip	Hub: M Material	Hub: S Surface Treatment	Handwheels: M Material	Grip Mounting Holes Insert: M Material	Grip: M Material	Grip Thread: M Material	Grip Thread: S Surface Treatment
Without Hole	PHLN	PHLFN	-	EN-JL 1030/ EN-GJL-200	Black Oxide	Phenol	Brass	Phenol	1.0711/ 9S20	Trivalent Chromate
	-	-	PHLN-R			Nylon 6	1.0715/9SMn28 Trivalent Chromate			
H9 Hole + Female Thread	PHLM	PHLFM	-	1.4305/X10CrNiS18-9	-	Phenol	Brass			
	PHLSM	-	-							
H9 Hole + Keyway + Tap	PHLK	PHLFK	-	EN-JL 1030/EN-GJL-200	Black Oxide					
	PHLSK	-	-	1.4305/X10CrNiS18-9	-					
Square Hole	PHLW	PHLFW	-	EN-JL 1030/EN-GJL-200	Black Oxide					
Slit	PHLP	-	-	1.1191/C45E	Black Chromate	Polypropylene				



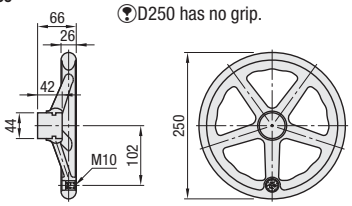




D80~D200

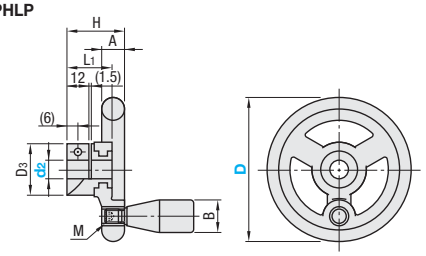


D250



D250 has no grip.

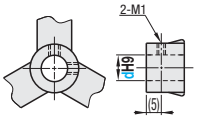
PHLP



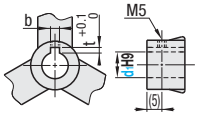
d is a through-hole.

Square Hole Corner: R0.5 or Less

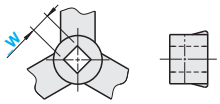
H9 Hole + Female Thread



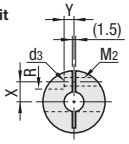
H9 Hole + Keyway + Female Thread



Square Hole



Slit



Grips - Non-rotating are GRW **P.1011**

Grips - Rotating are GRMBM **P.1011**

Part Number: Type	D	H9 Hole + Female Thread: d Selection	M1 (Coarse)	H9 Hole+Keyway +Female Thread: d1	b	t	Square Hole: W Selection	Slit: d2	H	A	D1	D2	D3	L	L1	d1	h1	X	Y	R (Ø)	d3	M (Coarse)	M2 (Coarse)	P	PHLP Ref. tightening torque	B: PHL_	B: PHLF_	G: PHL_	G: PHLF_	Mass (g): PHL_	Mass (g): PHLF_
Without Hole H9 Hole PHLN + Keyway PHLFN + Female Thread H9 Hole PHLK + Female Thread PHLM PHLFK·PHLSK Square Hole PHLFM PHLW·PHLFW PHLSM Slit PHLP	80	*10 · *12 · 14	5	10	3	1.4	10	10	32	13	20	28	28	25	25	22	8	9	7	8.5	4.5	8	4	26	3	20	19	40	55	135	177
	100	10 · *12 · *15		12	4	1.8	12 14	12	36		25	35	35	28	28			10	9	10	5.5		5	37	5					200	242
	125	*12 · *16 · 18							40	17		40		30		28.5	12							50				55	81.5	330	410
	140	*15 · 18 · *20	6	15	5	2.3	-	-	41	18	30		45	-	-	30	14	-	-	-	-	10	-	55	-	23	22	67	104	410	565
	160	16 · 18 · 20		16			14 17		47	20				-	-									65						485	640
	180	16 · 18 · 20							50	23	35	50	-	35	-									73						640	795
	200	16 · 18 · 20							54				-	40	-									80		24		74		780	935
Without Hole · Grip PHLN-R	250	-	-	-	-	-	-	-	66	26	-	44	-	42	-	-	-	-	-	-	-	10	-	-	-	24	-	74	-	980	-

Only * marked d dimensions are available for Stainless Steel Type. Only D80, 100 and 125 are Slit Type

Order Example

Part Number	-	d
PHLN80		
PHLM100	-	12
PHLP125	-	12

Days to Ship

6 Days

2 Days

P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

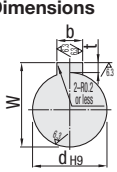
For orders larger than indicated quantity, please request a quotation.

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	10%	20%	30%

D	€ Unit Price: No shaft bore: PHLN	PHLN-R	PHLFN	H9 Hole+Female Thread: PHLM	PHLSM	PHLFM	H9 Hole+Keyway+Female Thread: PHLK	PHLSK	PHLFK	Square Hole: PHLW	PHLFW	Slit: PHLP
80												
100												
125												
140												
160												
180												
200												
250												

New JIS (B1301) Keyway Dimensions

dH9		W	b JS9		+0.1 0
10	+0.036 0	11.4	3	±0.0125	1.4
12	+0.043 0	13.8	4	±0.0150	1.8
15		17.3	5		2.3
16		18.3			



Solid Disk Handwheels / Adjusting Collars

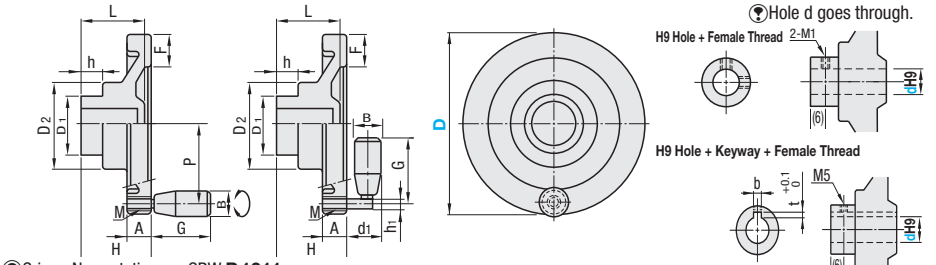
CAD Data

Solid Disk Handwheels

RoHS



Shaft Bore Config.	Type		Hub		Hand-wheels	Grip Mounting Holes	Grip	Grip Thread	
	Non-folding Grips	Folding Grips	M Material	S Surface Treatment	M Material	M Material	M Material	M Material	S Surface Treatment
Without Hole	PHSN	PHSFN	EN-JL 1030/EN-GJL-200	Black Oxide	Phenol	Brass	Phenol	1.0711/ 9S20	Trivalent Chromate
	AHSN	AHSFN	EN AC-51300/G-AlMg5	Buff Polished					
H9 Hole + Female Thread	PHSM	PHSFM	EN-JL 1030/EN-GJL-200	Black Oxide					
	AHSM	AHSFM	EN AC-51300/G-AlMg5	Buff Polished					
Square Hole	PHSK	PHSFK	EN-JL 1030/EN-GJL-200	Black Oxide					
	AHSK	AHSFK	EN AC-51300/G-AlMg5	Buff Polished					



Grips - Non-rotating are GRW **P.1011**
Grips - Rotating are GRMBM **P.1011**

Part Number Type		D	PHSM · PHSFM AHSM · AHSFM d Selection	PHSM · PHSFM AHSM · AHSFM M1 (Coarse)	PHSK · PHSFK AHSK · AHSFK d	b	t	H	A	F	D1	D2	h	L	d1	h1	M (Coarse)	P	B PHS_ AHS_	B PHSF_ AHSF_	G PHS_ AHS_	G PHSF_ AHSF_	Mass (g) PHS_ _	Mass (g) AHS_ _
(Phenol)		80	10	5	10	3	1.4	35	13	15	28	36	14	30	22	8	8	34	20	19	40	55	125	185
PHSN	PHSFN	100	12		12	4	1.8	40	15	17	32	39		36				41					310	295
PHSM	PHSFM	125	12 · 16					44		19	39	46	15	38	28.5	12		52			55	81.5	450	440
PHSK	PHSFK																							
(Aluminum)		150	15 · 20	6	15	5	2.3	48	18	21	48	48		43	30	14	10	64	23	22	67	104	570	670
AHSN	AHSFN	*175	16 · 20		16			53	19	24		56						74					730	-
AHSM	AHSFM	*200	16 · 20					57	21	27		61						86	24		75		1020	-
AHSK	AHSFK																							

⊗*D175 and D200 are not available for Stainless Steel Type. ⊗PHSN175 has been discontinued.

Order Example: Part Number - d → PHSN80 / PHSM100 - 12

Days to Ship: 6 Days P.87 / 2 Days

Price

Volume Discount (Round down to one Cent.) P.87

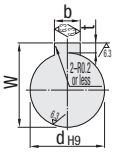
Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

D	€ Unit Price PHSN	PHSFN	PHSM	PHSFM	PHSK	PHSFK	AHSN	AHSFN	AHSM	AHSFM	AHSK	AHSFK
80												
100												
125												
150												
175												
200												

New JIS (B1301) Keyway Dimensions

dH9	W	bJS9	t+0.1 0
10 +0.036 0	11.4	3 ±0.0125	1.4
12	13.8	4	1.8
15 +0.043 0	17.3	5 ±0.0150	2.3
16	18.3		

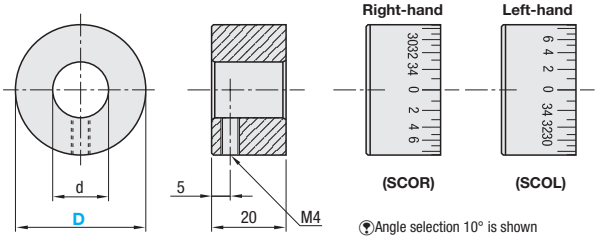


Adjusting Collars

RoHS



Type Right-hand	Type Left-hand	M Material	S Surface Treatment
SCOR	SCOL	EN AW-5056/ AlMg5	Black Anodize



Angle selection 10° is shown

Part Number Type	D	Angle	d	Mass (g)	€ Unit Price
SCOL(Left) SCOR(Right)	22	10 15	8	20	
	27		12	25	
	35		15	40	
	45		16	72	

Order Example: Part Number SCOR35 - Angle 10

Days to Ship: 6 Days P.87

Price

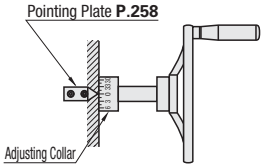
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example

Pointing Plate **P.258**



Handwheels - Folding / Handwheels-Flat

CAD Data

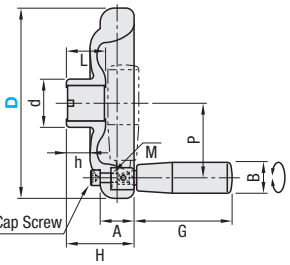
Folding Handwheels

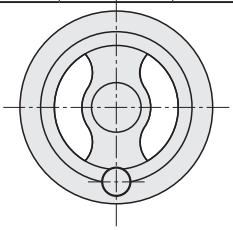
RoHS





Type	Handwheels		Hub		Grip	Grip Thread		Included Screw	
	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material	M Material	S Surface Treatment	M Material	S Surface Treatment
PHSLN	Phenol	-	1.0038/ S235JR	Black Oxide	Phenol	1.0038/ S235JR	Trivalent Chromate	Structural Alloy Steel	Trivalent Chromate
AHSLN	EN-JL 1030/ EN-GJL-200	Chrome Plating							





Grips are GRMLM **P.1012**

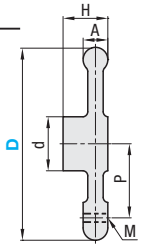
Part Number Type	D	H	A	d	L PHSLN	L AHSLN	h	M (Coarse)	P PHSLN	P AHSLN	B	G	Mass (g) PHSLN	Mass (g) AHSLN	€ Unit Price PHSLN	€ Unit Price AHSLN
PHSLN (Phenol Resin)	80	34.2	20	20.5	16.5	16.5	10	5	30	29	18	42	100	410		
	100	37.5	20	25.2	18.5	18.5	12.2	5	39	38	18	42	152	640		
AHSLN (EN-JL 1030/EN-GJL-200)	125	48	25.5	32	26	26	15.7	6	50.5	48.5	23	67.5	296	1250		
	140	50.5	25.5	36	29	28.5	17.5	6	54		23	67.5	404	1670		
	160	56.9	28.5	40.5	33	33	19.9	8	62.7		26	82.5	594	2500		

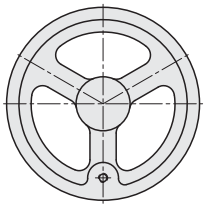
Flat Handwheels

RoHS



Type	Handwheels	
	M Material	S Surface Treatment
AHNF	EN-JL 1030/ EN-GJL-200	Chrome Plating





Grips are separately sold.

Part Number Type	D	H	A	d	M	P	Reference Mass (g)	€ Unit Price	Applicable Grips
AHNF	80	24	14	25	5	26.5	386		GRMK13
	100	25	15	30		37	618		
	125	29	16	35	6	48	985		GRMK16
	140	30	17			55	1287		
	160	33	18	38	8	62.5	1735		GRMK20
	180	35	20			71.5	2313		
	200	37	22	40	10	78.5	3511		GRMK22

Order Example

Part Number
PHSLN80
AHSLN100
AHNF140

Days to Ship 6 Days P87

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

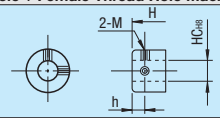
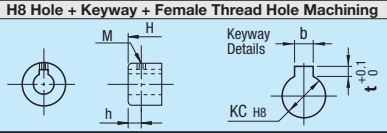
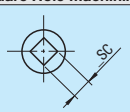
For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number - (HC · KC · SC)

PHSLN125 - SC10
AHSLN160 - KC20
AHNF80 - HC10

10 Days

Alterations	H8 Hole + Female Thread Hole Machining	H8 Hole + Keyway + Female Thread Hole Machining	Square Hole Machining
			
Code	HC	KC	SC
Spec.	Adds an H8 hole at hub center, and two tapped setscrew holes. HC=1 mm Increment. Ordering Code: HC16	Adds an H8 hole at hub center, a key groove and its tapped hole. KC = 1mm Increment. Ordering Code: KC15	Adds a square hole at hub center. = 1mm Increment. Ordering Code: SC12

HC:

D	HC (H8)	h	HC (H8)	M (Coarse Thread)
80	6~10	6	6~9	4
100	6~13	7	10~16	5
125	6~14	7	17~19	6
140	6~22	8	20~25	8
160	6~25	8		

KC:

D	KC (H8)	M	h	KC (H8)	b Dimensions	b Tolerance	t
80	-	-	-	10	3	±0.0125	1.4
100	10	5	6	11, 12	4	±0.015	1.8
125	10~12	5	6	13~17	5	±0.015	2.3
140	10~17	5	8	18~22	6	±0.015	2.8
160	10~20	6	10				

SC:

D		Tolerance
80	-	10~14 +0.1 0
100	10	
125	10	
140	10~12	
160	10~14	

Price Adder		H8 Hole + Female Thread Hole Machining	H8 Hole + Keyway + Female Thread Hole Machining	Square Hole Machining
	PHSLN	24,60	28,40	32,20
	AHSLN AHNF	1,350	1,450	1,500

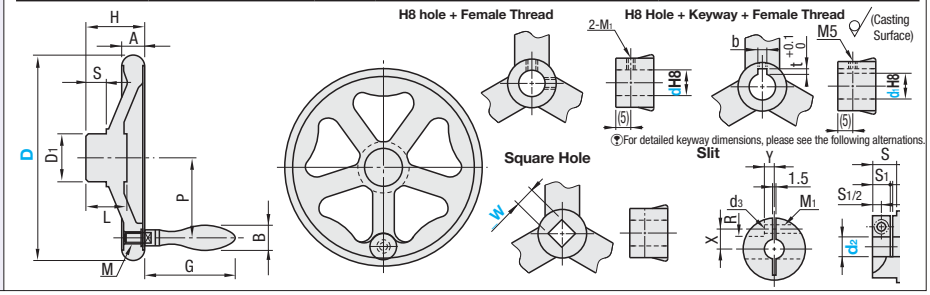
Five Spoked Handwheels

CAD Data

RoHS



Inner Diameter Shaft Bore Shape	Type: Non-rotating Grips	Type: Rotating Grips	Type: Without Grip	Handwheels: M Material	Handwheels: S Surface Treatment	Grip: M Material	Grip: S Surface Treatment	Grip Thread: M Material	Grip Thread: S Surface Treatment	Included Screw: M Material	Included Screw: S Surface Treatment
Without Hole	AHLN	AHLNK	AHLN-R	EN-JL 1030	Chrome Plating	1.0038	Chrome Plating	1.0038	Chrome Plating	-	-
	AHLNA	AHLNAK	-	EN AC-46200	Shot Blasted	EN AW-2024	Shot Blasted				
H8 hole+Female Thread	AHLNM	AHLNKM	-	EN-JL 1030	Chrome Plating	1.0038	Chrome Plating				
H8 Hole+Keyway + Female Thread	AHLNKC	AHLNKCK	-								
Square Hole	AHLNW	AHLNKW	-								
Slit	-	AHLND	-	EN AC-46200	Shot Blasted	EN AW-2024	Shot Blasted			Structural Alloy Steel	Trivalent Chromate
	-	AHLNF	-	EN JS-1050	Chrome Plating	1.0038	Chrome Plating				



Part Number Type	D	H	A	D1	L	S	M Steel	M Aluminum	B	G Standard	G Rotating	P	H8 hole+ Female Thread d	H8 hole+ Female Thread M1 (Coarse)	H8 hole+ Keyway + Female Thread d1	b	t	Square Hole W Selection	Slit d2	Slit S1	Slit X	Slit Y	Slit R (Radius)	Slit d3	Hexagon Socket Cap Screws M1 (Coarse)	AHLND Reference Tightening (Nm)	AHLNF Reference Tightening (Nm)	Reference Mass (g) Steel	Reference Mass (g) Aluminum
Without Hole / Without Grip AHLN-R; AHLN H8 hole+Female Thread AHLNA AHLNK AHLNM AHLNAK AHLNKM	80	36	14	24	24	15	5	8	13	38.5	49	28	10	5	10	3	1.4	10	*10	12	9	8	8.5	4.5	4	3	3	380	160
																			12											
	100	39	15	30	28							39.5	12		12	4	1.8	12	10	12	10	9	9.5	5.5	5	5	5	600	250
																			*12											
	125	40	16	33			6		16	48.5	55	46.5							12		13	8				6	6	900	345
																			*15											
H8 Hole+Keyway+ Female Thread AHLNKC AHLNKCK	140	44	17	35	30	16	8		20	62.5	70.7	53.5	15	6	15	5	2.3	14	-	-	-	-	-	-	-	-	-	-	1100	425
	160	46	18	37	32							62.5	16		16	5	2.3		16	14	15	10.5	12.5	6.5	6	10	-	1400	560
																			20											
Slit AHLNF AHLND; Square Hole AHLNW AHLNKW	200	59.5	24	43	41	19	10	10	25	77.5	87.3	81						17	16		16.5	11				11		2800	1140
	250	65	26	48	44			-				100	20		20				20									4900	-

*marked items are only applicable for Slit Type AHLNF.

Order Example: Part Number AHLN160 / AHLNF80 - d 10

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

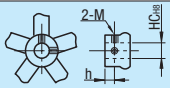
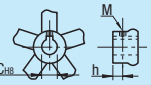
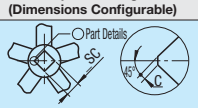
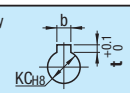
D	€ Unit Price: Without Hole AHLN	Without Hole AHLNK	Without Hole AHLNA	Without Hole AHLNAK	H8 hole+Female Thread AHLNM	H8 hole+Female Thread AHLNKM	H8 Hole+Keyway+Female Thread AHLNKC	H8 Hole+Keyway+Female Thread AHLNKCK	Square Hole AHLNW	Square Hole AHLNKW	Slit AHLND	Slit AHLNF	Without Hole · Without Grip AHLN-R
80													
100													
125													
140													
160													
200													
250													

Alterations

Part Number AHLNAK200 - (HC · KC · SC) SC20

10 Days

- Shaft bore (H8) and square bore dimensions are configurable. - Only applicable for types with no holes

Alterations	H8 hole (Dimension Configurable)+ Female Thread Hole Machining	H8 hole (Dimension Configurable)+Keyway+ Female Thread Hole Machining	Square Boring (Dimensions Configurable)
			
Code	HC	KC	SC
Spec.	Adds an H8 hole at hub center, and two tapped setscrew holes. HC=1 mm Increment Ordering Code HC16	Adds an H8 hole at hub center, a key groove and its tapped hole. KC = Selectable Ordering Code KC15 	Adds a square hole at hub center. SC = 1mm Increment Ordering Code SC12

D	HC (H8)	h
80	10~15	6
100	10~16	
125	12~18	
140	14~19	8
160	14~20	
200 · 250	16~23	10

HC (H8)	M (Coarse Thread)
10~16	5
17~19	6
20~23	8

D	HC (H8)	M	h
80	10 · 11 · 12	5	6
100			
125	12 · 14		
140	14 · 15 · 16		8
160			
200 · 250	16 · 17 · 18	6	10

KC (H8)	b Dimensions	b Tolerance	t
10	3	±0.0125	1.4
11 · 12	4	±0.0150	1.8
14~17	5		2.3
18	6		2.8

D	SC
80 · 100	10~12
125	10~14
140 · 160	10~17
200 · 250	10~20

SC	Tolerance	C
10~14	+0.1 0	0.5
15~20	+0.15 0	1

Price Adder		HC	KC	SC
	AHLN · AHLNKC	13,50	14,50	15,00
	AHLNA · AHLNAK	21,00	25,00	29,00

Two Spoked Handwheels

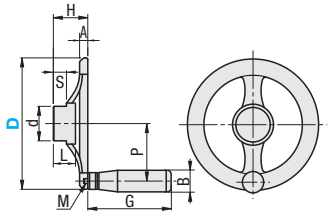
CAD Data



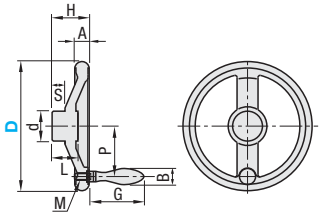
Type			Handwheels		Grip		Grip Thread	
Without Grip	Non-rotating Grips	Rotating Grips	M Material	S Surface Treatment	M Material	S Surface Treatment	M Material	S Surface Treatment
SHLNN	-	SHLN	1.4401/G-X5CrNiMo17-12-2 (1.4401/X5CrNiMo17-12-2 equivalent)	Shot Blasted	1.4301/ X5CrNi18-10	Electrolityc Polishing	1.4301/ X5CrNi18-10	Electrolityc Polishing
-	AHTN	AHTNK	EN-JL 1030/EN-GJL-200	Chrome Plating	1.0038/S235JR	Chrome Plating	1.0038/ S235JR	Chrome Plating
-	-	AHTNAK	EN AC-46200/Ac-AlSi8Cu3	Shot Blasted + Buffing	EN AW-2024	Shot Blasted		
-	AHTNA	-						

(Casting Surface)

Stainless Steel Type



Stainless Steel · Aluminum Type



Stainless Steel Grips are GRMS, and Stainless Steel and Aluminum Grips are GRMK on **P.1010**

Stainless Steel SHLNN · SHLN

Part Number		H	A	S	d	L	M	B	G	P	Reference Mass (g)	
Type	D										With Grip	Without Grip
Without Grip SHLNN	80	22	6.5	7	20	11.7	5	10	45	35.6	425	400
	100	27	7.5	8.7	25	14.6	6	13	57	43.5	605	550
	125	32	8	10.9	31	18.3				54.7	755	700
Rotating Grips SHLN	140	36	9	12.2	35	20.5	8	16	68	62.5	935	880
	160	40	9	14	40	23.4				71.5	1300	1200
	200	50	11.3	17.4	50	32	10	20	80	90	2180	2000

Steel AHTN · AHTNK Aluminum AHTNA · AHTNAK

Part Number		H	A	S	d	L	M		B	G		P	Reference Mass (g)	
Type	D						Steel	Aluminum		Standard	Rotating		Steel	Aluminum
Steel Grips AHTN	80	36	14	15	24	24	5	8	13	38.5	49	28	370	138
Steel Grips - Rotating AHTNK	100	39	15		30	28						37	575	215
	125	40	16		33		6		16	48.5	55	46.5	895	310
Aluminum Grips AHTNA	140	44	17	16	35	30						52.5	1095	380
Aluminum Grips - Rotating AHTNAK	160	46	18		37	32	8		20	62.5	70.7	62.5	1460	485
	200	59.5	24	19	43	41	10	10	25	77.5	87.3	81	2890	890

Order Example — Part Number: AHTN80, SHLN100, AHTNAK200

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

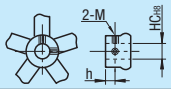
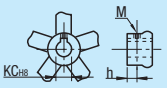
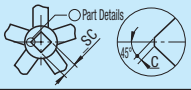
For orders larger than indicated quantity, please request a quotation.

D	€ Unit Price					
	SHLN	SHLNN	AHTN	AHTNK	AHTNA	AHTNAK
80						
100						
125						
140						
160						
200						

Alterations — Part Number - (HC · KC · SC)

AHTN80 - HC10
SHLN100 - KC11
AHTNAK200 - SC20

10 Days

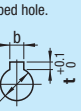
Alterations	H8 Hole + Female Thread Hole Machining	H8 Hole + Keyway + Female Thread Hole Machining	Square Hole Machining
			
Code	HC	KC	SC
Spec.	Adds an H8 hole at hub center, and two tapped setscrew holes. HC=1 mm Increment Ordering Code: HC16	Adds an H8 hole at hub center, a key groove and its tapped hole. KC = Selectable Ordering Code: KC15	Adds a square hole at hub center. SC = 1mm Increment Ordering Code: SC12

D	HC (H8)	h
80	10~15	6
100	10~16	
125	12~18	
140	14~19	8
160	14~20	
200	16~23	10

HC (H8)	M (Coarse Thread)
10~16	5
17~19	6
20~23	8

D	KC (H8)	M	h
80	10, 11, 12	5	6
100			
125	12, 14		
140	14, 15, 16	6	8
160			
200	16, 17, 18	6	10

KC (H8)	b Dim.	b Tolerance	t
10	3	±0.0125	1.4
11 · 12	4		1.8
14~17	5	±0.0150	2.3
18	6		2.8



D	SC	SC	Tolerance	C
80 · 100	10~12	10~14	+0.1 0	0.5
125	10~14			
140 · 160	10~17	15~20	+0.15 0	1
200	10~20			

Price Adder				
	AHTN · AHTNK	13,50	14,50	15,00
	AHTNA · AHTNAK	21,00	25,00	29,00
	SHLN · SHLNN	26,00	32,00	37,50

Add. Spec.

Aluminum Knurled Handwheels / Stainless Steel Knurled Handwheels

Price Reduction Up to 52%

CAD Data

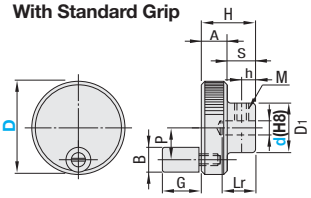
Aluminum Knurled Handwheels

RoHS

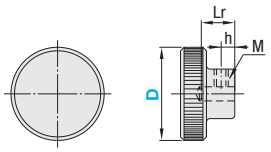


Type		Shape	Female Thread	Handwheels		Grip	Grip Thread	
With Grip	Without Grip			M Material	S Surface Treatment	M Material	M Material	S Surface Treatment
HOK	HOKN	Standard	With Tap	EN AW-5056/AlMg5	Black Anodize	Nylon6 (Black)	1.0715/9SMn28	Black Oxide
HBK	HBKN		Without Tap					
HOKW	HOKNW		With Tap		Clear Anodize	Nylon6 (White)		
HBKW	HBKNW		Without Tap					
HOKS	HOKNS		With Tap	1.4301/X5CrNi18-10	-	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10	-
-	HBKNS		Without Tap					
HOKP	HOKNP	Slit	With Tap	EN AW-5056/AlMg5	Black Anodize	Nylon6 (Black)	1.0715/9SMn28L	Black Oxide

With Standard Grip



Without Standard Grip

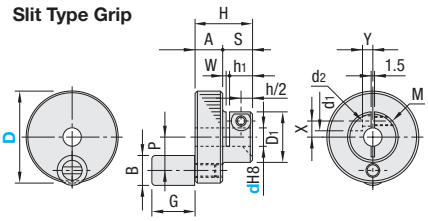


The drawing shows the tapped type.
Female Thread Type comes with one set screw.
Aluminum: 1.7220/34CrMo4, Black Oxide
Stainless Steel: 1.4301/X5CrNi18-10

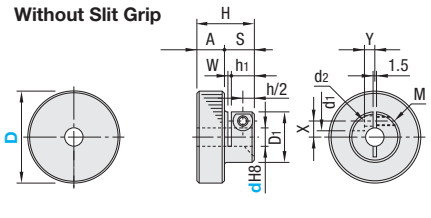
Stainless Steel Knurled Handwheels



Slit Type Grip



Without Slit Grip



Part Number Type		D	Standard Type (Selections)		Slit Type	H	A	S	D1	Lr	h	Slit Type								P	B	G	M	Mass (g)	
												h1	W	X	Y	d1	d2	Hexagon Socket Cap Screws M1	Hexagon Socket Cap Screws Reference Tightening Torque (Nm)						
With Grip	Without Grip		d																					Aluminum	Stainless Steel
Standard Type HOK(Black) HBK(Black) HOKW(White) HBKW(White) HOKS(Stainless Steel)	HOKN(Black) HBKN(Black) HOKNW(White) HBKNW(White) HOKNS(Stainless Steel) HBKNS(Stainless Steel)	40	*6	8	8	25	12	13	22	15	6.5	10		7	4.5	8.5	4.5	M4	1.5	14.5	13	18.8	5	50	150
		50	*8	10	10	28	13	15	27	18	7.5	11	1.5	9	5				1.5	17				87	255
		63	*10	12	12	32	14	18	35	22	9	12		11	6	10	5.5	M5	3.0	23	14	20.8		161	460
Slit Type HOKP(Black)	HOKNP(Black)	80	*12	16	-	40	15	25	45	28	12.5	-								30	16	23.8	6	299	855

*sizes are only applicable for HOK and HOKN. Only D=40, 50 and 63 are available for Slit Type. When d dimensions are not specified, then 40-8, 50-10, 63-12 or 80-16 .

Order Example

Part Number	-	d
HOK40	-	6
HBKNW40	-	8
HOKP63	-	12

Days to Ship

- Black Anodize: 6 Days P.87
- Clear Anodize · Stainless Steel: 8 Days, Express A 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

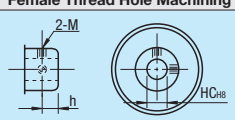
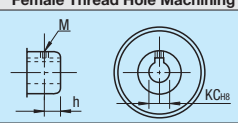
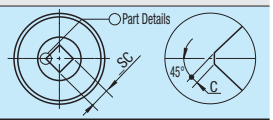
D	€ Unit Price												
	Standard Type											Slit Type	
	With Grip					Without Grip						With Grip	Without Grip
	HOK	HBK	HOKW	HBKW	HOKS	HOKN	HBKN	HOKNW	HBKNW	HOKNS	HBKNS	HOKP	HOKNP
40													
50													
63													
80													

Alterations

Part Number - (HC · KC · SC) 10 Days

HBK50 - HC10

Shaft bore is a through-bore. Not applicable for Slit Type

Alterations	Shaft Bore Dia. Changes (H8)+ Female Thread Hole Machining	Shaft Bore Dia Changes (H8)+Keyway+ Female Thread Hole Machining	Square Hole Machining
			
Code	HC	KC	SC
Spec.	Adds a H8 hole at hub center, and two tapped setscrew holes. Comes with one set screw. HC=1 mm Increment Ordering Code HC16	Adds a H8 hole at hub center, a keyway and its tapped hole. Comes with one set screw. KC = Selectable Ordering Code KC15	Adds a square hole at hub center. Comes with one set screw for Female Thread Type. SC = 1mm Increment Ordering Code SC12

D	HC (H8)
40	8~12
50	10~15
63	12~20
80	16~24

HC (H8)	M
8~15	M5
16~22	M6
23~24	M8

D	KC (H8)	M
40	10,11	5
50	10,11,12	
63	12,14,15	6
	16,17	
80	16,17,18,19,20,21	

KC (H8)	b Dimensions	b Tolerance	t
10,11,12	4	±0.0150	1.8
14,15,16,17	5		2.3
18,19,20,21	6		2.8

D	SC
40 · 50	10~12
63	10~15
80	10~23

SC	Tolerance	C
10~14	+0.1 0	0.5
15~23	+0.15 0	1

Price Adder		Standard Type	Slit Type
	Aluminum	7,10	7,90
	Stainless Steel	1,140	1,360

Knurled Knobs / Thick Knurled Knobs

Price Reduction
Up to 52%

CAD Data

Knurled Knobs

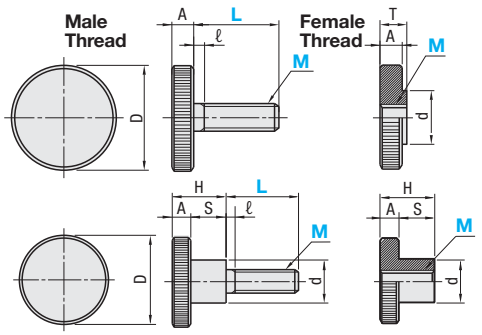
RoHS



Type: Male Thread – L Standard	Type: Male Thread – L Dimension Configurable	Type: Female Thread	Material	Surface Treatment
NOB	-	NOM	1.0736/ 9SMn36	Buff Polished Chrome Plating
NOOS	NOOSF	NOMS	1.4305/ X10 CrNiS18-9	NOOS · NOOSF: Brushed Finish NOMS: None
NOBB	-	NOMB	1.0736/ 9SMn36	Black Oxide

Stepped Type

Type: Male Thread – L Standard	Type: Male Thread – L Dimension Configurable	Type: Female Thread	Material	Surface Treatment
NKB	-	NKM	1.0736/ 9SMn36	Buff Polished Chrome Plating
NKOS	NKOSF	NKMS	1.4305/ X10 CrNiS18-9	NKOS · NKOSF: Brushed Finish NKMS: None
NKBB	-	NKMB	1.0736/ 9SMn36	Black Oxide



There may be uneven chrome coating around the threads.

Part Number: Type	M (Coarse)	L: Selection (Male Thread Only)	L: Configurable Specify in 1mm Increment	D	d	A	T	H	S	ℓ	€ Unit Price: NOB	NKB	NOBB NKBB	NOOS NKOS	NOM	NKM	NOMB NKMB	NOMS NKMS	NOOSF	NKOSF
(Male Thread L Dimension Selectable) NOB NOOS NOBB / Stepped Type NKB NKOS NKBB	3	6 10 16	6~16	12	6	2.5	3	7.5	5	1										
(Male Thread L Dimension Configurable) NOOSF / NKOSF	4	6 10 16 20	6~20	16	8	3.5	4	9.5	6	1.2										
(Female Thread) NOM NOMS NOMB / NKM NKMS NKMB	5	10 16 20 25	10~25	20	10	4	5	11.5	7.5	1.4										
	6	10 16 20 25 30	10~30	24	12	5	6	15	10	1.5										
	8	16 20 25 30	16~30	30	16	6	8	18	12	2										
	10	20 25 30 40	20~40	36	20	8	10	23	15	2.5										

Thick Knurled Knobs

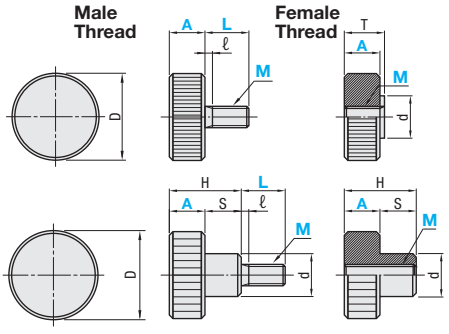
RoHS



Type: Male Thread – L Standard	Type: Male Thread – L Dimension Configurable	Type: Female Thread	Material	Surface Treatment
NOBA	-	NOMA	1.0711	Buff Polished Chrome Plating
NOOSA	NOOSAF	NOMSA	1.4305	Brushed Finish
NOBAB	-	NOMAB	1.0711	Black Oxide

Stepped Type

Type: Male Thread – L Standard	Type: Male Thread – L Dimension Configurable	Type: Female Thread	Material	Surface Treatment
NKBA	-	NKMA	1.0711	Buff Polished Chrome Plating
NKOSA	NKOSAF	NKMSA	1.4305	Brushed Finish
NKBAB	-	NKMAB	1.0711	Black Oxide



There may be uneven chrome coating around the threads.

Part Number: Type	M (Coarse)	L: Selection (Male Thread Only)	L: Configurable Specify in 1mm Increment	A	D	d	T	H	S	ℓ	€ Unit Price: NOBA NKBA	NOBAB NKBAB	NOOSA NKOSA	NOMA NKMA	NOMAB	NKMAB	NOMSA NKMSA	NOOSAF NKOSAF
(Male Thread L Dimension Selectable) NOBA / (Male Thread L Dimension Configurable) NOOSA NOOSAF / NOBAB / Stepped Type NKBA / NKOSA NKOSAF / NKBAB	3	6 10	6~10	5	12	6	5.5	10	5	1								
				6			6.5	11										
				8			9	13										
				12			13.5	17										
(Female Thread) NOMA NOMSA NOMAB / NKMA NKMSA NKMAB	4	6 10 16	6~16	7	16	8	7.5	13	6	1.2								
				9			10.5	15										
				11			12	17										
				17			18.5	23										
	5	10 16 20	10~20	8	20	10	9	15.5	7.5	1.4								
				10			11	17.5										
				12			13	19.5										
				26			29.5	33.5										
	6	10 16 20 25 30	10~30	10	24	12	11	20	10	1.5								
				13			14	23										
				15			16	25										
				25			26.5	35										
	8	16 20 25 30	16~30	12	30	16	14	24	12	2								
				15			17	27										
				30			31.5	42										
	10	20 25 30 40	20~40	16	36	20	18	31	15	2.5								
				20			22	35										
				40			41.5	55										

Order Example

Part Number	-	L	-	A
NOB3	-	10		
NOBA4	-	6	-	7

Days to Ship

•L Dimension Selectable Knurled Knobs: 6 Days P.87

•L Dimension Configurable Knurled Knobs, Thick Knurled Knobs: 8 Days

2 Days

Price

Volume Discount (Round down to one Cent.) P.87

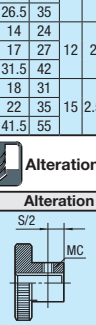
Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	(MC)	10 Days
NKMS6	-	MC	

Alteration	Code	Spec.	Price Adder
	MC	Adds a tap for a set screw on Female Thread Type NKMS (Stainless Steel Type) M MC: 6 M3; 8 M4; 10 M5. Applicable to M≥6	4,00

Knobs with Captured Washers - Knurled / Knobs - Stepped / Knobs - Large Diameter - Knurled / Knobs - Small Diameter - Knurled

CAD Data

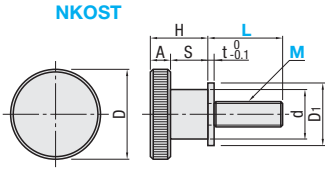
Knurled Knobs with Captured Washers

RoHS



Type	Knobs		Flat Washer
	M Material	S Surface Treatment	M Material
NKOST	1.4305/ X10CrNiS18-9	Brushed Finish	1.4305/ X10CrNiS18-9

NKOST



Part Number Type	M (Coarse)	L	D	d	A	H	S	D1	t	€ Unit Price
NKOST	6	10 16 20 25	24	12	5	15	10	14.5	1.5	
	8	16 20 25 30	30	16	6	18	12	20	2	
	10	20 25 30 40	36	20	8	23	15	25	2.5	

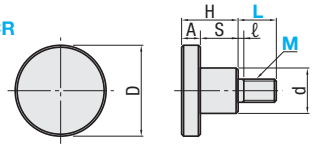
Stepped Knobs- No Knurling-

RoHS



Type	M Material
NKCR	1.4305/X10CrNiS18-9

NKCR



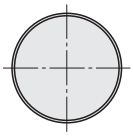
Part Number Type	M (Coarse)	L	D	d	A	H	S	ℓ	€ Unit Price
NKCR	3	6 10	12	6	2.5	7.5	5	1	
	4	10 16	16	8	3.5	9.5	6	1.2	
	5	10 16	20	10	4	11.5	7.5	1.4	
	6	16 20	24	12	5	15	10	1.5	

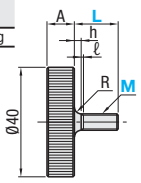
Large Diameter Knurled Knobs

RoHS

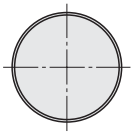


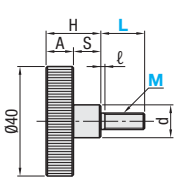
Type Standard	Type Stepped	M Material	S Surface Treatment
NORD	NKRD	1.0736/9SMn36	Buff Polished+Chrome Plating





Stepped





Part Number Type	M (Coarse)	L	d	A	R	H	h	S	ℓ	€ Unit Price NORD	€ Unit Price NKRD
Standard NORD Stepped NKRD	5	16 25	10	8	2.5	15.5	2.5	7.5	1.4		
	6	16 30	12	10	3	20	3	10	1.5		
	8	16 30	16	12	4	24	4	12	2		

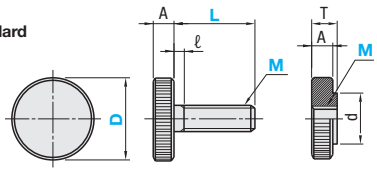
Small Diameter Knurled Knobs

RoHS

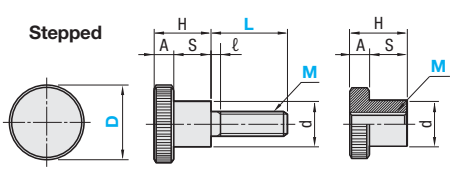


Type Standard	Type Stepped	Shape	M Material	S Surface Treatment
NOBC	NKBC	Male Thread	1.0736/9SMn36	Buff Polished+Chrome Plating
NOSC	NKOSC		1.4305/X10CrNiS18-9	Brushed Finish
NOMC	NKMC	Female Thread	1.0736/9SMn36	Buff Polished+Chrome Plating
NOMSC	NKMSC		1.4305/X10CrNiS18-9	-

Standard



Stepped



Part Number Type	M (Coarse)	L (Male Thread Only)	D € Unit Price	d	A	T	H	S	ℓ	€ Unit Price NOBC NKBC	€ Unit Price NOSC NKOSC	€ Unit Price NOMC NKMC	€ Unit Price NOMSC NKMSC
Standard / Stepped	3	6 10	*5 8 10	6	2.5	3	7.5	5	1				
NOBC NKBC	4	6 10 16	*7 12 14	8	3.5	4	9.5	6	1.2				
NOSC NKOSC	5	10 16 20	*12 16 18	10	4	5	11.5	7.5	1.4				
NOMC NKMC	6	10 16 20 25 30	*13 20 22	12	5	6	15	10	1.5				
NOMSC NKMSC	8	16 20 25 30	*17 26 28	16	6	8	18	12	2				
	10	20 25 30 40	*20 30 32	20	8	10	23	15	2.5				

*marked items are only applicable to NOBC and NOSC.

Order Example

Part Number	-	L	-	D
NKOST6	-	25		
NKCR3	-	10		
NORD8	-	30		
NOBC5	-	10	-	18

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Knobs with Hexagon Socket - Knurled / Knobs - Checker Knurled / Knobs with Fall-off Prevention - Knurled

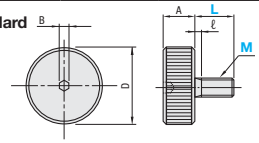
CAD Data

Hexagon Socket Knurled Knobs RoHS

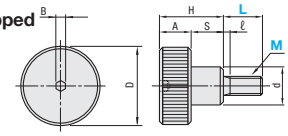


Type		M	S
Standard	Stepped	Material	Surface Treatment
NOBR	NKBR	1.0736/9SMn36	Buff Polished+Chrome Plating
NOOSR	NKOSR	1.4305/X10CrNiS18-9	Brushed Finish

Standard



Stepped



Part Number													€ Unit Price	
Type		M (Coarse)	L			A	D	d	H	S	ℓ	B	NOBR NKBR	NOOSR NKOSR
Standard	Stepped	3	6	10		12	12	6	17	5	1	2		
NOBR	NKBR	4	6	10	16	17	16	8	23	6	1.2	2.5		
NOOSR	NKOSR	5		10	16	20	26	20	10	33.5	7.5	1.4	3	

Order Example: Part Number NOBR3 - L 6 — Days to Ship: 6 Days — P.87 — Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

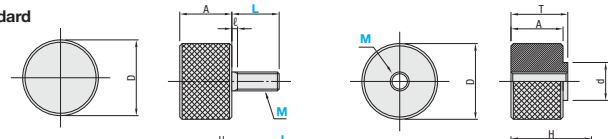
For orders larger than indicated quantity, please request a quotation.

Checker Knurled Knobs RoHS

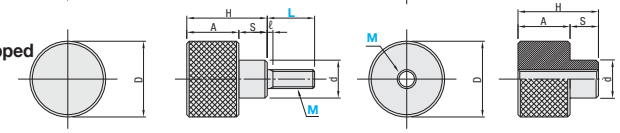


Type		Shape	M	S
Standard	Stepped		Material	Surface Treatment
NOBX	NKBX	Male Thread	1.0736/9SMn36	Buff Polished+Chrome Plating
NOOSX	NKOSX		1.4305/X10CrNiS18-9	Brushed Finish
NOMSX	NKMSX	Female Thread		

Standard



Stepped



Part Number												€ Unit Price		
Type		M (Coarse)	L (Male Thread Only)			A	D	d	T	H	S	ℓ	NOBX NKBX	NOOSX NKOSX	NOMSX NKMSX
Standard	Stepped	3	6	10		10	12	6	11	15	5	1			
NOBX	NKBX	4	6	10	16	11	16	8	12	17	6	1.2			
NOOSX	NKOSX	5		10	16	20	12	20	10	13	19.5	7.5	1.4			
NOMSX	NKMSX														

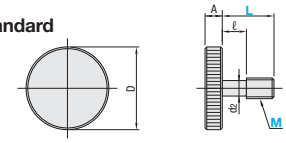
Drop-proof Knurled Knobs RoHS



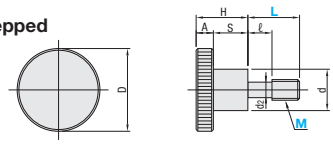
Type		M	S
Standard	Stepped	Material	Surface Treatment
NOBD	NKBD	1.0711/9S20	Buff Polished+Chrome Plating
NOOSD	NKOSD	1.4305/X10CrNiS18-9	Brushed Finish

There may be uneven chrome coating around the threads.

Standard

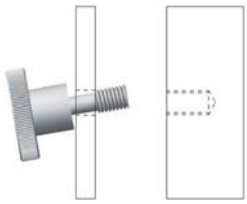


Stepped



Part Number												€ Unit Price	
Type		M (Coarse)	L	D	d	A	H	S	ℓ	d2		NOBD NKBD	NOOSD NKOSD
Standard	Stepped	3	10	12	6	2.5	7.5	5	6	2			
NOBD	NKBD	4	10	16	8	3.5	9.5	6	5	3			
NOOSD	NKOSD		15						10				
		5	10	20	10	4	11.5	7.5	4	3.8			
			15						9				
			20						14				
		6	15	24	12	5	15	10	7	4.5			
			20						12				
			30						22				
		8	20	30	16	6	18	12	10	6			
			30						20				

Example



Order Example: Part Number NOBX3 - L 6 / NOBD5 - L 10 — Days to Ship: 8 Days — Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Knobs with Tip Pad - Knurled/Knobs - Knurled/Knobs - Knurled

-Counterbored- -Slit-

Price Reduction
Up to 21%

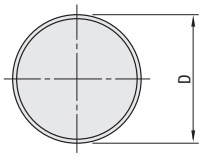
■Knurled Knobs with Tip Pads

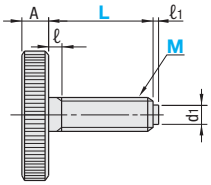
RoHS



Type	Body		Pad
	Material	Surface Treatment	Material
NOOSP	1.4305/ X10CrNiS18-9	Brushed Finish	Polyacetal (White)
NOOSC			Free-Cutting Brass (CW614N/CuZn39Pb3)

NOOSP
NOOSC





Part Number Type	M (Coarse)	L	A	D	d1	ℓ	ℓ1	€ Unit Price NOOSP	€ Unit Price NOOSC
Polyacetal NOOSP / Free-cutting Brass NOOSC	3	6 10	2.5	12	1.5	1	0.5		
	4	6 10 16	3.5	16	2	1.2	1		
	5	10 16 20	4	20	3	1.4	1		
	6	10 16 20 25 30	5	24	4	1.5	1		
	8	16 20 25 30	6	30	6	2	2		
	10	20 25 30 40	8	36	8	2.5	2		

Order Example: Part Number NOOSP6 - L 10

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Features: Length of the thread part is changeable by exchanging with a commercially-available bolt.

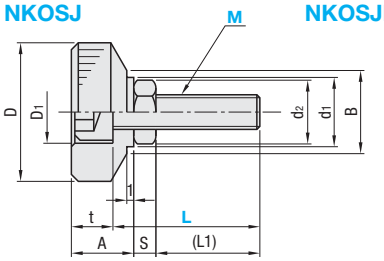
■Knurled Knobs - with H.S.C.S

RoHS

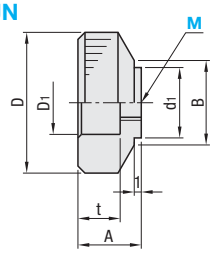


Type	Acces-sories	Body	Accessory	
			Bolt	Nut
		Material	Material	
NKOSJ	Bolts · Nuts	1.4305/ X10CrNiS 18-9	1.4305/ X10CrNiS18-9	
NKOSJN	Without Bolts and Nuts		-	

With Bolts and Nuts **NKOSJ**



Without Bolts and Nuts **NKOSJN**



Part Number Type	M	L Selectable only for NKOSJ	(L1)	D	D1	B	d1	(d2)	A	S	t	€ Unit Price NKOSJ	€ Unit Price NKOSJN
With Bolts and Nuts NKOSJ / Without Bolts and Nuts NKOSJN	4	12	6.6	16	7.5	11	9	8.1	8	2.4	5		
		15	9.6										
		20	14.6										
		25	19.6										
		30	24.6										
	5	15	8.8	20	9	12	10	9.2	9	3.2	6		
		20	13.8										
		25	18.8										
		30	23.8										
		35	28.8										
	6	15	8.4	24	11	14	12	11.5	10	3.6	7		
		20	13.4										
		25	18.4										
		30	23.4										
		35	28.4										

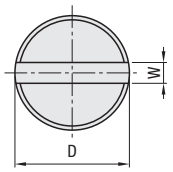
■Knurled Knobs -Slit

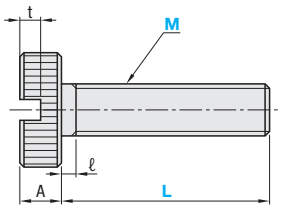
RoHS



Type	Material	Surface Treatment
NOBW	1.0736/9SMn36	Trivalent Chromate
NOOSW	1.4305/X10CrNiS18-9	Brushed Finish

NOBW
NOOSW





Part Number Type	M (Coarse)	L	D	A	ℓ	t	W	€ Unit Price NOBW	€ Unit Price NOOSW
NOBW NOOSW	3	6 10	5	2.5	1	1.5	1.8		
	4	6 10 16	7	3.5	1.2	1.5	1.8		
	5	10 16 20	11	4	1.4	2	1.8		
	6	10 16 20 25 30	13	5	1.5	2	1.8		

Order Example: Part Number NKOSJ4 - L 12 / NOBW3 - 10

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~29	30~39	40~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Knurled Knob Screws · Knurled Knob Screws - SR Tip

CAD Data

Knurled Knob Screws

RoHS

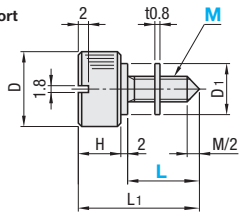
Product Number
Not RoHS compliant



Type		M Material	S Surface Treatment	A Accessory
Short	Long			
NRS	NRL	CW614N/CuZn39Pb3 BD Brass (JIS)	Chrome Plating	Nylon Washer
NRSS	NRLS	1.4305/X10CrNiS18-9	-	

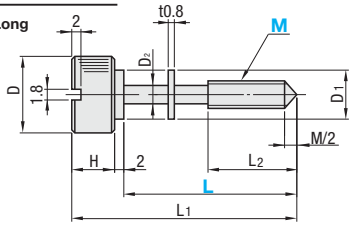
Short

NRS
NRSS



Long

NRL
NRLS



Short

Part Number Type	M (Coarse Thread)	L	L1	D	D1	H	Mass (g)	€ Unit Price NRS	€ Unit Price NRSS
NRS (Brass) NRSS (Stainless Steel)	4	10	20	15	10	8	12		
		15	25				13		
	5	10	20		12		14		
		15	25				15		
	6	10	22	18		10	24		
		15	27				25		

Order Example

Part Number	-	L
NRS5	-	15
NRL8	-	50

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29	30~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Long

Part Number Type	M (Coarse Thread)	L	L1	L2	D	D1	D2	H	Mass (g)	€ Unit Price NRL	€ Unit Price NRLS
NRL (Brass) NRLS (Stainless Steel)	4	20	30	12	15	10	3	8	14		
		25	35						14		
		30	40	15					14		
	5	20	30	12					15		
		25	35	15		12	3.8		16		
		30	40						16		
		40	50						17		
	6	30	42	15	18		4.5	10	27		
		35	47						27		
		40	52						28		
		50	62						29		
	8	40	52	24	14	6			50		
		50	62						53		

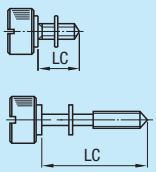
Order Example

Part Number	-	LC	-	(FC)
NRLS8	-	LC30	-	FC20

LC is only applicable to NRSS and NRLS (Stainless Steel).
FC is only applicable to NRLS.

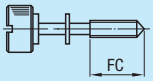
Days to Ship: 10 Days

Alterations

Alteration	Code	Spec.	Price Adder
	LC	L dimension can be specified in 1mm increment. Ordering Code LC30	3,00

M	LC
4	10~30
5	10~40
6	10~50
8	20~50

KRSS is only applicable to M4~6.

Alteration	Code	Spec.	Price Adder
	FC	Threads can be specified in 1mm increment. Ordering Code FC20 M≤FC≤LC-2 FC is only available in combination with LC. Applicable to NRLS only.	Free of Charge

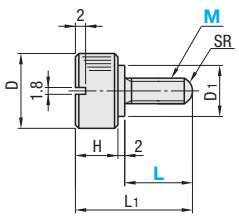
Knurled Knob Screws -SR Tip-

RoHS

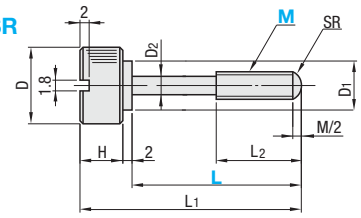


Type		M Material
Short	Long	
NRSSR	NRLSR	1.4305/X10CrNiS18-9

NRSSR



NRLSR



Short

Part Number Type	M (Coarse Thread)	L	L1	D	D1	H	SR	Mass (g)	€ Unit Price
NRSSR	4	10	20	15	10	8	4	12	
		15	25				4	13	
	5	10	20		12		5	14	
		15	25				5	15	
	6	10	22	18		10	6	24	
		15	27				6	25	

Order Example

Part Number	-	L
NRSSR4	-	10
NRLSR6	-	35

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Long

Part Number Type	M (Coarse Thread)	L	L1	L2	D	D1	D2	H	SR	Mass (g)	€ Unit Price
NRLSR	4	20	30	12	15	10	3	8	4	14	
		25	35						4	14	
		30	40	15					4	14	
	5	20	30	12					5	15	
		25	35	15		12	3.8		5	16	
		30	40						5	16	
		40	50						5	17	
	6	30	42	15	18		4.5	10	6	27	
		35	47						6	27	
		40	52						6	28	
		50	62						6	29	
	8	40	52	24	14	6			8	50	
		50	62						8	53	

Clamp Knobs - Knurled · Clamp Knobs - Checker Knurled/ Stainless Steel Knobs - Five Lobed / Stainless Steel Knobs / Stainless Steel Knobs - Wingnut Type

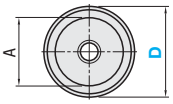
CAD Data

Knurled Clamp Knobs RoHS

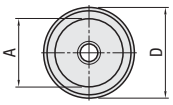


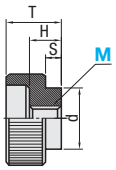
Type		Body		Accessory
Knurling	Checkered Patterns	M Material	S Surface Treatment	M Material
KNB	KNBX	1.1191/C45E	Black Oxide	-
KNBM	KNBMX		Electroless Nickel Plating	-
KNBS	KNBSX	1.4305/ X10CrNiS18-9	-	-
KNBSP	KNBSXP			Nylon Washer

Knobs - Knurled
KNB(Steel)
KNBM(Steel)
KNBS(Stainless Steel)



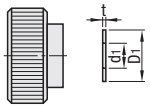
Knobs - Checker Knurled
KNBX(Steel)
KNBMX(Steel)
KNBSX(Stainless Steel)

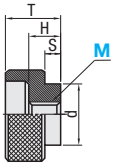




KNBSP

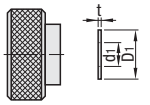
Knobs with Nylon Washer - Knurled





KNBSXP

Knobs with Nylon Washer - Checker Knurled



Part Number Type	M (Coarse Thread)	D Selection	D1	d	A	T	H	S	D1	d1	t	€ Unit Price KNB	KNBM	KNBS	KNBSP
Knobs - Knurled	3	10	12	8.4	7	7.2	4.2	2.4	-	-	-				
KNB		12			9										
KNBM	4	13	16	11.2	9	9.6	5.6	3.2	-	-	-				
KNBS		16			12										
KNBSP(With Nylon Washer)	*5	16	20	14	11	12	7	4	13	5.3	0.8				
Knobs - Checker Knurled		20			15										
KNBX	*6	19	24	16	13	14	8	4	13	6.3	0.8				
KNBMX		24			18										
KNBSX	*8	24	30	20	18	17	10	5	18	8.3	1				
KNBSXP(With Nylon Washer)		30			24										
	10	29	36	28	23	20	12	6	-	-	-				
		36			30										
	12	32	40	32	26	24	14	8	-	-	-				
		40			34										

Order Example

Part Number		D	Price
KNB3	-	12	
KNBSP5	-	16	
KNBX6			
KNBSXP8			

Days to Ship 6 Days P.87

Alterations

Part Number		D		(MC)
KNBS8	-	24	-	MC

10 Days

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Applicable to M≥8 of KNBS and KNBSX.

Alteration	Code	Spec.	Price Adder
S/2 MC	MC	Adds a tap for set screw to KNBS and KNBSX. M: 8 M3, 10 M4, 12 M5. Applicable M≥8	4,00

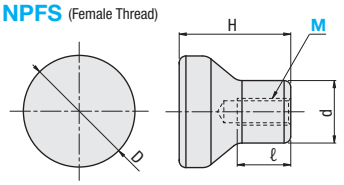
Stainless Steel Knobs - Round Knob



RoHS

Type	M Material	S Surface Treatment
NPFS	1.4301/X5CrNi18-10	Electrolityc Polishing

NPFS (Female Thread)



Part Number Type	M (Coarse Thread)	D	H	ℓ	d	Mass (g)	€ Unit Price
NPFS	4	21	21	8	12	30	
	5			10		49	
	6	25	25		14		
	8	33	33	14	18	113	

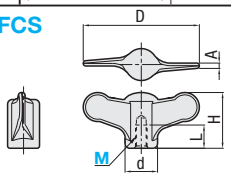
Stainless Steel Knobs - Wingnut Type



RoHS

Type	M Material	S Surface Treatment
NPFCS	1.4401/G-X5CrNiMo17-12-2 (1.4401/X5CrNiMo17-12-2)	Buff Polished

NPFCS



Part Number Type	M (Coarse Thread)	D	H	L	d	A	Mass (g)	€ Unit Price
NPFCS	5	50	24	13	14	2.3	30	
	6						49	
	8	75	35	16	21	3.4	113	
	10						113	

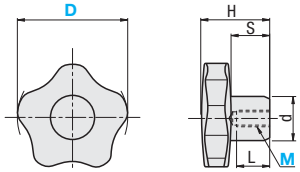
Stainless Steel Knobs - Five Lobed

RoHS



Type	M Material	S Surface Treatment
NPBFS	1.4401/G-X5CrNiMo17-12-2 (1.4401/X5CrNiMo17-12-2)	Electrolityc Polishing

NPBFS



Alterations

Part Number		M		(NC)
NPBFS40	-	6	-	NC

Applicable to NPBFS only.

Alterations	No Hole
Code	NC
Spec.	No Female Thread Hole There is only the center hole of 120° Ordering Code NC
Price Adder	Free of Charge

10 Days

Part Number Type	D	M (Coarse Thread)	H	S	L	d	Mass (g)	€ Unit Price
NPBFS	32	5	22	11	10	13	70	
	40	6	25	13	12	16	115	
	50	8	32	16	15	20	220	
	63	10	40	21	20	25	435	

Order Example

Part Number		M
NPBFS32	-	5

Days to Ship 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Knobs with Captured Washer - Knurled / Knobs with Pads - Knurled / Plastic Clamp Knobs

CAD Data

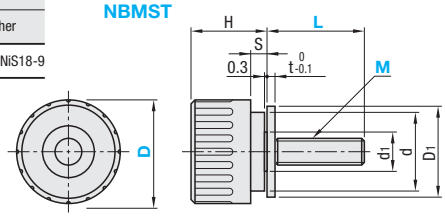
Knurled Knob Screws with Captured Washers

RoHS



Type	Material		
	Knobs	Screws	Flat Washer
NBMST	ABS	1.4301/X5CrNi18-10	1.4305/X10CrNiS18-9

NBMST



Part Number		L			Knob Color	H	S	d	d1	D1	t	Reference Mass (g)	€ Unit Price
Type	M (Coarse)–D												
NBMST	6-20	10	15	20	B (Black)	14	4	15	10	16	1.5	9	
	6-25		15	20	25			19		20		15	
	6-32			20	25	18	6	24	12	28	2	20	
	8-32		15		25							24	

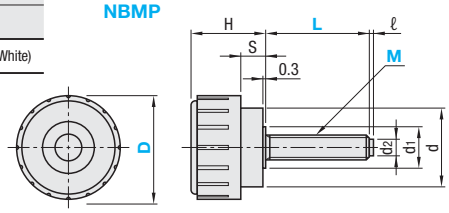
Knurled Knob Screws with Pad

RoHS



Type	Material		
	Knobs	Screws	Pad
NBMP	ABS	1.4301/X5CrNi18-10	Polyacetal (White)

NBMP



Part Number		L				Knob Color	H	S	d	d1	d2	ℓ	Reference Mass (g)	€ Unit Price
Type	M (Coarse) -D													
NBMP	3-16	10	15			B (Black)	12	2	11	9	1.5	0.5	4	
	4-16	10	15								2	1	5	
	5-16	10	15	20										
	5-20		15	20			14	4	15	10	3		7	
	5-25			20	25		18	6	19				14	
	6-20	10	15	20			14	4	15		4		9	
	6-25		15	20	25		18	6	19	10			15	
	6-32			20	25				24	12			20	
	8-32		15		25						6	2	24	

Order Example

Part Number	-	L	-	Knob Color
NBMST6-20	-	20	-	B
NBMP6-32	-	25	-	B

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

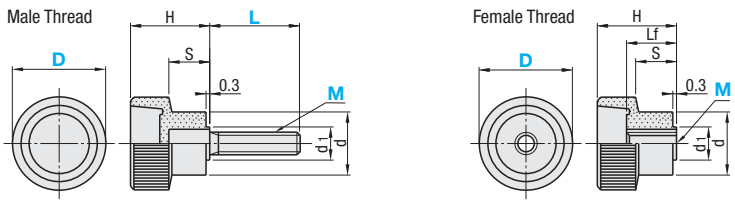
Plastic Clamp Knobs



RoHS

Product Number Not RoHS compliant

Type		Knobs	Screws	
Male Thread	Female Thread	Material	Material	Surface Treatment
NAM	-	ABS	1.1191/C45E	Zinc Plating
-	NAF		Brass (Insert)	Nickel Plating
NAMS	NAFS		1.4301/X5CrNi18-10	-



Part Number		L				Lf	H	S	d	d1	Mass (g)		€ Unit Price			
Type	M (Coarse) -D	NAM · NAMS				NAF · NAFS					NAM · NAMS	NAF · NAFS	NAM	NAF	NAMS	NAFS
NAM NAF	4-18	10	15			9	13	6	10	7	4	2				
	5-20	10	15	20		10	15		12	8						
	5-24	10	15	20			16	7	13							
	6-24	10	15	20	25				15	10	10	3				
NAMS NAFS	6-30	10	15	20	25	11	18				12	3				
	8-30		15	20	25					12	14	10				
	8-35		15	20	25		19	8	18		16	12				
	10-35			20	25					14						

Order Example

Part Number	-	L
NAM8-30	-	20

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	10%	20%	35%

For orders larger than indicated quantity, please request a quotation.

Knobs - Knurled/Plastic Handwheels - Knurled

-Knurled Knobs-

CAD Data

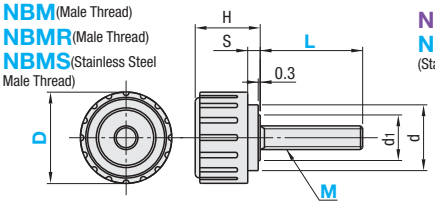
■Knurled Knobs -Knurled Knobs- RoHS



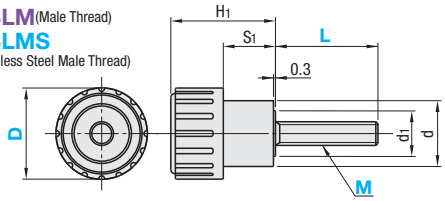
Type		Shape	Knob	Screws	
Standard	Stepped		M Material	M Material	S Surface Treatment
NBM	NBLM	Male Thread	ABS	1.0038/S235JR	Chrome Plating
NBMS	NBLMS			1.4301/X5CrNi18-10	-
NBF	NBLF	Female Thread		Brass (Insert)	-
NBMR	-	Male Thread	Nylon 6	1.0038/S235JR	Trivalent Chromate

①A protrusion for demolding is placed under the head.

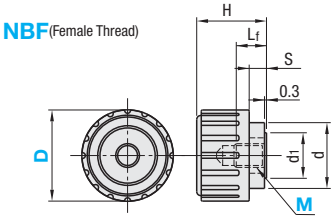
NBM(Male Thread)
NBMR(Male Thread)
NBMS(Stainless Steel Male Thread)



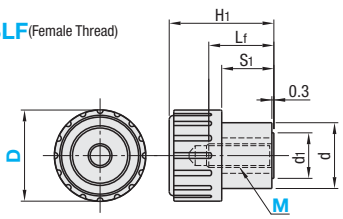
NBLM(Male Thread)
NBLMS
(Stainless Steel Male Thread)



NBF(Female Thread)



NBLF(Female Thread)



Part Number Type	M (Coarse) –D	L NBM · NBLM NBMS · NBLMS NBMR	Knob Color	Lf NBF	Lf NBLF	H	H1	S	S1	d	d1	Reference Mass (g) NBM NBMR NBLM	NBF NBLF	NBMS NBLMS	€ Unit Price NBM	NBMR	NBF	NBLM	NBLF	NBMS	NBLMS
*NBM NBMR NBMS *NBF Stepped Type *NBLM NBLMS *NBLF	3-16	10 15	B (Black) W (White)	5	10	12	16	2	6	11	9	10	5	10							
	4-16	10 15																			
	5-16	10 15 20																			
	5-20	(10) 15 20		6	15	14	22	4	12	15	10	15	6	15							
	5-25	20 25		9	16	18	27	6	15	19		19	9	19							
	6-20	10 15 20 (25)		6	15	14	22	4	12	15		15	6	15							
	6-25	15 20 25		9	16	18	27	6	15	19		29	16	29							
	6-32	20 25								24	12										
	8-25	(16) (25)																			
	8-32	15 (20) 25																			

①The default color will be black unless specified. ①White is available for * marked type only. ①Dimensions in () are only applicable for NBMR Black.

Order Example

Part Number		L		Knob Color
NBM3-16	-	15	-	B
NBM5-20	-	20	-	W
NBMR8-32	-	20		

Days to Ship: 6 Days P.87 / 2 Days P.87

Price

■Volume Discount (①Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	10%	20%	35%

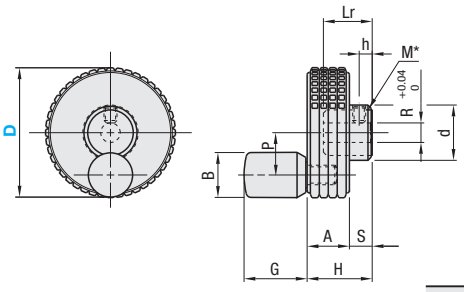
Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

①For orders larger than indicated quantity, please request a quotation.

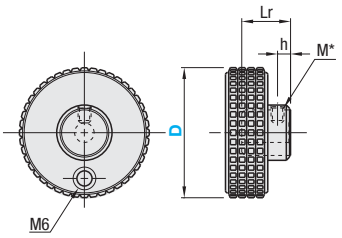
■Plastic Knurled Handwheels RoHS



CHBK(Rotatiing Grip)



CHBKN(Without Grip)



	M Material	S Surface Treatment
Handwheels	Polypropylene	-
Handwheel Insert	Brass	-
Set Screw	1.7220/34CrMo4	Black Oxide
Grip	Nylon6 (Black)	-
Grip Thread	1.0715/9SMn28/L	Black Oxide

*Tap will be added to the insert (brass).

Part Number Type	D	H	A	S	d	R	Lr	h	P	B	G	M	Mass (g) CHBK	Mass (g) CHBKN	€ Unit Price CHBK	€ Unit Price CHBKN
CHBK CHBKN	40	20	13	7	18.5	6	15	4	13	13	18.8	4	30	22		
	50	25	17	8	20		19	5	17.5			5	45	37		
	63	29	20	9	23	8	22	6	22	14	20.8		65	58		
	80	36	24	12	28	12	27	6	30	16	23.8	6	97	84		

Order Example: Part Number CHBK40

Days to Ship: 6 Days P.87

Price

■Volume Discount (①Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

①For orders larger than indicated quantity, please request a quotation.

Knobs - Knurled / Knobs - Large Diameter - Knurled
-Diamond Cut Type-

CAD Data

■Knurled Knobs -Diamond Cut Type-

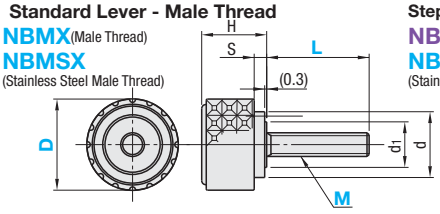
RoHS



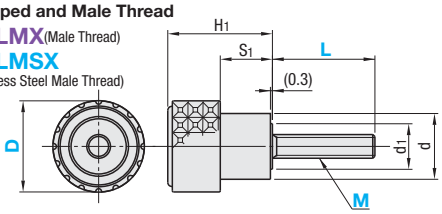
Type		Shape	Knob	Screws	
Standard	Stepped		M Material	M Material	S Surface Treatment
NBMX	NBLMX	Male Thread	ABS	1.0038/S235JR	Chrome Plating
NBMSX	NBLMSX			1.4301/X5CrNi18-10	-
NBFX	NBLFX	Female Thread		Brass (Insert)	-

A protrusion for demolding is placed under the head.

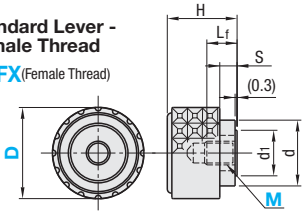
Standard Lever - Male Thread
NBMX (Male Thread)
NBMSX (Stainless Steel Male Thread)



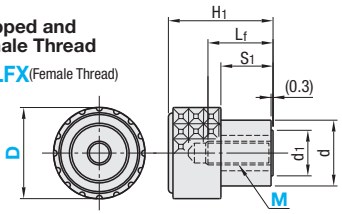
Stepped and Male Thread
NBLMX (Male Thread)
NBLMSX (Stainless Steel Male Thread)



Standard Lever - Female Thread
NBFX (Female Thread)



Stepped and Female Thread
NBLFX (Female Thread)



Part Number Type	M (Coarse) –D	L NBMX · NBLMX NBMSX · NBLMSX	Lf NBFX	Lf NBLFX	H	H1	S	S1	d	d1	Reference Mass (g) NBMX NBLFX	Reference Mass (g) NBFX NBLMX	Reference Mass (g) NBMSX NBLMSX	€ Unit Price NBMX	NBFX	NBLMX	NBLFX	NBMSX	NBLMSX
Standard Type NBMX	3-16	10 15	5	10	12	16	2	6	11	9	10	5	10						
	4-16	10 15																	
	5-16	10 15 20																	
NBMSX	5-20	15 20	6	15	14	22	4	12	15	10	15	6	15						
NBFX	5-25	20 25	9	16	18	27	6	15	19		19	9	19						
Stepped Type NBLMX	6-20	10 15 20	6	15	14	22	4	12	15		15	6	15						
	6-25	15 20 25	9	16	18	27	6	15	19	10	29	16	29						
NBLMSX	6-32	20 25							24	12									
NBLFX	8-32	15 25																	

■Large Diameter Knurled Knobs

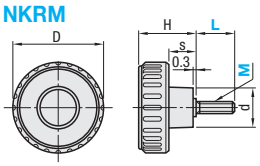
RoHS



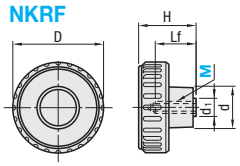
Type	Shape	Knob M Material	Screws M Material	Screws S Surface Treatment
NKRM	Male Thread	Nylon 6 (Mat Black)	1.0038/S235JR	Trivalent Chromate
NKRF	Female Thread		1.0715/9SMn28/L	
NKRR	For H8 Hole Type orders larger than indicated quantity, please request a quotation.		1.0038/S235JR	Black Oxide

A protrusion for demolding is placed under the head.

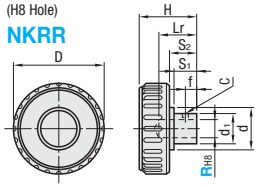
(Male Thread) **NKRM**



(Female Thread) **NKRF**



(H8 Hole) **NKRR**



■Male Thread / Female Thread Types

Part Number Type	M (Coarse Thread)	L NKRM	Lf NKRF	D	H	S	d	d1	Mass (g) NKRM	Mass (g) NKRF	€ Unit Price NKRM	€ Unit Price NKRF
Male Thread NKRM	5	10 16 20	10	32	22	10	15	9	13~15	15		
	6	10 16 20 25	15	40	25	11	17	10	20~22	17		
Female Thread NKRF	8	16 20 25	18	50	30	13.5	20	12	36~40	27		
	10	30 40 50	20	63	35	15	23	16	78~90	55		

Part Number Type	R_{H8}	D	Lr	H	S_1	S_2	d	d_1	C	f	Mass (g)	€ Unit Price
H8 Hole NKRR	8	40	15	25	9	11	19	14	2.8	7	31	
	10	50	19	32	13	15.5	22	17	2.8	8	48	
	12	63	23	40	17	20	26	21	3.8	10	89	

Order Example

Part Number	-	L
NBMX3-16	-	10
NKRM8	-	16
NKRR12		

Price

Days to Ship

6 Days P.87

2 Days

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Discount Rate	€ Unit Price	10%	20%	35%

For orders larger than indicated quantity, please request a quotation.

■NBLMX

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

Knobs - Mushroom Shaped/Knobs - Butterfly Shaped/ Knobs - Wing Shaped/Knobs - Three Lobed

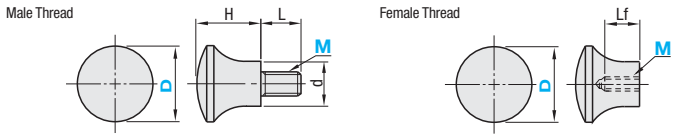
CAD Data

Mushroom Shaped Knobs

RoHS



Type	Screws	Knobs	Screws	
		M Material	M Material	S Surface Treatment
NMM	Male Thread	Phenol Resin (Black)	1.0715/9SMn28 L	Trivalent Chromate
NMF	Female Thread		Brass (Insert)	-



Part Number Type	Part Number M (Coarse) -D	L NMM	Lf NMF	H	d	Mass (g) NMM	Mass (g) NMF	€ Unit Price NMM	€ Unit Price NMF
NMM (Male Thread)	5-17	10	7	15	10	5	4		
	6-21		11	18	12	9	6		
NMF (Female Thread)	6-25			22	14	12	9		
	8-33	15	12	30	18	26	19		

Order Example: Part Number NMM5-17

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

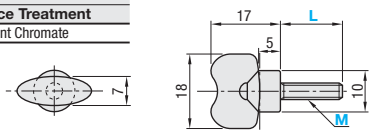
For orders larger than indicated quantity, please request a quotation.

Butterfly Shaped Knobs

RoHS



Type	Knobs M Material	Screws M Material	Screws S Surface Treatment
NWGMC	Phenol	1.0038/S235JR	Trivalent Chromate



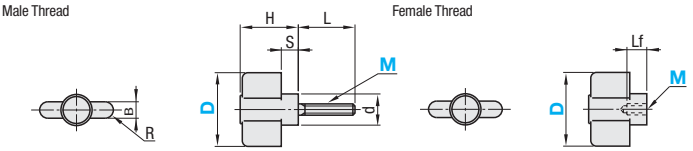
Part Number Type	Part Number M (Coarse Thread)	L	Mass (g)	€ Unit Price
NWGMC	3	10	5	
	4	10 15	10	
	5	10 15	13	

Wing Knobs

RoHS



Type	Screws	Knobs M Material	Screws M Material	Screws S Surface Treatment
NWGM	Male Thread	ABS (Matt Black)	1.0718/9SMnPb28	JIS STKM Bright Chromate Plating
NWGF	Female Thread		Brass	

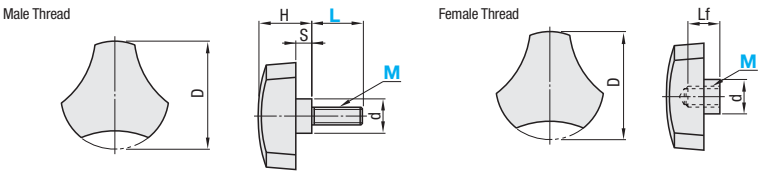


Part Number Type	Part Number M (Coarse) -D	L NWGM	Lf NWGF	B	H	S	d	R	Mass (g) NWGM	Mass (g) NWGF	€ Unit Price NWGM	€ Unit Price NWGF
NWGM NWGF	4-30	15	10	8	20	5	14	B/2	10	6		
	5-30								12			
	6-40		19	9	28	8	16		15	8		
	8-50	20		10			19		30	13		
	8-65	25		11			22		35	17		

Three Lobed Knobs



Type	Screws	Knobs M Material	Screws M Material	Screws S Surface Treatment
NTM	Male Thread	Phenol	1.0718/9SMnPb28	JIS STKM Bright Chromate Plating (Matt Black)
NTLF	Female Thread		Brass	-



Part Number Type	Part Number M (Coarse Thread)	L NTM	L NTLF	Lf NTLF	D	d	H	S	Mass (g) NTM	Mass (g) NTLF	€ Unit Price NTM	€ Unit Price NTLF
NTM NTLF	5	10 20		8.5	25	14	15	10	9	7		
	6	10 20		10	31	17	17	11	15	12		
	8	20 30		12	39	20	20	12	27	18		
	10	20 30		14	49	22	23	14	44	28		

Order Example: Part Number - L
NWGMC3 - 10
NWGM5-30
NTM8 - 30

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	10%	20%	35%

For orders larger than indicated quantity, please request a quotation.

Star Knobs - Star Shaped · Knobs - Cross Shaped/ Knobs - Five Lobed / Knobs - Six Lobed

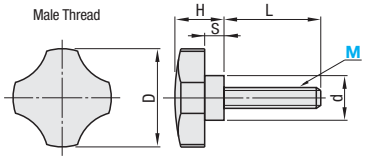
Price Reduction
Up to 25%

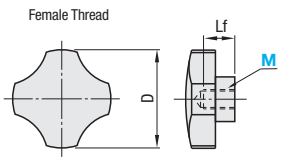
CAD Data

■Star Knobs RoHS



Type	Screws	Knobs M Material	Screws M Material	Screws S Surface Treatment
NKPM	Male Thread	Nylon 6	1.0038/S235JR	Trivalent Chromate
NKPF	Female Thread		Gunmetal (Insert)	-



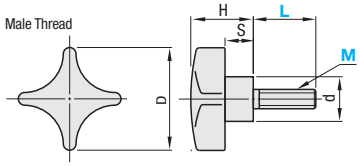


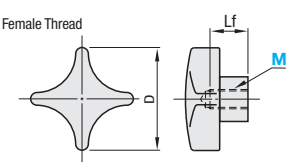
Part Number Type	Part Number M (Coarse Thread)	Knob Color	L NKPM	L NKPF	D	H	S	d	Mass (g) NKPM	Mass (g) NKPF	€ Unit Price NKPM	€ Unit Price NKPF
NKPM (Male Thread) NKPF (Female Thread)	5	B(Black) R(Red)	25	9	25	15	6	14	11	10		
	6		30	9.5	33	16.5	7	15	17	12		
	8		40	12	40	20	8	18	37	18		
	10				45			20	60	25		
	12			14	50	24	10	22	80	40		

■Cross Knobs RoHS



Type	Screws	Knobs M Material	Screws M Material	Screws S Surface Treatment
NCRM	Male Thread	Nylon 6 (Mat Black)	1.0715/9SMn28	Trivalent Chromate
NCRF	Female Thread			





Part Number Type	Part Number M (Coarse Thread)	L NCRM	Lf NCRF	D	H	S	d	Mass (g) NCRM	Mass (g) NCRF	€ Unit Price NCRM	€ Unit Price NCRF
NCRM (Male Thread) NCRF (Female Thread)	6	10 16 20 25 30	12	32	20	10	14	10~14	10		
	8	16 20 25 30	14	40	25	13	18	20~30	20		
	10	25 30 35	18	50	32	20	22	40~55	32		
	12	30 40	22	63	40	25	26	75~100	55		

Order Example

Part Number	-	Knob Color	-	L
NKPM5	-	B		
NKPF8	-	R		
NCRM6			-	30

Days to Ship: 6 Days / 2 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

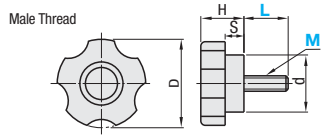
Quantity	1~9	10~19	20~39	40~99
Rate	€ Unit Price	20%	30%	40%

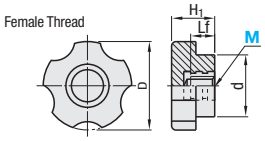
For orders larger than indicated quantity, please request a quotation.

■Five Lobed Knobs



Type	Screws	Knobs M Material	Screws M Material	Screws S Surface Treatment
NPEM	Male Thread	ABS	1.0038/S235JR	Chromate
NPEF	Female Thread		Brass (Insert)	-





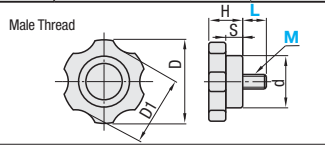
Part Number Type	Part Number M (Coarse Thread)	L NPEM	Lf NPEF	D	d	H	H1	S NPEM	S NPEF	Mass (g) NPEM	Mass (g) NPEF	€ Unit Price NPEM	€ Unit Price NPEF
NPEM NPEF	5	10 20	8.5	35	22	14	17	5	8	11	9		
	6	20 30								13	10		
	8	30 40	10	42	26	16	18	6		25	15		
	10	30 40	12	45	32	17	20		9	43	19		

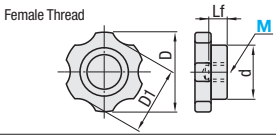
■Six Lobed Knobs RoHS



Product Number
Not RoHS compliant

Type	Screws	Knobs M Material	Screws M Material	Screws S Surface Treatment
NHM	Male Thread	ABS	1.0038/S235JR	Chromate
NHMS			1.4301/X5CrNi18-10	-
NHF	Female Thread		Brass (Insert)	-





Part Number Type	Part Number M (Coarse Thread)	L NHM	L NHMS	Lf NHF	D	D1	d	H	S	Mass (g) NHM	Mass (g) NHF	Mass (g) NHMS	€ Unit Price NHM	€ Unit Price NHF	€ Unit Price NHMS
NHM NHF NHMS	5	10 15 20 25 30	-	7	35	31.5	24	15	5	13	9	-			
	6	10 15 20 25 30	20 30							15	10	16			
	8	15 20 25 30 40 50	20 30 40	9	42	37.5	26	17	7	28	15	28			
	10	30 40 50	30 40	10	45	40.5	30	18	8	48	20	43			
	12	30 40 50	30 40 50	12	50	44.5	33	20	9	68	28	69			

Order Example

Part Number	-	L
NPEM5	-	10
NHM10	-	50

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Knobs - Seven Lobed/Super Knobs/Adjustment Screws with Knobs/Push-fit Knobs - Knurled

-Five · Three Lobed Type- -Spring Pressure Type-

NEW

Price Reduction Up to 62%

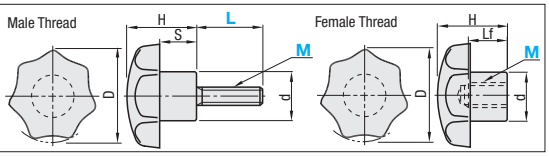
CAD Data

■Seven Lobed Knobs

RoHS



Type	Screws	Knobs M Material	Screws M Material	Screws S Surface Treatment
NKSM	Male Thread	Nylon 6 (Matt Black)	JIS SWCH10R ~C10	Trivalent Chromate
NKSF	Female Thread		Brass (Insert)	-



Part Number Type	M (Coarse Thread)	L (NKSM)	Lf NKSF	D	H	S	d	Reference Mass (g) NKSM	Reference Mass (g) NKSF	€ Unit Price NKSM	€ Unit Price NKSF
NKSM (Male Thread)	5	10 15 20 25 30	9.5	25	16	8	12	9	5		
	6	10 16 20 25 30	12	32	20	10	14	13	8		
	8	16 20 25 30 40 50 55	14	40	25	13	18	36	14		
NKSF (Female Thread)	10	25 30 40 45 55	18	50	32	17	22	64	35		
	12	30 40 50	22	63	40	21	26	111	49		

Order Example: Part Number NKSM12 - L 50

Days to Ship: 6 Days P.87 / 2 Days P.87

Price

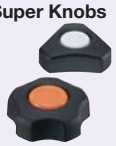
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~39	40~99
Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

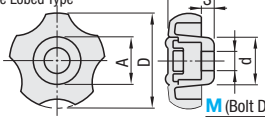
■Super Knobs

RoHS

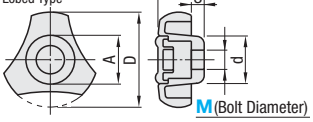


Type	Knobs M Material	Cap M Material
SKN	Nylon 66 (Black)	Polypropylene
SSN		

SKN Five Lobed Type



SSN Three Lobed Type



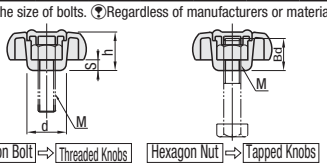
Part Number Type	M	Cap Color	D	d	H	S	A	€ Unit Price 1 ~ 20 pcs or more
SKN	6	Y(Orange) W(White)	34	18	16	4	15	
	8		38	20	18		18	
	10		43	22	22	6	21	
	12		53	26		4	25	
SSN	6		37	16	16	3.5	15	
	8		42	20	19	4.5	18	
	10		47	23	23	6	21	

Order Example: Part Number SKN6 - Cap Color Y

Days to Ship: 6 Days P.87

M in Part Number indicates the size of bolts. Regardless of manufacturers or materials, any commercially available hexagon bolts and nuts can be used.

Example



■How to Assemble

(1) Insert hexagon bolt or hexagon nut into the hexagonal hole of the knob perfectly.
(2) Fit the cap by setting two of the three claws.
(3) Then push the remaining claw using a screwdriver or lancet to complete.
* In case of tapped knob, pay attention to the engagement length with its threaded counterpart (Bd dimension in the figure).
Caps may fall off.

■Adjustment Screws with Knobs

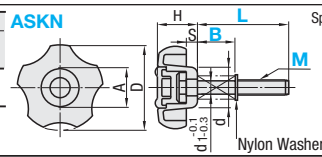
RoHS



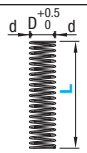
Type	Knobs M Material	Cap M Material	Bolt M Material	Bolt S Surface Treatment
ASKN	Nylon66 (Black)	Polypropylene	JIS SWRM10	Trivalent Chromate

Cap Color (Orange)

ASKN



Spring



Part Number Type	M (Coarse Thread)	L	B Spring Length	Springs Used	D	d	d1	H	S	A	Spring dimensions Wire Dia. (d)	Spring dimensions L	Spring dimensions D	Spring dimensions Constant	€ Unit Price
ASKN	6	30	10 20	6	34	18	5	16	4	15	0.8	10	6	N/mm 2.9 {kgf/mm} {0.3}	
		40	20 30								0.9	20			
		50	20 30									30			
	8	30	10 20	8	38	20	6	18		18	0.8	10	8		
		40	20 30								1	20			
		50	20 30									30			
		60	20 30 40								1.2	40			
	10	40	20 30	10	43	22	8	22	6	21	1.2	20	10		
		60	20								1.4	30			
		70	30 40									40			

Order Example: Part Number ASKN8 - L 60 - B 40

Days to Ship: 6 Days P.87

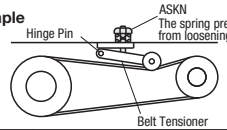
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49	50~99
Rate	€ Unit Price	20%	25%	35%

For orders larger than indicated quantity, please request a quotation.

Example



■Feature: Can be used by push-fitting on commercially available hexagonal socket head cap screws.

■Push-fit Knobs - Knurled

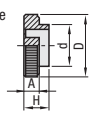
RoHS



Type	M Material
PACK-PKN	Polyacetal

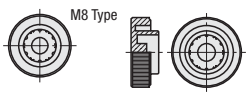
PACK-PKN

M3 ~ M6 Type

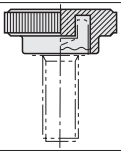


Do not use tools to tighten.

M8 Type



Mounting Example



Part Number Type	Screw Size M (Coarse)	Knob Color	D	d	H	A	Reference Destructive Torque (Nm)	Qty per Pkg.	€ Unit Price Per Pkg.
PACK - PKN	3	B(Black) G(Gray)	9.5	8.3	4.5	4	0.5	10 pcs. per pkg.	
	4		13	9.8	5.5		1.5		
	5		16	11.5	6.6	4.5	2.7		
	6		19	13	7.5		2.8		
	8		26	16	10.2	7.2	4.5		

Order Example: Part Number PACK-PKN3 - Knob Color B

Note that order quantity "1" delivers 10 pcs (one package).

Days to Ship: 6 Days P.87

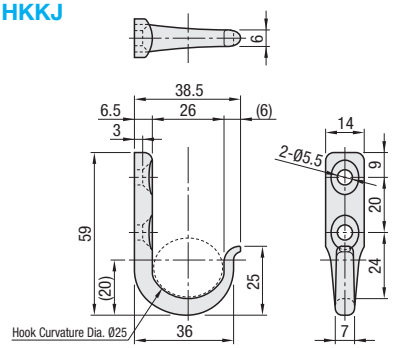
Hooks/ Knob - Tether Chain

CAD Data

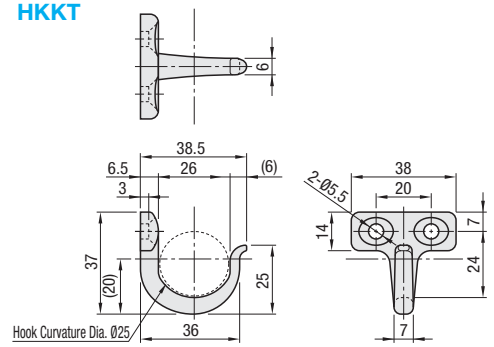


Type		M	S
J Shape	T Shape	Material	Surface Treatment
HKKJ	HKKT	1.4301/X5CrNi18-10	Buff Polished

HKKJ



HKKT



Part Number Type	Allowable Load (N)	Mass (g)	€ Unit Price 1 ~ 9 pc(s)	Volume Discount 10~
HKKJ	196	36		
HKKT		45		

Order Example — Part Number: HKKJ / HKKT — Days to Ship: 6 Days P.87

Example



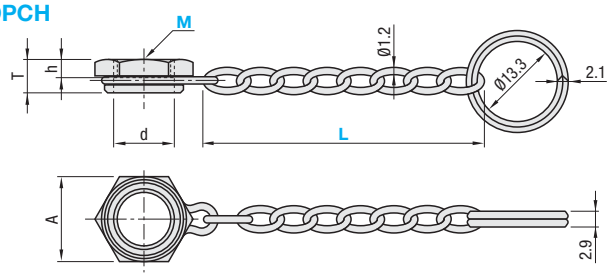
Drop-prevention Chains for Knobs

RoHS

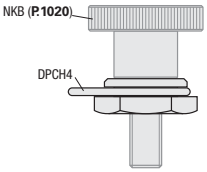


Type	M Material			
	Nut	Chain	Key Ring	Hook
DPCH	1.4301/X5CrNi18-10			1.4301/X5CrNi18-10-WPB

DPCH



Mounting Example



Part Number Type	M	L	A	d	T	h	Reference tightening torque Working Load	€ Unit Price Qty. 1 ~ 9	Volume Discount 10~
DPCH	3	150	7	3.2	4	2.5	2kg		
	4		8	4.2					
	5	250	10	5.2		2			
	6			6.2					
	8	350	12	8.2	5	2.5			
	10		14	10.2	5.5				

Order Example — Part Number: DPCH6 - 250 — Days to Ship: 6 Days P.87

Handles / Hinges / Door Parts

Handles / Hinges/ Door Parts

Addition



Price Reduction
Up to 23%



Addition



Price Reduction
Up to 71%







Product Name	Handles	Round Bar Handles -L and H Dimensions Configurable Type-	Small Handles	Handles with Washers	Handles with Rubber	Washers for Handle
Page	1037	1037	1037	1038	1038	1038









NEW





NEW





-Angled Handles-	- Small Diameter - Offset	Oval Type	Square Bar L Dimension Selectable Type	U-Shaped Type	L Dimension Configurable Type	Designer Handles	-Phenol Handles-
1039	1039	1040	1040	1040	1040	1041	1041













Addition





Nylon Type	Handles for Plate	-Rubber Type-	T-Shaped Handles	-Round Bar Grip-	-Oval Grip Handles-	Aluminum Handles
1042	1042	1042	1042	1043	1043	1044





NEW











Handles - Sheet Metal	Sheet Metal U-shaped Handles	Designer Handles	-Casting-	-Folding-	Handles with Cap	Aluminum Hollow Handles
1044	1044	1045	1045	1046	1046	1046

Addition















- Aluminum Hollow - Small Diameter	Welded Round Type	- with Pedestal - Offset	Aluminum Handles - with Plate - Offset	Aluminum Type	-Casting Offset-	Aluminum Hollow Type
1046	1047	1047	1047	1048	1048	1048

Addition



NEW



Addition



Price Reduction
Up to 49%



Small Dia. Aluminum Hollow Type	Small Resin External Handles	Handles - Nylon 6	Mounting Plates for Handle	Phenol - Counterbored	Cantilever Handles	Resin Handles with Cap
1048	1049	1049	1049	1050	1050	1050

Price Reduction
Up to 47%

Folding Handles	-Male Thread-	- Side Mount-	T-Shaped	Handles for Welding	Spring Loaded	Stainless Steel Rotary Handles	Embedded Handles
1051	1051	1051	1051	1052	1052	1052	1053

Price Reduction
Up to 24%

Price Reduction
Up to 26%

Stainless Steel Embedded Handles	Folding Embedded Handles	TPE Embedded Handles	Embedded Handles	Hinges -Stainless Steel	Hinges	Hinges	Hinge Nuts
1053	1054	1054	1054	1055	1056	1056	1056










Aluminum Hinges for Unequal Size Frames	- for Extra Low Head Cap Screws-	- Short Type / Long Type-	Protruded Aluminum Hinges	for Different Shape Frames	Stop Hinges	Hinges for Heavy Loads	Hinges with Slotted Holes
1057	1057	1058	1058	1059	1059	1060	1060







Addition



- Counterbored - One Side Slotted	Resin Hinges	Compact Plastic Hinges	Low Particulate Generation Hinges	Hinges - Offset Mounting Holes	Stepped Hinges - Stainless Steel	Spring Loaded Hinges	Torque Hinges -Fixed-
1060	1061	1061	1061	1062	1062	1062	1063





Price Reduction
Up to 17%





Torque Hinges - Adjustable Type-	Damper Hinges	Damper Hinges	Detachable Hinges - Stainless Steel	Detachable Hinges	- Aluminum	- Aluminum	Detachable Hinges for Heavy Loads
1063	1064	1064	1065	1065	1066	1066	1066

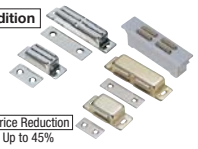



Addition

Price Reduction
Up to 53%

Addition

Price Reduction
Up to 37%

Addition

Price Reduction
Up to 45%

Stepped Detachable	Vertical Detachable	Welded Detachable	Welded Hinges - Stainless Steel	Welded Steel Hinges	Welded Hinges for Heavy Loads	Long Stainless Steel Hinges	Magnetic Catches
1067	1067	1067	1068	1068	1068	1068	1069







Price Reduction
Up to 30%


Magnetic Catches - High Strength	-Magnet Force Selectable Type-	Magnetic Catches	Thin Magnet Catches	Ultrathin Magnetic Catches	Low Particulate Generation	Low Particulate Generation Thin
1070	1070	1070	1071	1071	1072	1072



Not Available

Not Available

Not Available

Price Reduction
Up to 46%

Price Reduction
Up to 29%

Resin Catches	Door Limit Switches	Magnetic Catches with 3 Wires	Magnet Catches with Sensors - Lead Wire Connected	Magnetic Catches with Switch	Ball Catches	Snap Locks
1072	1073	1073	1074	1074	1074	1075

Covered Snap Locks	Snap Locks for Medium Loads	Adjustable Snap Locks	Corner Snap Locks	Knuckle Locks	Large Cabinet Locks	Hinges - With Slide Bolts
1076	1076	1077	1077	1077	1078	1078

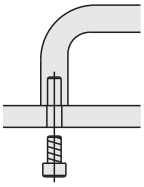
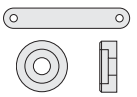
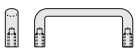
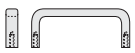
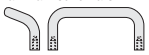
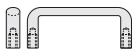
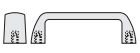
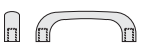
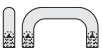
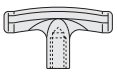
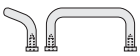
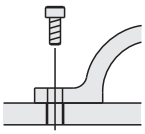
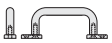
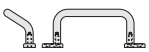
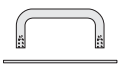
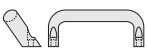
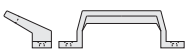
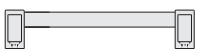
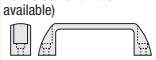
Addition

Square Latches	Airtight Latches	Latches	Canopy Latches	Small Canopy Latches	Latches with Catch Mechanisms	Rotary Latches	Spring Loaded Latches
1078	1078	1079	1079	1079	1080	1080	1080

Handles Overview

Handles

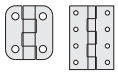
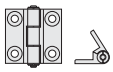
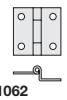
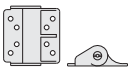
Please refer to product pages for detailed specifications.

How to Mount	Feature (Shape · Material)
Female Thread 	**Metal** ■ Round Bar (Dimension Selectable)  Allowable Load: 2500N **P.1037** ■ Round Bar (Dimension Configurable)  Allowable Load: 500 ~3400N **P.1037** ■ Round Bars - Small  Allowable Load: 3000N **P.1037** ■ Round Bar (with Rubber)  Allowable Load: 2500N **P.1038** ■ Round Bar (with Washer)  Allowable Load: 2500N **P.1038** ■ Reinforcement Plates · Washers for Round Bars  **P.1037 · 1038** ■ Oval Handles  Allowable Load: 300~2300N **P.1040** ■ Square Bar (L Dimension Selectable)  Allowable Load: 2500N **P.1040** ■ Square Bar (L Dimension Configurable)  Allowable Load: 2500N **P.1040** ■ Designer Handles  Allowable Load: 500N **P.1041** Handles with Angle ■ Round Bars · Small Dia. Round Bars  Allowable Load: 392N · 490N · 2000N **P.1039** **Non-metal** ■ Phenol  Allowable Load: 470 ~1100N **P.1041** ■ Nylon  Allowable Load: 500N **P.1042** ■ For Plates (Partially Metal)  **P.1042** ■ Rubber  **P.1042** ■ T-Shaped  **P.1042** Handles with Angle ■ Round Bar (with Washer)  Allowable Load: 2000N **P.1039**
External 	**Metal** ■ Round Bar Grip Handles  **P.1043** ■ Round Bar Handles with Plate  Allowable Load: 2000N **P.1043** ■ Oval Grip Handles  **P.1043** ■ Aluminum Oval  Allowable Load: 390 ~1200N **P.1044** ■ Sheet Metal Handles  Allowable Load: 160 ~ 400N **P.1044** ■ Sheet Metal U-shaped Handles  **P.1044** ■ Designer Handles  Allowable Load: 500N **P.1045** ■ Cast Handles  Allowable Load: 500N **P.1045** ■ Cast Handles  Allowable Load: 500N **P.1045** ■ Folding Handles  Allowable Load: 500 ~ 650N **P.1046** ■ With Cap (Special Nut Available)  **P.1046** Handles with Angle ■ Aluminum Hollow Type  **P.1046** ■ Small Dia. Aluminum Hollow Type  **P.1046** ■ Round Bar  **P.1047** ■ With Mounting Tabs  Allowable Load: 2000N **P.1047** ■ With a Plate  **P.1047** ■ Aluminum Oval  Allowable Load: 1100N **P.1048** Handles with Angle ■ Cast Offset  Allowable Load: 500N **P.1048** ■ Aluminum Hollow Type  **P.1048** ■ Small Dia. Aluminum Hollow Type  **P.1048** **Non-metal** ■ Nylon (Special Reinforcement Plate available)  Allowable Load: 500N **P.1049** ■ Phenol Allowable Load: 470 ~1100N **P.1050** ■ Cantilever (Partially Aluminum) Allowable Load: 60 ~500N **P.1050** ■ With Cap (Special Nut Available) Allowable Load: 500N **P.1050**
Embedded	**Metal** ■ Male Thread **P.1053** ■ Countersunk Holes **P.1053** ■ Folding **P.1054** ■ Rotation **P.1052** **Non-metal** ■ TPE **P.1054** ■ ABS Resin **P.1054**
(Others) Male Thread Welded Special	**Metal** ■ Male Thread Folding Allowable Load: 500N **P.1051** ■ Male Thread Allowable Load: 2500N **P.1051** ■ T-Shaped **P.1051** ■ Side Mount Allowable Load: 500N **P.1051** ■ Welded **P.1052** ■ Spring-loaded **P.1052**

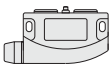
Hinges · Door Parts · Handles Overview

■Hinges

Please refer to product pages for detailed specifications.

How to Mount	Feature (Shape · Material)					
Standard	Standard	■ Stainless Steel Hinges · Steel Hinges (Through Holes)  P.1055	■ Stainless Steel (Countersunk Holes)  P.1055	■ Aluminum Hinges (Countersunk Holes)  P.1057	■ Aluminum - Long Type · Short Type (Countersunk Holes)  P.1058	■ Aluminum Hinges (Counterbored Holes for Extra Low Head Cap Screws)  P.1057	■ Stainless Steel Hinges for Heavy Loads (Counterbored Holes)  P.1060
	Functional Shape	■ Hinges w/Slot Protrusions (Countersunk Holes)  P.1058	■ Limited Angle Hinges (Countersunk Holes)  P.1059	■ Slotted Holes  P.1060	■ Slotted Counterbored Holes  P.1060		
		■ Plastic (Counterbored Holes)  P.1061	■ Compact Plastic Hinges (Countersunk Holes)  P.1061	■ Aluminum Low Particle Hinges (Countersunk Holes)  P.1061	■ Staggered Holes (Through Holes)  P.1062	■ Stepped Hinges (Through Holes)  P.1062	
	With Mechanisms	■ Fixed Torque Type (Through Holes)  P.1063	■ Adjustable Torque Type (Counterbored Holes)  P.1063	■ Damper Hinges (Counterbored Holes)  P.1064	■ Damper Hinges (Through Holes)  P.1064	■ Spring-loaded (Through Holes)  P.1062	
Detachable Hinges	Standard	■ Aluminum Flag Hinges (Countersunk Holes)  P.1059	■ Stainless Steel (Countersunk Holes)  P.1065	■ Stainless Steel (Through Holes)  P.1065	■ Aluminum Hinges (Countersunk Holes)  P.1066	■ Aluminum Hinges (Counterbored Holes)  P.1066	■ Stainless Steel Hinges for Heavy Loads (Counterbored Holes)  P.1066
Welded		■ Stainless Steel  P.1068	■ Stainless Steel Hinges for Heavy Loads  P.1068	■ Long Hinges  P.1068	■ Welded Detachable Hinges  P.1067		
	Special Configurations	■ Stepped Hinges (Through Holes)  P.1067	■ Vertical Type (Countersunk Holes)  P.1067				

■Catches

Standard	■Standard  P.1069	■Embedded  P.1068	■Strong  P.1070	■ Magnet Force Selectable  P.1070	Thin  P.1071	■Low Particulate Generation  P.1072	■Adjustable  P.1071
Sensors with Switches	■with Terminal  P.1073	■ with Three Wires P.1073	■with Lead Wires P.1074	■ Non-Contact Door Switches P.1073	■Resin Catches P.1072	■Ball Catches P.1074	

■Snap Locks · Latches · Keys · Latches

■Snap Locks P.1075~P.1077

■ Cabinet Locks · Draw-bolts · Sealed Latches, etc. P.1078

■ Latches P.1079 · P.1080

Round Bar Handles / Reinforcement Plates for Handles

NEW

Price Reduction Up to 71%

Female Thread

CAD Data

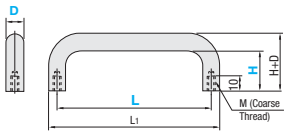
Round Handle Dimension Selectable Type

RoHS



Type		Material	Surface Treatment
Standard Type	Milled Type		
(1) UWAN	UWANHM	1.0715/9SMn28	Chrome Plating
(2) UWANK	-		Black Oxide
(3) UWANS	UWANSHM	1.4301/X5CrNi18-10	Buffing
(4) UWANA	-	Aluminum Alloy	Buffing
(5) UWANEA	-		Clear Anodize
(6) UWANB	-		Electrostatic Coating (Mat Black)

Milled Type is machined on mounting faces.



Part Number Type	D	L	H	L1	M	Allowable Load (N)	€ Unit Price UWAN	UWANK	UWANS	UWANA	UWANEA	UWANB	UWANHM	UWANSHM
UWAN, UWANK, UWANS, UWANA, UWANEA, UWANB, UWANHM (Milled Type), UWANSHM (Milled Type)	10	80	27	90	5	2500								
			50											
		100	27	110										
			50											
		110	27	120										
			30		6									
			50		5									
		120	27	130										
			30		6									
			50											
		125	27	135										
			50											
		160	27	170	5									
			50											
		200	27	210										
			50											
		250	27	260										
			50											
	12	150	40	162	8									
			75											
		188	40	200										
			75											
		238	40	250										
			75											
		288	40	300										
			75											

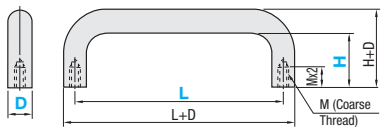
The default H dimension will be H27 for D10 and H40 for D12 unless specified.

L and H Dimensions Configurable Round Handles



RoHS

Type	Material	Surface Treatment
UWAF	1.0715/9SMn28	Chrome Plating
UWAFS	1.4301/X5CrNi18-10	Buffing
UWAFA	Aluminum Alloy	Buffing
UWAFB		Electrostatic Coating (Mat Black)



Part Number Type	D	1mm Increment L	H	M (Coarse)	Allowable Load for Reference (N)
UWAF (Steel), UWAFS (Stainless Steel), UWAFA (Aluminum), UWAFB (Aluminum, Black)	6	80~200	27~40	4	500~1000
	7				600~1000
	8	80~300	27~50		
	9				
	10			5	1700~2500
	12		40~50	8	2700~3400

Order Example

Part Number	-	L	-	H
UWAN10	-	80	-	50
UWAF10	-	290	-	40

Days to Ship

Dimension Selectable Type: 6 Days

Configurable L and H: 10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

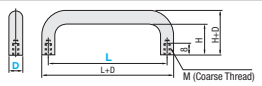
Part Number Type	D	€ Unit Price L80~199 D6	D7	D8	D9	D10	D12	L200~300 D6	D7	D8	D9	D10	D12
UWAF (Steel)													
UWAFS (Stainless Steel)													
UWAFA (Aluminum)													
UWAFB (Aluminum, Black)													

Small Handles

RoHS



Type	Material	Surface Treatment
UWANC	1.0715	Chrome Plating
UWANCS	1.4301	Buffing



Part Number Type	D	L	H	M	Allowable Load (N)	Mass (g)	€ Unit Price UWANC Qty.1~19	UWANC 20~	UWANCS Qty.1~19	UWANCS 20~
UWANC (Steel), UWANCS (Stainless Steel)	6	48	37	4	3000	24				
		66				28				
	7	68	23	5		30				
	8	48	37	4		45				
		66				52				
	9	48				63				
		66				71				

Order Example

Part Number	-	L
UWANC6	-	66

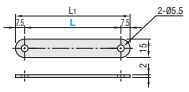
Days to Ship: 6 Days P.87

Reinforcement Plates for Handle

RoHS



UWANAT



Material: 1.4301/X5CrNi18-10

Part Number Type	L	L1	Applicable Handles	Reference Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
UWANAT	80	95	UWAN10-80	21		
	100	115	UWAN10-100	26		
	110	125	UWAN10-110	28		
	120	135	UWAN10-120	31		
	125	140	UWAN10-125	32		

The relevant handles are applicable to part numbers of different types of materials and surface treatment.

Order Example

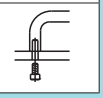
Part Number	L
UWANAT80	

Days to Ship: 6 Days P.87

Round Bar Handles with Washer / Handles with Rubber

Spec.Change
Printed in Purple

Female Thread



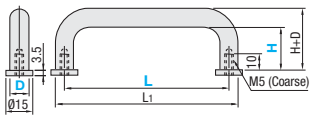
CAD Data

Handles with Washers

RoHS



Type	M Material	S Surface Treatment
(1) UWANZ	1.0715/9SMn28	Chrome Plating
(2)UWANKZ		Black Oxide
(3) UWANSZ	1.4301/X5CrNi18-10	Buffing
(4) UWANAZ	Aluminum Alloy	Buffing
(5) UWANEAZ		Clear Anodize
(6) UWANBZ		Electrostatic Coating (Mat Black)



* For details of washers, please refer to the washers for handles below.

Part Number Type	D	L	H	Washer Selectable	L1	Allowable Load (N)	€ Unit Price UWANZ	UWANKZ	UWANSZ	UWANAZ	UWANEAZ	UWANBZ
UWANZ UWANKZ UWANSZ UWANAZ UWANEAZ UWANBZ	10	80	27	G (1.0715/9SMn28 Chrome Plating) B (1.0715/9SMn28 Electrostatic Coating · Black) S (1.4301/ X5CrNi18-10)	90	2500						
			50									
		100	27		110							
			50									
		110	27		120							
			50									
		120	27		130							
			50									
		125	27		135							
			50									
		160	27		170							
			50									
		200	27		210							
			50									
		250	27		260							
			50									

When selecting a washer of 1.4301/X5CrNi18-10, 0,35 EUR is added to € Unit Price.

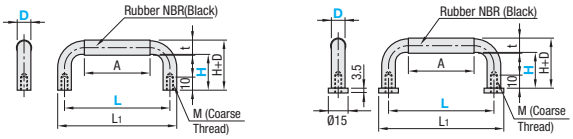
Handles with Rubber

RoHS



Type No Washer	Type With Washer	M Material	S Surface Treatment
UWANSL	UWANSLZ	1.4301/X5CrNi18-10 + Rubber	Buffing
UWANL	UWANLZ	SUM22L + Rubber	Chrome Plating

Rubber-coated handle helps easy grip.



* For details of washers, please refer to the washers for handles below.

Part Number Type	D	L	H	Washer Selectable For washer included types	L1	M	A	T	Allowable Load (N)	€ Unit Price UWANL	UWANSL	UWANLZ	UWANSLZ
UWANL UWANSL UWANLZ (with Washer) UWANSLZ (with Washer)	10	80	27	G (1.0715/9SMn28 Chrome Plating) B (1.0715/9SMn28 Electrostatic Coating · Black) S (1.4301/ X5CrNi18-10)	90	5	50	11.5	2500				
			50										
		100	27		110		70						
			50										
		110	27		120		80						
			50										
		120	27		130		90						
			50										
		125	27		135		95						
			50										
		160	27		170		130						
			50										
		200	27		210		170						
			50										
		250	27		260		220						
			50										
	12	150	40		162	8	120	13.5					
			75										
		188	40		200		158						
			75										
		238	40		250		208						
			75										
		288	40		300		258						
			75										

When selecting a washer of 1.4301/X5CrNi18-10, 0,35 EUR is added to € Unit Price.

Order Example

Part Number	L	H	Washer Selectable
UWANZ10	100	50	G
UWANLZ10	100	27	G

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

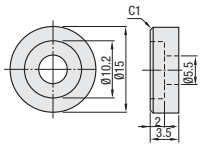
For orders larger than indicated quantity, please request a quotation.

Washers for Handle

RoHS



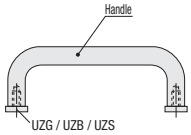
Type	M Material	S Surface Treatment
UZG	1.0715/9SMn28	Chrome Plating
UZB	1.0715/9SMn28	Electrostatic Coating (Mat Black)
UZS	1.4301/ X5CrNi18-10	Barrel Finishing



Only available for round rods of Ø10.
UZG and UZB specifications have changed since 2010 for compliance with RoHS.

Part Number	€ Unit Price
UZG	
UZB	
UZS	

Example



Order Example

Part Number
UZG

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

NEW Angled Handles

Female Thread



CAD Data

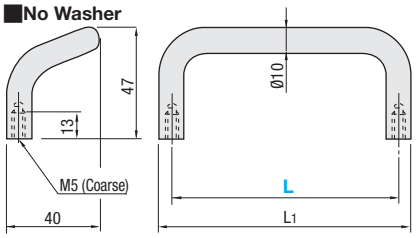
Standard Type RoHS



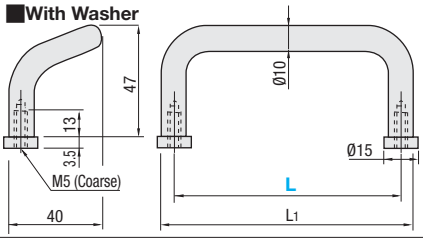
Type		M	S
No Washer	With Washer	Material	Surface Treatment
UHFN	UHFNZ	1.0715/9SMn28	Chrome Plating
UHFNS	UHFNSZ	1.4301/X5CrNi18-10	Buffing
UHFNA	UHFNAZ	Aluminum Alloy	Buffing
UHFNEA	UHFNEAZ		Clear Anodize
UHFNB	UHFNBZ		Electrostatic Coating (Mat Black)

- For single washers, refer to P.1038

No Washer



With Washer



No Washer

Part Number Type	L	L1	Allowable Load (N)	Reference Mass (g)	€ Unit Price UHFN	UHFNS	UHFNA	UHFNEA	UHFNB
UHFN (Steel) UHFNS (Stainless Steel) UHFNA (Aluminum) UHFNEA (Aluminum) UHFNB (Aluminum, Black)	48	58	2000	90					
	66	76		100					
	88	98		114					
	100	110		122					
	110	120		127					
	120	130		134					
	125	135		136					
	160	170		158					

With Washer

Part Number Type	L	Washer Selectable	L1	Allowable Load (N)	Reference Mass (g)	€ Unit Price UHFNZ	UHFNSZ	UHFNAZ	UHFNEAZ	UHFNBZ
UHFNZ (Steel) UHFNSZ (Stainless Steel) UHFNAZ (Aluminum) UHFNEAZ (Aluminum) UHFNBZ (Aluminum, Black)	48	G (1.0715/9SMn28 +Chrome Plating)	58	2000	90					
	66		76		100					
	88		98		114					
	100	B (1.0715/9SMn28 +Electrostatic Painted (Black))	110		122					
	110		120		127					
	120		130		134					
	125	S (1.4301/X5CrNi18-10)	135		136					
	160		170		158					

When selecting a washer of 1.4301/X5CrNi18-10, 0,35 EUR is added to € Unit Price.

Order Example

Part Number - Washer Selectable

UHFN66
UHFNZ100 - G

Price

Days to Ship

6 Days P.87 2 Days

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

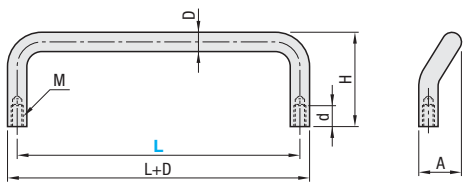
Qty.	1~9	10~19	20~39	40~99
Disc. Rate	€ Unit Price	20%	30%	40%

For orders larger than indicated quantity, please request a quotation.

Small Diameter Type RoHS



UHFNSC



M Material	S Surface Treatment
1.4301/ X5CrNi18-10	Buffing

Part Number Type	L	D	H	A	D	M	Allowable Load (N)	Reference Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~49	50~99	100~
UHFNSC	60	6	30	16	7	4	392	23				
	80		31.5					28				
	100	8	32	18	10	5	490	54				
	120		40					70				

Order Example

Part Number

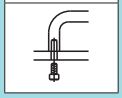
UHFNSC80

Days to Ship

6 Days P.87

Oval Handles · Square Bar Handles

Female Thread



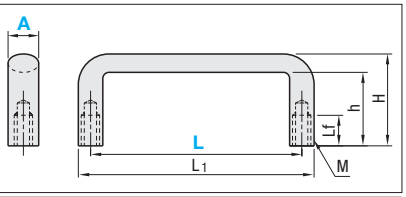
CAD Data

■Oval Type

RoHS



Type	M Material	S Surface Treatment
(1)UABL	Aluminum Alloy	Tumble Polish
(2)UABR		Electrostatic Coating (Mat Black)
(3)UABLA		Buffing
(4)UABLC	1.0715/9SMn28	Chrome Plating
(5)UABS	1.4301/ X5CrNi18-10	Sandblasted



Part Number Type	A	L	L1	Lf	H	h	M (Coarse)	Mass (g)	Allowable Load (N)	€ Unit Price UABL	UABR	UABLA	UABLC	UABS
UABL(Tumble Polish) UABR(Electrostatic Painted) UABLA(Buffed) UABLC(Steel) UABS(Stainless Steel)	20	100	113	10	47	34	M6	84	1100					
		112	125		49	36		96						
		120	133		51	38		100	700					
		128	141					106	600					
		160	173					126	470					
	26	112	129	12	53	36	M8	157	2300					
		120	137		55	38		162	1400					
		128	145					178	1200					
		160	177		57	40		209	600					
		180	197					218	500					
		192	209					242	470					
		300	317					345						
		350	367					390	380					
		400	417					440	300					

Order Example: Part Number UABL20 - L 100

Days to Ship: 6 Days / 2 Days P.87

Price

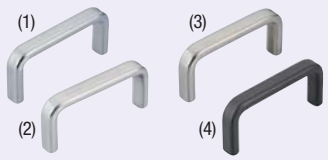
■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~19	20~39	40~99
Rate	€ Unit Price	20%	30%	40%

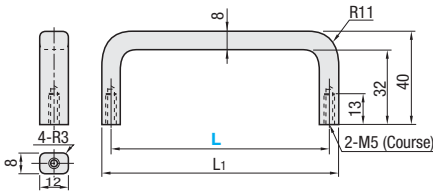
For orders larger than indicated quantity, please request a quotation.

■Square Bar L Dimension Selectable Type

RoHS



Type	M Material	S Surface Treatment
(1)USAN	1.0715/9SMn28	Chrome Plating
(2)USANS	1.4301/ X5CrNi18-10	Buffing
(3)USANA	Aluminum Alloy	Buffing
(4)USANB		Electrostatic Coating (Mat Black)



Part Number Type	L	L1	Allowable Load (N)	Reference Mass (g)	€ Unit Price USAN	USANS	USANA	USANB
USAN(Steel) USANS(Stainless Steel) USANA(Aluminum) USANB(Aluminum, Black)	80	88	2500	76				
	100	108		88				
	125	133		103				
	160	168		125				
	200	208		150				
	250	258		180				

Order Example: Part Number USAN80

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

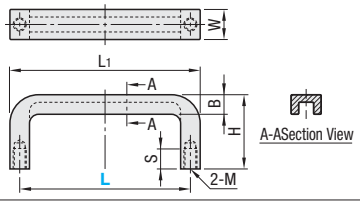
For orders larger than indicated quantity, please request a quotation.

■Square Bar U-Shaped Type

RoHS



USANK



M Material	S Surface Treatment
Zinc Alloy	Chrome Plating

Part Number Type	L	L1	W	H	B	S	M (Coarse)	Reference Mass (g)	€ Unit Price USANK
USANK (U-shaped)	68	76	12	30	8	8	M5	55	
	100	108	14	30	8	8	M5	80	
	110	120	16	40	10	8	M6	130	
	120	130	16	40	10	8	M6	145	
	188	200	18	50	12	10	M8	250	

Order Example: Part Number USANK100

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

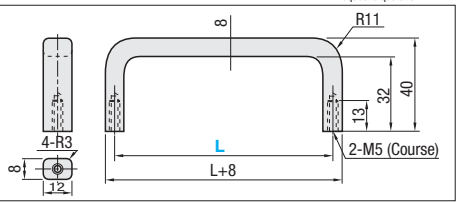
For orders larger than indicated quantity, please request a quotation.

■Square Bar Type L Dimension Configurable

RoHS



Type	M Material	S Surface Treatment
USANSF	1.4301/ X5CrNi18-10	Buffing



Part Number Type	L 1mm Increment	Allowable Load (N)	€ Unit Price
USANSF	80~125	2500	
	126~250		
	251~300		

Order Example: Part Number USANSF - L 85

Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Designer Handles / Phenol Handles

Female Thread

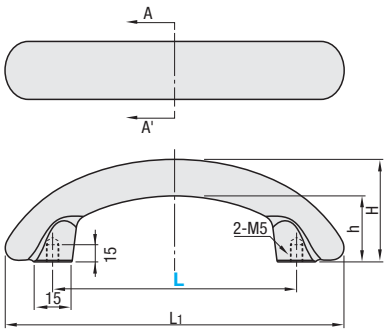
CAD Data

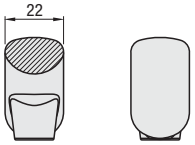
■Designer Handles

UWSY



■Feature: Designed to be aesthetically pleasing and easy to grip.





Section View A-A'

M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Buffing

RoHS

Part Number Type	L	L1	H	h	Allowable Load (N)	Mass (g)	€ Unit Price
UWSY	100	138	42	27	500	351	
	150	190	44	29		448	

ex Example



Order Example — Part Number: UWSY100

Days to Ship — 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

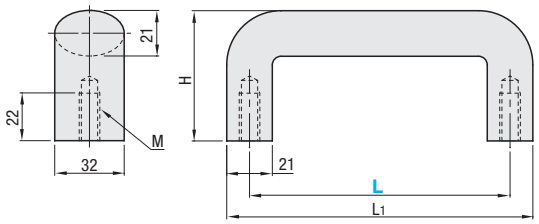
Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Phenol Resin Handles

UPCFN





RoHS

	M Material
Handle	Phenol Resin
Thread	Brass (Insert)

Part Number Type	L	L1	M	H	Mass (g)	Allowable Load (N)	€ Unit Price
UPCFN	90	110	6	50	90	1100	
	114	132			105	1100	
	120	142	8	60	140	700	
	140	162			155	600	
	160	182			170	600	
	180	202			200	500	
	200	222			210	470	

Order Example — Part Number: UPCFN114

Days to Ship — 6 Days P.87

Price

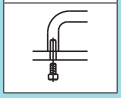
■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Non-metal Handles / T-shaped Handles

Female Thread



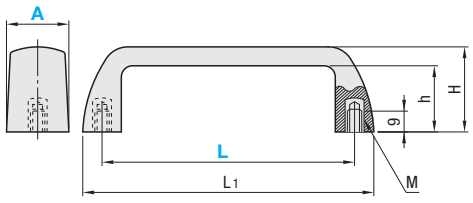
CAD Data

■Nylon Type

RoHS



UPFN



	Material
Handle	Glass Fiber Reinforced Nylon 6
Thread	Brass (Insert)

Part Number Type	A	L	Handle Colors	L1	H	h	M (Coarse)	Allowable Load (N)	Mass (g)	€ Unit Price B(Black)	€ Unit Price W(White) · M(Orange) · R(Red)
UPFN	26	105	B(Black) W(White) M(Orange) R(Red)	121	37	29	6	500	55		
		110		133	40	32			60		
		117					8		62		

The default handle color will be black unless specified.

Order Example: Part Number UPFN26 - L 105 - Handle Colors B

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

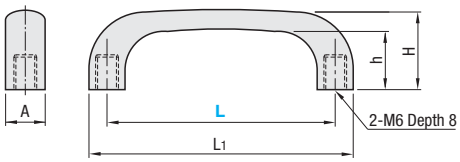
For orders larger than indicated quantity, please request a quotation.

■For Plates

RoHS



HHDS HHDSW HHDSA HHDSS



Type	Material	Surface Treatment
HHDS	Polycarbonate (Black)	-
HHDSW	Polycarbonate (White)	-
HHDSA	EN AC-46100/ G-AlSi12Cu	Baked Finish Silver Metallic
HHDSS	1.4301/ X5CrNi18-10	Buffing

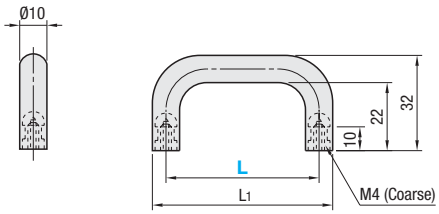
Part Number Type	L	L1	H	h	A	Mass (g) HHDS · HHDSW	Mass (g) HHDSA	Mass (g) HHDSS	€ Unit Price HHDS	€ Unit Price HHDSW	€ Unit Price HHDSA	€ Unit Price HHDSS
HHDS HHDSW HHDSA HHDSS	90	110	32	24	13	17	43	90				
	104	127	37	27.7	16	25	65	150				
	122	149	43.3	32.5	19	42	102	220				

There is no allowable load for the panel mounting handles.

■Rubber Type



UGFN



	Material
Handle	EPDM Rubber (Mat Black)
Thread	Brass (Insert)

Part Number Type	L	L1	Mass (g)	€ Unit Price
UGFN (Rubber Type)	40	50	10	
	53	63	12	
	70	80	15	

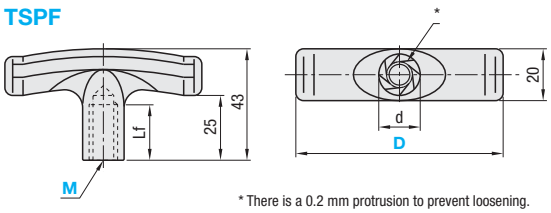
The allowable load value not provided since feasible to measure.

■T-Shaped

RoHS



TSPF



* There is a 0.2 mm protrusion to prevent loosening.

	Material	Surface Treatment
Handle	Glass Fiber Reinforced Nylon (Mat Black)	-
Thread	1.0038/S235JR (Insert)	Trivalent Chromate

Part Number Type	D	M	Lf	D	Mass (g)	€ Unit Price
TSPF	50	3	20	11	26	
		4			28	
		5			30	
	80	5	25	16	46	
		6			50	
		8			56	

Order Example: Part Number HHDS90 / UGFN70 / TSPF50 - M 4

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Round Bar Grip Handles / Round Bar Handles with Plate / Oval Grip Handles

External

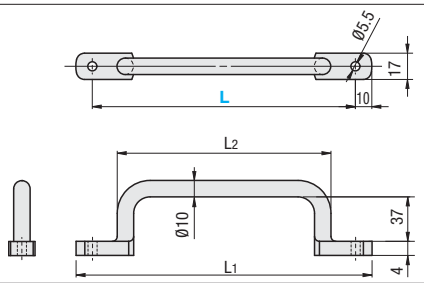
CAD Data

Round Bar Grip Handles

RoHS



Type	M Material	S Surface Treatment
UWASN	1.0715/ 9SMn28L	Chrome Plating
UWASNB	1.0715/ 9SMn28L	Black Oxide
UWANSS	1.4301/ X5CrNi18-10	Buffing



Part Number Type	L	L1	L2	€ Unit Price UWASN	UWASNB	UWANSS
UWASN UWASNB UWANSS	110	130	80			
	120	140	90			
	125	145	95			
	160	180	130			
	200	220	170			
	250	270	220			

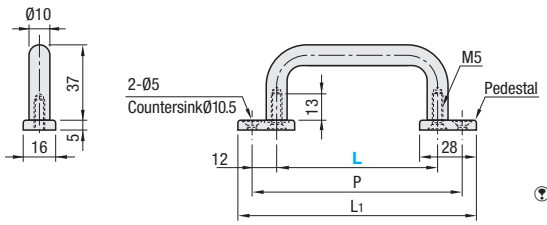
Round Handles with Plate

RoHS



The pedestals are rotatable in any desired position.

Type	M Material	S Surface Treatment	A Accessory: Washer UWANG M Material	Washer UWANG S Surface Treatment	Washer UWANSG M Material	Washer UWANSG S Surface Treatment	Thread M Material
UWANG	1.0715/9SMn28L	Chrome Plating	Zinc Die Casting	Electrostatic Coating (Silver)	-	-	SHFBS5-12 M Material: 1.4301/ X5CrNi18-10 2pcs.
UWANSG	1.4301/X5CrNi18-10	Buffing	-	-	1.4301/X5CrNi18-10	-	



The handles are shipped with the pedestals uninstalled.

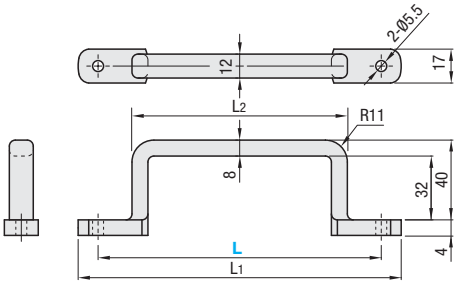
Part Number Type	L	P	L1	Allowable Load (N)	€ Unit Price UWANG	UWANSG
UWANG (Steel) UWANSG (Stainless Steel)	80	104	118	2000		
	100	124	138			
	110	134	148			
	120	144	158			
	125	149	163			
	160	184	198			
	200	224	238			
	250	274	288			

Oval Grip Handles

RoHS



Type	M Material	S Surface Treatment
USAST	1.0715/ 9SMn28L	Chrome Plating
USASTS	1.4301/ X5CrNi18-10	Buffing



Part Number Type	L	L1	L2	Mass (g)	€ Unit Price USAST	USASTS
USAST (Steel) USASTS (Stainless Steel)	110	130	78	126		
	120	140	88	133		
	125	145	93	137		
	160	180	128	160		
	200	220	168	188		
	250	270	218	224		

Order Example

Part Number
UWASN110
UWANSG200
USAST125

Days to Ship: 6 Days P.87

Price

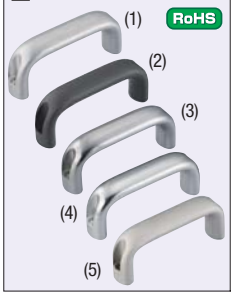
Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

CAD Data

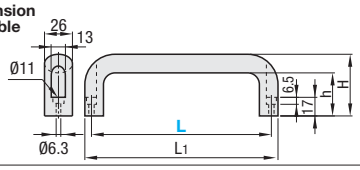
Aluminum Handles



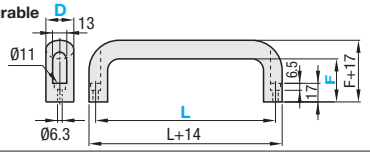
RoHS

Type		M Material	S Surface Treatment
L Dimension Selectable	L · F Configurable		
(1)UADL	UADLF	Aluminum Alloy	Tumble Polish
(2)UADR	UADRF		Electrostatic Coating (Mat Black)
(3)UADLA	-		Buffing
(4)UADEL	-		Clear Anodize
(5)UADS	UADSF	1.4301/X5CrNi18-10	Sandblasted

- L Dimension Selectable



- L · F Configurable



Part Number Type	L	L1	H	h	Allowable Load (N)	€ Unit Price UADL	UADR	UADLA	UADEL	UADS
(L Dimension Selectable) UADL UADR UADLA UADEL UADS	100	114	47	30	1200					
	116	130	53	36	1200					
	132	146	55	38	800					
	150	164	67	50	600					
	164	178	57	40	600					
	196	210			390					

Part Number Type	D	1mm Increment L	F	Allowable Load for Reference (N)	€ Unit Price UADLF	UADRF	UADSF
(L· F Configurable) UADLF UADRF UADSF	26	100~200	30~50	390~1200			

Order Example

Part Number	-	L	-	F
UADR		116		
UADLF26	-	100	-	40

? - is not necessary for L Dimension Selectable Type.

Days to Ship

L Dimension Selectable Handles: 6 Days (P.87)

2 Days

Handles - L · F Configurable: 10 Days

Price

Volume Discount (?Round down to one Cent.) P.87

Quantity	1~9	10~19	20~39	40~99
Discount Rate	€ Unit Price	20%	30%	40%

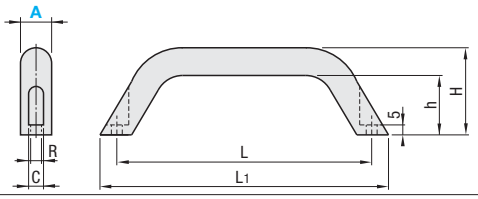
?For orders larger than indicated quantity, please request a quotation.

Aluminum Handles



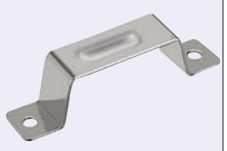
RoHS

Type	M Material	S Surface Treatment
(1)HHDF	Aluminum Alloy	Electrostatic Coating (Mat Black)
(2)HHDFL	Aluminum Alloy	Tumble Polish
(3)HHDFA	Aluminum Alloy	Buffing



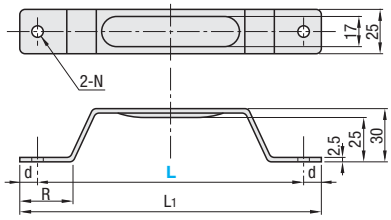
Part Number Type	A	Mass (g)	L	L1	H	h	R	C	€ Unit Price HHDF	HHDFL	HHDFA
HHDF	19	64	90	107	41	29	5.3	9			
HHDFL	20	110	93.5	112	44	31	6.5	10.5			
HHDFA	26	250	130	149	57	40	8.5	13.3			

Sheet Metal Handles



RoHS

Type	M Material	S Surface Treatment
UWDSU	1.0038/S235JR	Chrome Plating
UWDSUS	1.4301/X5CrNi18-10	Buffing



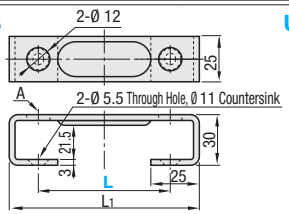
Part Number Type	L	L1	R	d	N	Allowable Load (N)	Mass (g)	€ Unit Price UWDSU	UWDSUS
UWDSU(Steel)	80	96	20	8	5.5	400	61		
UWDSUS(Stainless Steel)	100	116	23			380	70		
	150	170	30	10	6.5	160	93		

Sheet Metal U-shaped Handles



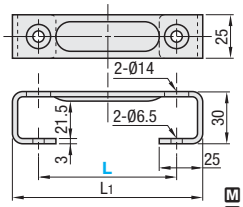
RoHS

UWASUS



There is a Ø12 through hole on A after spec. revision (after June 2010).

UWSUSD



M Material: 1.4301/X5CrNi18-10
S SurfaceTreatment: Finish Buffed

Part Number Type	L	L1	Mass (g)	€ Unit Price UWASUS	UWSUSD
UWASUS UWSUSD	68	98	105		
	100	130	120		
	110	140	130		
	120	150	135		
	150	180	155		
	188	218	185		
	238	268	215		
	288	318	235		

Order Example: Part Number UWASUS100

Days to Ship: 6 Days (P.87)

Price

Volume Discount (?Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

?For orders larger than indicated quantity, please request a quotation.

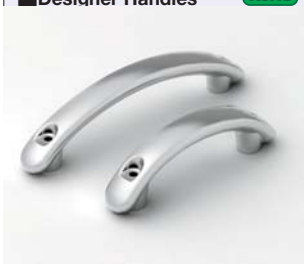
Designer Handles / Cast Handles

External

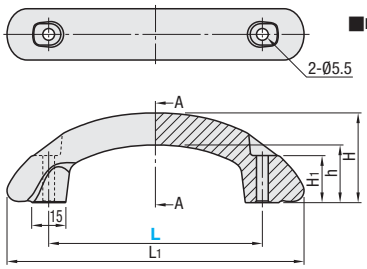
CAD Data

■Designer Handles

RoHS



UWSD



■**Feature:** Designed to be aesthetically pleasing and easy to grip.

M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Finish Buffed

Part Number Type	L	L1	H	h	H1	Allowable Load (N)	Mass (g)	€ Unit Price
UWSD	100	139	42	27	22	500	337	
	150	190	44	29	20		434	

ex Example



Order Example

Part Number
UWSD150

Days to Ship: 6 Days P.87

Price

■**Volume Discount** (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

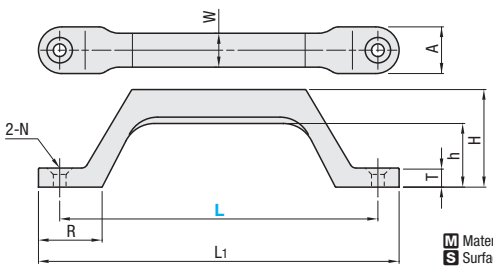
For orders larger than indicated quantity, please request a quotation.

■Cast Handles

RoHS



UWASND



M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Finish Buffed

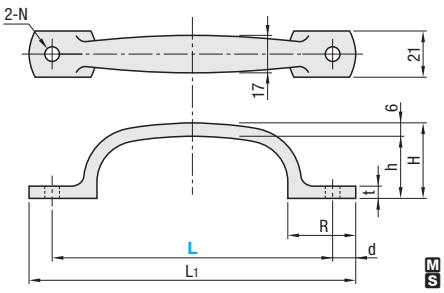
Part Number Type	L	L1	H	h	T	A	W	R	N Through	N Countersunk	Allowable Load (N)	Mass (g)	€ Unit Price
UWASND	80	96	32	20	6	18	12	20	4.5	8.5	500	97	
	100	116						23				116	
	150	170	46	30	9	22	16	30	6.5	12.5		301	
	200	220	46	30	9	22	16	30	6.5	12.5		354	

■Cast Handles

RoHS



UWANDC



M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Finish Buffed

Part Number Type	L	L1	H	h	T	R	D	N	Allowable Load(N)	Mass (g)	€ Unit Price
UWANDC	105	120	30	24	5	25	7.5	5.5	500	83	
	115	130	33	27	5	26	7.5	5.5		90	
	125	145	34	28	5.5	30	10	6.5		106	

Order Example

Part Number
UWASND100
UWANDC125

Days to Ship: 6 Days P.87

Price

■**Volume Discount** (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Folding Handles / Handles with Cap / Aluminum Hollow Handles

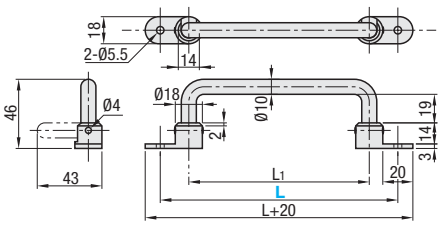
External

CAD Data

Folding Handles

RoHS

Type	Material	Surface Treatment
UWFASN	1.1191/C45E	Chrome Plating
UWFASNS	1.4301/X5CrNi18-10	Buffing



Part Number Type	L	L1	Allowable Load (N)	Mass (g)	€ Unit Price UWFASN	€ Unit Price UWFASNS
UWFASN(Steel) UWFASNS(Stainless Steel)	138	100	650	150		
	158	120	550	160		
	180	142	520	180		
	218	180	500	200		

Order Example: Part Number UWFASN138

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

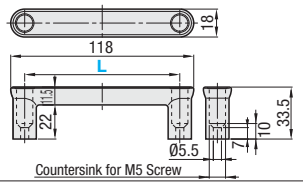
Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Handles with Cap

RoHS

Type	Handles Material	Handles Surface Treatment	Cap Material	Cap Color
HHDG	EN AC-46100/G-AlSi12Cu	Baked Finish	ABS	White
HHDGS	1.4301/X5CrNi18-10	Buffing	ABS	White



Part Number Type	L	Mass (g)	Applicable Screws	Quantity	€ Unit Price HHDG	€ Unit Price HHDGS
HHDG HHDGS	100	62	Countersunk Screws M5	2		

Order Example: Part Number HHDG100

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

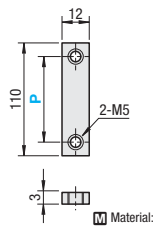
Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

With Cap Nuts for Handles

RoHS

HHPUW



Part Number Type	P	Applicable Handles	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHPUW	100	HHDG100 HHDGS100		

Order Example: Part Number HHPUW100

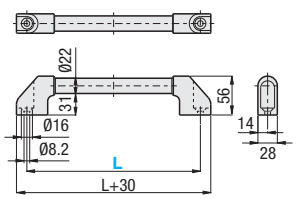
Days to Ship: 6 Days P.87

Aluminum Hollow Handles

RoHS

Part Name	Material
Hollow	EN AW-6063/AlMg0,7Si
Elbow	Glass Fiber Reinforced Nylon

UWAPN
UWAPF (L Dimension Configurable)

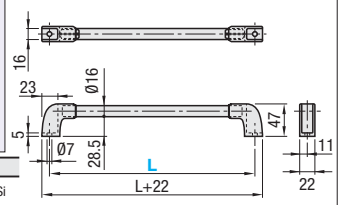


Handles - Aluminum Hollow - Small Diameter

RoHS

Part Name	Material
Hollow	EN AW-6063/AlMg0,7Si
Elbow	Polycarbonate

UWAPNC
UWAPFC (L Dimension Configurable)



L Dimension Selectable

Part Number Type	L	Applicable Screws	€ Unit Price
UWAPN (L Dimension Selectable)	150	Countersunk Screws M8	
	200		
	250		
	300		
	400		
	500		
	600		

L Dimension Configurable

Part Number Type	L 1mm Increment	Applicable Screws	€ Unit Price
UWAPF (L Dimension Configurable)	100~150	Countersunk Screws M8	
	151~200		
	201~250		
	251~300		
	301~400		
	401~500		
	501~600		

L Dimension Selectable

Part Number Type	L	Applicable Screws	€ Unit Price
UWAPNC (L Dimension Selectable)	100	Socket Head Cap Screws M6	
	150		
	200		
	250		
	300		

L Dimension Configurable

Part Number Type	L 1mm Increment	Applicable Screws	€ Unit Price
UWAPFC (L Dimension Configurable)	100~150	Socket Head Cap Screws M6	
	151~200		
	201~250		
	251~300		

Order Example: Part Number UWAPN150 UWAPFC-185

Days to Ship: - L Dimension Selectable 6 Days P.87; - L Dimension Configurable 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

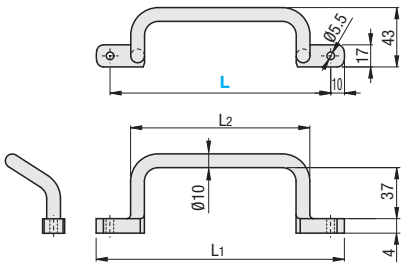
- is not needed for L Dimension Selectable Type.

Add. Spec. Angled Handles

■Welded Round Type RoHS

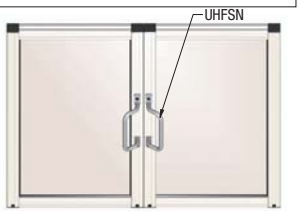


Type	[M] Material	[S] Surface Treatment
UHFSN	1.0715/9SMn28-L	Chrome Plating
UHFSNB	1.0715/9SMn28-L	Black Oxide
UHFNSS	1.4301/X5CrNi18-10	Buffing



Part Number Type	L	L_1	L_2	€ Unit Price UHFSN	UHFSNB	UHFSNS
UHFSN (Steel) UHFSNB (Steel) UHFNSS (Stainless Steel)	110	130	80			
	120	140	90			
	125	145	95			
	160	180	130			
	200	220	170			
	250	270	220			

Example

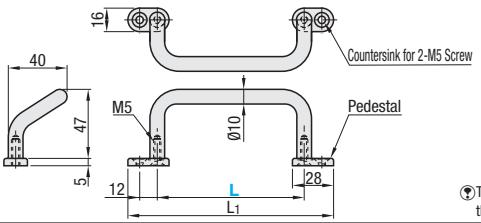


■With Mounting Tabs RoHS



The pedestals are rotatable in any desired position.

Type	[M] Material	[S] Surface Treatment	[A] Accessory: Pedestal G [M] Material	Pedestal G [S] Surface Treatment	Pedestal S [M] Material	Pedestal S [S] Surface Treatment	Thread [M] Material
UHFNGG	1.0715-L	Chrome Plating	Zinc Die Casting	Electrostatic Coating (Silver)	1.4301/ X5CrNi18-10	-	SHFBS5-12 [M] Material: 1.4301/ X5CrNi18-10 ⓨ 2 screws are included.
UHFNSG	1.4301	Buffing					
UHFNEAG	Aluminum Alloy	Clear Anodize					



ⓨThe handles are shipped with the pedestals uninstalled.

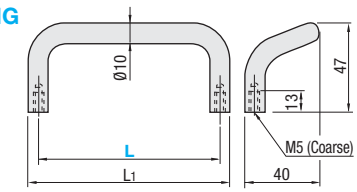
Part Number Type	L	Pedestal Selectable	L_1	Allowable Load (N)	Reference Mass (g)	€ Unit Price UHFNGG	UHFNSG	UHFNEAG
UHFNGG (Steel) UHFNSG (Stainless Steel) UHFNEAG (Aluminum)	48	G (Zinc Diecast) S (1.4301/X5CrNi18-10)	86	2000	90			
	66		104		100			
	88		126		114			
	100		138		122			
	110		148		127			
	120		158		134			
	125		163		136			
	160		198		158			

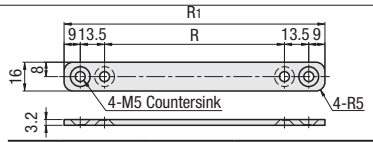
ⓨWhen 1.4301/X5CrNi18-10 pedestal is selected, 1,80 EUR is added.

■With a Plate RoHS



UHFNG





Part Name	[M] Material	[S] Surface Treatment	[A] Accessory
Handles	EN AW-6063/ AlMg0,7Si	Clear Anodize	SHFBS5-12 [M] Material: 1.4301/X5CrNi18-10 ⓨ2 screws are included.
Plate		Clear Anodize	

Part Number Type	L	L_1	R	R_1	Reference Mass (g)	€ Unit Price
UHFNG	100	110	100	145	50	
	120	130	120	165	52.5	
	125	135	125	170	54	

ⓨThe default L dimension will be 100 unless specified.

Example



Order Example

Part Number	-	Pedestal Selectable
UHFSN160		
UHFNGG100	-	G
UHFNG120		

Price

Days to Ship 6 Days P.87

■Volume Discount (ⓨRound down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

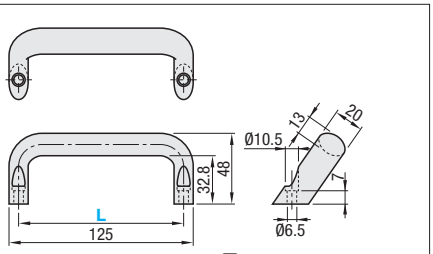
ⓨFor orders larger than indicated quantity, please request a quotation.

CAD Data

■Aluminum Type RoHS

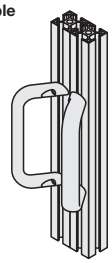


HHDNFA



M Material: Aluminum Alloy
S Surface Treatment: Baking Finish

Example



Part Number Type	L	Allowable Load (N)	Mass (g)	€ Unit Price
HHDNFA	112	1100	105	

■Casting Offset RoHS



UWASNDF



M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Finish Buffed

Part Number Type	L	L1	Allowable Load (N)	Mass (g)	€ Unit Price
UWASNDF	80	98	500	100	
	100	118		110	
	150	168		130	

Order Example
Part Number
HHDNFA112
UWASNDF100

Days to Ship: 6 Days P.88

Price

■Volume Discount (Round down to one Cent.) P.88

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

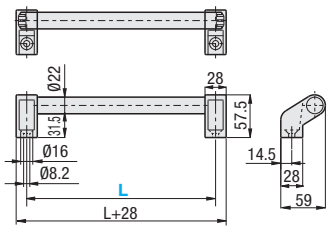
■Aluminum Hollow Type



RoHS

Part Name	M Material
Hollow	EN AW-6063/AlMg0,7Si
Elbow	Glass Fiber Reinforced Nylon

UHFAP
UHFAPF (L Dimension Configurable)



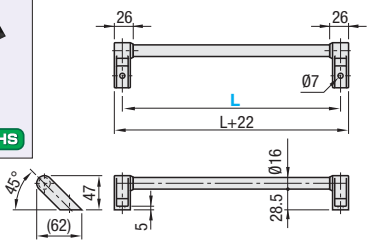
■Small Dia. Aluminum Hollow Type



RoHS

Part Name	M Material
Hollow	EN AW-6063/AlMg0,7Si
Elbow	Polycarbonate

UHFAPC
UHFAPFC (L Dimension Configurable)



■- L Dimension Selectable

Part Number Type	L	Applicable Screws	€ Unit Price
UHFAP (L Dimension Selectable)	150	Countersunk Screws M8	
	200		
	250		
	300		
	400		
	500		
	600		

■L Dimension Configurable

Part Number Type	L 1mm Increment	Applicable Screws	€ Unit Price
UHFAPF (L Dimension Configurable)	100~150	Countersunk Screws M8	
	151~200		
	201~250		
	251~300		
	301~400		
	401~500		
	501~600		

■- L Dimension Selectable

Part Number Type	L	Applicable Screws	€ Unit Price
UHFAPC (L Dimension Selectable)	100	Socket Head Cap Screws M6	
	150		
	200		
	250		
	300		

■L Dimension Configurable

Part Number Type	L 1mm Increment	Applicable Screws	€ Unit Price
UHFAPFC (L Dimension Configurable)	100~150	Socket Head Cap Screws M6	
	151~200		
	201~250		
	251~300		

Order Example
Part Number
UHFAP150
UHFAPFC-225

Days to Ship
- L Dimension Selectable: 6 Days P.87
L Dimension Configurable: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

- is not necessary for L Dimension Selectable Type.

Plastic Handles · Reinforcement Plates for Handles

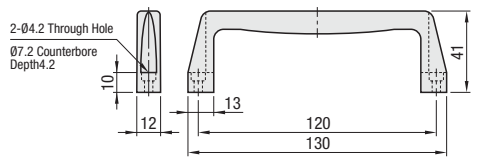
Price Reduction Up to 49%

External

Small Resin External Handles RoHS



UPCNN



Material
Glass Fiber Reinforced Nylon 6

Part Number	Allowable Load (N)	Mass (g)	€ Unit Price Qty.1~19	Volume Discount 20~
UPCNN	200	25		

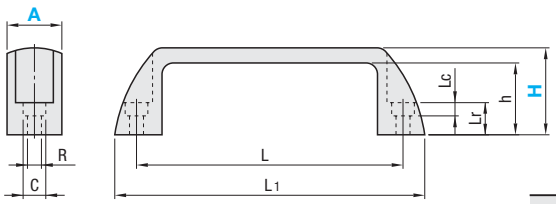
Order Example: Part Number UPCNN

Days to Ship: 6 Days P.87

Handles - Nylon 6 RoHS



UPCN



Material
Glass Fiber Reinforced Nylon 6

Part Number Type	A	Handle Colors	H	h	L	L1	R	C	Lr	Lc	Allowable Load (N)	Mass (g)	€ Unit Price B(Black) 1~9 pcs.	B(Black) 10~19	B(Black) 20~39	B(Black) 40~	W(White)·M(Orange)·R(Red)·G(Green) 1~9 pcs.	W(White)·M(Orange)·R(Red)·G(Green) 10~19	W(White)·M(Orange)·R(Red)·G(Green) 20~39	W(White)·M(Orange)·R(Red)·G(Green) 40~
UPCN	19	B (Black)	36	30	90	108.5	5.5	9.5	11	6	500	23								
			51	45								24								
	21	W (White)	36	30	93.5	112	6.5	10.5	13	7		25								
			51	45								28								
	26	M (Orange)	41	34	117	139	8.5	13.3	15	9		38								
			57	50								48								
	27	R (Red)	45	37	132	156			16			54								
			63	55								62								
	28	G (Green)	52	42	152	177	6.5	10.5	13	7		66								
			50	42	179	204	8.5	13.3	17	9		68								
			71	63								86								

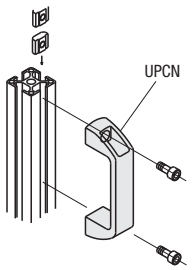
The default handle color will be black unless specified. The default H dimension will be A19-H36, A21-H36, A26-H41, A27-H45 and A28-H50 unless specified.

Order Example: Part Number UPCN21 - Handle Colors B - H 51

Days to Ship: 6 Days 2 Days P.87

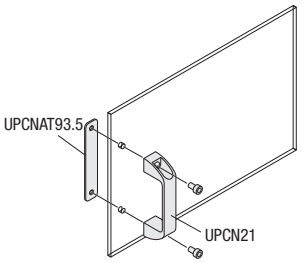
Example

How to mount on Aluminum Frames.



How to use a reinforcement plate

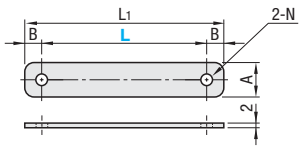
A reinforcement plate prevents cracks and distortions, and is effective for thin panels.



Reinforcement Plates for Handle RoHS



UPCNAT



Material: 1.4301/X5CrNi18-10

Part Number Type	L	L1	A	B	N	Applicable Handles	Reference Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
UPCNAT	90	108.5	19	9.25	5.5	UPCN19	31		
	93.5	112	21		6.5	UPCN21	36		
	117	139	26	11	8.5	UPCN26	55		
	132	156	27	12		UPCN27	64		
	179	204	28	12.5		UPCN28	88		

Order Example: Part Number UPCNAT117

Days to Ship: 6 Days P.87

Phenol Handles / Cantilever Handles / Plastic Handles with Cap

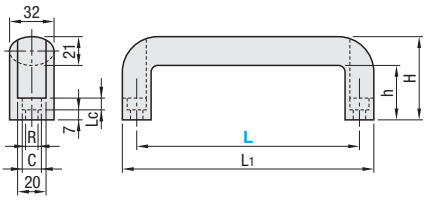
External

■Phenol Resin Handles

RoHS



UPCFAN



Material
Phenol Resin

Part Number Type	L	L1	h	H	R	C	Lc	Mass (g)	€ Unit Price
UPCFAN	90	111	29	50	6.5	10.5	6.5	88	
	114	135						108	
	120	141	39	60	8.5	13.5	8.5	116	
	140	161						131	
	160	181						145	
	180	201						164	
	200	221						178	

■Cantilever Handles

RoHS



Type	Handles		Cap
	Material	Surface Treatment	Material
HHKP	Glass Fiber Reinforced Nylon (Mat Black)	-	Nylon 6 (Mat Black)
HHKA	EN AC-46100/ G-AlSi12Cu	Baked Finish (Silver)	Nylon 6 (Mat Gray)

Example

Screws and washers are not included.

Part Number Type	L	H	h	A	R	C	Lr	Lc	D	P	K	Allowable Load (N) HHKP	Allowable Load (N) HHKA	Mass (g) HHKP	Mass (g) HHKA	€ Unit Price HHKP	€ Unit Price HHKA
HHKP(Resin) HHKA(Aluminum)	80	29	18	16	3	6	5	3	24	12	6	60	200	15	28		
	100	35	19	20	4	8	6	4	28	12	8	90	320	29	56		
	147	50.5	30	29	6	11	9	6	38	19	9	150	500	78	170		

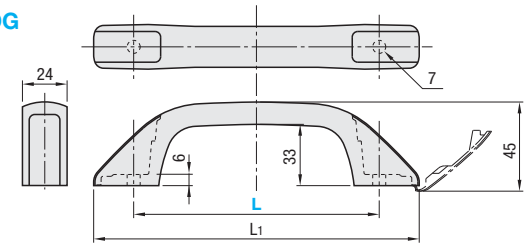
■Resin Handles with Cap

RoHS



UPCDG

(Nylon 6)



Material
Glass Fiber Reinforced Nylon 6

Part Number Type	L	L1	Allowable Load (N)	Mass (g)	€ Unit Price
UPCDG	90	133	500	30	
	94	136.5		33	
	117	160		36	
	132	175		39	

Order Example

Part Number
UPCFAN90
HHKP100
UPCDG132

Days to Ship

6 Days

P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

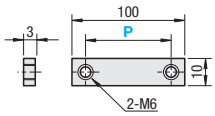
For orders larger than indicated quantity, please request a quotation.

■Nuts for Handles

RoHS



HHPUW



Material: 1.4301/X5CrNi18-10

Part Number Type	P	Applicable Handles	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHPUW	90	UPCDG90		

Order Example

Part Number
HHPUW90

Days to Ship

6 Days

P.87

Folding Handles / Round Bar Male Thread Handles / Side Mount Handles / T-shaped Male Thread Handles

NEW

Price Reduction Up to 47%

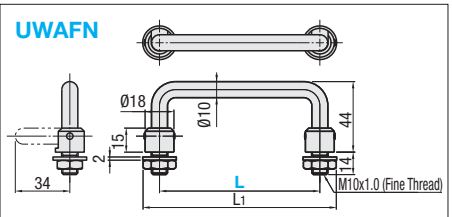
CAD Data

Folding Handles

RoHS



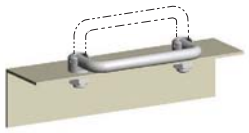
UWAFN



Material	S	Accessory
SUM22L	Chrome Plating	Washers (1.4301/X5CrNi18-10), 2pcs. Nuts (1.4301/X5CrNi18-10), 2pcs.

Part Number Type	L	L1	Allowable Load (N)	Mass (g)	€ Unit Price
UWAFN	100	118	500	133	
	120	138		156	
	180	198		225	

Example



Order Example: Part Number UWAFN100

Days to Ship: 8 Days — Express A: 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

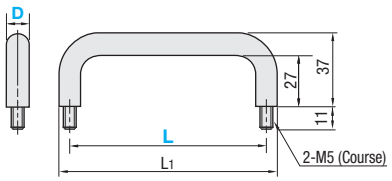
For orders larger than indicated quantity, please request a quotation.

Male Thread

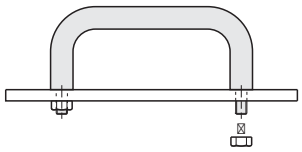
RoHS



Type	Material	Surface Treatment
UWANM	SUM22L	Chrome Plating
UWANSM	1.4301/X5CrNi18-10	Buffing



Example



Part Number Type	D	L	L1	Allowable Load (N)	Mass (g)	€ Unit Price UWANM	€ Unit Price UWANSM
UWANM (Steel) UWANSM (Stainless Steel)	10	80	90	2500	76		
		100	110		88		
		110	120		94		
		120	130		100		
		125	135		103		
		160	170		125		
		200	210		150		
		250	260		180		

Order Example: Part Number UWANM10 - L 100

Days to Ship: 6 Days P87

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

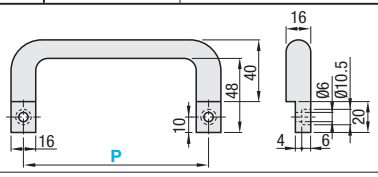
For orders larger than indicated quantity, please request a quotation.

Handles - Side Mount

RoHS

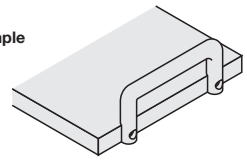


Type	Material	Surface Treatment
UWANY	1.4301/X5CrNi18-10	Buffing



Part Number Type	P	Allowable Load (N)	Mass (g)	€ Unit Price
UWANY	120	500	270	

Example



Order Example: Part Number UWANY120

Days to Ship: 6 Days P87

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

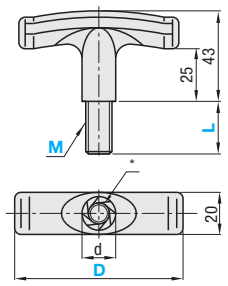
T-Shaped Handles

RoHS



Male Thread

TSPM



* There is a 0.2 mm protrusion to prevent looseness.

	Material	Surface Treatment
Handle	Glass Fiber Reinforced Nylon (Mat Black)	-
Thread	1.0038/S235JR (Insert)	Trivalent Chromate

Part Number Type	D	M	L	D	Reference Mass (g)	€ Unit Price
Male Thread TSPM	50	4	10	11	30	
		5	15		32	
		6	20		34	
	80	6	15	16	53	
		8	20		65	
		10	25		69	

Order Example: Part Number TSPM50 - M 4 - L 10

Days to Ship: 6 Days P87

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Weld Handles / Spring Loaded Handles / Stainless Steel Rotary Handles

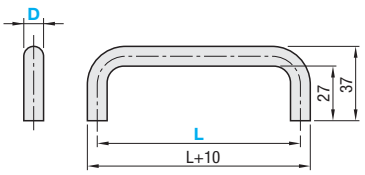
CAD Data

Weld Handles

RoHS



UWANW



Antirust oil is applied to protect the raw material.

M Material: 1.0715/9SMn28

Part Number Type	D	L	Mass (g)	€ Unit Price
UWANW	10	80	83	
		100	95	
		120	109	

Order Example: Part Number UWANW10 - L 100

Days to Ship: 6 Days P.87

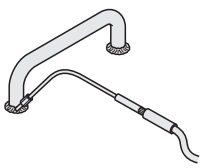
Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example



Features

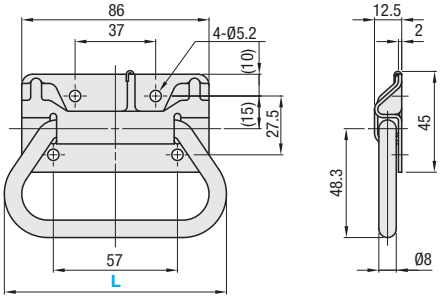
This type of handle has no tapped screws. Air expansion by welding does not blow off any screws.

Spring Loaded Handles

RoHS



UWUASP UWUASPS



When hands are released from the grip, the spring functions to fold the handle as shown in the drawing.

Type	M Material	S Surface Treatment
UWUASP	1.0330/DC01	Chrome Plating
UWUASPS	1.4301/ X5CrNi18-10	-

Part Number Type	L	Mass (g)	€ Unit Price UWUASP	€ Unit Price UWUASPS
UWUASP (Steel) UWUASPS (Stainless Steel)	102	158		

Order Example: Part Number UWUASP102

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

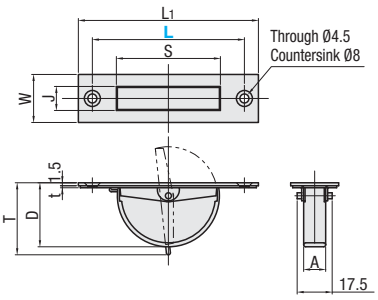
For orders larger than indicated quantity, please request a quotation.

Stainless Steel Rotary Handles

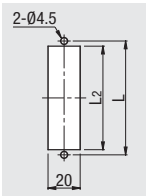
RoHS



UWAKS



Dimensions of Panel Mounting Holes



M Material: 1.4301/X5CrNi18-10

Part Number Type	L	W	L1	S	J	D	T	T	A	L2	Mass (g)	€ Unit Price
UWAKS	76	24	90	52	12	32	36	1	11	60	49	
	94		110	64	12	38	42	1	11	74	59	
	115	25	135	90	12.2	50	55	1.2	12	102	88	

Order Example: Part Number UWAKS94

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Stainless Steel Embedded Handles

CAD Data

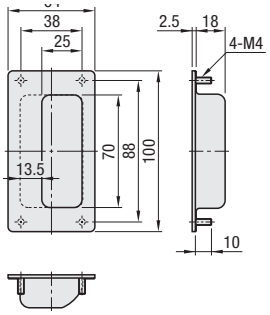
■Embedded Handles

RoHS

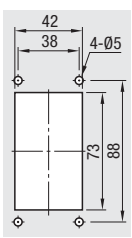


UWUANA

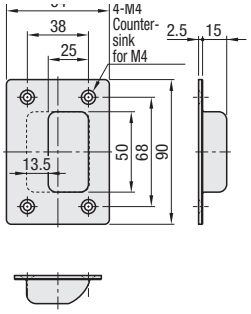
Male Thread



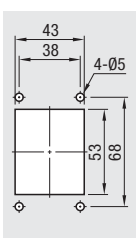
Dimensions of Panel Mounting Holes



Countersunk Hole Type



Dimensions of Panel Mounting Holes



M Material: 1.4301/X5CrNi18-10

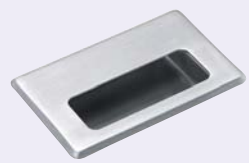
Part Number Type	Male Thread Countersunk Hole Type	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~49	Volume Discount 50~
UWUANA	B(Male Thread Type)	85 (Male Thread Type)			
	S(Countersunk Type)	94 (Countersunk Type)			

Part Number: UWUANA - Type Selection: B

6 Days P.87

■Embedded Handles

RoHS



UWUAN

Male Thread Studs Type

Nut Type

Dimensions of Panel Mounting Holes

M Material	Finish
1.4301/ X5CrNi18-10	Brushed

Example



Part Number Type	L	Male Thread Studs Type Nut Type	W	P	F	S	A	A1	T	(J)	L1	W1	Mass (g)	€ Unit Price
UWUAN	94	B (Male Thread Studs Type)	60	76	32	61	25	43	12	14.5	63	43	80	
	109.5	N (Nut Type)	64	88	38	67.5	25	40	14.5	13	73	42	100	
	138		88	110	65	96	35	62	21	11.5	99	64	170	

Part Number: UWUAN94 - Male Thread Studs Type Nut Type: B

6 Days P.87

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

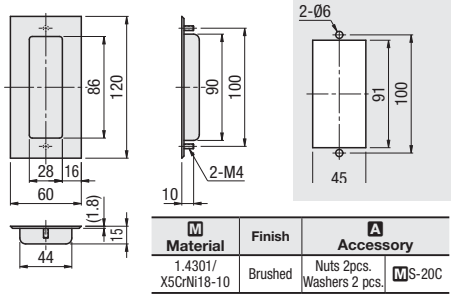
■Embedded Handles

RoHS



UWAUNS

Dimensions of Panel Mounting Holes



M Material	Finish	A Accessory	
1.4301/ X5CrNi18-10	Brushed	Nuts 2pcs. Washers 2 pcs.	MS-20C

Part Number Type	Mass (g)	€ Unit Price
UWAUNS	50	

Part Number: UWAUNS

6 Days P.87

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Folding Embedded Handles / TPE Embedded Handles / Embedded Resin Handles

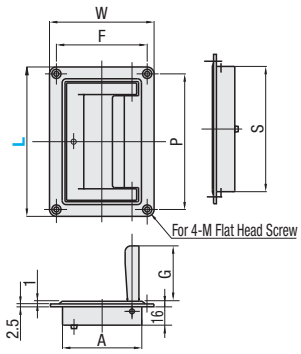
CAD Data

■Folding Embedded Handles

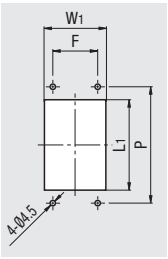


RoHS

UWUAFN



Dimensions of Panel Mounting Holes



Material: EN Ac-46100/G-AlSi12Cu

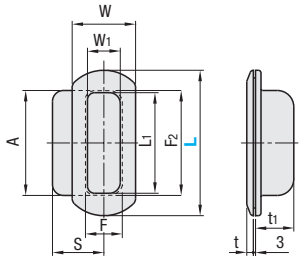
Part Number Type	L	W	P	F	S	A	G	L1	W1	Mass (g)	€ Unit Price
UWUAFN	130	91	118	79	109	69	49.5	110	70	197	
	200	80	184	50	169	71	51	171	73	286	

■TPE Embedded Handles

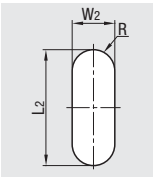


RoHS

UWAUNB



Dimensions of Panel Mounting Holes



5 pcs./package
Order quantity should be noted.
Adhesive is recommended for mounting.

Thickness of the applicable plate is 3mm.

Material: Non-PVC TPE

* TPE is thermoplastic elastomer, which has properties close to rubber at ambient temperature.

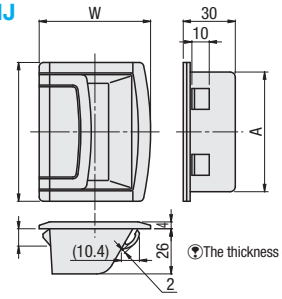
Part Number Type	L	W	L1	W1	A	S	F	F2	T	t1	L2	W2	R	Mass (g)	€ Unit Price (5pcs./package)
UWAUNB	62	34	40	18	44	29	23	53	4	18	54	24	11.5	30	
	92	42	62	22	66	42	27	83	5	32	84	28	13.5	50	
	133	58	92	30	96	47	39	119	6	35	120	40	19.5	110	

■Embedded Resin Handles

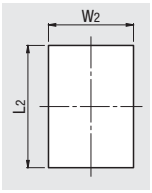


RoHS

UWAUNJ



Dimensions of Panel Mounting Holes



The thickness of the applicable plate is 1~1.2mm.

Material: ABS Resin

Example



Adhesive is recommended for mounting.

Part Number Type	L	W	L2	W2	A	Mass (g)	€ Unit Price
UWAUNJ	80	60	70	48.5	69	50	
	120	82	108.5	70	108	70	
	180	82	168.5	70	168	90	

Order Example

Part Number
UWUAFN130
UWAUNB92
UWAUNJ80

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

6 Days P.87

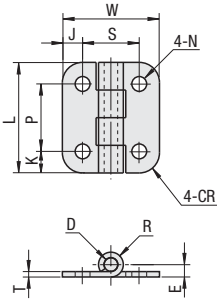
Stainless Hinges / Steel Hinges

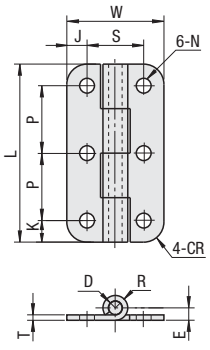
CAD Data

RoHS



SHHPS(Stainless Steel)
SHHPSK(Stainless - Brushed Finish)
SHHPT(Steel)





When the hinges are mounted onto an object such as a panel,hinge nuts are recommended as shown on **P.1057**

Type	M Material	S Surface Treatment
SHHPS	1.4401/ X5CrNiMo17-12-2	-
SHHPSK	1.4301/X5CrNi18-10	Brushed Finish
SHHPT	1.0330/DC01 or 1.0320/St.22	Chrome Plating

Part Number Type	No.	One Side No. of Holes	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	N	T	E	R	CR	D	SHHPS € Unit Price 1~8 pcs.	SHHPS Volume Discount 9~	SHHPSK € Unit Price 1~8 pcs.	SHHPSK Volume Discount 9~
SHHPS SHHPSK	5	2	9	88	43	41	36	8	25	7.5	21	5.5	2	4.6	4.6	7.5	5				
		3	11	108	70	66															
	6	2	12	117	60	48	48	9	30	8	32	6.5									
		3	15	147	98	78															
	8	2	25	245	130	59	62	11	37	10	42		3	5.6	5.6	10					
		3	38	372	230	96								6.1	6.1		6				
	845	2	30	294	190	70	80	13.5	43	16.5	47			5.6	5.6		5				
		3	40	392	325	113								6.1	6.1		6				

* The allowable load is the value when 2 pieces are used.

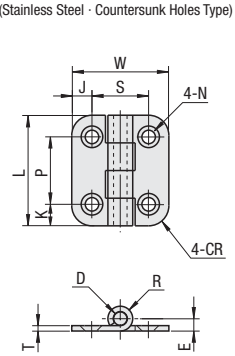
Part Number Type	No.	One Side No. of Holes	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	N	T	E	R	CR	D	€ Unit Price 1~8 pcs.	Volume Discount 9~
SHHPT	5	2	9	88	36	41	36	8	25	7.5	21	5.5	2	4.6	4.6	4	5		
		3	11	108	59	66													
	6	2	12	117	50	48	48	9	30	8	32	6.5							
		3	15	147	83	78													
	8	2	25	245	124	59	62	11	37	10	42		3.2	6.5	6.5	5	6		
		3	38	372	207	96													
	845	2	30	294	181	70	80	13.5	43	16.5	47								
		3	40	392	298	113													

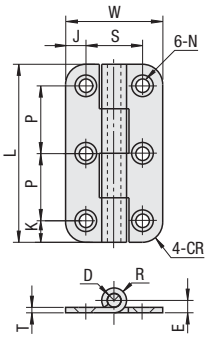
* The allowable load is the value when 2 pieces are used.

RoHS



SHHPSD(Stainless Steel · Countersunk Holes Type)





M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	One Side No. of Holes	* Allowable Load kg	N	Mass g	L	W	K	P	J	S	Through	Countersink	T	E	R	CR	D	€ Unit Price 1~8 pcs.	Volume Discount 9~
SHHPSD	5	2	9	88	34	41	36	8	25	7.5	21	5.5	8.6 (For M4 Screws)	2	4.6	4.6	4	5		
		3	11	108	56	66														
	6	2	12	117	49	48	48	9	30	8	32									
		3	15	147	80	78														
	8	2	25	245	111	59	62	11	37	10	42	6.5	10.6 (For M5 Screws)	3	6.1	6.1	5	6		
		3	38	372	185	96														
	845	2	30	294	162	70	80	13.5	43	16.5	47									
		3	40	392	266	113														

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number	-	Holes on One Side
SHHPS6	-	2
SHHPSD6	-	3

Days to Ship: **6 Days** P.87

Hinges / Hinge Nuts

Price Reduction
Up to 26%

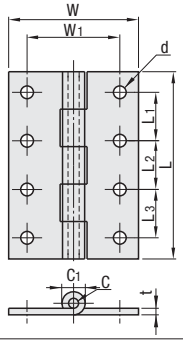
CAD Data

Hinges RoHS

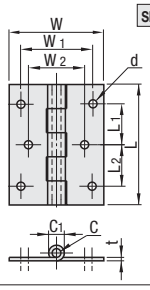
HHS



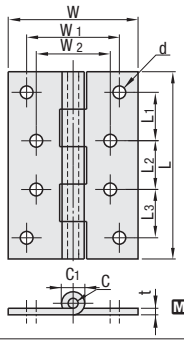
Shape No. A



Shape No. B



Shape No. C



Material: 1.4301/X5CrNi18-10

Part Number Type	No.	L	Shape No.	W	W1	W2	L1	L2	L3	C	C1	T	D	Divisions	* Allowable Load (N)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount 20~99	100~
HHS	25	25	A	20	12	-	16	-	-	2	3.8	0.8	3.4	3	9.8	6			
	30	30					22									7			
	40	40		30	22		28			3	6.4	1.5			58.8	12			
	50	50					36						4.5	5	68.6	16			
	65A	65		50	30		23	23		4	8.5	2			127.4	25			
	65		B		36	30	22	22											
	75A	75	A		30	-	27	27					5.5		147	46			
	75		B		36	30	26	26											
	90A	90	A	60	38	-	35	35		6	12.7	3	6.6		245	68			
	90		B		46	36	34	34											
	100A	100	A		38	-	26	26	26						294	100			
	100		C		46	36													

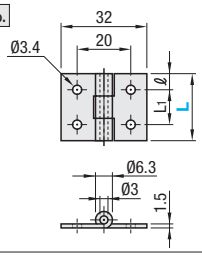
* The allowable load is the value when 2 pieces are used.

Hinges RoHS

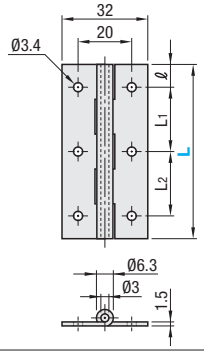
HHKS



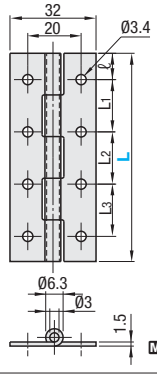
Shape No. A



Shape No. B



Shape No. C



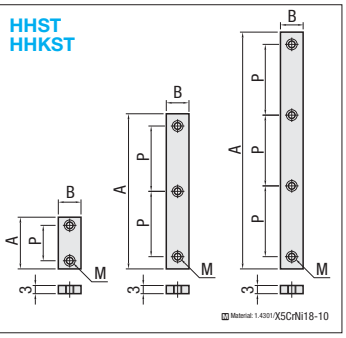
Material: 1.4301/X5CrNi18-10

Part Number Type	L	Shape No.	ℓ	L1	L2	L3	Divisions	*Allowable Load (N)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount 20~99	100~
HHKS	25	A	6	13	-	-	3	29.4	13			
	30		7	16	-	-		39.2	16			
	40		8	24	-	-		58.8	21			
	50		10	30	-	-		68.6	26			
	65	B	8.5	24	24	-	5	98.0	34			
	75		9.5	28	28	-		107.8	39			
	90		10	35	35	-		127.4	47			
	100	C	11	26	26	26		147.0	52			

* The allowable load is the value when 2 pieces are used.

Hinge Nuts RoHS

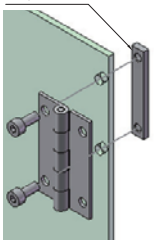
HHST
HHKST



Part Number Type	No.	No. of Holes	B	A	P	M	Applicable Hinges	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHST	25	2	6	22	16	3	HHS25		
	30		6	28	22	3	HHS30		
	40		7	36	28	3	HHS40		
	50		7	45	36	4	HHS50		
	65	3	9	55	23	4	HHS65A		
	75		11	65	27	5	HHS75A		
	90		12	82	35	6	HHS90A		
	100	4	12	90	26	6	HHS100A		
HHKST	25	2	6	19	13	3	HHKS25		
	30		6	22	16	3	HHKS30		
	40		6	32	24	3	HHKS40		
	50		6	39	30	3	HHKS50		
	65	3	6	57	24	3	HHKS65		
	75		6	65	28	3	HHKS75		
	90		6	79	35	3	HHKS90		
	100	4	6	87	26	3	HHKS100		

Example

Hinge Nuts



Order Example

Part Number
HHS100
HHKS100
HHST30
HHKST75

Days to Ship

6 Days

P.87

Aluminum Hinges / Aluminum Hinges for Unequal Size Frames / Aluminum Hinges with Extra Low Head Cap Screws / Hinge Nuts

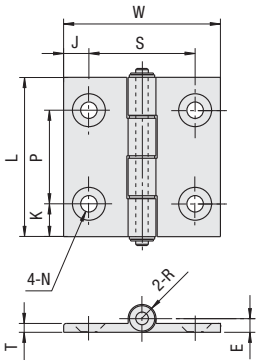
CAD Data

■Aluminum Hinges ■Aluminum Hinges for Unequal Size Frames

RoHS



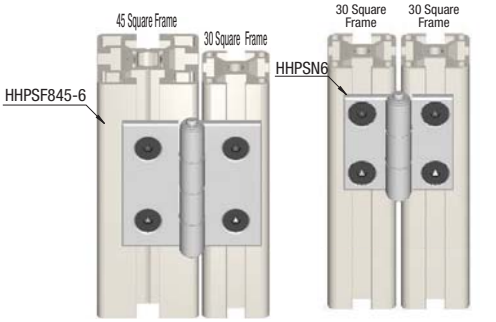
HHPSN (Clear Anodize)
HHPBSN (Black Anodize)
HHPSF (For Unequal Size Frames: Clear Anodize)



M Material: A6063S-T5 Bushing: Polyacetal
S Surface Treatment: Anodize

Example

- For a set of screws and nuts for an aluminum frame, refer to **P.719**



Connection of Unequal Size Frames.
Connection of Similar Size Frames.

Hinges for Different Shape Frames
HHPSF 6-5: Attaches HFS5-20mm to HFS6-30mm.
HHPSF8-6: Attaches HFS6-30mm to HFS8-40mm.
HHPSF845-5: Attaches HFS5-30mm to HFS8-45mm.
HHPSF 8-5: Attaches HFS5-20 mm to HFS8-40mm.
HHPSF 845-6: Attaches HFS6-30 mm to HFS8-45mm.

When the hinges are mounted onto an object such as a panel, the hinge nuts below are recommended.

Part Number		* Allowable Load		Mass g	L	W	K	P	J	S	N		T	E	R	Clear Anodize		Black Anodize	
Type	No.	kg	N								Through	Counter-bored				€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
																1~8 pcs.	9~	1~8 pcs.	9~
HHPSN HHPBSN (Black Anodize)	5	10	98	22	47	36	11	25	7.5	21	5.5	11	3.5	5	5				
	6			33		48	8.5	30	8	32	6.5	13		5.5	5.5				
	8			48	63	62	13	37	10	42									
	8-45	15	147	81		80	10	43	16.5	47			4.5						
HHPSF (For Unequal Size Shape Frames)	6-5	10	98	33	47	44.75	8.5	30	10.75	26.5	5.5	11	3.5	5.5	5.5				
											6.5	13							
	8-5	10	98	48	63	54.25	13	37	15.25	31.5	5.5	11	3.5	5.5	5.5				
											6.5	13							
	845-5	10	98	81	63	55.5	13	37	14	34	5.5	11	3.5	5.5	5.5				
											6.5	13							
	8-6	15	147	48	63	62	13	37	12.5	37	6.5	13	3.5	5.5	5.5				
	845-6	15	147	48	63	62	13	37	11.5	39	6.5	13	3.5	5.5	5.5				

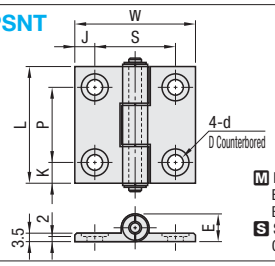
* The allowable load is the value when 2 pieces are used.

■Aluminum Hinges Extra Low Head Cap Screws

RoHS



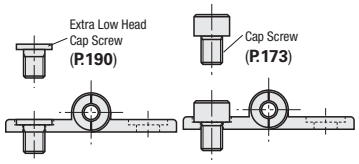
HHPSNT



M Material: EN AW-6063/AlMg0,7Si Bushings: Polyacetal
S Surface Treatment: Clear Anodize

Example

Normal cap bolts are available for installation.
When the hinges are mounted onto an object such as a panel, the hinge nuts below are recommended.



Part Number		* Allowable Load		Mass g	L	W	K	P	J	S	D Through	D Counter-bored	E	€ Unit Price	Volume Discount
Type	No.	kg	N											1~8 pcs.	9~
HHPSNT	5	10	98	22	47	36	11	25	7.5	21	5.5	10	5		
	6			34		48	8.5	30	8	32	6.5	11	5.5		
	8			49	63	62	13	37	10	42					

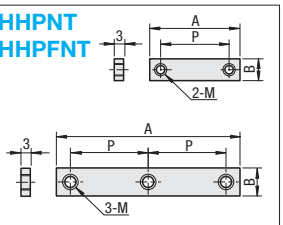
* The allowable load is the value when 2 pieces are used.

■Hinge Nuts

RoHS



HHPNT
HHPFNT



M Material: 1.4301/X5CrNi18-10

Part Number		No. of Holes	B	A	P	M	€ Unit Price 1~9 pcs.	Volume Discount 10~
Type	No.							
HHPNT	5	2	9	34	25	5		
		3		59				
	6	2	10	40	30	6		
		3		70				
	8	2	12	49	37			
		3		86				
	845	2		55	43			
		3		98				
HHPFNT	5	2	14	33	20	5		
	6	2	16	38	25	6		
	8	2	18	48	30			

■Applicable Hinge Nuts for Hinges on Panel

Hinges		No.	No. of Holes	Applicable Hinge Nuts
HHPSN HHPSJ HHPSDT HHPSNH SHPSNA HHPNL HHPSSD	HHPBSN SHHPS HHPSNA HHPMGS SHHPSZ HHPNR	5	2	HHPNT5-2
		6		HHPNT6-2
		8		HHPNT8-2
		8-45		HHPNT845-2
HHPSF		8-6		HHPNT8-2
		845-6		
SHHPS		5	3	HHPNT5-3
		6		HHPNT6-3
		8		HHPNT8-3
		845		HHPNT845-3
HHPFLN HHPFDLN HHPFDRN	HHPFRN	5	2	HHPFNT5-2
		6		HHPFNT6-2
		8		HHPNT8-2
		8-45		

Not applicable to HHPSJ6, SHPSNA6 and SHHPSZ6.

Order Example

Part Number	-	No. of Holes
HHPSN6		
HHPSNT8		
HHPNT5	-	3

Days to Ship 6 Days P.87

Aluminum Hinges - Long Type - Short Type / Aluminum Hinges w/Protrusions

CAD Data

■Aluminum Hinges Short Type

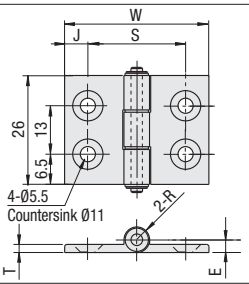
RoHS



Short Type

HHPSNC
(Clear Anodize)

HHPBSNC
(Black Anodize)



M Material: EN AW-6063/AlMg0,7Si-T5 Bushing: Polyacetal
S Surface Treatment: Anodize

Part Number		* Allowable Load		Mass g	W	J	S	T	E	R	Clear Anodize		Black Anodize	
Type	No.	kg	N								€ Unit Price 1~8 pcs.	Volume Discount 9~	€ Unit Price 1~8 pcs.	Volume Discount 9~
HHPSNC HHPBSNC (Black Anodize)	5	10	98	19	36	7.5	21	3.5	5	5				
	6			24	48	8	32		5.5	5.5				
	8			27	62	10	42							
	8-45	15	147	36	80	16.5	47	4.5						

* The allowable load is the value when 2 pieces are used.

■Aluminum Hinges Long Type

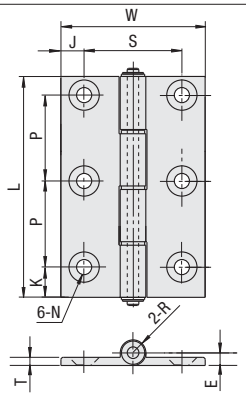
RoHS



Long Type

HHPSNL
(Clear Anodize)

HHPBSNL
(Black Anodize)



M Material: EN AW-6063/AlMg0,7Si-T5 Bushing: Polyacetal
S Surface Treatment: Anodize

Part Number		* Allowable Load		Mass g	L	W	K	P	J	S	N		T	E	R	Clear Anodize		Black Anodize	
Type	No.	kg	N								Through	Counter-sunk				€ Unit Price 1~8 pcs.	Volume Discount 9~	€ Unit Price 1~8 pcs.	Volume Discount 9~
HHPSNL HHPBSNL (Black Anodize)	5	15	147	49	66	36	8	25	7.5	21	5.5	11	3.5	5	5				
	6			69	78	48	9	30	8	32	6.5	13		5.5	5.5				
	8			106	113	62	13.5	43	10	42									
	8-45	23	220	144		80			16.5	47			4.5						

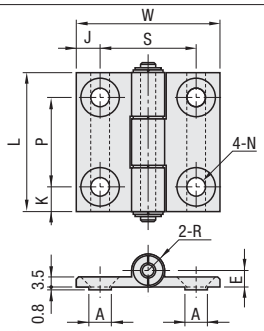
* The allowable load is the value when 2 pieces are used.

■Protruded Aluminum Hinges

RoHS



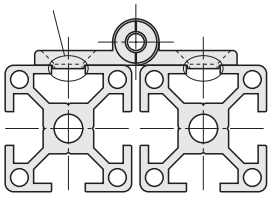
HHPSDT



M Material: EN AW-6063/AlMg0,7Si Bushing: Polyacetal
S Surface Treatment: Clear Anodize

Example

The protrusion prevents misalignment when assembling.



- For a set of screws and nuts for an aluminum frame, refer to **P.720**
When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

Part Number		* Allowable Load		Mass g	L	W	K	P	J	S	N		E	A	R	€ Unit Price 1~8 pcs.	Volume Discount 9~
Type	No.	kg	N								Through	Countersunk					
HHPSDT	5	10	98	23	47	36	11	25	7.5	21	5.5	11	5	5.5	5		
	6			35		48	8.5	30	8	32	6.5	13	5.5	7.5	5.5		
	8			51		63	62	13	37	10	42			9.5			

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number
HHPSNC5
HHPBSNL8-45
HHPSDT6

Days to Ship: **6 Days** P.87

Flag Hinges / Flag Hinges for Different Shape Frames / Stop Hinges

CAD Data

Flag Hinges

RoHS



(Photo: Hinge for left-hand use)



(Photo: Hinge for right-hand use)

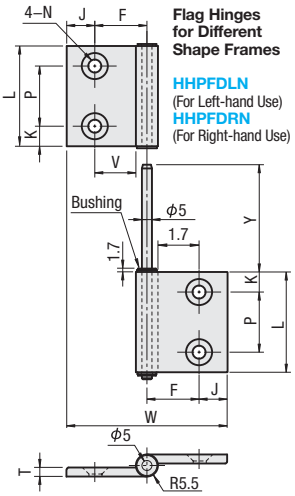
Flag Hinges

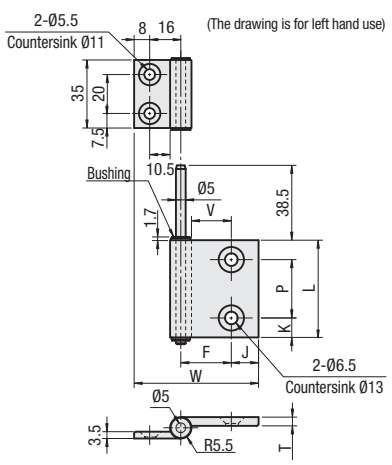
HHPFLN
(For Left-hand Use)

HHPFRN
(For Right-hand Use)

Flag Hinges for Different Shape Frames

HHPFDLN
(For Left-hand Use)
HHPFDRN
(For Right-hand Use)





M Material: EN AW-6063/AlMg0,7Si-T5 Bushing: Polyacetal (White)
S Surface Treatment: Anodize

Part Number		*Allowable Load		Mass (g)	L	W	K	P	J	F	V	N		T	Y	€ Unit Price	Volume Discount
Type	No.	Kg	N									Through	Countersunk			1~8 pcs.	9~
HHPFLN HHPFRN	5	10	98	36	35	48	7.5	20	8	16	10.5	5.5	11	3.5	38.5		
	6			46	40	62	7.5	25	10	21	15.5				43.5		
	8	15	147	74	50	80	10	30	14	26	20.5	6.5	13	4.5	53.5		
	8-45			74	50	80	10	30	11.5	28.5	23						
HHPFDLN HHPFDRN	6	10	98	42	55	40	7.5	25	10	21	15.5	-		3.5	-		
	8	15	147	56	64	50	10	30	14	26	20.5			4.5			
	8-45					50	10	30	11.5	28.5	23						

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number
HHPFLN8-45

Days to Ship

6 Days P.87

2 Days

Example



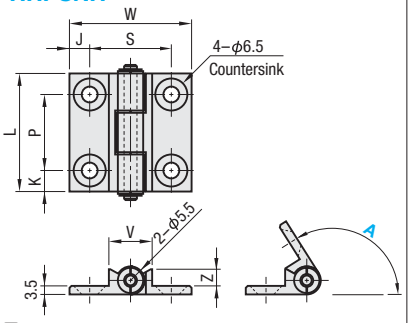
When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on P.1057

Stop Hinges

RoHS



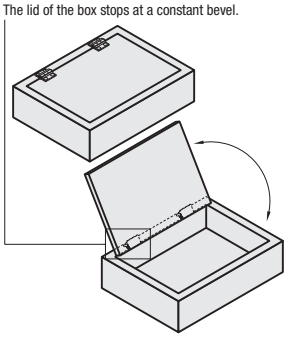
HHPSNH



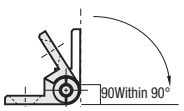
M Material: EN AW-6063/AlMg0,7Si-T5 Bushing: Polyacetal
S Surface Treatment: Clear Anodize

Example

The lid of the box stops at a constant bevel.



When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on P.1057



When a hinge is positioned within 90°, it automatically falls to be flat.

Part Number		A (Angle)	*Allowable Load		Mass g	L	W	K	P	J	S	V	Z	€ Unit Price	Volume Discount
Type	No.		kg	N										1~8 pcs.	9~
HHPSNH	6	120	10	98	37	47	48	8.5	30	8	32	17	6.8		
		135			36								5.4		
		150			35								4.2		
	8	120	10	98	58	63	62	13	37	10	42	21	7.3		
		135			56								5.8		
		150			55								4.5		

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number	-	Angle
HHPSNH6	-	120

Days to Ship

6 Days P.87

Hinges for Heavy Loads / Hinges with Slotted Holes / Aluminum Hinges with Slotted Holes

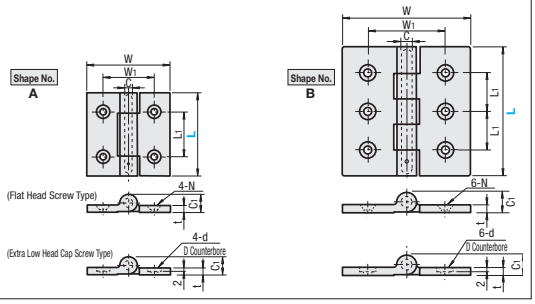
CAD Data

Hinges for Heavy Loads

RoHS



Type		Material	Surface Treatment	
Flat Head Screw Type	Extra Low Head Cap Screws		Hinge Plates	Shaft
HHSZ	HHSZT	1.4401/X5CrNiMo17-12-2	Buffing	-
HHSZD	-	Zinc Die Casting	Chrome Plating	-



Part Number Type	L	Shape No.	W	W1	L1	C	C1	T	HHSZ · HHSZD N Through	HHSZ · HHSZD N Countersunk	HHSZT D	HHSZT D	Divisions	Allowable Load (N)	Weight (g)	HHSZ € Unit Price Qty.1~19	HHSZ Volume Discount 20~	HHSZD € Unit Price Qty.1~19	HHSZD Volume Discount 20~	HHSZT € Unit Price Qty.1~19	HHSZT Volume Discount 20~
HHSZ HHSZD HHSZT	50	A	50	35	20	6	14	5	4.4	8.6	8.6	4.6	3	350	110						
	65		65	40	35				5.6	10.6	9.6	5.6		450	190						
	75		75	50	40	8	16	6	6.6	12.6	10.6	6.6		650	305						
	100	B	100	60	30								5	850	500						
	125		100	60	37.5	8	16	6	6.6	12.6	-	-	5	1000	650						

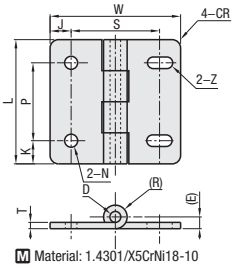
* The allowable load is the value when 2 pieces are used.

Hinges with Slotted Holes

RoHS



SHPSNA



When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	Allowable Load kg	Allowable Load N	Mass (g)	L	W	K	P	J	S	N	Z	T	(E)	(R)	CR	D	€ Unit Price Qty.1~19	Volume Discount 20~
SHPSNA	5	9	88	34	41	36	8	25	7.5	21	5.5	5.5x6.5	2	4.6	4.6	4	5		
	6	12	117	48	48	48	9	30	8	32		5.5x10							
	8	25	245	111	59	62	11	37	10	42	6.5	6.5x10	3	6.1	6.1	5	6		

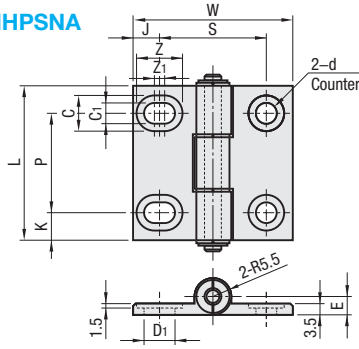
* The allowable load is the value when 2 pieces are used.

Aluminum Hinges - Counterbored - One Side Slotted

RoHS

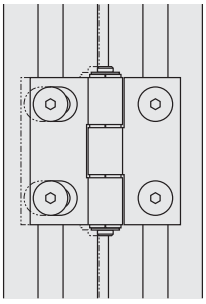


HHPSNA



M Material: EN AW-6063/AlMg0,7Si Bushing: Polyacetal
S Surface Treatment: Clear Anodize

Example



Slotted mounting holes make it possible to adjust right and left positions.

When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

Part Number Type	No.	Allowable Load kg	Allowable Load N	Mass g	L	W	K	P	J	S	D Through	D Counterbored	D1	C	C1	Z	Z1	E	€ Unit Price 1~8 pcs.	Volume Discount 9~
HHPSNA	5	10	98	22	47	36	11	25	7.5	21	5.5	10	7	10	5.5	11.5	1.5	5		
	6			32		48	8.5	30	8	32	6.5	11	9.5	11	6.5	14	3	5.5		
	8			47	63	62	13	37	10	42			11.5			16	5			

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number
HHSZ65
SHPSNA5
HHPSNA8

Days to Ship **6 Days** P.87

Resin Hinges / Compact Plastic Hinges / Low Particulate Generation Hinges

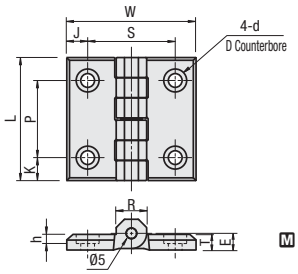
CAD Data

■Resin Hinges

RoHS



HHPSJ



When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

M Material: Hinge Plates: Nylon 6, Shaft: 1.4301/X5CrNi18-10

Part Number Type	No.	Color	*Allowable Load Kg	N	Mass g	L	W	K	P	J	S	D	D	T	E	R	h	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHPSJ	6	B(Black)	10	96	21	48	47	9	30	8	32	9.5	5.5	6	6.5	12.6	3.8		
	8	W(White)	15	147	35	59	62	11	37	10	42	11	6.6	7.5	8	14.5	4.4		
	845				44	70	80	13.5	43	16.5	47								

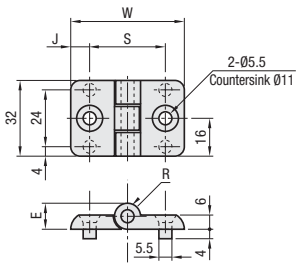
* The allowable load is the value when 2 pieces are used. The default color will be black unless specified.

■Compact Plastic Hinges

RoHS



HHPSJC



M Material: Hinge Plates: Nylon 6, Shaft: 1.4301/X5CrNi18-10

Part Number Type	No.	*Allowable Load kg	N	Mass (g)	W	J	S	E	R	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHPSJC	5	10	98	12.5	36	7.5	21	10	5		
	6	10	98	15.8	48	8	32	11	5.5		
	8	10	98	26.2	62	10	42	11	5.5		

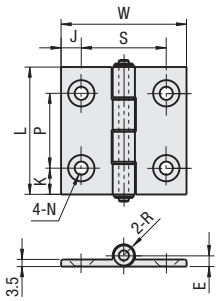
* The allowable load is the value when 2 pieces are used.

■Low Particulate Generation Hinges

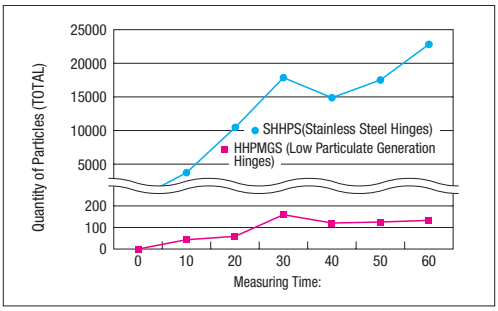
RoHS



HHPMGS



M Material:EN AW-6063/AlMg0,7Si-T5
Bushing : Oil Soaked Polyacetal
S Surface Treatment: Electroless Nickel Plating



Features

■Excels in friction resistance and sliding. Has less dust compared with conventional hinges because the resin of sliding section is made from the special material (oil embedded Polyacetal) .

■The aluminum part is electroless nickel plated instead of conventional clear anodizing. It provides an excellent electric conductivity, resulting in less dust collection.

When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

Part Number Type	No.	*Allowable Load kg	N	Mass g	L	W	K	P	J	S	N Through	N Countersunk	E	R	€ Unit Price 1~8 pcs.	Volume Discount 9~
HHPMGS	5	10	98	22	47	36	11	25	7.5	21	5.5	11	5	5		
	6			33		48	8.5	30	8	32	6.5	13	5.5	5.5		
	8			48	63	62	13	37	10	42						

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number	-	Color
HHPSJ6	-	B
HHPSJC8		
HHPMGS5		

Days to Ship: 6 Days P.87

Hinges with Offset Mounting Holes / Stepped Stainless Steel Hinges/ Spring-loaded Hinges

CAD Data

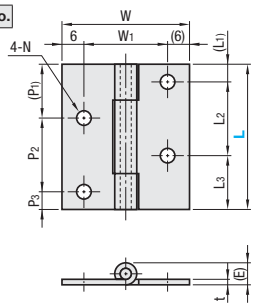
Hinges - Offset Mounting Holes

RoHS

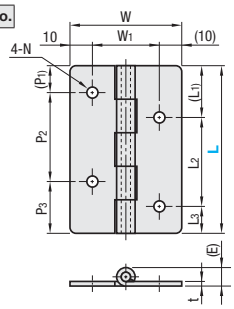


HHSOY

Shape No. A



Shape No. B



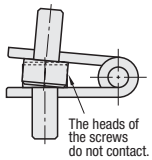
M Material: 1.4301/X5CrNi18-10

Part Number Type	L	Shape	L1	L2	L3	W	W1	P1	P2	P3	N	T	E	*Allowable Load N	Weight (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHSOY	40	A	5	20	15	35	23	15	20	5	4.2	1.5	6.3	58.8	21.6		
	50		5.5	26	18.5			18.5	26	5.5				78.4	27.3		
	75	B	23	40	12	50	30	12	40	23	5	2	8.8	147	75.7		

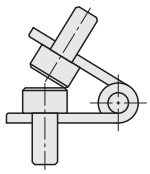
* The allowable load is the value when 2 pieces are used.

Example

Hinge with Staggered Holes



Other Hinges

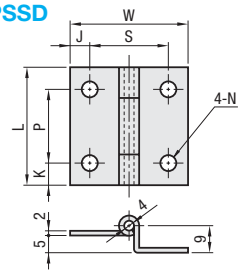


Stepped Hinges - Stainless Steel

RoHS



HHPSSD



When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	L	W	K	P	J	S	N	Allowable Load (Kg)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount 20~
HHPSSD	5	41	36	8	25	7.5	21	5.5	4.5	32		
	6	48	48	9	30	8	32	6.5	6	46		

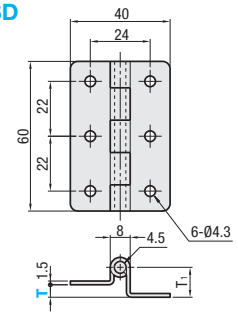
* The allowable load is the value when 2 pieces are used.

Stepped Hinges - Stainless Steel

RoHS



HHSD



M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Buffing

Part Number Type	T	T1	*Allowable Load (Kg)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount 20~
HHSD	1.2	8.2	7	38		
	2.3	9.3				
	3.2	10		40		
	5	12		42		

*The allowable load above is the value when 2 hinges are used.

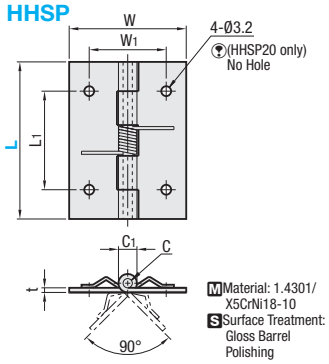
Spring Loaded Hinges

RoHS



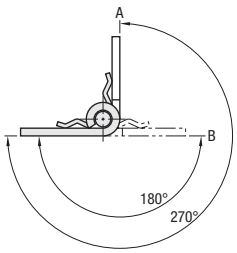
The photo shows a spring-loaded hinge in an uninstalled condition (free state).

HHSP



M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Gloss Barrel Polishing

Example



Spring load is a value at (A) with the vanes folded at 270° as shown above.
(HHSP20 (only) measures a value at (B) with the vanes at 180°.
(Do not open the HHSP20 vanes beyond 180° (B). Small wire diameter spring may cause problems.

Part Number Type	L	W	W1	L1	C	C1	T	Spring Load (kgf)	Weight (g)	€ Unit Price 1~39 pcs.	Volume Discount 40~
HHSP	20	14	-	-	1	(2.2)	0.5	0.38	11.5		
	25	32	20	14	3	5.8	1.2	0.4	10		
	38	32	20	26	3	6.5	1.5	1	25		
	51	38	25	32	3	6.5	1.5	0.68	35		

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number
HHSOY40
HHPSSD6
HHSD3.2
HHSP38

Days to Ship: 6 Days

P.87

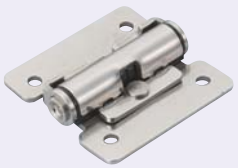
Torque Hinges

-Fixed Torque Type · Torque Adjustable Type-

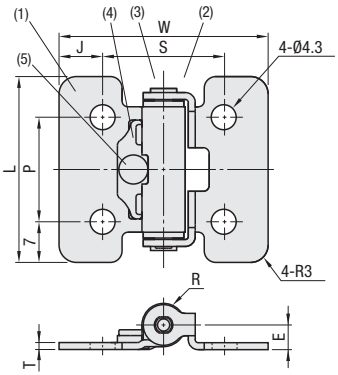
CAD Data

■Fixed Torque Type

RoHS



HHPT



Operating Temp. Range: -10°C~50°C
Operating Humidity Range: 90%RH or Low

Caution

- Use 2 hinges.
- Align the axes of the two hinges.
- Do not use the hinges outdoors or in any places where oil or grease adheres to the hinges.
- Do not use the hinges in any places requiring continuous open-close movements.
- Vertical use is not assumed given product characteristics. For vertical use, adjust allowable load and torque value to the actual operating conditions.

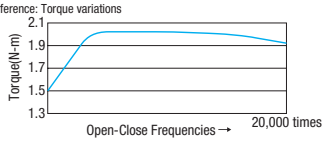
Part Name	Material
(1) Vane	1.4301/X5CrNi18-10
(2) Resin Barrel	Polyacetal
(3) Shaft	1.4305/X10CrNiS18-9
(4) Plate	1.4301/X5CrNi18-10
(5) Swage Pin	1.4567/X3CrNiCu18-9-4

Part Number		Rated Torque*		Mass (g)	L	W	P	J	S	T	E	R	€ Unit Price	Volume Discount
Type	No.	N · m	kgf · cm										Qty.1~19	20~
HHPT	3	0.35	3.4	15	32	36	18	7.5	21	1.2	4.25	7.5		
	7	0.7	6.9	28	40	48	26	8	32	1.2	4.75	8.5		
	15	1.5	14.7	64	50	48	36	8	32	2	6.5	12		

* Rated torque has a margin of error between +40% and -20%.
* Rated torque value is for a single hinge.

Example

Ambient Temp.(20±15°C),Operating Humidity Range: 90%RH or Low
Reference: Torque variations



Data above are not guaranteed values but reference values of HHPT.
Open-Close intervals: 5 times /min. (Single open-close operation=0°<>160°)
* Considering torque deteriorations caused by aging, temperature and humidity variation, the torque value is set higher than the rated torque value at shipping.

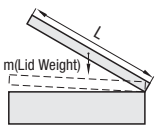
Order Example — Part Number: HHPT7

Days to Ship — 6 Days P.87

■ How to select a Torque Hinge.
Basically, the lid is operated as shown on right.
Calculate necessary torque according to the following formula before selecting a torque hinge that satisfies the specifications.
(Assume that the lid's center of gravity lies in the middle.)

[Formula]
Max. Torque T=L/2xm(Weight: kg)x9.8(Newton: N)

(Example) When L=0.3m and m=2kg,
Max. Torque T=0.3/2x2x9.8=2.94N m.
→Select two pieces of **HHPT15**

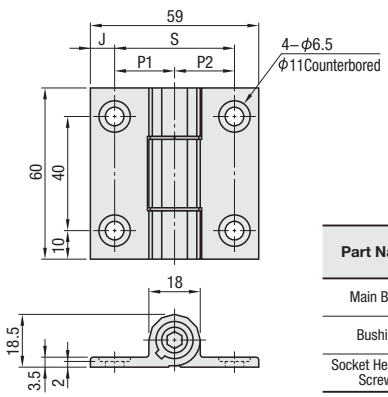


■Adjustable Torque Type

RoHS



HHPTF
HHPTFB



Part Name	Material	Surface Treatment
Main Body	EN AW-6063/ AlMg0,7Si	Anodizing
Bushing	Polyacetal	-
Socket Head Cap Screws	1.4567/ X3CrNiCu18-9-4	-

Part Number		* Allowable Load		** Rated Torque		Mass (g)	S	P1	P2	J	Clear Anodize		Black Anodize	
Type	No.	kg	N	N · m	kgf · cm						€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
											1~8 pcs.	9~	1~8 pcs.	9~
HHPTF HHPTFB (Black Anodize)	6	10	98	0 ~ 4.9	0 ~ 50	54	32	16	16	13.5				
	8-6						37	16	21	13.5				
	8						42	21	21	8.5				

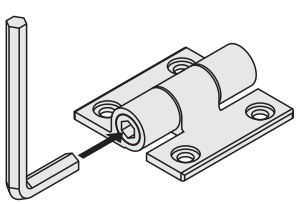
* The allowable load is the value when 2 pieces are used. ** Rated torque value is for a single hinge.

Order Example — Part Number: HHPTF8

Days to Ship — Days P.87

Example

Use a hexagon wrench to adjust torque value.
If tightened with a force of 1.5N-m or more, a hexagon wrench might be damaged.



Damper Hinges

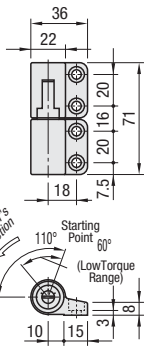
CAD Data

■Damper Hinges RoHS

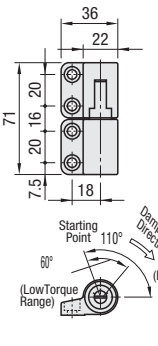


HHPR

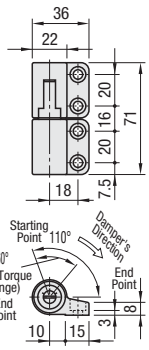
1A



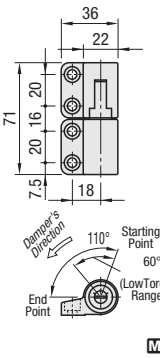
1B



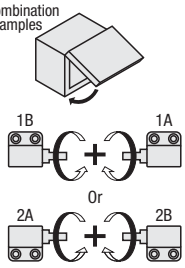
2A



2B



Combination Examples



M Material: Polybutyleneterephthalat

Part Number Type	No.	Reverse Torque (N-m) *	Max. Operating Angle	Operating Temp. Range (°C)	Mass (g)	€ Unit Price Qty.1~19	Volume Discount 20~
HHPR	1A	0.49~1.27	110	0~40	46		
	1B						
	2A						
	2B						

* Reverse Torque value is for a single damper hinge.

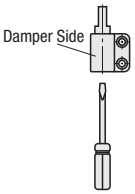
Order Example: Part Number HHPR1B

Days to Ship: 6 Days P.87

Example

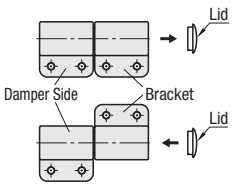
■How to adjust torque.

Torque can be easily adjusted with a flat-blade screwdriver.



■Bracket Position Change

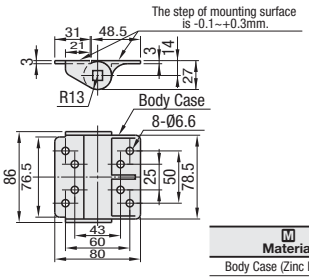
Bracket mounting position can be adjusted. The lid is removable.



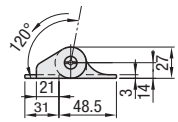
■Damper Hinges RoHS



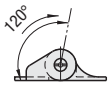
MSDH

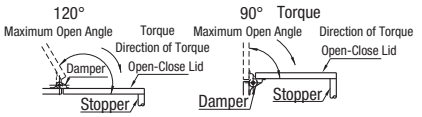


L Type (Direction of Torque: Counterclockwise)



R Type (Direction of Torque: Clockwise)





M Material	S Surface Treatment	Max. Useable Angle	Operating Temp. Range (°C)	Mass (g)
Body Case (Zinc Die Cast)	Silver Painted	120	-5~50	410
Hinge (1.4301/X5CrNi18-10)	-			

Part Number Type	Max. Usable Torque {N-m}	Shaft Rotating Direction Selection	Max. Reverse Torque (N-m)	€ Unit Price
MSDH	3	L (Counterclockwise)	0.4 or less	
	5		0.6 or less	
	7.5	R (Clockwise)	0.8 or less	
	10		1.0 or less	

Order Example: Part Number MSDH3 - Shaft Rotating Direction L

Days to Ship: 8 Days — Express A — 2,00 EUR/ piece P.88

Please request a quotation for orders of 3 or more identical pieces.

Price

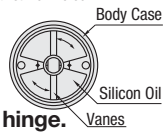
■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

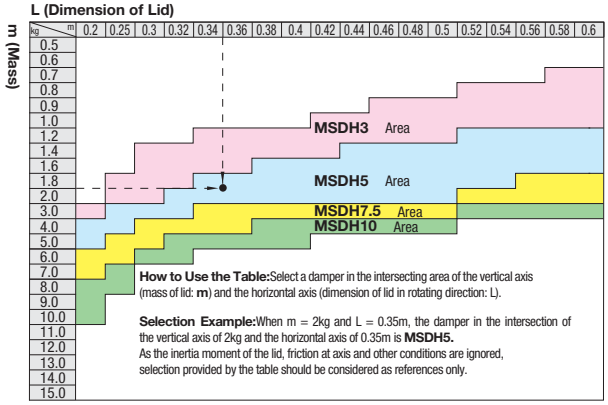
<Basic Principle>

The rotation of the vanes compresses the oil and generates control (brake) force to act against work force.



■Table of Selection Guide

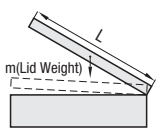
L (Dimension of Lid)



How to Use the Table: Select a damper in the intersecting area of the vertical axis (mass of lid: **m**) and the horizontal axis (dimension of lid in rotating direction: L).

Selection Example: When m = 2kg and L = 0.35m, the damper in the intersection of the vertical axis of 2kg and the horizontal axis of 0.35m is **MSDH5.**
As the inertia moment of the lid, friction at axis and other conditions are ignored, selection provided by the table should be considered as references only.

■How to select a damper hinge.



The lid in a horizontal position generates maximum torque as shown on left. Calculate maximum torque according to the following formula before selecting a damper that satisfies the specifications.

[Formula]
Max. Torque T=L/2xm(Weight: kg)x9.8(Newton: N)

Example) When L=0.4m and m=5kg,
Max. Torque T=0.4/2x5x9.8=9.8N-m.
→Select **MSDH10**

Note) The selection made by the calculation above is for reference only.
The friction resistance and the effect of inertia moment at the hinge were not taken into consideration in the example above.

The viscosity of the oil in the damper changes depending on the temperature of the operating environment. Generally, the damping characteristic decreases with rising temperature, whereas it increases with lowering temperature.

Detachable Hinges - Stainless Steel

Price Reduction
Up to 17%

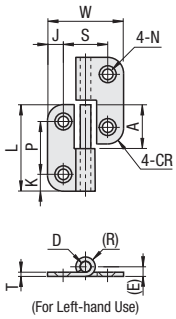
CAD Data

Detachable Hinges - Stainless Steel

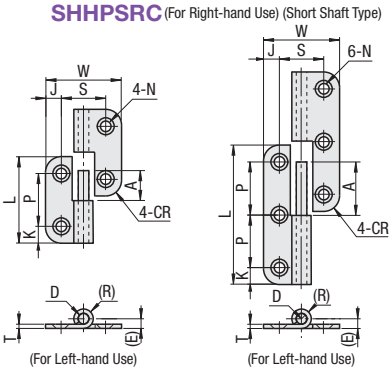
RoHS



SHHPSL (For Left-hand Use)
SHHPSR (For Right-hand Use)



SHHPSLC (For Left-hand Use) (Short Shaft Type)
SHHPSRC (For Right-hand Use) (Short Shaft Type)



Material: 1.4301/X5CrNi18-10

Part Number Type	No.	One Side No. of Holes	* Allowable Load kg	* Allowable Load N	Mass (g)	L	W	SHHPSL SHHPSR A	SHHPSLC SHHPSRC A	K	P	J	S	N Through	N Countersink Counterbored	T	(E)	(R)	CR	D	€ Unit Price 1~8 pcs.	Volume Discount 9~
SHHPSL SHHPSLC (For Left-hand Use)	5	2	9	88	34	41	36	19	14	8	25	7.5	21	5.5	8.6 (For M4 Screws)	2	4.6	4.6	4	5		
		3	11	108	55	66		31	26													
	6	2	12	117	49	48	48	22	17	9	30	8	32									
		3	15	147	80	78		37	32													
SHHPSR SHHPSRC (For Right-hand Use)	8	2	25	245	111	59	62	29	24	11	37	10	42	6.5	10.6 (For M5 Screws)	3	6.1	6.1	5	6		
		3	38	372	185	96		47	42													
	845	2	30	294	162	70	80	34	29	13.5	43	16.5	47									
		3	40	392	266	113		56	51													

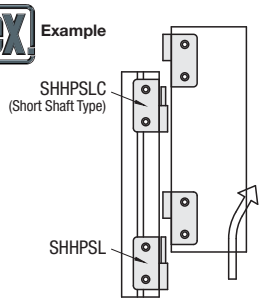
* The allowable load is the value when 2 pieces are used.

Order Example

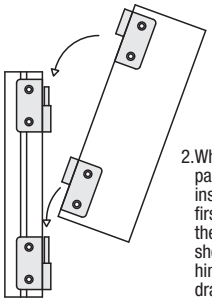
Part Number	-	Holes on One Side
SHHPSL5	-	3

Days to Ship: 6 Days P.87 2 Days

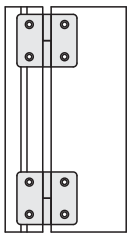
Example



1. Remove the panel from the frame.



2. When installing the panel into the frame, insert the lower hinge first as the shaft of the other hinge is shorter (the upper hinge in the above drawing).



3. Installing and removing the panel is easy since positioning is set first by the lower hinge, and then inserted into the upper hinge.

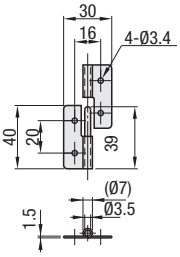
Detachable Hinges - Stainless Steel

RoHS

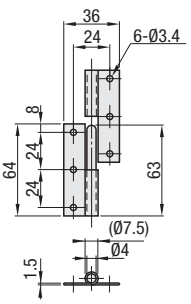


HNS2L Left-hand Type
HNS2R Right-hand Type

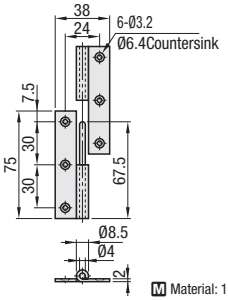
The drawings are for Right Door types.



HNS3L Left-hand Type
HNS3R Right-hand Type



HNS4L Left-hand Type
HNS4R Right-hand Type



Material: 1.4301/X5CrNi18-10

The Right Door Type has a door on the right side.

Part Number Type	* Allowable Load (N)	Weight (g)	€ Unit Price Qty. 1~19	Volume Discount 20~99	Volume Discount 100~
HNS2L	48	21			
HNS2R					
HNS3L	68	44			
HNS3R					
HNS4L	147	65			
HNS4R					

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number
HNS2L

Days to Ship: 6 Days P.87

Aluminum Detachable Hinges / Detachable Hinges for Heavy Loads

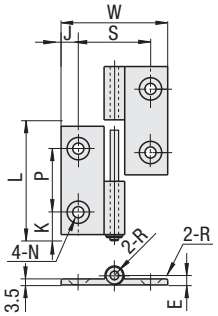
CAD Data

Detachable Hinges - Aluminum RoHS



HHPNL (For Left-hand Use)

HHPNR (For Right-hand Use)



(The drawing is for left hand use)

When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

M Material: EN AW-6063/AlMg0,7Si-T5
Bushings: Polyacetal
S Surface Treatment: Anodize

Part Number Type	No.	* Allowable Load kg	* Allowable Load N	Mass (g)	L	W	K	P	J	S	N Through	N Countersunk	E	R	€ Unit Price 1~8 pcs.	Volume Discount 9~
HHPNL(For Left-hand Use) HHPNR(For Right-hand Use)	5	10	98	22	47	36	11	25	7.5	21	5.5	11	5	5		
	6			33		48	8.5	30	8	32	6.5	13	5.5	5.5		
	8			48	63	62	13	37	10	42						

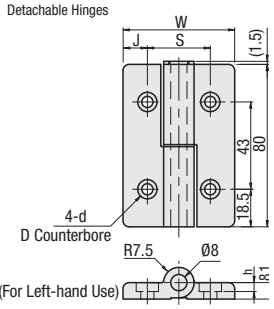
* The allowable load is the value when 2 pieces are used.

Detachable Hinges - Aluminum RoHS

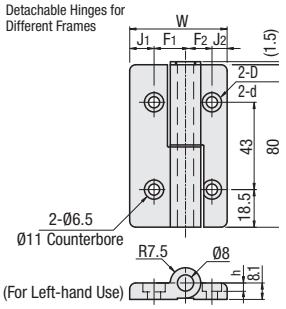


	Type: Detachable Hinges	Type: Detachable Hinges for Different Frames	Hinge Plates: M Material	Hinge Plates: S Surface Treatment	Bushing: M Material
For Left-hand Use	HHPNLK	HHPNDLK	EN AC-46100/ G-AlSi12Cu	Shot Blasted	Polyacetal
	HHPNLK-B	-		Baked Finish (Black)	
	HHPNLK-S	-		Baked Finish (Silver Metallic)	
For Right-hand Use	HHPNRK	HHPNDRK	EN AC-46100/ G-AlSi12Cu	Shot Blasted	Polyacetal
	HHPNRK-B	-		Baked Finish (Black)	
	HHPNRK-S	-		Baked Finish (Silver Metallic)	

Detachable Hinges



Detachable Hinges for Different Frames



When the hinges are mounted onto an object such as a panel, hinge nuts are recommended as shown on **P.1057**

Part Number Type	No.	* Allowable Load Kg	* Allowable Load N	Mass (g)	W	J	S	D	d	h	€ Unit Price Qty.1~19	Volume Discount 20~
Detachable Hinges HHPNLK HHPNLK-B HHPNLK-S / HHPNRK HHPNRK-B HHPNRK-S	5-25	10	98	86	41	7.5	26	9.5	5.5	4.1		
	6			103	55	12	31	11	6.5	4.4		
	8	15	147	120	73	16	41					
	8-45			130	83	18.5	46					

Part Number Type	No.	* Allowable Load Kg	* Allowable Load N	Mass (g)	W	J1	F1	D	d	h	J2	F2	€ Unit Price Qty.1~19	Volume Discount 20~
Detachable Hinges for Different Frames HHPNDRK HHPNDLK	6-5	10	98	95	48	12	15.5	9.5	5.5	4.1	7.5	13		
	8-5	15	147	103	57	16	20.5				7.5	13		
	845-5			108	62	18.5	23				7.5	13		
	8-6			111	64	16	20.5	11	6.5	4.4	12	15.5		
	845-6			116	69	18.5	23				12	15.5		

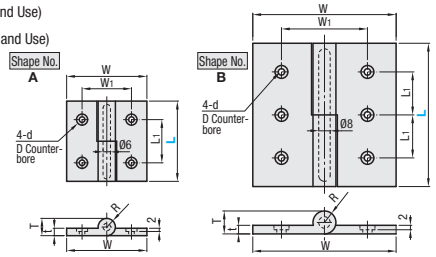
* The allowable load is the value when 2 pieces are used.

Detachable Hinges for Heavy Loads RoHS



HNZL (For Left-hand Use)

HNZR (For Right-hand Use)



(The drawing is for left hand use)

	M Material	S Surface Treatment
Hinge Plates	JIS SUS306	Buffing
Shaft		-
Bushing	Polyacetal	-

Part Number Type	L	Shape No.	W	W1	L1	T	R	T	D	D	*Allowable Load (N)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount 20~
HNZL HNZR	50	A	50	35	20	14	13.5	5	8.6	4.6	350	120		
	65		65	40	35				9.6	5.6	450	185		
	75		75	50	40	16	15.5	6	10.6	6.6	650	270		
	100	B	100	60	30						650	450		

* The allowable load is the value when 2 pieces are used.

Order Example

Part Number
HHPNR5
HHPNLK-B6
HHPNDRK8-5
HNZL100

Days to Ship: 6 Days P.87

Stepped Detachable Hinges · Vertical Detachable Hinges · Welded Detachable Hinges

CAD Data

Stepped Detachable Hinges

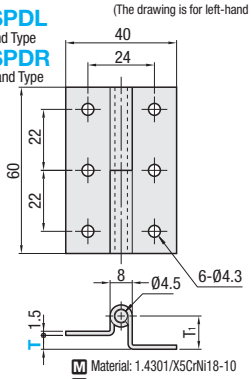
RoHS



(Left-hand Type)

HHSPDL Left-hand Type
HHSPDR Right-hand Type

(The drawing is for left-hand use.)

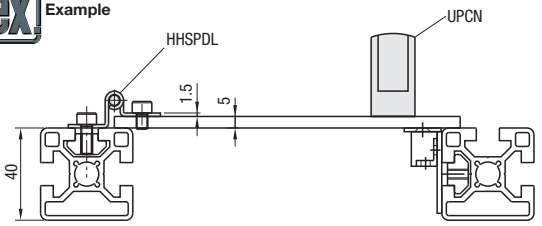


M Material: 1.4301/X5CrNi18-10
S Surface Treatment: Buffing

Part Number Type	T	T1	Allowable Load (Kg)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount 20~
HHSPDL	3	10	7	40		
HHSPDR	5	12		42		

The allowable load above is the value when 2 hinges are used.

Example



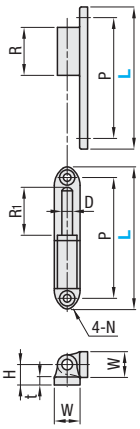
The Right-lid Type has a lid on the right side.

Vertical Detachable Hinges

RoHS



HHSV



M Material: 1.4301/X5CrNi18-10 S Surface Treatment: Tumble Polished Gloss

Part Number Type	L	N Through	N Countersunk	Allowable Load (Kg)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHSV	35	3.2	6.2	2	13		
	51			4	30		
	60	4.2	8.2	6	45		
	80			10	95		

L	W	P	D	H	t	R	R1
35	8	27	3	6	2	9	8
51	11	40	4	8	2.5	15	14.4
60	13	48	5	9.5	3	18	18
80	14.5	68	6	11.5	4.5	27	27

The allowable load above is the value when 2 hinges are used.

Order Example: Part Number HHSPDL3, HHSV51

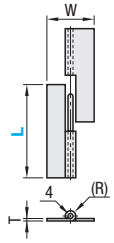
Days to Ship: 6 Days P.87

Welded Detachable Hinges

RoHS



HHSML (For Left-hand Use)
HHSMR (For Right-hand Use)



(For Left-hand Use)

M Material: 1.0330/DC01
S Surface Treatment: Trivalent Chromate

Part Number Type	L	W	T	(R)	Allowable Load (Kg)	Weight (g)	€ Unit Price 1~19 pcs.	Volume Discount 20~
HHSML (For Left-hand Use) HHSMR (For Right-hand Use)	50	32	1.6	7.5	7	30		
	64	36	1.6	7.5	10	45		
	75	38	2	8.5	15	65		

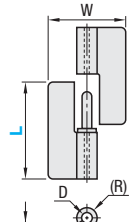
The allowable load above is the value when 2 hinges are used.

for Heavy Loads Welded Detachable Hinges

RoHS



Type	M Material	S Surface Treatment
HHSMZL HHSMZR	1.0330/DC01	Trivalent Chromate
HHSMYL HHSMYR	1.4301/X5CrNi18-10	Mirror Polishing



(For Left-hand Use)

Part Number Type	L	W	T	(R)	D	Allowable Load (Kg)	Weight (g)	€ Unit Price 1~19 pcs.	Volume Discount 20~
HHSMZL (For Left-hand Use) HHSMZR (For Right-hand Use)	50	40	2.5	10.5	5	15	60		
	65	50	2.5	10.5	5	20	89		
	75	70	3	12.5	6	30	165		
	100	72	4	16	8	50	347		
HHSMYL (For Left-hand Use) HHSMYR (For Right-hand Use)	50	40	2.6	10.5	5	15	62		
	65	50	2.6	10.5	5	20	95		
	75	70	3.2	12	6	30	180		
	100	72	4	16	8	50	335		

The allowable load above is the value when 2 hinges are used.

Order Example: Part Number HHSML50, HHSMYR75

Days to Ship: 6 Days P.87

Welded Hinges · Long Hinges

NEW

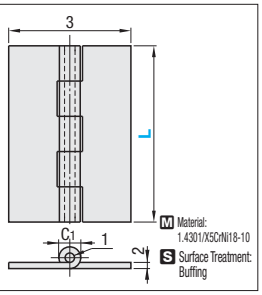
Price Reduction
Up to 53%

CAD Data

■Welded Hinges - Stainless Steel RoHS



HHSY



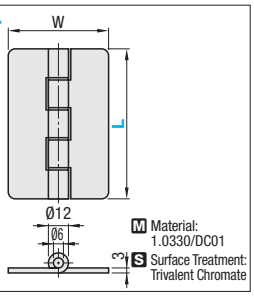
Part Number Type	L	W	C	C1	T	*Allowable Load (kg)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount Price 20~
HHSY	40	35	3	6.3	1.5	6	25		
	50	30	3	6.4	1.5	7	16		
	65	50	4	8.5	2	13	25		
	75					15	46		
	90	60	6	12.7	3	25	68		
	100					30	100		

* The allowable load is the value when 2 pieces are used.

■Welded Steel Hinges RoHS



HHSYT



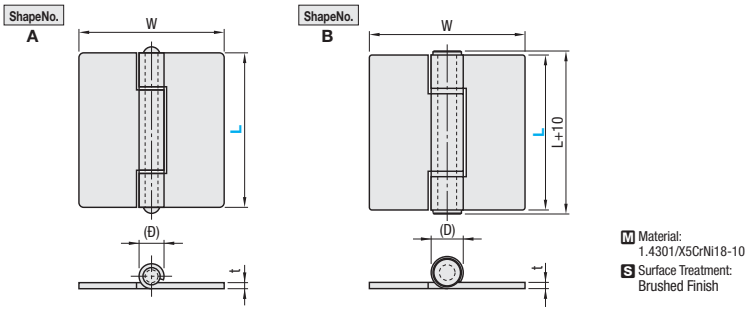
Part Number Type	L	W	*Allowable Load (kg)	Divisions	Weight (g)	€ Unit Price Qty.1~19	Volume Discount Price 20~
HHSYT	60	50	25	3	105		
	90	60	40	5	180		
	100	80	45	5	245		

* The allowable load is the value when 2 pieces are used.

■Welded Hinges for Heavy Loads RoHS



HHSYZ



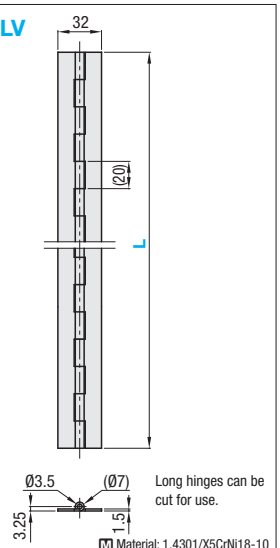
Part Number Type	L	W	(D)	t	Shape No.	* Allowable Load (Kg)	Weight (g)	€ Unit Price Qty.1~19	Volume Discount 20~
HHSYZ	50	50	12	3	A	20	90		
	60	64				25	130		
	75	70				30	165		
	100	100	20	4	B	60	520		
	125	100				70	610		
	150	120				90	840		

* The allowable load is the value when 2 pieces are used.

■Long Stainless Steel Hinges RoHS



HHSLV



Part Number Type	L	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHSLV	300	165		
	350	190		
	450	250		
	600	335		
	750	410		
	850	470		
	1000	580		

Order Example

Part Number
HHSY50
HHSYT90
HHSYZ100
HHSLV300

Days to Ship

6 Days P.87

Magnetic Catches

Price Reduction
Up to 45%

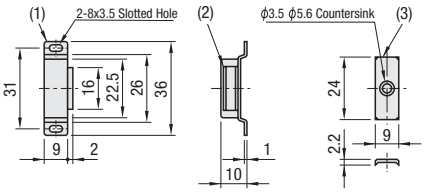
CAD Data

■Magnetic Catches

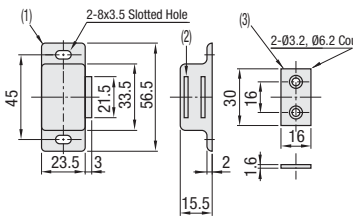


RoHS

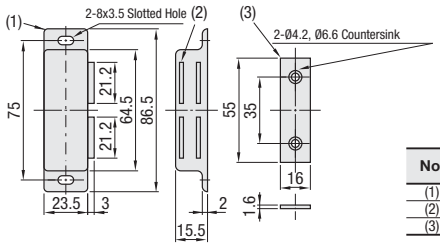
MGCE1S



MGCE1



MGCE2



No.	Part Name	M Material	S Surface Treatment
(1)	Housing	Aluminum Alloy	Anodizing
(2)	Magnet	Ferrite	-
(3)	Catch Plate	1.0330/DC01	Nickel Plating

Part Number Type	No.	Retention Force (kgf)	Mass (g)	€ Unit Price Qty.1~19	Volume Discount 20~
MGCE	1S	0.5	7.5		
	1	5.5	36.7		
	2	9	72		

Order Example — Part Number: MGCE2

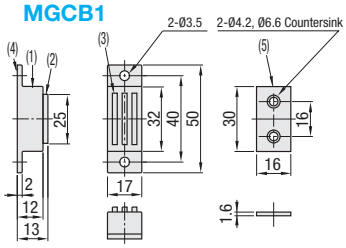
Days to Ship: 6 Days P.87

■Magnetic Catches

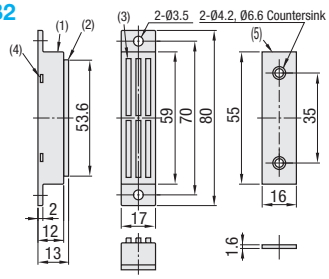


RoHS

MGCB1



MGCB2



No.	Part Name	M Material	S Surface Treatment
(1)	Housing	BSP	Nickel Plating
(2)	Yokes	1.0330/DC01	Nickel Plating
(3)	Magnet	Ferrite	-
(4)	Base	Aluminum Alloy	Anodizing
(5)	Catch Plate	1.0330/DC01	Nickel Plating

Part Number Type	No.	Retention Force (kgf)	Mass (g)	€ Unit Price Qty.1~19	Volume Discount 20~
MGCB	1	7	32		
	2	10	63		

Order Example — Part Number: MGCB1

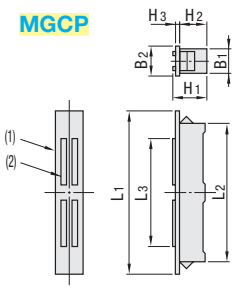
Days to Ship: 6 Days P.87

■Magnetic Catches

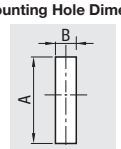


RoHS non-compliant

MGCP



Mounting Hole Dimensions



Applicable Plate Thickness t	Mounting Hole Dimensions MGCP1 A	MGCP1 B	MGCP2 · MGCP3H A	MGCP2 · MGCP3H B	MGCP3 A	MGCP3 B
0.5	22.5	8.3	-	-	-	-
0.8	-	-	34.1	8.2	55.0	8.2
1.0			34.1		55.0	
1.2			34.5		55.5	
1.6			35.0		56.0	
2.0			36.5		56.5	

MGCP1· 2 · 3 Ferrite Magnet
MGCP 3H Neodymium Magnet

No.	Part Name	M Material	S Surface Treatment
(1)	Housing	Resin	-
(2)	Base	1.0330/DC01	Colored Chromate

Part Number Type	No.	L1	L2	L3	B1	B2	H1	H2	H3	Retention Force (kgf)	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount 5~
MGCP	1	24.2	22.4	15	8.2	9.6	12.3	10.9	0.9	1.3	5		
	2	40	33.9	21.6	8	10	13.5	11	1.2	2.2	9		
	3H									4.5			
	3	64	54.5	43			14	11.5	1.5		20		

MGCP3H is a compact type of MGCP3 with the same retaining force.

Order Example — Part Number: MGCP2

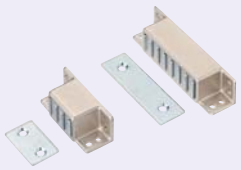
Days to Ship: 6 Days P.87

Strong Magnetic Catches / Magnetic Catches

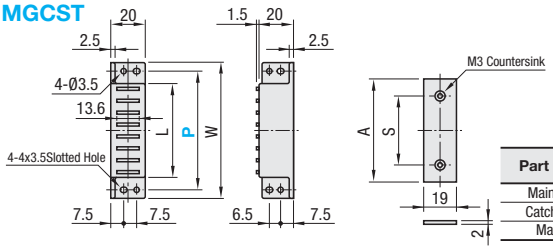
CAD Data

■Magnetic Catches - High Strength

RoHS



MGCST



Part Name	M Material	S Surface Treatment
Main Body	Zinc Alloy	Nickel Plating
Catch Plate	1.0330/DC01	Trivalent Chromate
Magnet	Ferrite	-

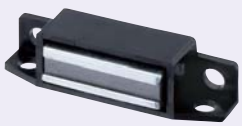
Part Number Type	P	W	L	A	S	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~49	Volume Discount 50~
MGCST	30	40	20	22	12	3	56			
	40	50	27	29	18	7	74			
	50	60	41	43	27	11	110			
	70	80	55	60	40	14	140			

Order Example — Part Number: MGCST30

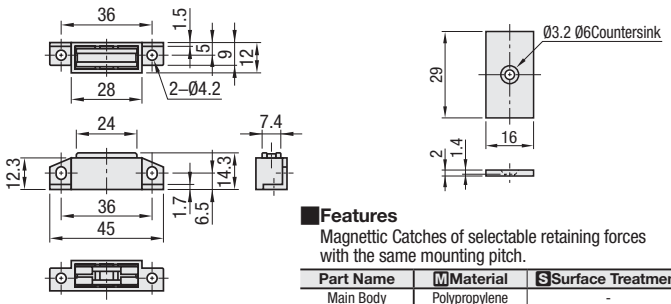
Days to Ship: 6 Days P.87

■Magnetic Catches Magnetic Force Selectable Type

RoHS



MGCEJ



■Features

Magnettic Catches of selectable retaining forces with the same mounting pitch.

Part Name	M Material	S Surface Treatment
Main Body	Polypropylene	-
Catch Plate	1.0330/DC01	Trivalent Chromate

10 pcs. per package. Check Qty. before ordering.

Part Number Type	No.	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 Pkgs.	Volume Discount 10~19	Volume Discount 20~
MGCEJ	1	1.8	10			
	2	4.5	10			
	3	8	10			

10 pcs. per pack

Order Example — Part Number: MGCEJ1

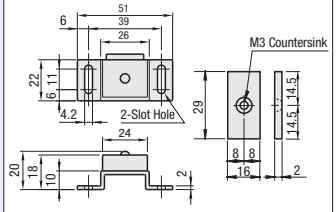
Days to Ship: 6 Days P.87

■Magnetic Catches

RoHS



HMEN-T HMEN-T2



Part Name	M Material	S Surface Treatment
Housing	1.4301	Dark Brown Paint
Magnet	Ferrite	-
Plate	1.0330	Chrome Plating

Part Number	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HMEN-T	3	41		
HMEN-T2	1.5	41		

Order Example — Part Number: HMEN-T, HMENP

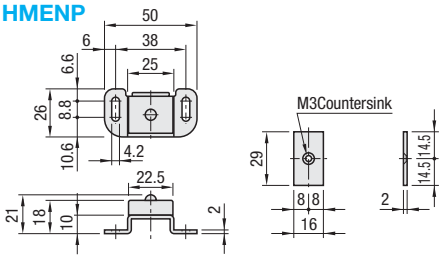
Days to Ship: 6 Days P.87

■Magnetic Catches

RoHS



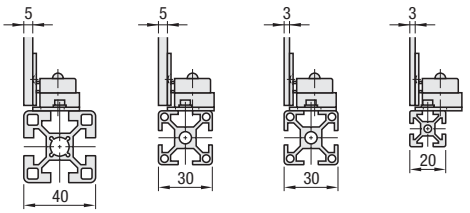
HMENP



Part Name	M Material	S Surface Treatment
Housing	1.4301/X5CrNi18-10	Dark Brown Paint
Magnet	Ferrite	-
Plate	1.0330/DC01	Trivalent Chromate

Part Number	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HMENP	2.8	39		

Example — How to apply HMENP magnetic catches to aluminum frames.



■When mounting a 5mm-thick panel to 40-Square Type.

■When mounting a 5mm-thick panel to 30-Square Type.

■When mounting a 3mm-thick panel to 30-Square Type.

■When mounting a 3mm-thick panel to 20-Square Type.

Thin Magnetic Catches / Ultrathin Magnetic Catches / Adjustable Magnetic Catches

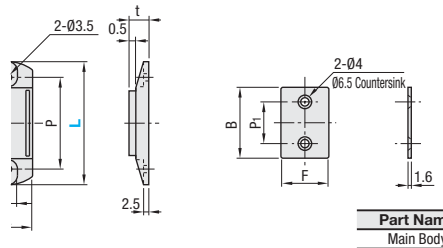
CAD Data

■Thin Magnetic Catches



RoHS

MGCBU



Part Name	Material	Surface Treatment
Main Body	ABS Resin	-
Catch Plate	1.0330/DC01	Chrome Plating
Magnet	Ferrite	-

10 pcs. per package. Check Qty before ordering.

Part Number Type	L	P	A	T	F	B	P_1	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 Pkgs.	Volume Discount 10~
MGCBU	49	34	17	6.5	16.5	24	13	0.9	15		
	59	44	23.5	6.7	23	34	20	2.0	33		
	70	55	24.5	7.7	24	45	30	3.5	49		

10 pcs. per pack

Order Example — Part Number: MGCBU49

Days to Ship: 6 Days

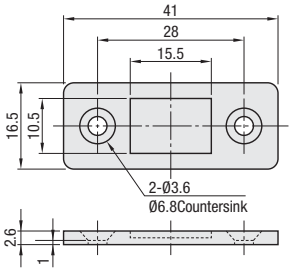
P.87

■Ultrathin Magnetic Catches



RoHS

MGCM



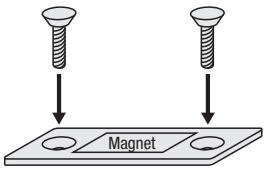
Part Name	Material	Surface Treatment
Main Body	1.0330/DC01	Nickel Plating
Magnet	Neodymium	Nickel Plating

There is no receiving plate.

Part Number Type	No.	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
MGCM	1	1.5	12		
	2	4	12		

Example

Use Flush Bolt M3



Order Example — Part Number: MGCM2

Days to Ship: 6 Days

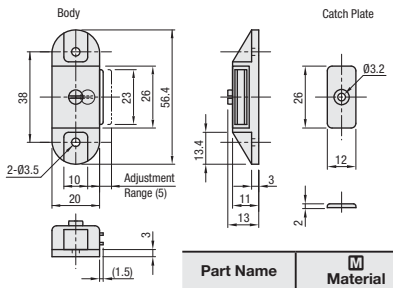
P.87

■Magnetic Catches Adjustable Type



RoHS

AMGCB



Part Name	Material	Surface Treatment
Main Body	Polypropylene	-
Catch Plate	1.0330/DC01	Chrome Plating
Magnet	Ferrite	-

Part Number Type	No.	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~19	Volume Discount 20~
AMGCB	1	3.1	15			

Example

The catch portion moves fore and aft when the adjusting screw is turned.



■Features

- The magnet position can be adjusted by 5mm increment.

Order Example — Part Number: AMGCB1

Days to Ship: 6 Days

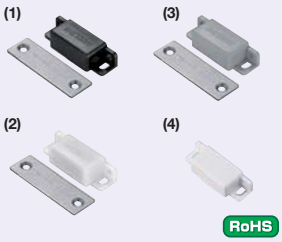
P.87

NEW Low Particulate Generation Magnetic Catches / Low Particulate Generation Thin Magnetic Catches / Resin Catches

Price Reduction
Up to 30%

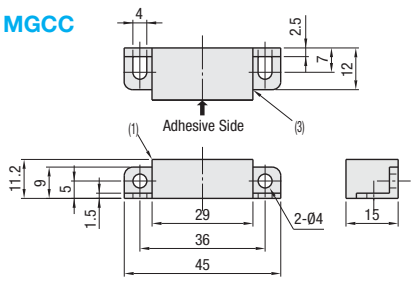
CAD Data

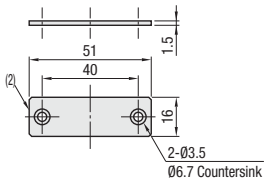
■Low Particulate Generation Magnet Catches



RoHS

MGCC





No.	Part Name	Material
(1)	Main Body	Polyacetal
(2)	Catch Plate	1.4016/X6(8)Cr17
(3)	Magnet	Neodymium Magnet

Part Number Type	No.	Retention Force (kgf)	Mass (g)	Color	€ Unit Price 1~9 pcs.	Volume Discount 10~
MGCC	1	1.0	21	(1) Black		
	2	1.4	22	(2) Gray		
	3	2.0	24	(3) White		
	4	3.3	25	(4) White		

■Features
- The magnet encapsulated structure is effective for preventing rust and dust intrusions.
- These magneticcatches are the best suited for use in clean rooms.

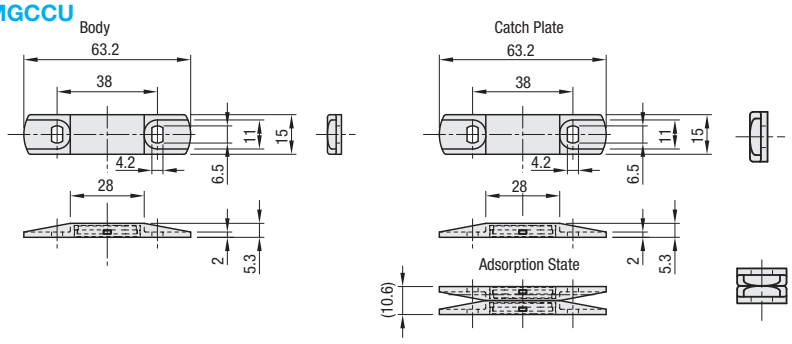
Order Example: Part Number MGCC3
Days to Ship: 6 Days P.87

■Low Particulate Generation Thin Magnetic Catches



RoHS

MGCCU



Part Name	Material
Main Body	Polyacetal
Catch Plate	1.4016/X6(8)Cr17
Magnet	Neodymium Magnet

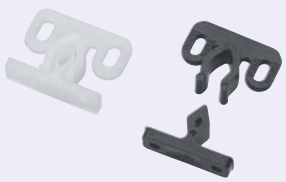
The catch plate is resin-coated.

Part Number Type	No.	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
MGCCU	1	1	14		

■Features
- As the catch plate is resin-coated, particle generation can be reduced even further.

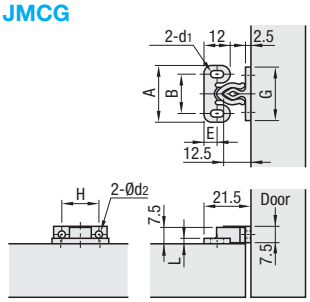
Order Example: Part Number MGCCU1
Days to Ship: 6 Days P.88

■Resin Catches



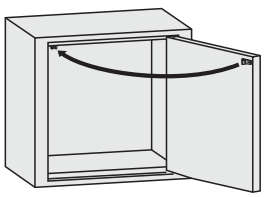
RoHS

JMCG



Part Name	Material
Female Side	Polyacetal
Male Side	Polyamide

ex Example



Part Number Type	No.	Retention Force (kgf)	Latching Force (kgf)	A	B	E	G	H	L	d1	d2	Mass (g)	Color	€ Unit Price Qty.1~
JMCG	1W	1.7	2.2	26	18	6	24.5	17	2.5	3.3x6	3.3	2	White	
	2B	2.7	3.1	24	17	7	22	15.5	2	2.5x5.5	2.5	1.5	Black	
	2W	2.7	3.1	24	17	7	22	15.5	2	2.5x5.5	2.5	1.5	White	

Order Example: Part Number JMCG1W
Days to Ship: 6 Days P.87

Magnetic Catches with Sensors / Door Limit Switches

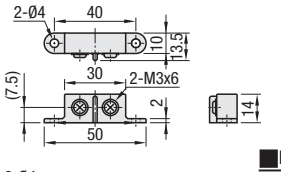
CAD Data

Door Limit Switches

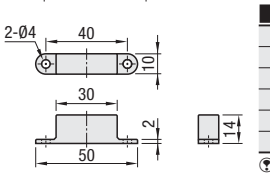


RoHS

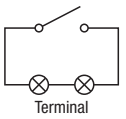
BCWS Body Side



Door Side



Wiring



Performance

Detection Distance	As Shown Below
Maximum Operating Voltage	DC100V
Maximum Operating Current	0.5A
Maximum Operating Power	10W
Contact Resistance	150mΩ
Withstand Voltage	DC200V 1min

AC Unusable

Part Name	Material
Main Body	ABS
Magnet	Ferrite
Terminal	1.4301/X5CrNi18-10

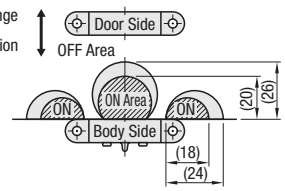
Part Number Type	Part Number No.	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
BCWS	1	19		

Order Example — Part Number: BCWS1

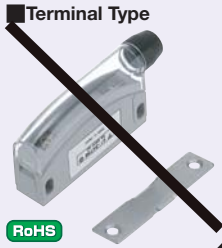
Days to Ship: 6 Days P.88

Example

Detection Range / Moving Direction

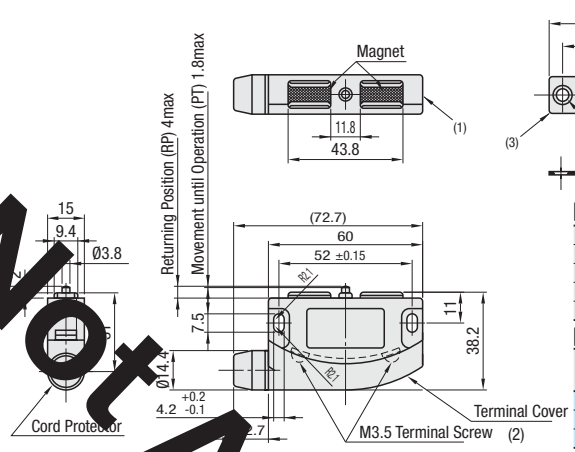


Terminal Type



RoHS

No.	Part Name	Material	S
(1)	Main Body	Polybuthylen-eterephthalate (PBT)	-
(2)	Terminal Cover	Polycarbonate	-
(3)	Back Plate	1.0330/DC01	Nickel Plating



Operating Properties of Switch

Operating Force (OF) (N{gf})	3.43{350}max.
Returning Force (RF) (N{gf})	0.49{50}min.
ON Distance (PT)	1.8mm max.
Hysteresis Range (MD)	0.2~0.8mm
Returning Position (RP)	4.0mm max.

Rating

	Resistive Load	Lamp Load	Inductive Load
AC125V	5A	1.5A	3A
AC250V	5A	-	3A
DC30V	5A	-	1.5A

Part Number Type	Part Number No.	Operation	Retention Force (kgf)	Case Color	Mass (g)	Unit Price Qty. 1	Volume Discount
		OFF when attracted	3	Gray	52		
		ON when attracted					

Order Example — Part Number

Days to Ship: 8 Days — Express A: 2,00 EUR/piece P.88

Flat charge of 5,40 EUR for 3 or more identical pieces.

Performance Overview

Electrical Performance	Insulation Resistance (Initial)	100MΩ or More (With 500VDC Insulation Resistance Meter)
	Withstand Voltage	Between Contact Points: 1,000VAC/min. (Initial) Between Each Terminal and Non-charging Metal Part: 2,100VAC/min. Between each Terminal and Ground: 2,100VAC/min.

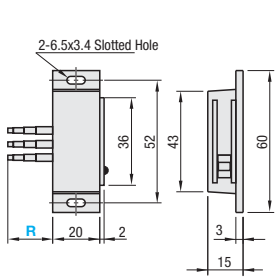
Life	Mechanical Life	100,000 times/min.
	Electrical Life	50,000 Times or More (Resistive load 250 Open/Close Frequency: 20 times/min.) 30,000 Times or More (Lamp Load 125
Degree of Protection		IP40

Operating Conditions	Operation Temperature	-20~+80°C (No freezing)
	Operation Environment Humidity	95% RH or Less
	Allowable Operating Frequency	Mechanical: 60 times/min., Electrical: 20 times/min.

Magnetic Catches with 3 Wires



RoHS



When the main body and the plate are in contact, White -Red conducts.
When the main body and the plate are separated, White -Black conducts.



Max. Contact Capacity
AC250V3A
DC125V0.4A

Part Name	Material	S Surface Treatment
Main Body	Polyethylene	-
Plate	1.0330/DC01	Trivalent Chromate

Part Number Type	R	Retention Force (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
		2	43		

Order Example — Part Number - R: - 150

Days to Ship: 6 Days P.87

The default R dimension will be 150 unless specified.

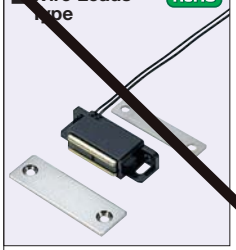
Not Available

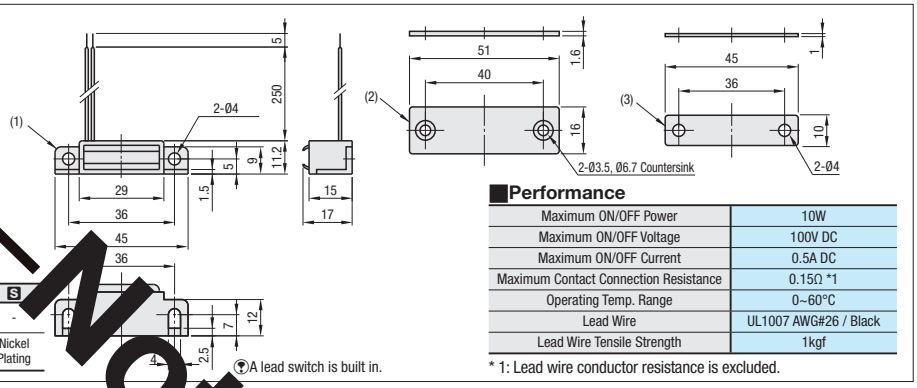
Magnetic Catches with Sensors / Ball Catches

Price Reduction
Up to 46%

CAD Data

Wire Leads Type RoHS





No.	Part Name	Material	S
(1)	Main Body	Polycarbonate	-
(2)	Catch Plate	1.0330/DC01	Nickel Plating
(3)	Back Plate		

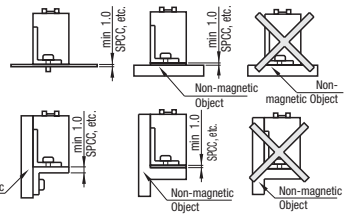
A lead switch is built in.

Performance

Maximum ON/OFF Power	10W
Maximum ON/OFF Voltage	100V DC
Maximum ON/OFF Current	0.5A DC
Maximum Contact Connection Resistance	0.15Ω *1
Operating Temp. Range	0~60°C
Lead Wire	UL1007 AWG#26 / Black
Lead Wire Tensile Strength	1kgf

* 1: Lead wire conductor resistance is excluded.

Part Number Type	No.	Operation	Retention Force (kgf)	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount 5~
		OFF when attracted	3	28		
		ON when attracted				



Order Example: Part Number

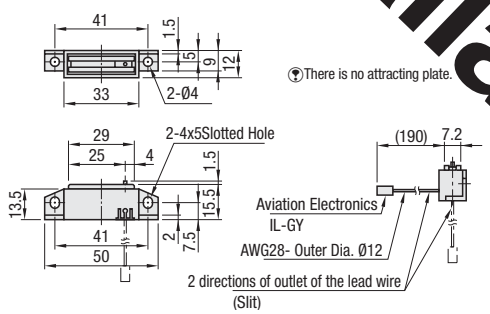
Days to Ship: 6 Days P87

Precautions for Use

- Do not apply any strong impacts since a [illegible] switch is used.
- Do not use or store in places with strong magnetic fields, [illegible] objects, etc. away from the attraction surface of the product.
- Carefully keep magnetic materials (particles) a[illegible] objects, etc. away from the attraction surface of the product.
To mount it on a nonmagnetic object (wood, resin, glass, aluminum, etc.), mount the included back plate or a similar magnetic object o[illegible] surface.

Magnetic Catches with Switch RoHS





Performance

Contact Type	1 Circuit, 1 Contact, Normally Closed
Rating	30VDC 10mA (Resistive Load)
ON/OFF Voltage	500VAC / min.
Maximum Contact Connection Resistance	100MΩ or more (500VDC)
Operating Temperature Range	-10°C ~ +70°C
Lead Wire	For IL-G of Japan Aviation Electronics
Lead Wire Tensile Strength	1kgf

Part Name	Material	Surface Treatment
Main Body	Polypropylene	-
Magnet	Ferrite	-

Part Number Type	Retention Force (kgf)	Case Color	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~49	50~
	3	Black	13			

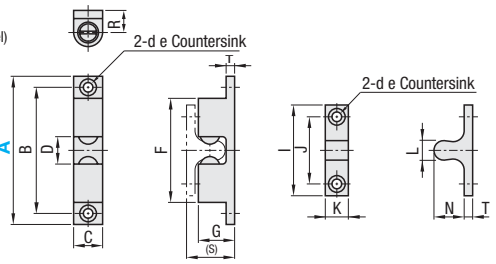
Order Example: Part Number

Days to Ship: 6 Days P87

Ball Catches RoHS



BCAS (Stainless Steel)
BCASS (Stainless Steel)
BCASD (Zinc Diecast)



Type	Material	Surface Treatment
BCAS	1.4401/ X5CrNiMo17-12-2	-
BCASS	1.4301/ X5CrNi18-10	-
BCASD	Zinc Die Casting	Chrome Plating

Part Number Type	A	B	C	D	D	e	F	G	T	I	J	K	N	L	R	(S)	Latching Force N (kgf)	Unlatching Force N (kgf)	Mass (g)	€ Unit Price BCAS	BCASS	BCASD
BCAS BCASS BCASD	32	25	8	4	3.2	6.2	18	9	2	18	11	8	6.5	3.2	6	11.5	17(1.7)	8(0.8)	12			
	43	35	8	5.9	3.2	6.2	28.4	10	2.5	25	16	7.5	8.5	4.5	6	13.5	20(2)	13(1.3)	16			
	50	40	10	7.5	4.2	8.2	31.5	12.2	2.9	30	20	9	10.3	6	7.7	15.9	23(2.3)	18(1.8)	28			
	70	60	13	13			51	17	4	42	30	10.5	15	10	10.5	23	56(5.7)	38(3.9)	78			

Order Example: Part Number BCAS 50

Days to Ship: 6 Days P87

Price

Volume Discount (Round down to one Cent.) P87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Not Available

Snap Locks

Price Reduction
Up to 29%

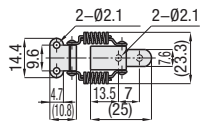
CAD Data

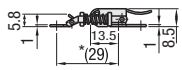
Snap Locks

RoHS



PKBSA (Stainless Steel)





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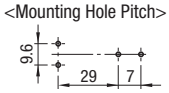
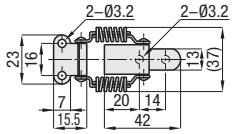
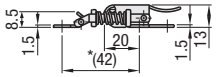


PKBS1 (Stainless Steel)





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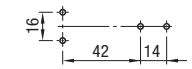
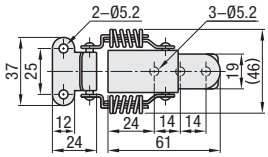
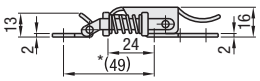


PKBS2 (Stainless Steel)





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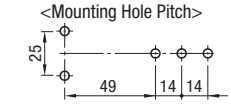


Material	Surface Treatment
1.4301/X5CrNi18-10	Tumble Polish

* The dimensions are for 0mm pull distance.

Part Number Type	No.	* Pull Force N (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~19	20~
PKBS	A	20(2)	10			
	1	68(7)	36			
	2	170(17.4)	78			

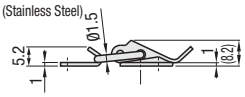
* Pull force is for 1mm pull distance.

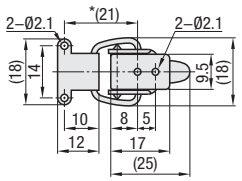
Snap Locks

RoHS



PKWS 1 (Stainless Steel)





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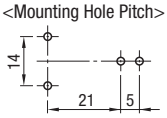
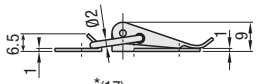
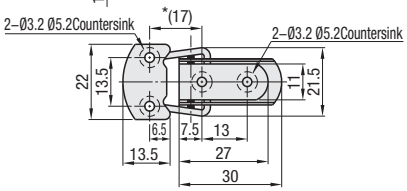


PKWS 2 (Stainless Steel)





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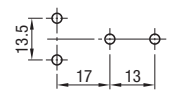
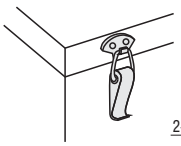
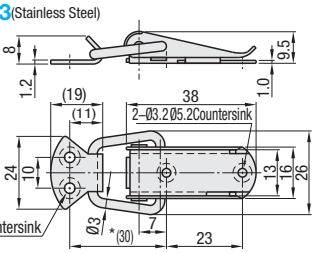


Recommended Screws: Cross Recessed Pan Head M2 Screws

PKWS 3 (Stainless Steel)

Example





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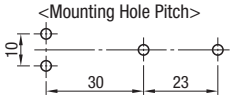
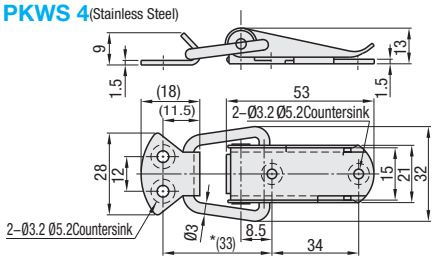


PKWS 4 (Stainless Steel)



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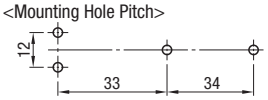


* The dimensions are for 0mm pull distance.

Material	Surface Treatment
1.4301/X5CrNi18-10	Tumble Polish

Part Number Type	No.	* Pull Force N (kgf)	Mass (g)	€ Unit Price Qty. 1~49	Volume Discount 50~
PKWS	1	49(5)	11		
	2	78(8)	12		
	3	98(10)	18		
	4	147(15)	37		

Order Example — Part Number: PKBS2, PKWS1

Days to Ship: 6 Days

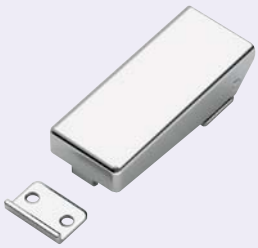
P.87

* Pull force is for 1mm pull distance.

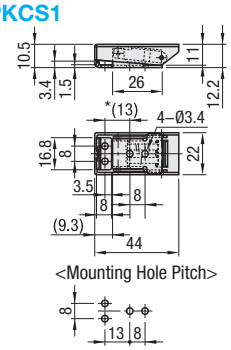
Covered Snap Locks / Snap Locks for Medium Loads

CAD Data

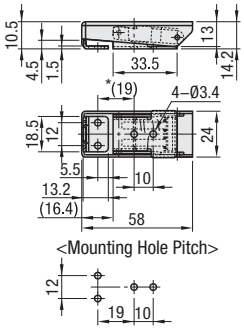
Covered Snap Locks RoHS



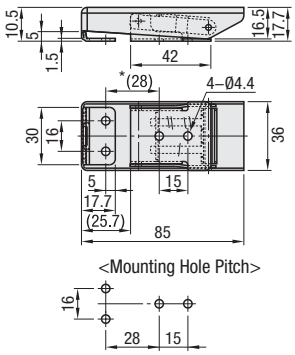
PKCS1



PKCS2



PKCS3



* The dimensions are for 0mm tightening amount.

Material	Surface Treatment
1.4301/X5CrNi18-10	Tumble Polish

Part Number Type	No.	* Pull Force N (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
PKCS	1	12(1.2)	25		
	2	69(7)	53		
	3	81(8.3)	115		

* Pull force is for 1mm pull distance.

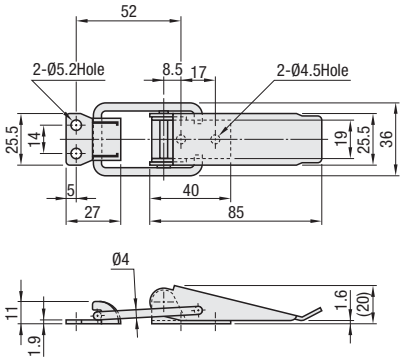
Order Example — Part Number: PKCS2

Days to Ship — 6 Days P.87

Snap Locks for Medium Loads RoHS



PKWSZ



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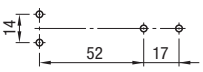


* The dimensions are for 0mm pull distance.

Material	Surface Treatment
1.0330/DC01	Trivalent Chromate

Part Number Type	No.	* Pull Force N (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~29	30~49	50~
PKWSZ	1	245(25)	79				

* Pull force is for 1mm pull distance.

Order Example — Part Number: PKCS2, PKWSZ1

Days to Ship — 6 Days P.87

Adjustable Snap Locks · Corner Snap Locks · Knuckle Locks

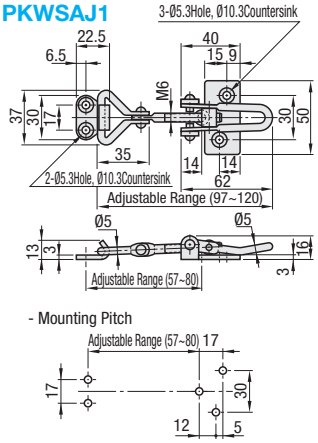
CAD Data

■Adjustable Snap Locks

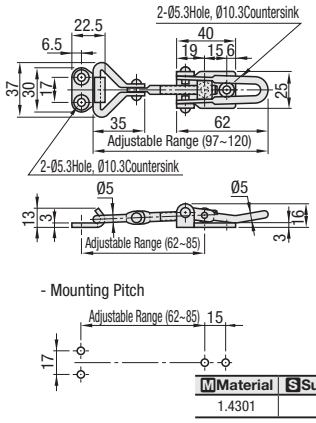
RoHS



PKWSAJ1



PKWSAJ2



Material	Surface Treatment
1.4301	-

Part Number Type	No.	* Pull Force N (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~29	30~49	50~
PKWSAJ	1	588(60)	100				
	2	588(60)	90				

■Features

Adjustable by approx. 23mm after installing Snap Locks.

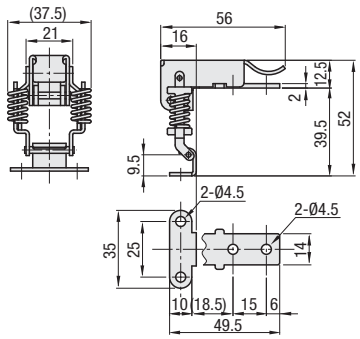
■Corner Snap Locks

RoHS



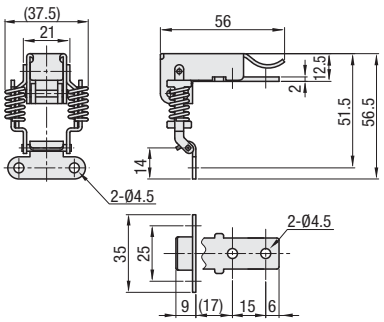
In-line Catch Type

PKBSK1 (Stainless Steel)



Right Angle Catch Type

PKBSK2 (Stainless Steel)



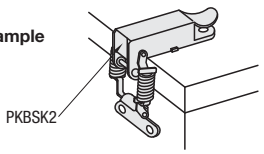
* The dimensions are for 0mm pull distance.

Material	Surface Treatment
1.4301	Electrolityc Polishing

Part Number Type	No.	* Pull Force N (kgf)	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~19	20~
PKBSK	1	44(4.5)	56			
	2					

* Pull force is for 1mm pull distance.

ex. Example

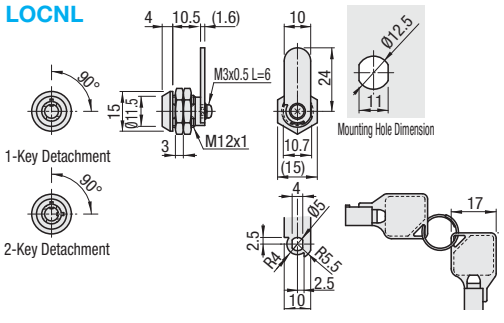


■Knuckle Locks

RoHS



LOCNL



- Mass: 25g

The cam must turn right or left when locked, and must face upward when unlocked.

External force must not be applied to the cam when locked.

The key must not be inserted or removed while rotating.
It must be inserted or removed at a predetermined position.

Part Name	Material	Surface Treatment
Main Body	Zinc Die Casting	Chrome Plating
Hexagon Nut	1.0330/DC01	Trivalent Chromate
Lock Plate	1.0330/DC01	Trivalent Chromate
Keys (2pcs. included)	1.0330/DC01	Chrome Plating

Part Number Type	No.	Operation Key In / Out	€ Unit Price 1~9 pcs.	Volume Discount 10~
LOCNL	1	1 Location		
	2	2 Locations		

Order Example

Part Number
PKWSAJ1
PKBSK2
LOCNL1

Days to Ship: 6 Days

P.87

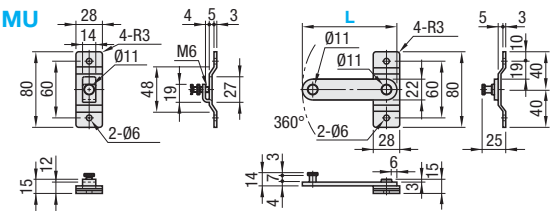
Large Cabinet Locks · Slide-bolts · Square Latches · Airtight Latches

CAD Data

■Large Cabinet Locks RoHS

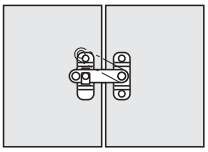


HHMU



M Material	S Surface Treatment
1.4301	Electrolityc Polishing

Example

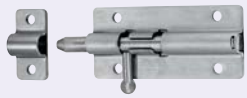


Part Number Type	L	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHMU	100	193		
	150	219		

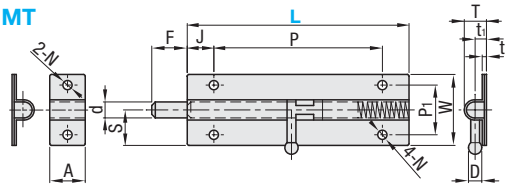
Order Example: Part Number HHMU100

Days to Ship: 6 Days P.87

■Hinges - With Slide Bolts RoHS

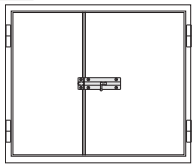


HHMT



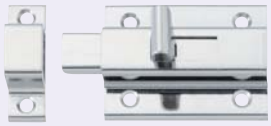
M Material: 1.4301/X5CrNi18-10

Example

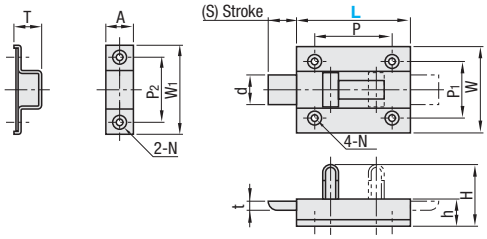


Part Number Type	L	W	P	P1	D	D	T	T	t1	A	S	F	J	N	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~
HHMT	90	40	60	28	7.5	9	12	2.4	5.7	20	20	20	15	5	128		
	125	40	95	28	7.5	9	12	2.4	5.7	20	20	20	15	5.2	167		
	180	60	140	40	10	13	16	3	8	25	30	25	20	6.2	451		

■Square Latches RoHS



HHMSQ



M Material: 1.4301/X5CrNi18-10

Part Number Type	L	P	P1	P2	W	W1	D	(S)	A	T	t	H	h	N Through	N Countersunk	Mass (g)	€ Unit Price 1~9 pcs.	Volume Discount 10~49	Volume Discount 50~
HHMSQ	50	34	25	28	38	38	13	12.5	12	12.5	4	27	12	3.5	7	58			
	65	47	31	32	45	45	15	15	15	13.5	5	28	12.5	5	9	100			

■Airtight Latches RoHS



Photo: Left-hand use

LCAR (For Right-hand Use)
LCAL (For Left-hand Use)

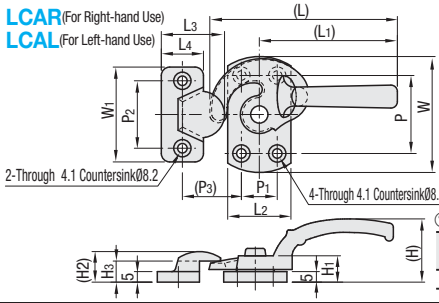
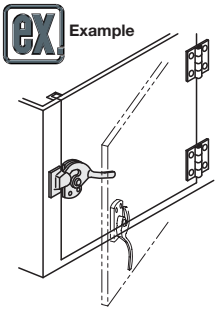


Figure: Right-hand use

M Material	S Surface Treatment
1.4301	Buffing

Example



Part Number Type	No.	(L)	(L1)	L2	L3	L4	W	W1	(H)	H1	(H2)	H3	P	P1	P2	(P3)	Mass (g)	€ Unit Price
LCAR (For Right-hand Use) LCAL (For Left-hand Use)	11	89	65.5	30	30	20	55	45	30	12.5	14.5	10	37	17	32	28	150	
	16	113	85.5	30	30	20	60	45	40	13	14.5	10	40	20	32	28	194	
	20	125	98	32	31.5	23	65	50	40	14	17	11	43	22	35	30	210	
	25	140	109	40	35	24	80	50	46.5	14.5	18	13	52	25	34	34	290	
	30	170	127	45	40	28	90	52	50.8	16.8	19	14.5	70	34	40	43	450	

Order Example: Part Number HHMT90, HHMSQ65, LCAR16

Days to Ship: 6 Days P.87

Price

- Available for LCAR and LCAL only.

■Volume Discount (Round down to one Cent.)

Qty.	1~19	20~24	25~29	30~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Latches / Canopy Latches

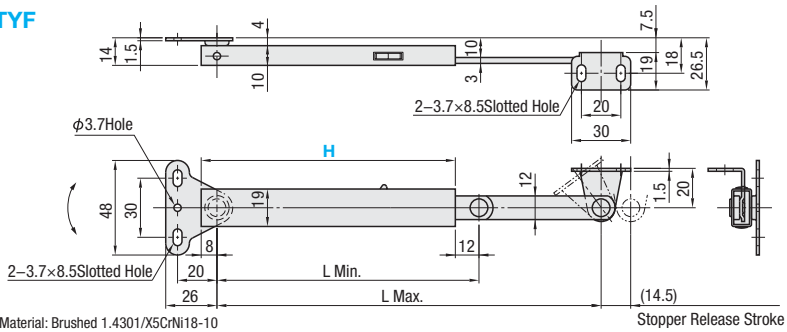
CAD Data

■Latches



RoHS

STYF



M Material: Brushed 1.4301/X5CrNi18-10

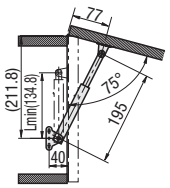
Part Number Type	H	Min. Length L Min	Max. Length L Max	Mass (g)	Maximum Retainable Load N (kgf)/1 Pc.	€ Unit Price
STYF	129	133	195	126	147(15)	
	166	170	270	148		

The body and the bracket can be used on both sides.

Order Example | Part Number: STYF166 | Days to Ship: 6 Days P.87

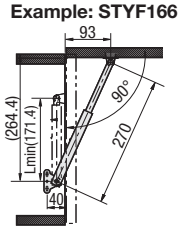
Example

Example: STYF129



The figure is for right side.

Example: STYF166



The figure is for right side.

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Cautions

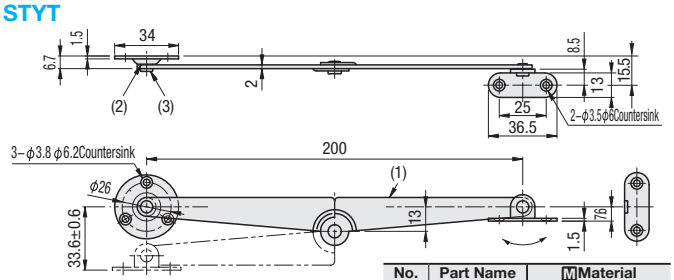
- The upper and lower brackets can be positioned according to the height and degree of the door/lid. When the door/lid is closed, L min dimension must be larger than the minimum dimension of contraction. (If L min dimension is smaller, the hinges and latches might be damaged.)
- When two latches are used, they might not be in sync. on right and left sides.

■Canopy Latches



RoHS

STYT

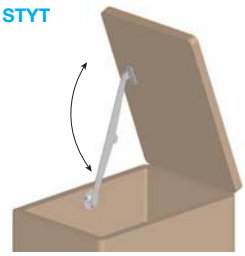


No.	Part Name	M Material
(1)	Main Body	1.4301/X5CrNi18-10
(2)	Washer	Polyamide
(3)	Rivet	1.4301/X5CrNi18-10

Figure: Left-hand use

Example

STYT



Part Number Type	Right and Left	Mass (g)	€ Unit Price
STYT	L(For Left Side)	66	
	R(For Right Side)		

Order Example | Part Number: STYTL | Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

Please request a quotation for qty. more than listed.

■Small Canopy Latches



RoHS

STYTM

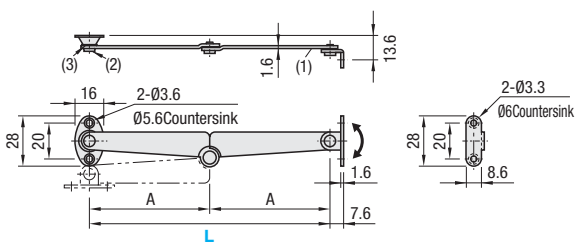
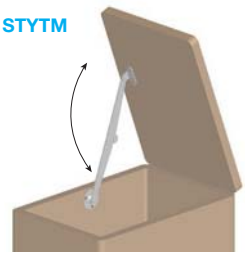


Figure: Left-hand use

No.	Part Name	M Material	S Surface Treatment
(1)	Main Body	1.0330/DC01	Chrome Plating
(2)	Washer	Polyamide	-
(3)	Rivet	Brass	Chrome Plating

Example

STYTM



Part Number Type	Right and Left	L	A	Mass (g)	€ Unit Price Qty.1~19	Volume Discount 20~
STYTM	L(For Left Side) R(For Right Side)	106	53	20		
	L(For Left Side) R(For Right Side)	134	67	31		

Order Example | Part Number: STYTMR134

Days to Ship: 6 Days P.87

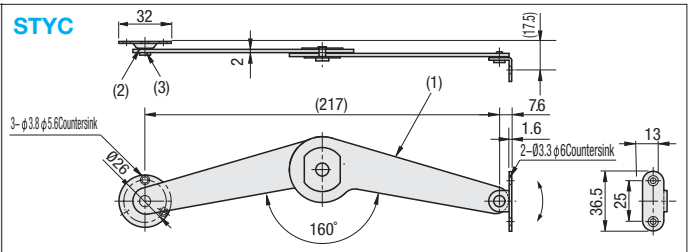
Latches with Catch Mechanisms / Rotary Latches / Spring Loaded Latches

CAD Data

■Latches with Catch Mechanisms



STYC

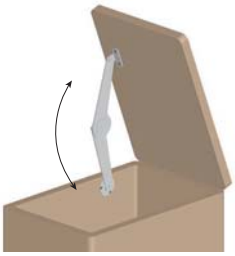


The Latches click when open at 160° before being fixed by the catch mechanism.
The catch mechanism can be released when firmly pushed at the ends of the latches (e.g. with hands).
The Latches do not have a locking and fixing mechanism.
Figure: Left-hand use

No.	Part Name	Material	Surface Treatment
(1)	Main Body	Steel	Chrome Plating
(2)	Washer	Polyamide	-
(3)	Rivet	Brass	Chrome Plating

Example

STYC



RoHS

Part Number Type	Part Number Right and Left	Mass (g)	€ Unit Price
STYC	L(For Left Side) R(For Right Side)	125	

Order Example — Part Number: STYCR

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

Please request a quotation for qty. more than listed.

■Rotary Latches



STYR

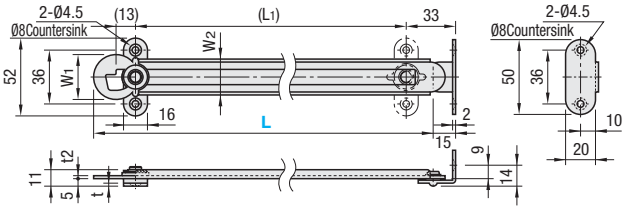
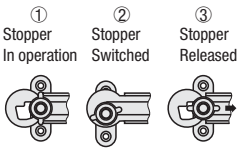


Figure: Right-hand use

Material: Electropolished 1.4301/X5CrNi18-10

Example



RoHS

Part Number Type	Part Number Right and Left	L	(L1)	W1	W2	T	Mass (g)	€ Unit Price
STYR	L(For Left Side) R(For Right Side)	150	105	28	23	1.5	75	
	L(For Left Side) R(For Right Side)	198	153	28	23	1.5	85	
	L(For Left Side) R(For Right Side)	277	231	30	24	2	120	

Order Example — Part Number: STYRL150

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

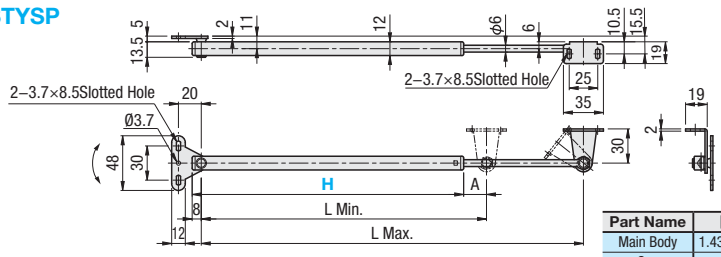
Qty.	1~9	10~14	15~19	20~49
Rate	Price List	5%	10%	18%

Please request a quotation for qty. more than listed.

■Spring Loaded Latches



STYSP



Part Name	Material	Finish
Main Body	1.4301/X5CrNi18-10	Brushed
Cap	Polyamide	-

Use this product in pairs.

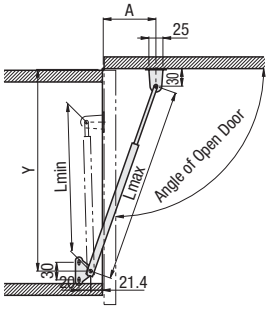
RoHS

Part Number Type	Part Number H	Max. Length L Max	Min. Length L Min	Stroke	A	Mass (g)	Reactive Force of Spring Latch N (kgf) L Max	Reactive Force of Spring Latch N (kgf) L Min	€ Unit Price
STYSP	170	222	172	50	10	145	31.4(3.2)	68.6(7.0)	
	238	335	250	85	20	185	37.2(3.8)	83.3(8.5)	
	269	380	280	100	19	205	35.3(3.6)	83.3(8.5)	

The body and the bracket can be used on both sides.

Example

Example of STYSP



■Features

When the door/lid is opened or closed, it will automatically stop at the preset position by the action of the spring.
An extra stroke or action is not required.
The mounting example shows the distance from the rotation center of hinge.
When the door/lid is closed, L min dimension must be larger than the minimum dimension of contraction. (If L min is smaller, the hinge or the latch might be damaged.)

Type	Mass of Door (kg)	Angle of Open Door	Lmax	A	Y
STYSP170 (Two Latches, Right and Left)	2.4 or Less	90	222	58	235.9
	2.6 or Less	85		63	240.4
	3.0 or Less	75		75	251.5
STYSP238 (Two Latches, Right and Left)	2.9 or Less	90	335	90	334.5
	3.1 or Less	85		97	351.4
	3.6 or Less	75		115	368.1
STYSP269 (Two Latches, Right and Left)	3.1 or Less	90	380	103	386.9
	3.3 or Less	85		111	394.6
	3.9 or Less	75		131	413.7

Order Example — Part Number: STYSP

Days to Ship: 6 Days P.87

Price

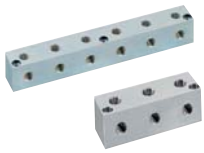
■Volume Discount (Round down to one Cent.) P.87

Qty.	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

Please request a quotation for qty. more than listed.

Manifolds

Manifolds






Product Name	Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic	Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic
Page	1084	1084	1085	1085







Manifold Blocks -Hydraulic / Pneumatic	Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic	Manifold Blocks - Pneumatic	Manifold Blocks - Pneumatic
1086	1087	1087	1088	1088






Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic	Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic
1089	1090	1091	1092






Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic	Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic
1093	1094	1095	1096







Manifold Blocks - Hydraulic	Manifold Blocks - Pneumatic	Manifold Blocks - Hydraulic / Pneumatic	Manifold Blocks - Hydraulic / Pneumatic, Two Circuit
1097	1098	1099/ 1100	1101



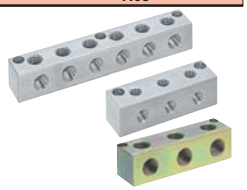




Air Manifold Blocks - 2 Circuit Type-	Manifold Blocks - Hydraulic	Hydraulic Manifold Blocks	Manifold Blocks - Pneumatic	Terminal Blocks - Hydraulic
1102	1103	1104	1104	1105







Terminal Blocks - Pneumatic	Terminal Blocks - Hydraulic	Terminal Blocks - Pneumatic	Terminal Blocks - Hydraulic	Terminal Blocks - Pneumatic
1105	1106	1106	1107	1107



Terminal Blocks - Hydraulic
1109



Terminal Blocks - Pneumatic
1110



Manifold Blocks - Hydraulic, Block Square 50, High Pressure
1111



Manifold Blocks - Pneumatic
1111



Manifolds with Magnets
1111



Manifold Blocks-Hydraulic / Pneumatic-Selectable Thread Size-
1112



Manifold Blocks - Pneumatic
1113



Aluminum Frame Manifolds
1113



Rotary Manifolds
1114



Hollow Manifolds
1115



Hollow Manifolds -Socket Selectable-
1116



-One Direction-
1117



Sockets for Hollow Manifolds
1117



Hollow Manifolds
1118



Hollow Manifolds -2 Directions 90°
1119



Sockets for 90° Type
1119



Hollow Manifolds -2 Directions 180°-
1120



Plates with Fittings
1121



Simplified Manifolds
1121



Brackets with Fittings - Socket
1122



-One-touch Coupling-
1122

[Reference] Recommended Tightening Torque
(When the recommended values are exceeded, the threads may be damaged or tapered threads may interfere with each other.)

Thread Size		M3	M4	M5	R1/8	R1/4	R3/8	R1/2	R3/4	R1
Through hole diameter		2.5~2.6	3.3~3.4	4.2~4.3	8.2~8.5	11~11.5	14.4~14.5	18.0	23~23.5	29~29.5
Tightening Torque N·m (kgf·cm)	For Hydraulics (1.0038/S235JR · JIS SUS)	0.3~0.5 (3 ~ 5)	1.0~1.5 (10 ~ 15)		8~10 (80 ~ 100)	12~16 (120 ~ 160)	25~30 (250 ~ 300)	35~40 (350 ~ 400)	50~60 (500 ~ 600)	80~90 (800 ~ 900)
	For Hydraulics (Brass) For Pneumatic Type (EN AW-5052/AlMg2,5 · EN AW-6063/AlMg0,7Si)	0.3~0.5 (3 ~ 5)	0.5~1 (5 ~ 10)		4~6 (40 ~ 60)	7~9 (70 ~ 90)	10~13 (100 ~ 130)	20~23 (200 ~ 230)	30~35 (300 ~ 350)	40~50 (400 ~ 500)

*When sizes of through holes on the side (G and K) are different, smaller size is applied.
*Tightening torque is the reference value.
*Please wrap seal tapes twice around the mating parts such as joints before use.

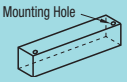
[G (PF) Thread Manifold]
G (PF) Thread represents "Hollow Parallel Tap" in compliance with "JIS B 0202" and interchangeable with "ISO 228-1".
The prices and lead-times are the same as those of PT / NPT thread.

[G (PF) Thread Manifold Ordering Method]
Please place an order specified with G before model No.

(Ex.) <PT Threads> **BMAF4-Q3-R2-S3**
<PF Threads> **G-BMAF4-Q3-R2-S3**

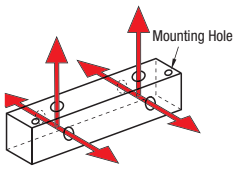
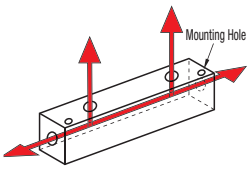
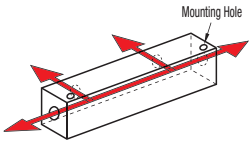
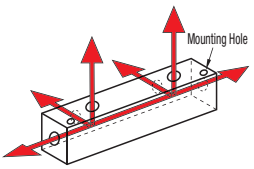
Manifold Shapes

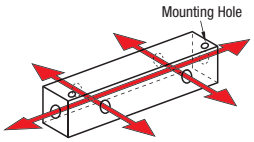
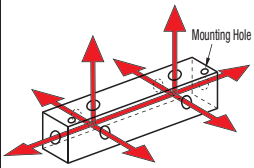
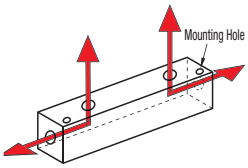
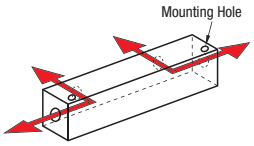
Standard position of the mounting hole

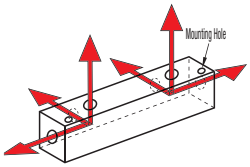
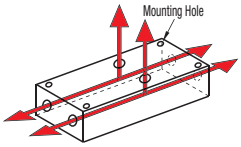
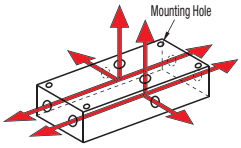
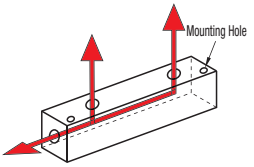


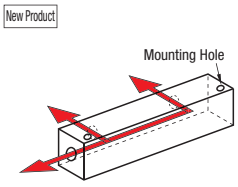
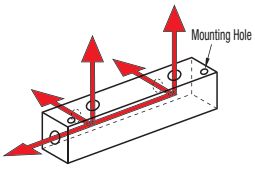
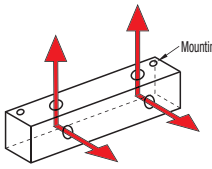
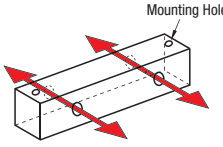
*Standard mounting holes are located as shown in the drawing on left. Some types vary.
See details on each product page.

Manifold Blocks · Terminal Blocks

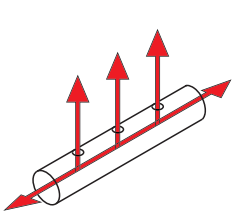
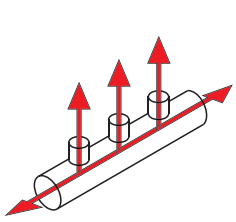
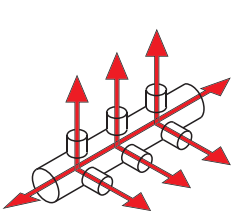
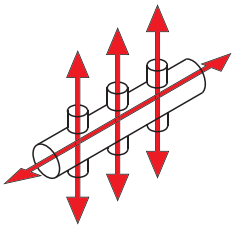
Page	P.1083 · 1089 · 1090	P.1085 · 1088 · 1091 · 1092	P.1086 · 1093 · 1094	P.1087 · 1095 · 1096
Shape Icons				

Page	P.1088 · 1099 · 1100	P.1097 · 1098 · 1112	P.1101	P.1101
Shape Icons				

Page	P.1101	P.1102	P.1102	P.1103
Shape Icons				

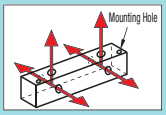
Page	P.1104	P.1104	P.1105 · 1107 · 1108	P.1106 · 1109 · 1110
Shape Icons	New Product 	New Product 		

Hollow Manifolds

Page	P.1115	P.1116 · 1117 · 1118	P.1119	P.1120
Shape Icons				

Manifold Blocks - Hydraulic / Pneumatic

-Standard Thread Size-



CAD Data

For recommended tapered thread tightening torque and through-pilot hole information, please see **P.1082**

RoHS

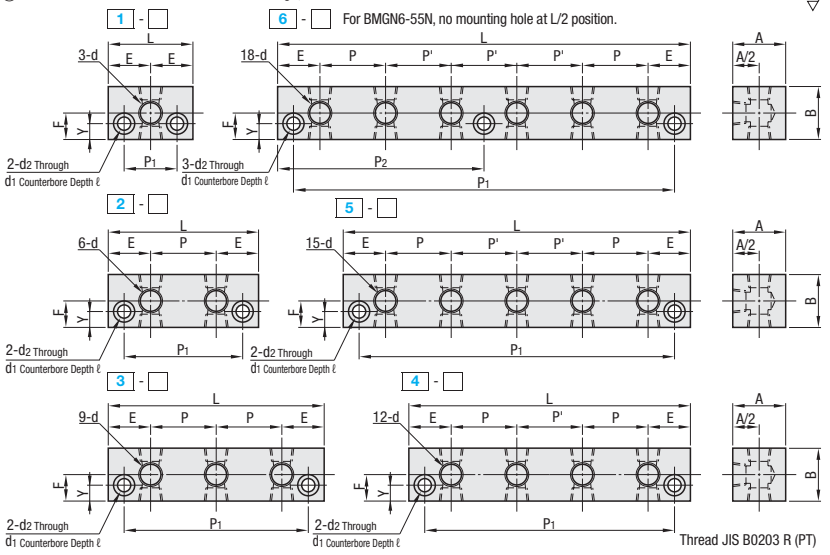


Type	Material	Surface Treatment	Normal Pressure
BMAN	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
BMANR	1.4301/X5CrNi18-10	-	
BMGN	EN AW-5052/AlMg2,5	-	1MPa ≈ 10kgf/cm² or less

*BMGN_-55N is for space-saving.

The material of BMGN_-55N is EN AW-6063/AlMg0,7Si.

6.3



Part Number Type	No.		d Rc (PT)	A	B	L	P	P'	P1	P2	E	F	Y	d1	d2	ℓ	€ Unit Price BMAN	€ Unit Price BMANR
BMAN (Oil Hydraulic) / BMANR (Water Hydraulic)	1	11	1/8	40	30	40	-	-	25	-	20	B/2	7	11	6.6	6.5		
		22	1/4															
	2	11	1/8		30	80	40	-	65	-	20							
		22	1/4															
		33	3/8		40		38				21							
	3	11	1/8		30	120	40	-	105	-	20							
		22	1/4															
		33	3/8		40		39				21							
	*4	11	1/8		30	160	40	40	145	-	20							
		22	1/4															
		33	3/8		40		39				21							
	*5	11	1/8		30	200	40	40	185	-	20							
		22	1/4															
		33	3/8		40		39				21							
*4, 5 and 6 are only available for BMAN Only	*6	11	1/8		30	240	40	40	225	120	20							
		22	1/4															
		33	3/8		40		39				21							

Part Number Type	No.		d Rc (PT) M (Coarse)	A	B	L	P	P'	P1	P2	E	F	Y	d1	d2	ℓ	€ Unit Price
BMGN (Pneumatic)	1	11	1/8	25	25	40	-	-	25	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35							17.5					
		55	M5	25	25							12.5					
		55N		15	15	30			20		15	7.5	3.5	-	4.3	-	
	2	11	1/8	25	25	70	30	-	55	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35							17.5					
		55	M5	25	25							12.5					
		55N		15	15	45	15		35		15	7.5	3.5	-	4.3	-	
	3	11	1/8	25	25	100	30	-	85	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35							17.5					
		55	M5	25	25							12.5					
		55N		15	15	60	15		50		15	7.5	3.5	-	4.3	-	
	4	11	1/8	25	25	130	30	30	115	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35							17.5					
		55	M5	25	25							12.5					
		55N		15	15	75	15	15	65		15	7.5	3.5	-	4.3	-	
	5	11	1/8	25	25	160	30	30	145	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35							17.5					
		55	M5	25	25							12.5					
		55N		15	15	90	15	15	80		15	7.5	3.5	-	4.3	-	
	6	11	1/8	25	25	190	30	30	175	95	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35							17.5					
		55	M5	25	25							12.5					
		55N		15	15	105	15	15	95	-	15	7.5	3.5	-	4.3	-	

Order Example

Part Number
BMAN2-33
BMGN3-22N

Days to Ship: 6 Days P.88

Price

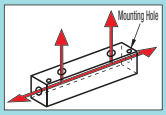
Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Manifold Blocks - Hydraulic · Pneumatic

-Lateral Through Hole · Upper Hole Type-



CAD Data

For recommended tapered thread tightening torque and through-pilot hole, please see **P.1082**

RoHS

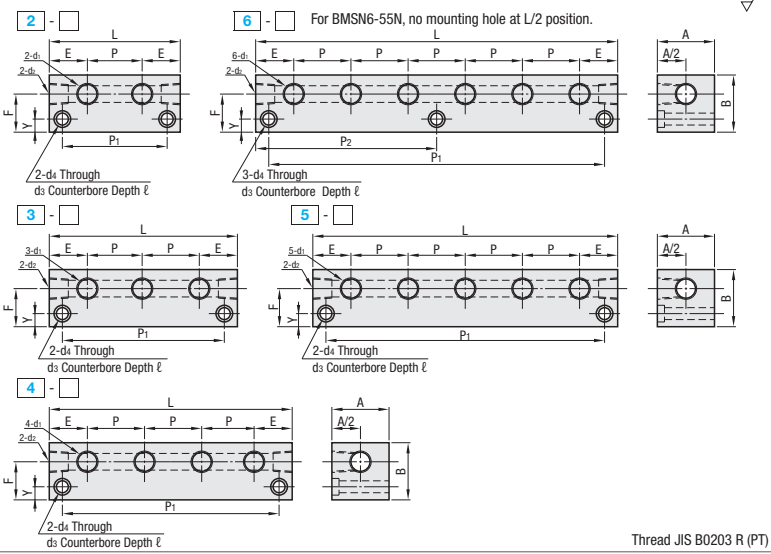


Type	Material	Surface Treatment	Normal Pressure
BMBN	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
BMBNR	1.4301/X5CrNi18-10	-	
BMSN	EN AW-5052/AlMg2,5	-	1MPa ≈ 10kgf/cm² or less

*No._-55N is for space-saving.

The material of EN AW-6063/AlMg0,7Si_-55N is EN AW-6063/AlMg0,7Si.

6.3



Thread JIS B0203 R (PT)

Part Number Type	No.		d1 Rc (PT)	d2 Rc (PT)	A	B	L	P	P1	P2	E	F	Y	d3	d4	ℓ	€ Unit Price BMBN	€ Unit Price BMBNR
BMBN (Oil Hydraulic) BMBNR (Water Hydraulic)	2	12	1/8	1/4	30	35	90	40	50	-	25	22	7	11	6.6	6.5		
		22	1/4	3/8														
		23																
		33	3/8	1/2														
		34																
	3	12	1/8	1/4			130		90	-								
		22	1/4	3/8														
		23																
		33	3/8	1/2														
		34																
	*4	12	1/8	1/4			170		130	-								
		22	1/4	3/8														
		23																
		33	3/8	1/2														
		34																
	*5	12	1/8	1/4			210		170	-								
		22	1/4	3/8														
		23																
		33	3/8	1/2														
		34																
	*6	12	1/8	1/4			250		210	125								
		22	1/4	3/8														
		23																
		33	3/8	1/2														
		34																

*4, 5 and 6 are only available for BMBN.

Part Number Type	No.		d1 Rc (PT) M (Coarse)	d2 Rc (PT) M (Coarse)	A	B	L	P	P1	P2	E	F	Y	d3	d4	ℓ	€ Unit Price
BMSN (Pneumatic)	2	11	1/8	1/8	30	30	70	30	55	-	20	20	7	9.5	5.5	5.5	
		12		1/4													
		22	1/4														
		55	M5	M5													
		55N			15	15	45	15	35		15	10	3.5	-	4.3	-	
	3	11	1/8	1/8	30	30	100	30	85	-	20	20	7	9.5	5.5	5.5	
		12		1/4													
		22	1/4														
		55	M5	M5													
		55N			15	15	60	15	50		15	10	3.5	-	4.3	-	
	4	11	1/8	1/8	30	30	130	30	115	-	20	20	7	9.5	5.5	5.5	
		12		1/4													
		22	1/4														
		55	M5	M5													
		55N			15	15	75	15	65		15	10	3.5	-	4.3	-	
	5	11	1/8	1/8	30	30	160	30	145	-	20	20	7	9.5	5.5	5.5	
		12		1/4													
		22	1/4														
		55	M5	M5													
		55N			15	15	90	15	80		15	10	3.5	-	4.3	-	
	6	11	1/8	1/8	30	30	190	30	175	95	20	20	7	9.5	5.5	5.5	
		12		1/4													
		22	1/4														
		55	M5	M5													
		55N			15	15	105	15	95	-	15	10	3.5	-	4.3	-	

Order Example — Part Number: BMBN2-12

6 Days P.88

Price

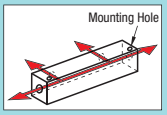
Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Manifold Blocks -Hydraulic · Pneumatic

-Lateral Through Hole · Vertical Semi-through Hole Type-



CAD Data

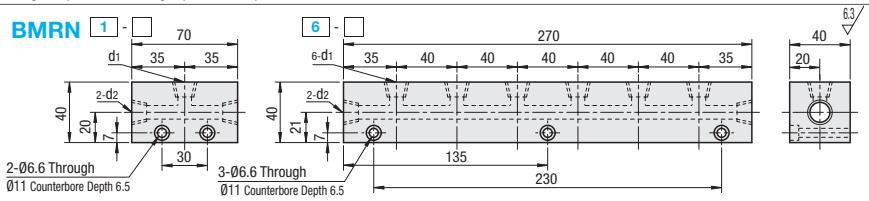
For recommended tapered thread tightening torque and through-pilot hole, please see **P.1082**

■Manifold Blocks - Hydraulic

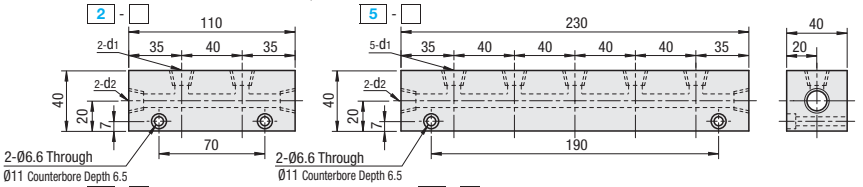
RoHS



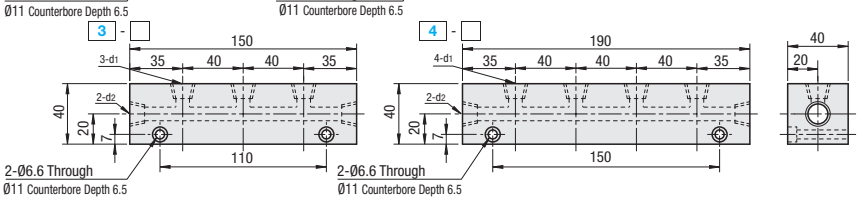
BMRN 1 - □



2 - □



3 - □



(Normal Pressure: 20.6MPa≈210kgf/cm² or less)

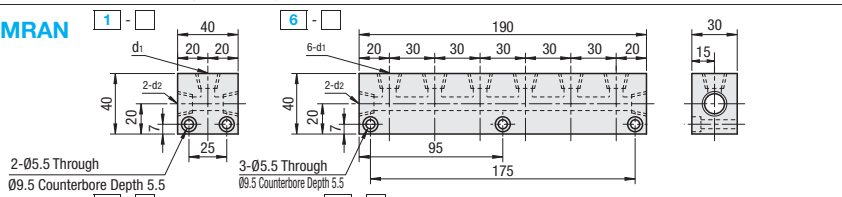
Thread JIS B0203 R (PT) M Material: 1.0038/S235JR S Surface Treatment: Trivalent Chromate

■Manifold Blocks - Pneumatic

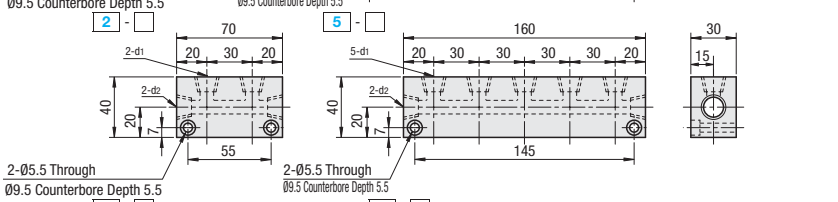
RoHS



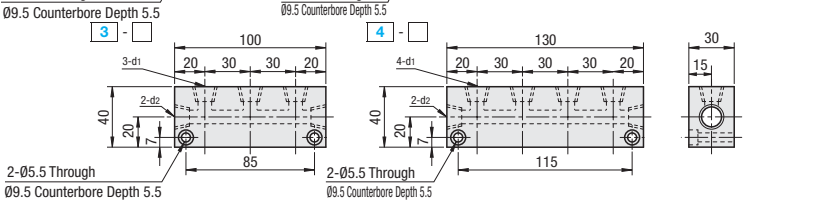
BMRAN 1 - □



2 - □



3 - □



(Normal Pressure: 1MP≈10kgf/cm² or less)

Thread JIS B0203 R (PT) M Material: EN AW-5052/AlMg2,5

Part Number Type	No.		d1 Rc (PT)	d2 Rc (PT)	€ Unit Price
BMRN	1	22	1/4	1/4	
	2	13	1/8	3/8	
		23	1/4	3/8	
		33	3/8	3/8	
		34	3/8	1/2	
	3	22	1/4	1/4	
		33	3/8	3/8	
		34	3/8	1/2	
	4	12	1/8	1/4	
		22	1/4	1/4	
		23	1/4	3/8	
		33	3/8	3/8	
	5	22	1/4	1/4	
		23	1/4	3/8	
		34	3/8	1/2	
	6	24	1/4	1/2	

Part Number Type	No.		d1 Rc (PT)	d2 Rc (PT)	€ Unit Price
BMRAN	1	11	1/8	1/8	
		22	1/4	1/4	
	2	11	1/8	1/8	
		12	1/8	1/4	
		22	1/4	1/4	
	3	11	1/8	1/8	
		12	1/8	1/4	
		22	1/4	1/4	
	4	11	1/8	1/8	
		12	1/8	1/4	
		22	1/4	1/4	
	5	22	1/4	1/4	
	6	22	1/4	1/4	

Order Example

Part Number
BMRN2-33
BMRAN3-22

6 Days P.88

Price

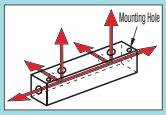
■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Manifold Blocks -Hydraulic · Pneumatic

-Lateral Through Hole · L-Shaped Hole Type-



CAD Data

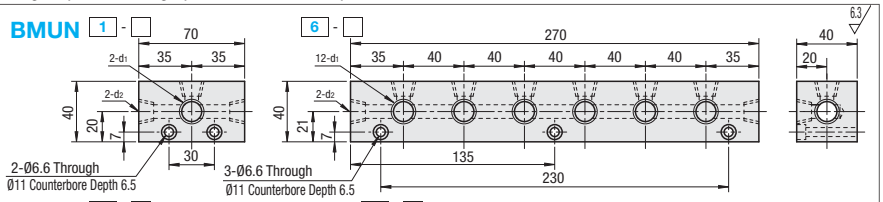
For recommended tapered thread tightening torque and through-pilot hole information, please see **P.1082**

■Manifold Blocks - Hydraulic

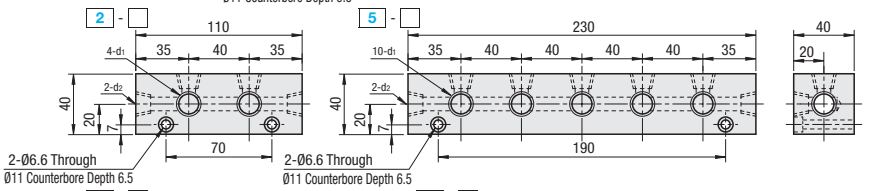
RoHS



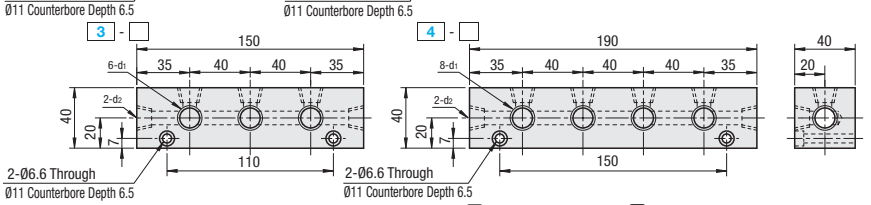
BMUN 1 - □



2 - □



3 - □



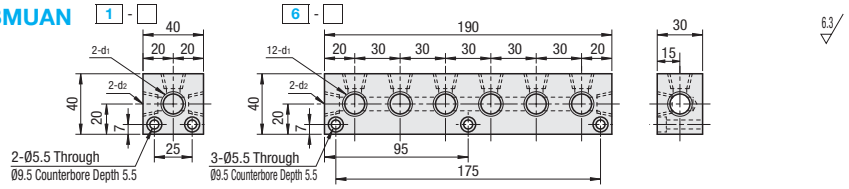
(Normal Pressure: 20.6MPa≈210kgf/cm² or less) Thread JIS B0203 R (PT) M Material: 1.0038/S235JR S Surface Treatment: Trivalent Chromate

■Manifold Blocks - Pneumatic

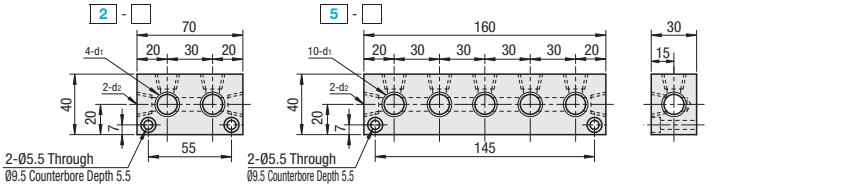
RoHS



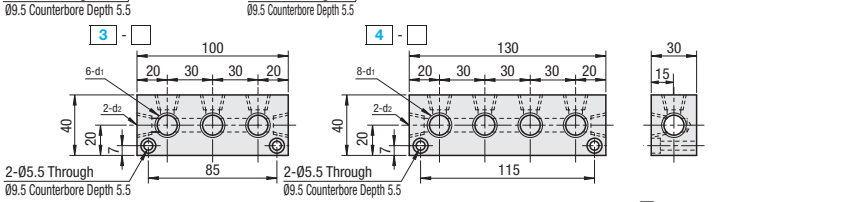
BMUAN 1 - □



2 - □



3 - □



(Normal Pressure: 1MP≈10kgf/cm² or less) Thread JIS B0203 R (PT) M Material: EN AW-5052/AlMg2,5

Part Number Type	No.		d1 Rc (PT)	d2 Rc (PT)	€ Unit Price
BMUN	1	33	3/8	3/8	
	2	13	1/8	3/8	
		22	1/4	1/4	
		23	1/4	3/8	
		34	3/8	1/2	
	3	22	1/4	1/4	
		23	1/4	3/8	
		33	3/8	3/8	
	4	12	1/8	1/4	
		22	1/4	1/4	
		23	1/4	3/8	
	5	23	1/4	3/8	
	6	34	3/8	1/2	

Part Number Type	No.		d1 Rc (PT)	d2 Rc (PT)	€ Unit Price
BMUAN	1	22	1/4	1/4	
	2	11	1/8	1/8	
		12	1/8	1/4	
		22	1/4	1/4	
	3	11	1/8	1/8	
		12	1/8	1/4	
		22	1/4	1/4	
	4	12	1/8	1/4	
		22	1/4	1/4	
	5	12	1/8	1/4	
		22	1/4	1/4	
	6	12	1/8	1/4	
		22	1/4	1/4	

Order Example

Part Number
BMUN2-22
BMUAN4-22

6 Days P.88

Price

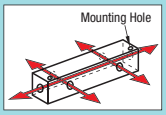
■Volume Discount (Round down to one Cent.) P.88

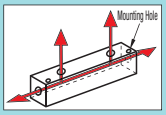
Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Manifold Blocks - Pneumatic

-Lateral · Vertical Through Hole · Lateral Through Hole · Upper Hole Type





CAD Data

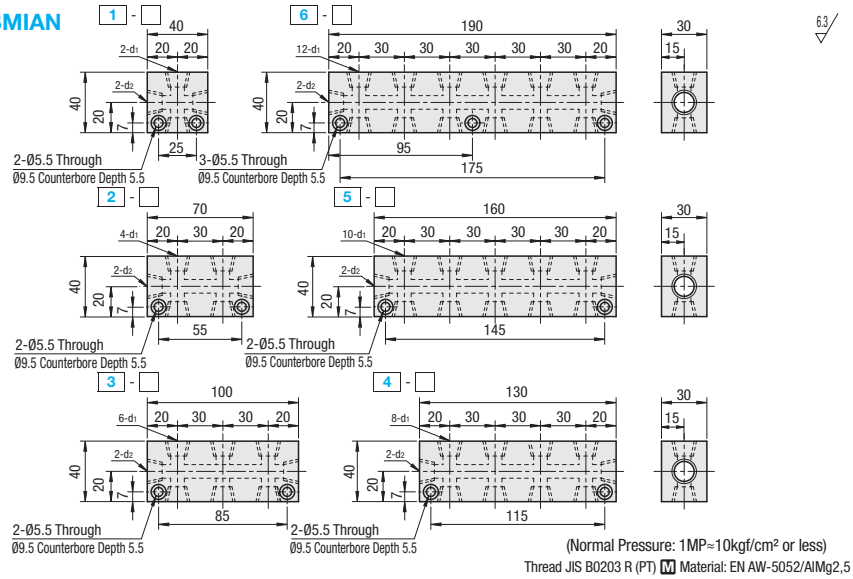
For recommended tapered thread tightening torque and through-pilot hole information, please see **P.1082**

■Manifold Blocks - Pneumatic

RoHS



BMIAN



(Normal Pressure: 1MP≈10kgf/cm² or less)

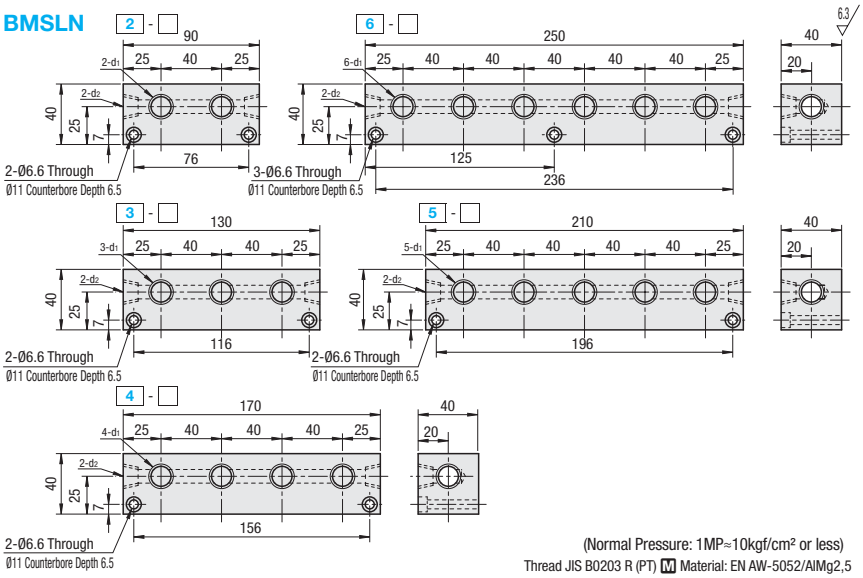
Thread JIS B0203 R (PT) M Material: EN AW-5052/AlMg2,5

■Manifold Blocks - Pneumatic

RoHS



BMSLN



(Normal Pressure: 1MP≈10kgf/cm² or less)

Thread JIS B0203 R (PT) M Material: EN AW-5052/AlMg2,5

Part Number Type	No.		d1 Rc (PT)	d2 Rc (PT)	€ Unit Price
BMIAN	1	11	1/8	1/8	
		22	1/4	1/4	
	2	11	1/8	1/8	
		12	1/8	1/4	
		22	1/4	1/4	
	3	11	1/8	1/8	
		22	1/4	1/4	
	4	11	1/8	1/8	
		12	1/8	1/4	
		22	1/4	1/4	
	5	12	1/8	1/4	
		22	1/4	1/4	
	6	11	1/8	1/8	

Part Number Type	No.		d1 Rc (PT)	d2 Rc (PT)	€ Unit Price
BMSLN	2	24	1/4	1/2	
		33	3/8	3/8	
		44	1/2	1/2	
	3	33	3/8	3/8	
		44	1/2	1/2	
	4	23	1/4	3/8	
		24	1/4	1/2	
		33	3/8	3/8	
		44	1/2	1/2	
	5	24	1/4	1/2	
		33	3/8	3/8	
		44	1/2	1/2	
	6	23	1/4	3/8	

Order Example — Part Number: BMIAN3-22

6 Days — P88

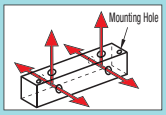
Price

■Volume Discount (Round down to one Cent.) P88

Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Manifold Blocks - Hydraulic
-Standard Thread Size-



CAD Data

G (PF) thread is added. Orders specified with "G-" before Type No. are acceptable. (Ex.**G-BMAF**) For details of ordering methods and recommended tapered thread tightening torques and through-pilot holes, please see **P.1082**

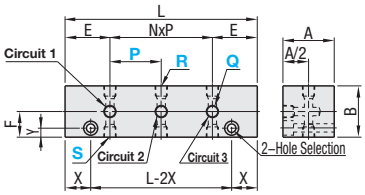
RoHS



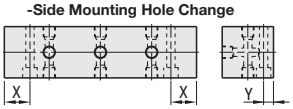
Type								Material	Surface Treatment	Normal Pressure
Pitch (P) Standard					Pitch (P) Configurable					
25x32	40 Square	50 Square	60 Square	70 Square	40 Square	50 Square	60 Square			
BMAS	BMAF	BMAFL	BMAFLK	BMAL	BMAFP	BMAFLP	BMAFLKP	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
-	BMAFM	BMAFLM	-	BMALM	-	BMAFLMP	-		Electroless Nickel Plating	
BMASR	BMAFR	BMAFLR	-	-	-	-	-	1.4301/X5CrNi18-10	-	
-	BMAFS	-	-	-	-	-	-	1.4401/X5CrNiMo17-12-2		1MPa ≈ 10kgf/cm² or less
-	BMAFC	-	-	-	-	-	-	Brass		

* Drawing is for when 3 Circuit type is selected.
The total number of Q, R and S threads is 9.

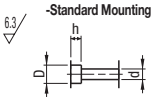
Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)



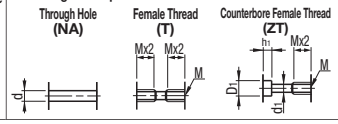
-Side Mounting Hole Change



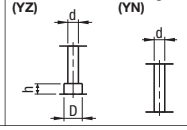
-Standard Mounting Hole



-Mounting Hole Options



-Side Mounting Hole Change



Mounting Holes Dimension	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	*4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

* Only 1.4301/X5CrNi18-10 d1 dimension is 4.3.

Mounting hole can be selected.
When no **shape modification** is specified, **standard mounting hole shape** is selected.

<L Dimension Calculation>
Ex.: In the case of BMAFP3- ~ -P35
L=NxP+2E=(Number of Circuits 3-1)x35+2x20=110

Part Number			*Rc (PT), NPT	Pitch P		No. of Pitches N	Total No. of Q · R · S Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	Q · R · S	Standard Type	1mm Increment									M
(25x32)		1	1(1/8)	25	-	0	3	25	32	20	16	7.5	7	M5
		2				1	6							
		3				2	9							
Pitch Standard		4				3	12							
BMAS		5				4	15							
BMASR		6				5	18							
		7				6	21							
		8				7	24							
(x 40)	NA(Through)	1	1(1/8)	40	25~50	0	3	40	40	20	20	7.5	7	M6
		2				1	6							
Pitch Standard / Pitch Configurable		3	2(1/4)			2	9							
BMAF / BMAFP	T(Female Thread)	4	3(3/8)			3	12							
BMAFM		5	1N(NPT 1/8)			4	15							
BMAFR		6	2N(NPT 1/4)			5	18							
BMAFS		7	3N(NPT3/8)		30~50	6	21							
BMAFC	ZT(Counterbore Female Thread)	8				7	24							
(x 50)		1		60	35~60	0	3	50	50	30	25	7.5	8	M8
		2	2(1/4)			1	6							
Pitch Standard / Pitch Configurable		3	3(3/8)			2	9							
BMAFL / BMAFLP	YZ(Side Counterbore)	4	4(1/2)			3	12							
BMAFLM / BMAFLMP		5	6(3/4)			4	15							
BMAFLR		6			40~60	5	18							
(x 60)		1		60	35~60	0	3	60	60	30	30	7.5	8	M8
		2	2(1/4)			1	6							
Pitch Standard / Pitch Configurable	YN(Side Through)	3	3(3/8)			2	9							
BMAFLK / BMAFLKP		4	4(1/2)			3	12							
		5	6(3/4)			4	15							
		6			40~60	5	18							
(x 70)		1		60	-	0	3	70	70	40	35	10	10	M8
Pitch Standard		2	6(3/4)			1	6							
BMAL		3	8(1)			2	9							
BMALM		4				3	12							

For * marked Q, R and S, please specify 1, 2, 3, 4, 6, 8, 1N, 2N or 3N indicated before ( ).
Single Circuit is not available for Pitch Configurable Type.
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
6 and 8 circuit types have an additional mounting hole at L/2, and 7-circuit type at P/2 of 2 / 3 port, and 5 / 6 port.

For Block Square 50 Type, if 3 / 4 is selected for both tapered threads at right angles, the threads may interfere with each other. Select Block Square 60 Type instead.
Please select NA, T or ZT for 7 and 8 circuit types mounting hole shape.
1.4401/X5CrNiMo17-12-2 / Brass is up to 6 connections.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits	-	Q	-	R	-	S	-	P
BMAF		4	-	Q3	-	R2	-	S3		
BMAFLP	NA	3	-	Q3	-	R4	-	S4	-	P45

Price

■Volume Discount (Round down to one Cent) **P.87**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

Days to Ship

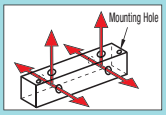
- 1.4301/X5CrNi18-10: **8 Days** — Express A 8,00 EUR/piece — **P.88**
- 1.0038/1.0038/S235JR Trivalent Chromate, 1.0038/S235JR Electroless Nickel Plating (Block square 50, 70): **10 Days** — Express B 8,00 EUR/piece — **P.88**
- 1.0038/1.4401/X5CrNiMo17-12-2 Electroless Nickel Plating (Block square 40), 1.4401/X5CrNiMo17-12-2, Brass: **8 Days**

A Express Charge of 21,60 EUR for 3 or more identical pieces.
A Express Charge of 21,60 EUR for 3 or more identical pieces.

No. of Circuits	Pitch (P) Standard € Unit Price													Pitch (P) Configurable € Unit Price			
	25x32		40 Square					50 Square			60 Square	70 Square		40 Square	50 Square		60 Square
	BMAS	BMASR	BMAF	BMAFM	BMAFR	BMAFS	BMAFC	BMAFL	BMAFLM	BMAFLR	BMAFLK	BMAL	BMALM	BMAFP	BMAFLP	BMAFLMP	BMAFLKP
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	

Manifold Blocks - Pneumatic

-Standard Thread Size-



CAD Data

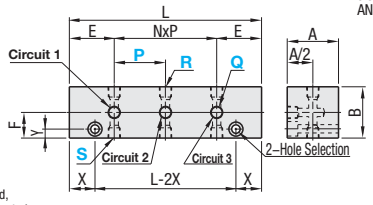
G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMGF**) For details of ordering methods and recommended tapered thread tightening torques and through-pilot holes, please see **P.1082**



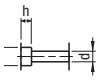
Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
20 Square	25 Square	35 Square	50 Square	20 Square	25 Square	35 Square			
BMGFC	BMGF	BMGFK	BMGFL	BMGFCP	BMGFP	BMGFKP	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
BMGFCA	BMGFA	-	BMGFLA	BMGFCAP	BMGFAP	-		Clear Anodize	

* Drawing is for when 3 Circuit type is selected.
The total number of Q, R and S threads is 9.

Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

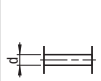


-Standard Mounting Hole



-Mounting Hole Options

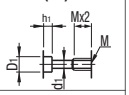
Through Hole (NA)



Female Thread (T)



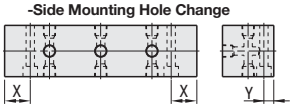
Counterbore Female Thread (ZT)



Mounting hole can be selected.
When no **shape modification** is specified, **standard mounting hole shape** is selected. Except when 20 Square is not specified, through hole is selected.

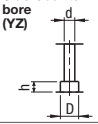
<L Dimension Calculation>
Ex.: In the case of BMGFP3- ~ -P25
L=NxP+2E= (Number of Circuits 3-1)x25+2x20=90

-Side Mounting Hole Change



-Side Mounting Hole Change

Side Counterbore (YZ)



Side Through (YN)



Mounting Holes Dimension	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	4.2	4.5
M8	8.5	14	8.5	11	6.8	6.5

Part Number			*Rc(PT), NPT, M(Coarse)	Pitch P		No. of Pitches N	Total No. of Q · R · S Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	Q · R · S	Standard Type	1mm Increment									M
(x 20)		1	1(1/8)	15	15~50	0	3	20	20	20	10	5	4	M5
Pitch Standard / Pitch Configurable	T(Female Thread)	2	M3(M3)			1	6							
BMGFC / BMGFCP	YN(Side Through)	3	M4(M4)			2	9							
BMGFCA / BMGFCAP		4	5(M5)			3	12							
		5				4	15							
		6				5	18							
		7			20~50	6	21							
		8				7	24							
(x 25)		1	1(1/8)	30	20~50	0	3	25	25	20	12.5	7.5	7	M5
Pitch Standard / Pitch Configurable		2	2(1/4)			1	6							
BMGF / BMGFP		3	5(M5)			2	9							
BMGFA / BMGFAP	NA(Through)	4	1N(NPT 1/8)			3	12							
		5	2N(NPT 1/4)			4	15							
	T(Female Thread)	6			25~50	5	18							
		7				6	21							
		8				7	24							
(x 35)		1	1(1/8)	30	20~50	0	3	35	35	20	17.5	7.5	7	M5
Pitch Standard / Pitch Configurable	ZT(Counterbore Female Thread)	2	2(1/4)			1	6							
BMGFK / BMGFKP		3	5(M5)			2	9							
	YZ(Side Counterbore)	4	1N(NPT 1/8)			3	12							
		5	2N(NPT 1/4)			4	15							
		6			25~50	5	18							
		7				6	21							
		8				7	24							
(x 50)	YN(Side Through)	1	2(1/4)	40	-	0	3	50	50	25	25	8.5	8.5	M8
Pitch Standard		2	3(3/8)			1	6							
BMGFL		3	4(1/2)			2	9							
BMGFLA		4				3	12							
		5				4	15							
		6				5	18							

For * marked Q, R and S, please specify 1, 2, 3, 4, 5, M3, M4, 1N or 2N indicated before ( ). Single Circuit is not available for Pitch Configurable Type.
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings. Each 6 and 8 Circuit type has an additional mounting hole at the midpoint of the overall length. 7 Circuit type an additional mounting hole at each midpoint of, from the left, 2 and 3 port pitch, and 5 and 6 port pitch (Except for 20 square).
For Block Square 25 Type, if 1 / 4 is selected for both tapered threads at right angles, the threads may interfere with each other. Select Block Square 35 Type instead.
Please select NA, T or ZT for 7 and 8 circuit types mounting hole shape.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits	-	Q	-	R	-	S	-	P
BMGF	T	4	-	Q2	-	R5	-	S2		
BMGFP	ZT	4	-	Q2	-	R2	-	S2	-	P50

Days to Ship

- EN AW-5052/AlMg2,5: 8 Days — Express A 8,00 EUR/piece — P.88
  A Express Charge of 21,60 EUR for 3 or more identical pieces.
- EN AW-5052/AlMg2,5 Clear Anodize: 8 Days

Price

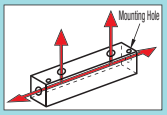
Volume Discount (Round down to one Cent) **P.87**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Circuits	Pitch (P) Standard € Unit Price							Pitch (P) Configurable € Unit Price				
	20 Square		25 Square		35 Square	50 Square		20 Square		25 Square		35 Square
	BMGFC	BMGFCA	BMGF	BMGFA	BMGFK	BMGFL	BMGFLA	BMGFCP	BMGFCAP	BMGFP	BMGFAP	BMGFKP
1												
2												
3												
4												
5												
6												
7												
8												

Manifold Blocks - Hydraulic

-Lateral Through Hole · Upper Hole Type-



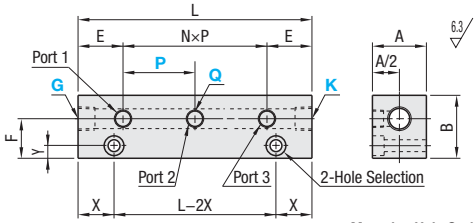
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMBF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

RoHS



Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
25x32	30x35	50 Square	60 Square	25x32	30x35	50 Square			
BMBS	BMBF	BMBFL	BMBL	BMBSP	BMBFP	BMBFLP	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
-	BMBFM	BMBFLM	-	-	BMBFMP	BMBFLMP		Electroless Nickel Plating	
BMBSR	BMBFR	BMBFLR	-	BMBSRP	BMBFRP	BMBFLRP	1.4301/X5CrNi18-10	-	
-	BMBFS	-	-	-	BMBFSP	-	1.4401/X5CrNiMo17-12-2		
-	BMBFC	-	-	-	-	-	Brass		1MPa ≈ 10kgf/cm² or less

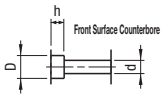


* Drawing is for when 3 Port type is selected.
The total number of Q, G and K threads is 5.

Ⓟ Port 1 dimension of 30x35 square is 15.
Ⓟ Mounting hole can be selected.
Ⓟ **Standard hole shape** is selected when no **hole shape modification** is specified.

<L Dimension Calculation>
In the case of BMBFP3-~-P35
L=NxP+2E=(Number of Ports 3-1)x35+2x25=120

-Standard Mounting Hole

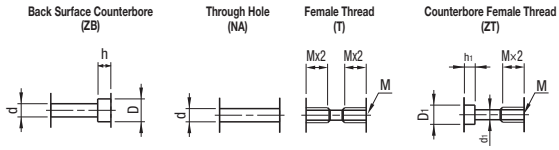


Mounting Holes Dimension	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	*4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

* Only 1.4301/X5CrNi18-10 d1 dimension is 4.3.

Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

-Mounting Hole Options



Part Number			*Rc (PT), NPT		Pitch P		No. of Pitches N	Q / G / K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	Q	G / K	Standard Type	1mm Increment									M
(25x32) Pitch Standard BMBS / Pitch Configurable BMBSP; BMBSR / BMBSRP		1			30	20~50	0	3	25	32	20	20	15	6	M5
		2					1	4							
		3					2	5							
		4	1 (1/8)	1 (1/8)			3	6							
		5	2 (1/4)	2 (1/4)			4	7							
		6					5	8							
		7					6	9							
		8				20~40	7	10							
(30x35) Pitch Standard BMBF / Pitch Configurable BMBFP; BMBFM / BMBFMP; BMBFR / BMBFRP; BMBFS / BMBFSP; BMBFC	ZB (Back Surface Counterbore)	1			40	25~50	0	3	30	35	25	22	15	7	M6
		2					1	4							
		3	1 (1/8)	2 (1/4)			2	5					20		
	NA (Through)	4	2 (1/4)	3 (3/8)			3	6							
		5	3 (3/8)	4 (1/2)			4	7							
	T (Female Thread)	6	1N (NPT 1/8) 2N (NPT 1/4) 3N (NPT3/8)	2N (NPT 1/4) 3N (NPT3/8) 4N (NPT 1/2)			5	8							
		7					6	9							
		8				25~40	7	10							
(x 50) Pitch Standard BMBFL / Pitch Configurable BMBFLP; BMBFLM / BMBFLMP; BMBFLR / BMBFLRP	ZT (Counterbore Female Thread)	1			60	35~60	0	3	50	50	30	28	20	8	M8
		2	2 (1/4)	2 (1/4)			1	4							
		3	3 (3/8)	3 (3/8)			2	5							
		4	4 (1/2)	4 (1/2)			3	6							
		5	6 (3/4)	6 (3/4)			4	7							
		6					5	8							
(x 60) Pitch Standard BMBL		1			60	-	0	3	60	60	40	35	25	9	M8
		2	6 (3/4)	8 (1)			1	4							
		3	8 (1)				2	5							
		4					3	6							

Ⓟ For *marked Q, G and K, please specify 1, 2, 3, 4, 6, 8, 1N, 2N, 3N or 4N indicated before ( ).
Ⓟ Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
Ⓟ 6 and 8 port types have an additional mounting hole at L/2, and 7-port type at P/2 of 2 / 3 port, and 5 / 6 port.
Ⓟ Single Circuit is not available for Pitch Configurable Type. Ⓟ 1.4401/X5CrNiMo17-12-2 / Brass is up to 6 connections.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits		Q		G		K		P
BMBF		3	-	Q3	-	G4	-	K2		
BMBFLP	NA	3	-	Q3	-	G4	-	K6	-	P45

Days to Ship

- 1.4301/X5CrNi18-10
8 Days Express A 8,00 EUR/piece P.88
Ⓟ A Express Charge of 21,60 EUR for 3 or more identical pieces.

- 1.0038/S235JR Electroless Nickel Plating (Block 30x35) · Brass
8 Days

- 1.0038/S235JR Trivalent Chromate · 1.0038/S235JR Electroless Nickel Plating (Block Square 50)
10 Days Express B 8,00 EUR/piece P.88
Ⓟ A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

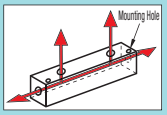
Volume Discount (Ⓟ Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	Pitch (P) Standard € Unit Price											Pitch (P) Configurable € Unit Price								
	25x32		30x35					50 Square			60 Square	25x32		30x35				50 Square		
	BMBS	BMBSR	BMBF	BMBFM	BMBFR	BMBFS	BMBFC	BMBFL	BMBFLM	BMBFLR	BMBL	BMBSP	BMBSRP	BMBFP	BMBFMP	BMBFRP	BMBFSP	BMBFLP	BMBFLMP	BMBFLRP
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				

Manifold Blocks - Pneumatic

-Lateral Through Hole · Upper Hole Type-



CAD Data

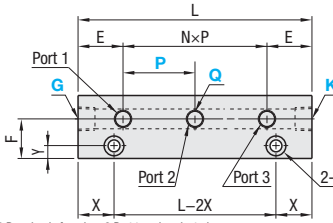
G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMSF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

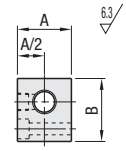
RoHS



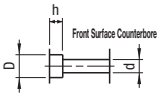
Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
20 Square	30 Square	40 Square	60 Square	20 Square	30 Square	40 Square			
BMSFC	BMSF	BMSFL	BMSFB	BMSFCP	BMSFP	BMSFLP	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
BMSFCA	BMSFA	BMSFLA	-	BMSFCAP	BMSFAP	BMSFLAP		Clear Anodize	

Material of 60 square is EN AW-6063/AlMg0,7Si.





-Standard Mounting Hole



Mounting Holes Dimension	d	D	h	D_1	d_1	h_1
M5	5.5	9.5	5.5	8	4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

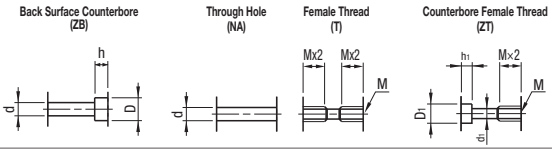
Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

* Drawing is for when 3 Port type is selected.
The total number of Q, G and K threads is 5.

Mounting hole can be selected.
Standard hole shape is selected when no **hole shape modification** is specified.
Note that the default of 20 Square is Through Hole.

<L Dimension Calculation>
In the case of BMSFCP3-~-P35
L=NxP+2E= (Number of Circuits 3-1)x25+2x20=90

-Mounting Hole Options



Part Number Type	Mounting Hole Options	No. of Circuits	*Rc(PT), NPT, M(Coarse) Q	G · K	Pitch P Standard Type	1mm Increment	No. of Pitches N	Q · G · K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes M
(x 20) Pitch Standard: BMSFC / BMSFCA; Pitch Configurable: BMSFCP / BMSFCAP	T (Female Thread)	1	1(1·8) M3(M3) M4(M4) 5(M5)	1(1·8) M3(M3) M4(M4) 5(M5)	15	15~50	0	3	20	20	20	13	5	4	M5
		2					1	4							
		3					2	5							
		4					3	6							
		5					4	7							
		6					5	8							
		7		1(1·8)			6	9							
		8				15~35	7	10							
(x 30) Pitch Standard: BMSF / BMSFA; Pitch Configurable: BMSFP / BMSFAP	ZB (Back Surface Counterbore)	1	1(1·8) 2(1·4) 5(M5) 1N(NPT 1·8) 2N(NPT 1·4)	1(1·8) 2(1·4) 5(M5)* 1N(NPT 1·8) 2N(NPT 1·4)	30	20~50	0	3	30	30	20	20	7.5	7	M5
		2					1	4							
		3					2	5							
		4					3	6							
		5					4	7							
		6					5	8							
		7*					6	9							
		8*				20~35	7	10							
(x 40) Pitch Standard: BMSFL / BMSFLA; Pitch Configurable: BMSFLP / BMSFLAP	NA (Through) T (Female Thread) ZT (Counterbore Female Thread)	1	1(1·8) 2(1·4) 3(3·8) 4(1·2)	2(1·4) 3(3·8) 4(1·2)	40	35~60	0	3	40	40	25	25	7	7	M6
		2					1	4							
		3					2	5							
		4					3	6							
		5					4	7							
		6					5	8							
		7				35~50	6	9							
		8				-	7	10							
(x 60) Pitch Standard: BMSFB		1	6(3·4) 8(1)	8(1)	60	-	0	3	60	60	40	35	25	9	M8
		2					1	4							
		3					2	5							
		4					3	6							

For *marked Q, G and K, please specify 1, 2, 3, 4, 5, 6, 8, M3, M4, 1N and 2N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
6 and 8 port types have an additional mounting hole at L/2, and 7-port type at P/2 of 2 / 3 port, and 5 / 6 port.(Except for 20 Square).
* For the 30 Square manifolds, * denoted combinations are not selectable.
Single Circuit is not available for Pitch Configurable Type.
* For the 20 Square Pitch Specified Types, M3, M4 and 5(M5) cannot be selected for G and K.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits	-	Q	-	G	-	K	-	P
BMSF	T	5	-	Q2	-	G1	-	K2		
BMSFLP	ZT	5	-	Q2	-	G3	-	K3	-	P50

Price

Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

Days to Ship

·EN AW-5052/AlMg2,5, EN AW-6063/AlMg0,7Si
8 Days

- EN AW-5052/AlMg2,5 Clear Anodize
10 Days

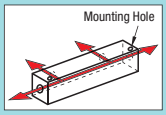
Express B 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

No. of Ports	Pitch (P) Standard € Unit Price							Pitch (P) Configurable € Unit Price					
	20 Square		30 Square		40 Square		60 Square	20 Square		30 Square		40 Square	
	BMSFC	BMSFCA	BMSF	BMSFA	BMSFL	BMSFLA	BMSFB	BMSFCP	BMSFCAP	BMSFP	BMSFAP	BMSFLP	BMSFLAP
1													
2													
3													
4													
5													
6													
7													
8													

Manifold Blocks - Hydraulic

-Lateral Through Hole · Vertical Semi-through Hole Type-

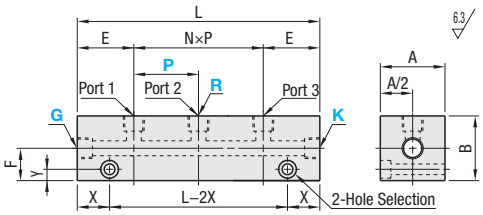


CAD Data

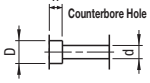
G (PF) screws are added. Orders can be placed with "G-" before the model No. (Ex.: **G-BMRF**) For details of ordering methods, recommended tapered threads tightening torque and through pilot holes, please refer to **P.1082**.



Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
30x35	40 Square	50 Square	70 Square	30x35	40 Square	50 Square			
BMRS	BMRF	BMRFL	BMRL	-	BMRFP	BMRFLP	1.0038/ S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
-	BMRFM	BMRFLM	BMRLM	-	-	BMRFLMP		Electroless Nickel Plating	
BMRSR	BMRFR	BMRFLR	-	BMRSRP	BMRFRP	BMRFLRP	1.4301/ X5CrNi18-10	-	
-	BMRFC	-	-	-	-	-	Brass		1MPa ≈ 10kgf/cm² or less



-Standard Mounting Hole



Mounting Holes Dimension	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	*4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

* Only 1.4301/X5CrNi18-10 d1 dimension is 4.3.

Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

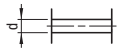
** Drawing when 3 port type is selected.
The total no. of R, G and K threads is 5 each.

Mounting holes can be selected.
For the **default Mounting Holes,** see **Standard Mounting Hole** above.

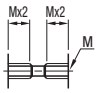
<L Dimension Calculation>
Ex.: In the case of BMRFP3- ~ -P35
L=NxP+2E=(No. of Circuits 3-1)x35+2x35=140

• Mounting Hole Options

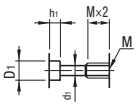
Through Hole (NA)



Female Thread (T)



Counterbore Female Thread (ZT)



Part Number			*Rc (PT), NPT		Pitch P		No. of Pitches N	R · G · K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	R	G · K	Standard Type	1mm Increment									M
(30x35) Pitch Standard: BMRS, BMRSR / Pitch Configurable: BMRSRP		1	1(1·8) 2(1·4)	1(1·8) 2(1·4)	30	20~50	0	3	30	35	20	20	15	6	M5
		2					1	4							
		3					2	5							
		4					3	6							
		5					4	7							
		6					5	8							
		7					6	9							
		8				20~40	7	10							
(x 40) Pitch Standard: BMRF, BMRFM, BMRFR, BMRFC / Pitch Configurable: BMRFP, BMRFRP	NA(Through) T(Female Thread) ZT(Counterbore Female Thread)	1	1(1·8) 2(1·4) 3(3·8) 1N(NPT 1·8) 2N(NPT 1·4) 3N(NPT 3·8)	2(1·4) 3(3·8) 4(1·2) 2N(NPT 1·4) 3N(NPT 3·8) 4N(NPT 1·2)	40	25~50	0	3	40	40	35	20	20	7	M6
		2					1	4							
		3					2	5							
		4					3	6							
		5					4	7							
		6					5	8							
		7				20~45	6	9							
		8				20~40	7	10							
(x 50) Pitch Standard: BMRFL, BMRFLM, BMRFLR / Pitch Configurable: BMRFLP, BMRFLMP, BMRFLRP		1	2(1·4) 3(3·8) 4(1·2) 6(3·4)	2(1·4) 3(3·8) 4(1·2) 6(3·4)	60	35~60	0	3	50	50	30	28	20	8	M8
		2					1	4							
		3					2	5							
		4					3	6							
		5					4	7							
		6					5	8							
(x 70) Pitch Standard: BMRL, BMRLM		1	6(3·4) 8(1)	8(1)	60	-	0	3	70	70	40	35	25	9	M8
		2					1	4							
		3					2	5							
		4					3	6							

For * marked R, G and K, please specify 1, 2, 3, 4, 6, 8, 1N, 2N, 3N or 4N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
6 and 8 port types have an additional mounting hole at L/2, and 7-port type at P/2 of 2 / 3 port, and 5 / 6 port.
Single Port is not available for Pitch Configurable Type.
Selectable up to 6 Ports for Brass.

Order Example

Part Number										
Type		Mounting Hole Options		No. of Circuits		R		G		K		P
BMRF				3	-	R3	-	G2	-	K2		
BMRFLP		NA		4	-	R2	-	G3	-	K4	-	P50

Days to Ship

- 1.4301/X5CrNi18-10
8 Days — Express A 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

- 1.0038/S235JR Electroless Nickel Plating (Block Square 40) / Brass
8 Days

- 1.0038/1.0038/S235JR Trivalent Chromate, 1.0038/S235JR Electroless Nickel Plating (Block square 50, 70)
10 Days — Express B 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

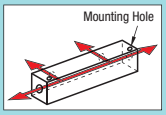
Volume Discount (Round down to one Cent) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	Pitch (P) Standard € Unit Price											Pitch (P) Configurable € Unit Price					
	30x35		40 Square				50 Square			70 Square		30x35	40 Square		50 Square		
	BMRS	BMRSR	BMRF	BMRFM	BMRFR	BMRFC	BMRFL	BMRFLM	BMRFLR	BMRL	BMRLM	BMRSRP	BMRFP	BMRFRP	BMRFLP	BMRFLMP	BMRFLRP
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	

Manifold Blocks - Pneumatic

-Lateral Through Hole · Vertical Semi-through Hole Type-



CAD Data

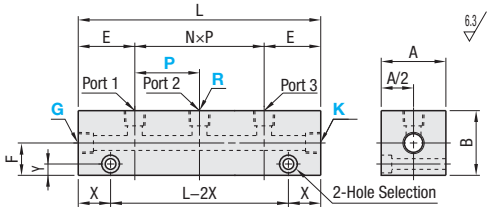
G (PF) screws are added. Orders can be placed with "G-" before the model No. (Ex.: **G-BMRAF**) For details of ordering methods, recommended tapered threads tightening torque and through pilot holes, please refer to **P.1082**.

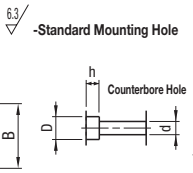
RoHS



Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
15 Square	25 Square	30x40	50 Square	25 Square	30x40	50 Square			
-	BMRAC	BMRAF	BMRAL	BMRACP	BMRAFP	BMRALP	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
BMRASA	BMRACA	BMRAFA	BMRALA	BMRACAP	BMRAFAP	BMRALAP		Clear Anodize	

Material of 15 square is EN AW-6063/AlMg0,7Si.





Mounting Holes Dimension	d	D	h	D1	d1	h1
M4	4.3	-	-	-	-	-
M5	5.5	9.5	5.5	8	4.2	4.5
M8	8.5	14	8.5	11	6.8	6.5

Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

* Drawing when 3 port type is selected.
The total no. of R, G and K threads is 5 each.

Mounting holes can be selected.
Standard hole shape is selected when no **hole shape modification** is specified.
Note that the default of 15 Square and 25 Square is Through Hole.

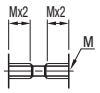
<L Dimension Calculation>
Ex.: In the case of BMRAFP3- ~ -P35
L=NxP+2E=(No. of Ports 3-1)x35+2x20=110

• Mounting Hole Options

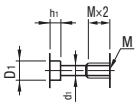
Through Hole (NA)



Female Thread (T)



CounterboreFemale Thread (ZT)



Part Number			*Rc(PT), NPT, M(Coarse)	Pitch P		No. of Pitches N	R · G · K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No. o Circuits	R · G · K	Standard Type	1mm Increment									M
(x 15) Pitch Standard **BMRASA**	**T**(Female Thread)	1	**M3**(M3) **M4**(M4) **5**	15	-	0	3	15	15	15	10	5	3.5	M4
		2				1	4							
		3				2	5							
		4				3	6							
		5				4	7							
		6				5	8							
		7				6	9							
		8				7	10							
(x 25) Pitch Standard **BMRAC** **BMRACA** Pitch Configurable **BMRACP** **BMRACAP**		1	**1**(1·8) **M3**(M3)** **M4**(M4)** **5**(M5)*	15	**15~50**	0	3	25	25	20	12.5	10	4	M5
		2				1	4							
		3				2	5							
		4				3	6							
		5				4	7							
		6				5	8							
		7**			**15~40**	6	9							
		8**			**15~35**	7	10							
(30x40) Pitch Standard **BMRAF** **BMRAFA** Pitch Configurable **BMRAFP** **BMRAFAP**	**NA**(Through) **T**(Female Thread)	1	**1**(1·8) **2**(1·4) **5**(M5)** **1N**(NPT 1·8) **2N**(NPT 1·4)	30	**20~50**	0	3	30	40	20	20	7.5	7	M5
		2				1	4							
		3				2	5							
		4				3	6							
		5				4	7							
		6				5	8							
		7**			**15~40**	6	9							
		8**			**15~35**	7	10							
(x 50) Pitch Standard **BMRAL** **BMRALA** Pitch Configurable **BMRALP** **BMRALAP**	**ZT**(Counterbore Female Thread)	1	**2**(1·4) **3**(3·8) **4**(1·2)	40	**35~60**	0	3	50	50	25	25	8.5	8.5	M8
		2				1	4							
		3				2	5							
		4				3	6							
		5				4	7							
		6				5	8							

For * marked R, G and K, please specify 1 · 2 · 3 · 4 · 5 · M3 · M4 · 1N or 2N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
** For the 25 and 30x40 Square manifolds, denoted combinations are not selectable.

No. of Port 1 can not be selected for Pitch Configurable Type.
6 and 8 port types have an additional mounting hole at L/2, and 7-port type at P/2 of 2 / 3 port, and 5 / 6 port. (Except for 15 and 20 square)
** For the 25 and 30x40 Square Pitch Specified Types, M3, M4 and 5(M5) cannot be selected for G and K.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits	-	R	-	G	-	K	-	P
BMRAC	T	2	-	R5	-	G1	-	K1		
BMRAFP	ZT	3	-	R1	-	G2	-	K2	-	P40

Days to Ship

- EN AW-5052/AlMg2,5 Products: **8 Days**
- EN AW-5052/AlMg2,5 Clear Anodize, EN AW-6063/AlMg0,7Si Clear Anodize: **10 Days** Express B 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

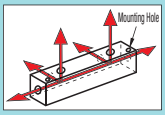
Volume Discount (Round down to one Cent) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	Pitch (P) Standard € Unit Price							Pitch (P) Configurable € Unit Price					
	15 Square	25 Square		30x40		50 Square		25 Square		30x40		50 Square	
	BMRASA	BMRAC	BMRACA	BMRAF	BMRAFA	BMRAL	BMRALA	BMRACP	BMRACAP	BMRAFP	BMRAFAP	BMRALP	BMRALAP
1													
2													
3													
4													
5													
6													
7													
8													

Manifold Blocks - Hydraulic

-Lateral Through Hole · L-Shaped Hole Type-



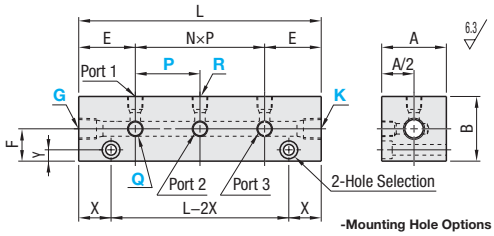
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMUF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

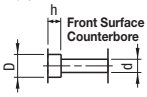
RoHS



Type						Material	Surface Treatment	Normal Pressure
Pitch (P) Standard			Pitch (P) Configurable					
30x35	40 Square	60 Square	30x35	40 Square	60 Square			
BMUS	BMUF	BMUFL	BMUSP	BMUFP	BMUFLP	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
-	BMUFM	BMUFLM	-	-	-		Electroless Nickel Plating	
BMUSR	BMUFR	BMUFLR	-	BMUFRP	BMUFLRP	1.4301/X5CrNi18-10	-	
-	BMUFS	-	-	BMUFSP	-	1.4401/X5CrNiMo17-12-2		
-	BMUFC	-	-	-	-	Brass		1MPa ≈ 10kgf/cm² or less



-Standard Mounting Hole



Mounting Holes Dimension	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	*4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

* Only 1.4301/X5CrNi18-10 d1 dimension is 4.3.

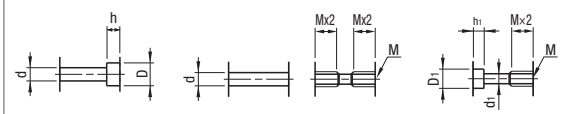
Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

* Drawing when 3 Port type is selected.
The total number of Q, R, G and K threads is 8.

Mounting holes can be selected.
Standard hole shape is selected when no **hole shape modification** is specified.

<L Dimension Calculation>
In the case of BMUFP3-~-P35
L=NxP+2E=(No. of Ports 3-1)x35+2x35=140

-Mounting Hole Options



Part Number			*Rc (PT), NPT		Pitch P		No. of Pitches N	Q · R · G · K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	Q · R	G · K	Standard Type	1mm Increment									M
(30x35) Pitch Standard BMUS / Pitch Configurable BMUSP; BMUSR	ZB(Back Surface Counterbore)	1	1(1·8) 2(1·4)	1(1·8) 2(1·4)	30	20~50	0	4	30	35	20	20	15	6	M5
		2					1	6							
		3					2	8							
		4					3	10							
		5					4	12							
		6					5	14							
		7					6	16							
		8				20~40	7	18							
(x 40) Pitch Standard BMUF BMUFM BMUFR BMUFS BMUFC / Pitch Configurable BMUFP BMUFRP BMUFSP	NA(Through) T(Female Thread) ZT(Counterbore Female Thread)	1	1(1·8) 2(1·4) 3(3·8) 1N(NPT 1·8) 2N(NPT 1·4) 3N(NPT3·8)	2(1·4) 3(3·8) 4(1·2) 2N(NPT 1·4) 3N(NPT3·8) 4N(NPT 1·2)	40	25~50	0	4	40	40	35	20	20	7	M6
		2					1	6							
		3					2	8							
		4					3	10							
		5					4	12							
		6					5	14							
		7				25~45	6	16							
		8				25~40	7	18							
(x 60) Pitch Standard BMUFL BMUFLM BMUFLR / Pitch Configurable BMUFLP BMUFLRP		1	2(1·4) 3(3·8) 4(1·2) 6(3·4)	2(1·4) 3(3·8) 4(1·2) 6(3·4)	60	35~60	0	4	60	60	30	30	20	8	M8
		2					1	6							
		3					2	8							
		4					3	10							
		5					4	12							
		6					5	14							

For *marked Q, R, G and K, please specify 1, 2, 3, 4, 6, 1N, 2N, 3N and 4N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.

Single Port is not available for Pitch Configurable Type. 1.4401/X5CrNiMp17-12-2 / Brass is up to 6 connections.
6 and 8 port types have an additional mounting hole at L/2, and 7-port type at P/2 of 2 / 3 port, and 5 / 6 port.

Order Example

Part Number											
Type	Mounting Hole Options	No. of Circuits	-	Q	-	R	-	G	-	K	-	P
BMUF		4	-	Q3	-	R2	-	G3	-	K3		
BMUFLP	NA	3	-	Q3	-	R4	-	G4	-	K4	-	P45

Days to Ship

- 1.4301/X5CrNi18-10
8 Days — Express A — 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

-1.0038/S235JR Electroless Nickel Plating (Block square 40), 1.4401/X6CrNiMo17-12-2, Brass
8 Days

-1.0038/S235JR Trivalent Chromate, 1.0038/S235JR Electroless Nickel Plating (Block Square 60)
10 Days — Express B — 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

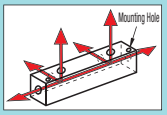
Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	Pitch (P) Standard € Unit Price										Pitch (P) Configurable € Unit Price					
	30x35		40 Square					60 Square			30x35	40 Square			60 Square	
	BMUS	BMUSR	BMUF	BMUFM	BMUFR	BMUFS	BMUFC	BMUFL	BMUFLM	BMUFLR	BMUSP	BMUFP	BMUFRP	BMUFSP	BMUFLP	BMUFLRP
1																
2																
3																
4																
5																
6																
7																
8																

Manifold Blocks - Pneumatic

-Lateral Through Hole · L-Shaped Hole Type-



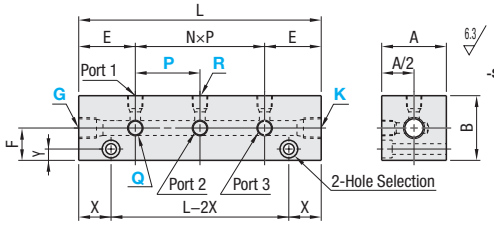
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMUAF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

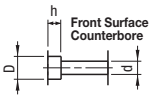
RoHS



Type						Material	Surface Treatment	Normal Pressure
Pitch (P) Standard			Pitch (P) Configurable					
25 Square	30x40	50 Square	25 Square	30x40	50 Square			
BMUAC	BMUAF	BMUAL	BMUACP	BMUAFP	BMUALP	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
BMUACA	BMUAFA	BMUALA	BMUACAP	BMUAFAP	BMUALAP		Clear Anodize	



-Standard Mounting Hole



Mounting Holes Dimension	d	D	h	D_1	d_1	h_1
M5	5.5	9.5	5.5	8	4.2	4.5
M8	8.5	14	8.5	11	6.8	6.5

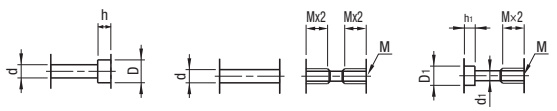
Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

* Drawing when 3 circuit type is selected.
The total number of Q, R, G and K threads is 8.

Mounting holes can be selected.
Standard hole shape is selected when no **hole shape modification** is specified.
Note that the default of 25 Square is Through Hole.

<L Dimension Calculation>
In the case of BMUAFP3-~-P35
L=NxP+2E=(Number of Ports 3-1)x35+2x20=110

-Mounting Hole Options



Part Number			*Rc(PT), NPT, M(Coarse)	Pitch P		No. of	Q · R · G · K							Mounting Holes
Type	Mounting Hole Options	No. of Circuits	Q · R · G · K	Standard Type	1mm Increment	Pitches N	Total No. of Threads	A	B	E	F	X	Y	M
(x 25) Pitch Standard BMUAC / Pitch Configurable BMUACP	T(Female Thread)	1	1(1·8) M3(M3)** M4(M4)** 5(M5)*	15	15~50	0	4	25	25	20	12.5	10	4	M5
		2				1	6							
		3				2	8							
		4				3	10							
		5				4	12							
		6				5	14							
BMUACA / BMUACAP		7**			15~40	6	16							
		8**			15~35	7	18							
(30x40) Pitch Standard BMUAF / Pitch Configurable BMUAFP	ZB(Back Surface Counterbore)	1	1(1·8) 2(1·4) 5(M5)** 1N(NPT 1·8) 2N(NPT 1·4)	30	20~50	0	4	30	40	20	20	7.5	7	M5
		2				1	6							
		3				2	8							
		4				3	10							
	NA(Through)	5				4	12							
		6				5	14							
BMUAFA / BMUAFAP		7**			15~40	6	16							
	T(Female Thread)	8**			15~35	7	18							
(x 50) Pitch Standard BMUAL / Pitch Configurable BMUALP	ZT(Counterbore Female Thread)	1	2(1·4) 3(3·8) 4(1·2)	40	35~60	0	4	50	50	25	25	8.5	8.5	M8
		2				1	6							
		3				2	8							
		4				3	10							
		5				4	12							
BMUALA / BMUALAP		6				5	14							

For *marked Q, R, G and K, please specify 1, 2, 3, 4, 5, M3, M4, 1N and 2N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
** For the 25 and 30x40 Square manifolds, denoted combinations are not selectable.

Single Port is not available for Pitch Configurable Type.
6 and 8 port types have an additional mounting hole at L/2, and 7-port type at P/2 of 2 / 3 port, and 5 / 6 port.
** For the 25 and 30x40 Square Pitch Specified Types, M3, M4 and 5(M5) cannot be selected for G and K.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits	-	Q	-	R	-	G	-	K	-	P
BMUAC	T	2	-	Q1	-	R5	-	G1	-	K1		
BMUAFP	ZT	3	-	Q1	-	R1	-	G2	-	K2	-	P40

Days to Ship

- EN AW-5052/AlMg2,5 Products: **8 Days**
- EN AW-5052/AlMg2,5 Clear Anodize: **10 Days**

Express B | 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

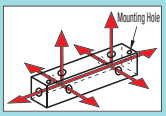
Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	Pitch (P) Standard € Unit Price						Pitch (P) Configurable € Unit Price					
	25 Square		30x40		50 Square		25 Square		30x40		50 Square	
	BMUAC	BMUACA	BMUAF	BMUAFA	BMUAL	BMUALA	BMUACP	BMUACAP	BMUAFP	BMUAFAP	BMUALP	BMUALAP
1												
2												
3												
4												
5												
6												
7												
8												

Manifold Blocks - Hydraulic

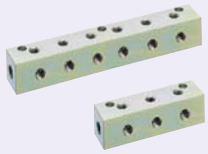
-Lateral Through Hole · T-Shaped Hole Type-



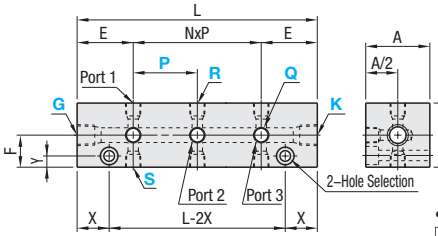
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMTF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

RoHS



Type						Material	Surface Treatment	Normal Pressure
Pitch (P) Standard			Pitch (P) Configurable					
40 Square	60 Square	70 Square	40 Square	60 Square	70 Square			
BMTF	BMTFL	-	-	BMTFLP	BMTLP	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
BMTFM	BMTFLM	BMTLM	-	-	-		Electroless Nickel Plating	
BMTFR	BMTFLR	-	BMTFRP	BMTFLRP	-	1.4301/X5CrNi18-10	-	
BMTFS	-	-	-	-	-	1.4401/X5CrNiMo17-12-2		1MPa ≈ 10kgf/cm² or less
BMTFC	-	-	-	-	-	Brass		



Mounting Holes Dimension	d	D	h	D1	d1	h1
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

* Drawing is for when 3 Port type is selected.
The total no. of Q, R, S, G and K threads is 11.

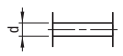
Mounting holes can be selected.

Standard hole shape is selected when no **hole shape modification** is specified.

<L Dimension Calculation>
An Example of BMTFLP3- ~ -P35
L=NxP+2E=(No. of Circuits 3-1)x35+2x30=130

•Mounting Hole Options

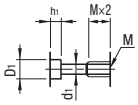
Through Hole (NA)



Female Thread (T)



Counterbore Female Thread (ZT)



Part Number			*Rc(PT), NPT, M(Coarse)		Pitch P		No. of Pitches N	Q • R • S • G • K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes M
Type	Mounting Hole Options	No. of Circuits	Q • R • S	G • K	Standard Type	1mm Increment									
(x 40) Pitch Standard BMTF BMTFM BMTFR BMTFS BMTFC / Pitch Configurable BMTFRP	NA(Through)	1	1(1/8)	2(1/4)	40	25~50	0	5	40	40	35	20	20	7	M6
		2	2(1/4)	3(3/8)			1	8							
		3	3(3/8)	4(1/2)			2	11							
		4	1N(NPT 1/8)	2N(NPT 1/4)			3	14							
		5	2N(NPT 1/4)	3N(NPT3/8)			4	17							
		6	3N(NPT3/8)	4N(NPT 1/2)		30~50	5	20							
(x 60) Pitch Standard BMTFL BMTFLM BMTFLR / Pitch Configurable BMTFLP BMTFLRP	T(Female Thread) ZT(Counterbore Female Thread)	1	2(1/4) 4(1/2) 6(3/4)	2(1/4) 3(3/8) 4(1/2) 6(3/4)	60	35~60	0	5	60	60	30	30	7.5	8	M8
		2					1	8							
		3					2	11							
		4					3	14							
		5					4	17							
		6				40~60	5	20							
(x 70) Pitch Standard BMTLM / Pitch Configurable BMTLP		1	4(1/2) 6(3/4)	4(1/2) 6(3/4) 8(1)	60	40~60	0	5	70	70	40	35	16.5	8	M8
		2					1	8							
		3					2	11							
		4					3	14							

For * marked Q, R, S, G and K, please specify 1, 2, 3, 4, 6, 8, 1N, 2N, 3N or 4N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.

Single Port is not available for Pitch Configurable Type.
Only 6 Port type has an additional mounting hole at L/2 position.

Order Example

Part Number											
Type	Mounting Hole Options	No. of Circuits	-	Q	-	R	-	S	-	G	-	K	-	P
BMTF		2		Q1		R1		S1		G2		K2		
BMTFLP	NA	3		Q3		R4		S4		G4		K4		P45

Days to Ship

•1.4301/X5CrNi18-10
8 Days — Express A 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

• 1.0038/S235JR Electroless Nickel Plating (Block Square 40) · 1.4401 / X5CrNiMo17-12-2Brass
8 Days

• 1.0038/S235JR Trivalent Chromate · 1.0038/S235JR Electroless Nickel Plating (Block square 60, 70)
10 Days — Express B 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

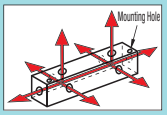
€ Volume Discount (€ Round down to one Cent) **P.88**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	Pitch (P) Standard € Unit Price									Pitch (P) Configurable € Unit Price			
	40 Square					60 Square			70 Square	40 Square	60 Square		70 Square
	BMTF	BMTFM	BMTFR	BMTFS	BMTFC	BMTFL	BMTFLM	BMTFLR	BMTLM	BMTFRP	BMTFLP	BMTFLRP	BMTLP
1													
2													
3													
4													
5													
6													

Manifold Blocks - Pneumatic

-Lateral Through Hole · T-Shaped Hole Type-



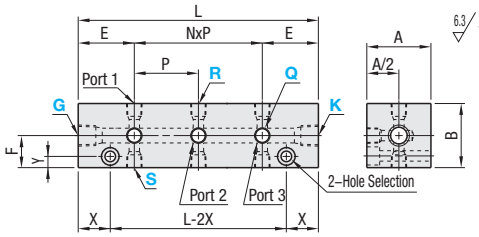
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMTAF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

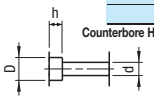
RoHS



Type			Material	Surface Treatment	Normal Pressure
25 Square	30x40	50 Square			
BMTAC	BMTAF	BMTAL	EN AW-5052/AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
-	BMTAFA	-		Clear Anodize	



Mounting Holes Dimension	d	D	h	D_1	d_1	h_1
M5	5.5	9.5	5.5	8	4.2	4.5
M8	8.5	14	8.5	11	6.8	6.5



Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

* Drawing is for when 3 Port type is selected.
The total no. of Q, R, S, G and K threads is 11.

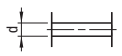
Mounting holes can be selected.

Standard hole shape is selected when no **hole shape modification** is specified.
Note that the default of 25 Square is Through Hole.

<L Dimension Calculation>
An Example of BMTAF3
L=NxP+2E=(No. of Ports 3-1)x30+2x20=100

•Mounting Hole Options

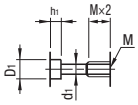
Through Hole (NA)



Female Thread (T)



Counterbore Female Thread (ZT)



Part Number			*Rc(PT), NPT, M(Coarse)		Pitch P	No. of Pitches N	Q • R • S • G • K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes M
Type	Mounting Hole Options	No. of Circuits	Q • R • S	G • K										
(x 25) BMTAC	T(Female Thread)	1	1(1/8) M3(M3) M4(M4) 5(M5)	1(1/8) M3(M3) M4(M4) 5(M5)	15	0	5	25	25	20	12.5	10	4	M5
		2				1	8							
		3				2	11							
		4				3	14							
		5				4	17							
		6				5	20							
(30x40) BMTAF BMTAFA	NA(Through) T(Female Thread)	1	1(1/8) 2(1/4) 5(M5) 1N(NPT 1/8) 2N(NPT 1/4)	1(1/8) 2(1/4) 5(M5) 1N(NPT 1/8) 2N(NPT 1/4)	30	0	5	30	40	20	20	7.5	7	M5
		2				1	8							
		3				2	11							
		4				3	14							
		5				4	17							
		6				5	20							
(x 50) BMTAL	ZT(Counterbore Female Thread)	1	2(1/4) 3(3/8) 4(1/2)	2(1/4) 3(3/8) 4(1/2)	40	0	5	50	50	25	25	8.5	8.5	M8
		2				1	8							
		3				2	11							
		4				3	14							
		5				4	17							
		6				5	20							

For * marked Q, R, S, G and K, please specify 1, 2, 3, 4, 5, M3, M4, 1N or 2N indicated before ( ).

Only 6 Port type has an additional mounting hole at L/2 position.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits	-	Q	-	R	-	S	-	G	-	K
BMTAC	T	3	-	QM3	-	R1	-	S1	-	G1	-	K1

Days to Ship

• EN AW-5052/AlMg2,5 Products
8 Days

• EN AW-5052/AlMg2,5 Clear Anodize
10 Days | Express B | 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

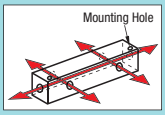
€ Volume Discount (ERound down to one Cent) **P.88**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	€ Unit Price			
	25 Square	30x40		50 Square
	BMTAC	BMTAF	BMTAFA	BMTAL
1				
2				
3				
4				
5				
6				

Manifold Blocks - Hydraulic

-Lateral · Vertical Through Hole Type-



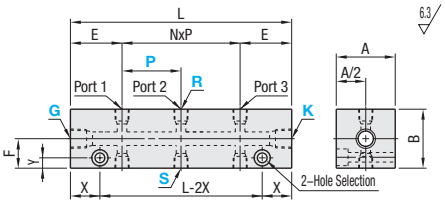
CAD Data

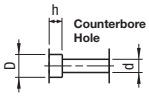
G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMIF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

RoHS



Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
30x35	40 Square	60 Sq.	70 Sq.	30x35	40 Sq.	60 Sq.			
BMIS	BMIF	-	BMIL	BMISP	BMIFP	-	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
-	BMIFR	BMIFLR	-	-	BMIFRP	BMIFLRP	1.4301/X5CrNi18-10	-	
-	BMIFS	-	-	-	-	-	1.4401/X5CrNiMo17-12-2		1MPa ≈ 10kgf/cm² or less





Mounting Holes Dim.	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	*4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

* Only 1.4301/X5CrNi18-10 d1 dimension is 4.3.

Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

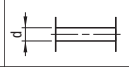
* Drawing when 3 Port type is selected.
The total no. of R, S, G and K threads is 8.

Mounting holes can be selected.
Standard hole shape is selected when no **hole shape modification** is specified.

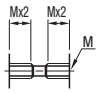
<L Dimension Calculation>
Ex.: In the case of BMIFP3- ~ -P35
L=NXP+2E=(No. of Ports 3-1)x35+2x35=140

•Mounting Hole Options

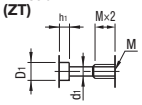
Through Hole (NA)



Female Thread (T)



Counterbore Female Thread (ZT)



Part Number			*Rc(PT), NPT, M(Coarse)		Pitch P		No. of Pitches N	R · S · G · K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	R · S	G · K	Standard Type	1mm Increment									M
(30x35) Pitch Standard **BMIS** Pitch Configurable **BMISP**	NA (Through) T (Female Thread) ZT (Counterbore Female Thread)	1	1 (1·8) 2 (1·4)	1 (1·8) 2 (1·4)	30	20~50	0	4	30	35	30	17.5	17	6	M5
		2					1	6							
		3					2	8							
		4					3	10							
		5					4	12							
		6				25~50	5	14							
(x 40) Pitch Standard **BMIF** **BMIFR** **BMIFS** Pitch Configurable **BMIFP** **BMIFRP**		1	1 (1·8) 2 (1·4) 3 (3·8) 1N (NPT 1·8) 2N (NPT 1·4) 3N (NPT3·8)	2 (1·4) 3 (3·8) 4 (1·2) 2N (NPT 1·4) 3N (NPT3·8) 4N (NPT 1·2)	40	25~50	0	4	40	40	35	20	20	7	M6
		2					1	6							
		3					2	8							
		4					3	10							
		5					4	12							
		6				30~50	5	14							
(x 60) Pitch Standard **BMIFLR** Pitch Configurable **BMIFLRP**		1	2 (1·4) 3 (3·8) 4 (1·2) 6 (3·4)	2 (1·4) 3 (3·8) 4 (1·2) 6 (3·4)	60	35~60	0	4	60	60	30	30	7.5	8	M8
		2					1	6							
		3					2	8							
		4					3	10							
		5					4	12							
		6				40~60	5	14							
(x 70) Pitch Standard **BMIL**		1	3 (3·8) 4 (1·2) 6 (3·4)	6 (3·4) 8 (1)	60	-	0	4	70	70	40	35	16.5	8	M8
		2					1	6							
		3					2	8							
		4					3	10							

For * marked R, S, G and K, please specify 1, 2, 3, 4, 6, 8, 1N, 2N, 3N or 4N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.

Single Port is not available for Pitch Configurable Type.
Only 6 Port type has an additional mounting hole at L/2 position.

Order Example

Part Number										
Type	Mounting Hole Opt.	No. of Circuits	-	R	-	S	-	G	-	K	-	P
BMIS		3	-	R1	-	S1	-	G1	-	K1		
BMISP	ZT	3	-	R2	-	S1	-	G1	-	K1	-	P25

Price

Volume Discount (Round down to one Cent) **P.88**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

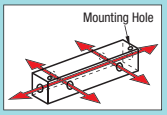
Days to Ship

- 1.4301/X5CrNi18-10: 8 Days — Express A 8,00 EUR/piece **P.88**
A Express Charge of 21,60 EUR for 3 or more identical pieces.
- 1.4401/X5CrNiMo17-12-2: 8 Days
- 1.0038/S235JR Trivalent Chromate: 10 Days — Express B 8,00 EUR/piece **P.88**
A Express Charge of 21,60 EUR for 3 or more identical pieces.

No. of Ports	Pitch (P) Standard € Unit Price						Pitch (P) Configurable € Unit Price			
	30x35	40 Square			60 Square	70 Square	30x35	40 Square		60 Square
	BMIS	BMIF	BMIFR	BMIFS	BMIFLR	BMIL	BMISP	BMIFP	BMIFRP	BMIFLRP
1										
2										
3										
4										
5										
6										

Manifold Blocks - Pneumatic

-Lateral · Vertical Through Hole Type-



CAD Data

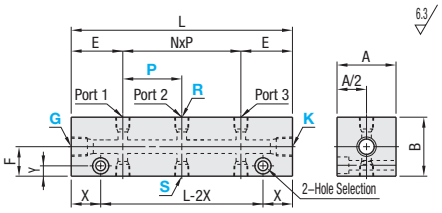
G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMIAF**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

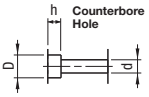
RoHS



Type			Material	Surface Treatment	Normal Pressure
30x40	50 Square	70 Square			
BMIAF	BMIAL	BMIAB	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
BMIAFA	-	-		Clear Anodize	

Material of 70 square is EN AW-6063/AlMg0,7Si.





Mounting Holes Dim.	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	4.2	4.5
M8	8.5	14	8.5	11	6.8	6.5

Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

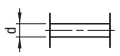
* Drawing when 3 Port type is selected.
The total no. of R, S, G and K threads is 8.

Mounting holes can be selected.
Standard hole shape is selected when no **hole shape modification** is specified.

<L Dimension Calculation>
Ex.: In the case of BMIAF3
L=NXP+2E=(No. of Ports 3-1)x30+2x20=100

•Mounting Hole Options

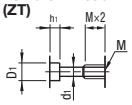
Through Hole (NA)



Female Thread (T)



Counterbore Female Thread (ZT)



Part Number			*Rc(PT), NPT, M(Coarse)		Pitch P	No. of Pitches N	R · S · G · K Total No. of Threads	A	B	E	F	X	Y	Mounting Holes
Type	Mounting Hole Options	No.	R · S	G · K	Standard Type									M
(30x40) BMIAF BMIAFA	NA (Through)	1	1 (1·8) 2 (1·4) 5 (M5) 1N (NPT 1·8) 2N (NPT 1·4)	1 (1·8) 2 (1·4) 5 (M5) 1N (NPT 1·8) 2N (NPT 1·4)	30	0	4	30	40	20	20	7.5	7	M5
		2				1	6							
		3				2	8							
		4				3	10							
		5				4	12							
		6				5	14							
(x 50) BMIAL	T (Female Thread) ZT (Counterbore Female Thread)	1	2 (1·4) 3 (3·8) 4 (1·2)	2 (1·4) 3 (3·8) 4 (1·2)	40	0	4	50	50	25	25	8.5	8.5	M8
		2				1	6							
		3				2	8							
		4				3	10							
		5				4	12							
		6				5	14							
(x 70) BMIAB		1	4 (1·2) 6 (3·4)	4 (1·2) 6 (3·4) 8 (1)	60	0	4	70	70	40	35	16.5	8	M8
		2				1	6							
		3				2	8							
		4				3	10							

For * marked R, S, G and K, please specify 1, 2, 3, 4, 5, 6, 8, 1N or 2N indicated before ( ).
Only 6 Port type has an additional mounting hole at L/2 position.

Order Example

Part Number										
Type	Mounting Hole Options	No. of Circuits	-	R	-	S	-	G	-	K
BMIAFA	ZT	3	-	R1	-	S2	-	G2	-	K2

Days to Ship

- EN AW-5052/AlMg2,5 / EN AW-6063/AlMg0,7Si Products: **8 Days**
- EN AW-5052/AlMg2,5 Clear Anodize: **10 Days** Express B 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

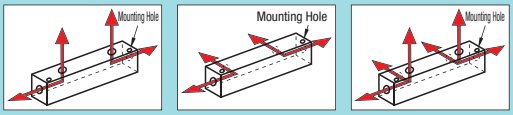
Price

Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Ports	€ Unit Price			
	30x40		50 Square	70 Square
	BMIAF	BMIAFA	BMIAL	BMIAB
1				
2				
3				
4				
5				
6				

Hydraulic · Water Pressure · Pneumatic Manifold
-Two-Circuit Type-



CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex. G-WBMBF) For details of ordering methods and recommended tapered thread tightening torques and through-pilot holes, please see P.1082

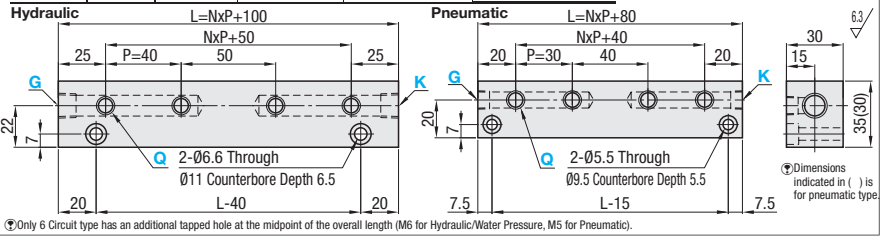
RoHS



Usage	Type	Block Square	Material	Surface Treatment	Normal Pressure
For Hydraulic	WBMBF	30x35	1.0038/S235JR	Trivalent Chromate	20.6MPa = 210kgf/cm² or less
	WBMBFR		1.4301/X5CrNi18-10	-	
For Pneumatic	WBMSF	30 Square	EN AW-5052/AlMg2,5	-	1MPa = 10kgf/cm² or less

Thread JIS B0203R (PT)
JIS B0202 G (PF): ISO G228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

*Drawing when 4 Circuit type is selected.
The total no. of Q, G and K threads is 6.



Dimensions indicated in ( ) is for pneumatic type.

Only 6 Circuit type has an additional tapped hole at the midpoint of the overall length (M6 for Hydraulic/Water Pressure, M5 for Pneumatic).

Part Number Type	No. of Circuits	Hydraulic *Rc (PT), NPT Q	Hydraulic *Rc (PT), NPT G · K	Pneumatic * RC (PT), M (Coarse), NPT Q · G · K	No. of Pitches N	Q · G · K Total No. of Threads	€ Unit Price WBMBF	WBMBFR	WBMSF
WBMBF WBMBFR WBMSF	2	1(1·8) 2(1·4) 3(3·8) 1N(NPT 1·8) 2N(NPT 1·4) 3N(NPT3·8)	2(1·4) 3(3·8) 4(1·2) 2N(NPT 1·4) 3N(NPT3·8) 4N(NPT 1·2)	1(1·8) 2(1·4) 5(M5) 1N(NPT 1·8) 2N(NPT 1·4)	0	4			
	4				2	6			
	6				4	8			

For * marked Q, G and K, please specify 1, 2, 3, 4, 5, 1N, 2N, 3N or 4N indicated before ( ).

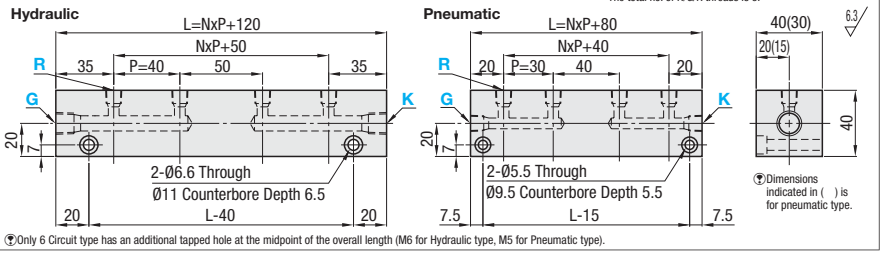
RoHS



Usage	Type	Block Square	Material	Surface Treatment	Normal Pressure
For Hydraulic	WBMRF	40 Square	1.0038/S235JR	Trivalent Chromate	20.6MPa = 210kgf/cm² or less
For Pneumatic	WBMRAF	30x40	EN AW-5052/AlMg2,5	-	1MPa = 10kgf/cm² or less

Thread JIS B0203R (PT)
JIS B0202 G(PF):ISO 228-1 Compatible
ANSI/ASME B.I.20.1-1983(NPT)

* Drawing when 4 Circuit type is selected.
The total no. of R/G/K threads is 6.



Dimensions indicated in ( ) is for pneumatic type.

Only 6 Circuit type has an additional tapped hole at the midpoint of the overall length (M6 for Hydraulic type, M5 for Pneumatic type).

Part Number Type	No. of Circuits	Hydraulic *Rc (PT), NPT R	Hydraulic *Rc (PT), NPT G · K	Pneumatic * Rc (PT), M (Coarse), NPT R · G · K	No. of Pitches N	R · G · K Total No. of Threads	€ Unit Price WBMRF	WBMRAF
WBMRF WBMRAF	2	1(1·8) 2(1·4) 3(3·8) 1N(NPT 1·8) 2N(NPT 1·4) 3N(NPT3·8)	2(1·4) 3(3·8) 4(1·2) 2N(NPT 1·4) 3N(NPT3·8) 4N(NPT 1·2)	1(1·8) 2(1·4) 5(M5) 1N(NPT 1·8) 2N(NPT 1·4)	0	4		
	4				2	6		
	6				4	8		

For * marked R, G and K, please specify 1, 2, 3, 4, 5, 1N, 2N, 3N or 4N indicated before ( ).

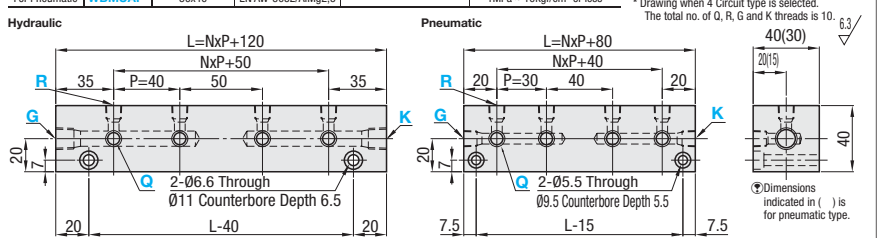
RoHS



Usage	Type	Block Square	Material	Surface Treatment	Normal Pressure
For Hydraulic	WBMUF	40 Square	1.0038/S235JR	Trivalent Chromate	20.6MPa = 210kgf/cm² or less
For Pneumatic	WBMUAF	30x40	EN AW-5052/AlMg2,5	-	1MPa = 10kgf/cm² or less

Thread JIS B0203R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

* Drawing when 4 Circuit type is selected.
The total no. of Q, R, G and K threads is 10.



Dimensions indicated in ( ) is for pneumatic type.

Only 6 Circuit type has an additional tapped hole at the midpoint of the overall length (M6 for Hydraulic type, M5 for Pneumatic type).

Part Number Type	No. of Circuits	Hydraulic *Rc (PT), NPT Q / R	Hydraulic *Rc (PT), NPT G · K	Pneumatic * RC (PT), M (Coarse), NPT Q · R · G · K	No. of Pitches N	Q · R · G · K Total No. of Threads	€ Unit Price WBMUF	WBMUAF
WBMUF WBMUAF	2	1(1/8) 2(1/4) 3(3/8) 1N(NPT 1/8) 2N(NPT 1/4) 3N(NPT3/8)	2(1·4) 3(3·8) 4(1·2) 2N(NPT 1·4) 3N(NPT3·8) 4N(NPT 1·2)	1(1·8) 2(1·4) 5(M5) 1N(NPT 1·8) 2N(NPT 1·4)	0	6		
	4				2	10		
	6				4	14		

For * marked Q, R, G and K, please specify 1, 2, 3, 4, 5, 1N, 2N, 3N or 4N indicated before ( ).

Order Example

Part Number	-	Q	-	R	-	G	-	K
WBMBF4	-	Q3			-	G3	-	K3
WBMRF4			-	R2	-	G2	-	K3
WBMUF4	-	Q1	-	R3	-	G3	-	K3

Price

Volume Discount (Round down to one Cent.) P.88

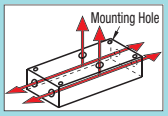
Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

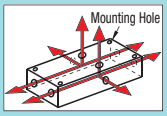
For orders larger than indicated quantity, please request a quotation.

Days to Ship

- 1.4301/X5CrNi18-10: 8 Days — Express A — 8,00 EUR/ piece P.88
  A Express Charge of 21,60 EUR for 3 or more identical pieces.
- EN AW-5052/AlMg2,5: 8 Days
- 1.0038/S235JR Trivalent Chromate: 10 Days — Express B — 8,00 EUR/ piece P.88
  A Express Charge of 21,60 EUR for 3 or more identical pieces.

Manifold Blocks - Pneumatic
-Double-





CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex. G-BMSW) For details of ordering methods and recommended tapered thread tightening torques and through-pilot holes, please see **P.1082**

■**Blocks 30x50**

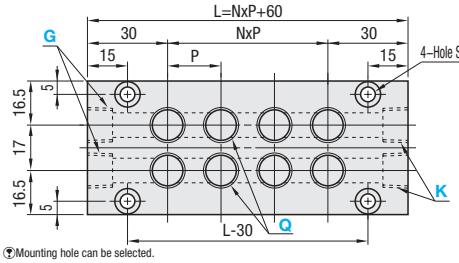
RoHS



Usage	Type	Material	Surface Treatment	Normal Pressure
For Pneumatic	BMSW	EN AW-5052/ AlMg2,5	-	1MPa = 10kgf/cm² or less
	BMSWA		Clear Anodize	

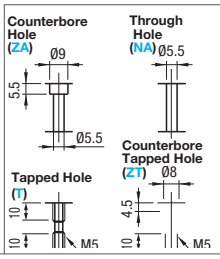
Thread JIS B0203R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible

*Drawing when 4 Circuit type is selected.
The total no. of Q, G and K threads is 12.



Mounting hole can be selected.

Mounting Hole Options



Part Number			*Rc(PT), M (Coarse)	Pitch P	Number of Pitches N	Q · G · K Total No. of Threads	€ Unit Price	
Type	Mounting Hole Selection	No. of Circuits	Q · G · K				BMSW	BMSWA
BMSW BMSWA	ZA(Counterbore) NA(Through hole) T(Female Thread) ZT(Counterbore Female Thread)	1	1(1·8) M3(M3) M4(M4) 5(M5) 2(1·4)	20	0	6		
		2			1	8		
		3			2	10		
		4			3	12		
		5			4	14		
		6			5	16		

For * marked Q, G and K, please specify 1, 2, M3, M4 or 5 indicated before ( ).

■**Blocks 30x50**

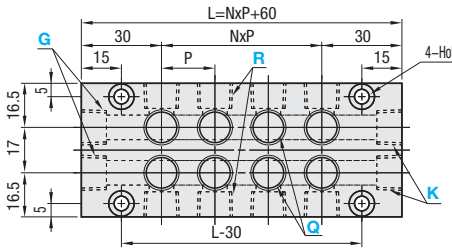
RoHS



Usage	Type	Material	Surface Treatment	Normal Pressure
For Pneumatic	BMUAW	EN AW-5052/AlMg2,5	-	20.6MPa = 210kgf/cm² or less

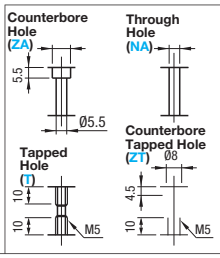
Thread JIS B0203R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible

*Drawing when 4 Circuit type is selected.
The total no. of Q/R/G/K threads is 20.



Mounting hole can be selected.

- Mounting Hole Options



Part Number			*Rc(PT), M (Coarse)	Pitch P	Number of Pitches N	Q · R · G · K Total No. of Threads	€ Unit Price
Type	Mounting Hole Selection	No. of Circuits	Q · R · G · K				
BMUAW	ZA(Counterbore) NA(Through hole) T(Female Thread) ZT(Counterbore Female Thread)	1	1(1·8) M3(M3) M4(M4) 5(M5) 2(1·4)	20	0	8	
		2			1	12	
		3			2	16	
		4			3	20	
		5			4	24	
		6			5	28	

For * marked Q, R, G and K, please specify 1, 2, M3, M4 or 5 indicated before ( ).

Order Example

Part Number											
Type	Mounting Holes	No. of Circuits	-	Q	-	R	-	G	-	K
BMSW	ZA	4	-	Q1			-	G2	-	K2
BMUAW	T	3	-	Q1	-	R1	-	G2	-	K2

Days to Ship

-EN AW-5052/AlMg2,5: 8 Days

- EN AW-5052/AlMg2,5 Clear Anodized Products: 10 Days

Express B: 8,00 EUR/ piece

P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

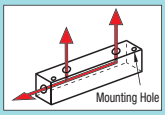
Price

■**Volume Discount** (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Hydraulic · Water Pressure · Pneumatic Manifold
-Horizontal Non-Through Hole Type-



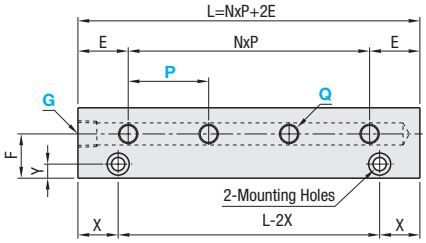
CAD Data

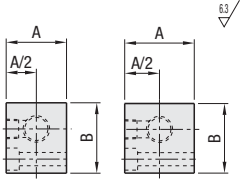
G (PF) screws are added. Orders can be placed with "G-" before the model No. (Ex.: **G-BMZF**) For details of ordering methods, recommended tapered threads tightening torque and through pilot holes, please refer to **P.1082**.



Usage	Type: Pitch (P) Standard 25x32	30x35	15 Square	20 Square	30 Square	40 Square	Pitch (P) Configurable 25x32	30x35	20 Square	30 Square	40 Square	Material	Surface Treatment	Normal Pressure
For Hydraulics	BMZS	BMZF	-	-	-	-	-	BMZFP	-	-	-	1.0038/S235JR	Trivalent Chromate / Electroless Nickel Plating	20.6MPa ≈ 210kgf/cm² or less
	BMZSM	BMZFM	-	-	-	-	BMZSMP	BMZFMP	-	-	-			
	BMZSR	BMZFR	-	-	-	-	BMZSRP	BMZFRP	-	-	-	1.4301/X5CrNi18-10	-	
For Pneumatic	-	-	BMZAS	BMZAFC	BMZAF	BMZAFL	-	-	BMZAFCP	BMZAFP	BMZAFLP	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
	-	-	BMZASA	BMZAFCA	BMZAFA	BMZAFLA	-	-	BMZAFCAP	BMZAFAP	BMZAFLAP		Clear Anodize	

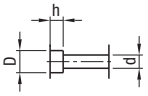
Material of 15 square is EN AW-6063/AlMg0,7Si.





6.3 Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible

Mounting Hole Options



* Drawing when 4 Port type is selected.
The no. of Q · G screws is 5.
Mounting holes will be through holes for 15 and 20 square types.

Part Number Type	No. of Circuits	* RC (PT), M (Coarse) Q	G	Pitch P Standard Type	1mm Increment	No. of Pitches N	Q · G Total No. of Threads	A	B	E	F	X	Y	Mounting Hole Dimensions d	D	h
Hydraulic (25 x 32 Sq.)	1	1(1/8) 2(1/4)	1(1/8) 2(1/4)	25	20~50 Please specify within NXP≤140.	0	2	25	32	20	20	15	6	5.5	9.5	5.5
	2					1	3									
Pitch Standard / Pitch Configurable	3					2	4									
BMZS / BMZSMP	4					3	5									
BMZSM / BMZSRP	5					4	6									
BMZSR																
Hydraulic (30 x 35 Sq.)	1	1(1/8) 2(1/4) 3(3/8)	1(1/8) 2(1/4) 3(3/8) 4(1/2)	35	25~50 Please specify within NXP≤120.	0	2	30	35	25	22	15	7	6.6	11	6.5
	2					1	3					20				
Pitch Standard / Pitch Configurable	3					2	4									
BMZF / BMZFP	4					3	5									
BMZFM / BMZFMP	5			30		4	6									
BMZFR / BMZFRP																
Pneumatic (15 Sq.)	1	M3(M3) M4(M4) 5(M5)	5(M5)	15	-	0	2	15	15	15	10	5	3.5	4.3	-	-
	2					1	3									
Pitch Standard	3					2	4									
BMZAS	4					3	5									
BMZASA	5					4	6									
Pneumatic (20 Sq.)	1	1(1/8) M3(M3) M4(M4) 5(M5)	1(1/8) 5(M5)**	15	15~50 When G is 5 (M5 is selected) N x P ≤ 70 When G is 1 (1/8 is selected), please specify within NXP≤130	0	2	20	20	20	13	5	4	5.5	-	-
	2					1	3									
Pitch Standard / Pitch Configurable	3					2	4									
BMZAFC / BMZAFCP	4					3	5									
BMZAFCA / BMZAFCAP	5**					4	6									
Pneumatic (30 Sq.)	1	1(1/8) 2(1/4) 5(M5)	1(1/8) 2(1/4) 5(M5)**	25	20~50 When G is 5 (M5 is selected) N x P ≤ 70 When G is 1 (1/8) or 2 (1/4), please specify within NXP≤130	0	2	30	30	20	20	7.5	7	5.5	9.5	5.5
	2					1	3									
Pitch Standard / Pitch Configurable	3					2	4									
BMZAF / BMZAFP	4					3	5									
BMZAFA / BMZAFAP	5**					4	6									
Pneumatic (40 Sq.)	1	1(1/8) 2(1/4) 3(3/8)	2(1/4) 3(3/8) 4(1/2)	30	25~50 Specify in the range of N x P ≤ 130.	0	2	40	40	25	25	7	7	6.6	11	6.5
	2					1	3									
Pitch Standard / Pitch Configurable	3					2	4									
BMZAFL / BMZAFLP	4					3	5									
BMZAFLA / BMZAFLAP	5					4	6									

For *marked Q and G, please specify 1 · 2 · 3 · 4 · 5 · M3 and M4 indicated before "( )".
When *marked 5 pneumatic outlet port configuration in 20 and 30 sq. are selected, 5 (M5) is not selectable for G.
Single Port is not available for Pitch Configurable Type.
Mounting holes will be through holes for Pneumatic 15 and 20 square types.

Order Example

Part Number		Q		G		P
BMZF4	-	Q1	-	G2		
BMZAFP3	-	Q2	-	G2	-	P30

Price

Volume Discount (Round down to one Cent) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

-1.0038S235JR Electroless Nickel Plating · 1.4301/X5CrNi18-10 · EN AW-5052/AlMg2,5 · EN AW-6063/AlMg0,7 Products
8 Days

-1.0038S235JR Trivalent Chromate · EN AW-5052/AlMg2,5 Clear Anodized EN AW-6063/AlMg0,7 Clear Anodized Products
10 Days

Express B 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

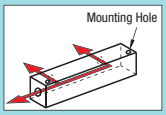
No. of Ports	€ Unit Price: Pitch Standard 25x32 BMZS	BMZSM	BMZSR	30x35 BMZF	BMZFM	BMZFR	Pitch Configurable 25x32 BMZSMP	BMZSRP	30x35 BMZFP	BMZFMP	BMZFRP
1											
2											
3											
4											
5											

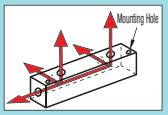
No. of Ports	€ Unit Price: Pitch Standard 15 Square BMZAS	BMZASA	20 Square BMZAFC	BMZAFCA	30 Square BMZAF	BMZAFA	40 Square BMZAFL	BMZAFLA	Pitch Configurable 20 Square BMZAFCP	BMZAFCAP	30 Square BMZAFP	BMZAFAP	40 Square BMZAFLP	BMZAFLAP
1														
2														
3														
4														
5														

NEW

Hydraulic · Pneumatic Manifold Blocks

-Blind Lateral Hole · Semi-through Hole Type / L-shape Hole Type-





CAD Data

G (PF) screws are added. Orders can be placed with "G-" before the model No. (Ex.: **G-BMZRF**) For details of ordering methods, recommended tapered threads tightening torque and through pilot holes, please refer to **P.1082.**

RoHS



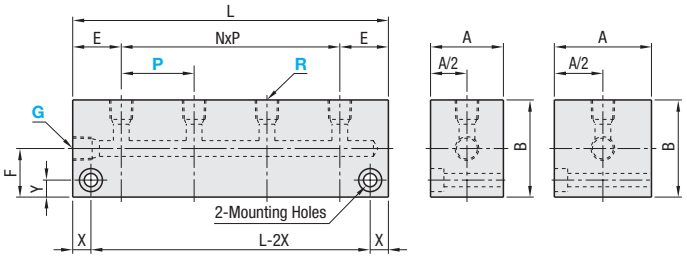






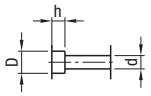
Usage	Type								Material	Surface Treatment	Normal Pressure
	Vertical Semi-through Hole Type				L-Shaped Hole Type						
	30x35	40 Square	30x40	50 Square	30x35	40 Square	30x40	50 Square			
Hydraulic	BMZRS	BMZRF	-	-	BMZUS	BMZUF	-	-	1.0038/	Trivalent Chromate	20.6MPa ≈ 210kgf/cm²
	BMZSRM	BMZFRM	-	-	BMZSUM	BMZFUM	-	-	S235JR	Electroless Nickel Plating	or less
For Pneumatic	-	-	BMZARF	BMZARFL	-	-	BMZAUF	BMZAUFL	EN AW-5052/	-	1MPa≈10kgf/cm² or less

-Vertical Semi-through Hole Type

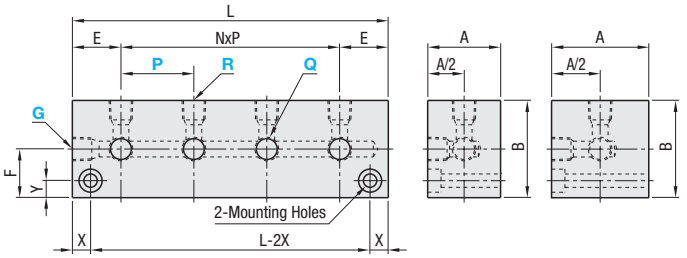


Thread
JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1
Compatible

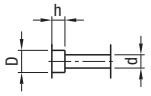
-Mounting Hole Options



- L-Shaped Hole Type



-Mounting Hole Options



*Drawing is for 4 outlet port configuration. The total number of Q · R · G screws is 5 for vertical semi-through hole and 9 for the L-shape.

Part Number		* RC (PT), M (Coarse)			Pitch P	No. of Pitches N	Total No. of Q · R · G Screws		L	A	B	E	F	X	Y	Mounting Hole Dimensions		
		Vertical Semi-through	L-shape	G			Vertical Semi-through	L-shape								d	D	h
Type	No. of Circuits	R	Q · R															
Hydraulic (30x35)	1	1(1/8) 2(1/4)		1(1/8) 2(1/4)	30	0	2	3	40	30	35	20	20	15	6	5.5	9.5	5.5
Vertical Semi-through Hole Type / L-Shaped Hole Type	2					1	3	5	70									
BMZRS / BMZUS	3					2	4	7	100									
BMZSRM / BMZSUM	4					3	5	9	130									
	5					4	6	11	160									
Hydraulic (x 40)	1	1(1/8) 2(1/4) 3(3/8)		1(1/8) 2(1/4) 3(3/8) 4(1/2)	40	0	2	3	70	40	40	35	20	20	7	6.6	11	6.5
Vertical Semi-through Hole Type / L-Shaped Hole Type	2					1	3	5	110									
BMZRF / BMZUF	3					2	4	7	150									
BMZFRM / BMZFUM	4					3	5	9	190									
Pneumatic (30 x 40 Sq.)	1	1(1/8) 2(1/4) 5(M5)		1(1/8) 2(1/4) 5(M5)**	30	0	2	3	40	30	40	20	20	7.5	7	5.5	9.5	5.5
Vertical Semi-through Hole Type / L-Shaped Hole Type	2					1	3	5	70									
BMZARF / BMZAUF	3					2	4	7	100									
	4**					3	5	9	130									
	5**					4	6	11	160									
Pneumatic (50 Sq.)	1	1(1/8) 2(1/4) 3(3/8) 4(1/2)		2(1/4) 3(3/8) 4(1/2)	40	0	2	3	50	50	50	25	25	8.5	8.5	8.5	14	8.5
Vertical Semi-through Hole Type / L-Shaped Hole Type	2					1	3	5	90									
BMZARFL / BMZAUFL	3					2	4	7	130									
	4					3	5	9	170									

For * marked Q · R and G, please specify 1 · 2 · 3 · 4 or 5 indicated before "( )". "When marked 4 and 5 pneumatic outlet port configuration in 30x40 squares are selected, 5 (M5) is not selectable for G.

Order Example

Part Number	-	Q	-	R	-	G
BMZRF3			-	R3	-	G3
BMZUF4	-	Q2	-	R2	-	G3

Price

Volume Discount (Round down to one Cent) **P.87**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

-1.0038/EN AW-5052/AlMg2,5 Electroless Nickel Plating A5052

8 Days

•1.0038/S235JR Trivalent Chromate

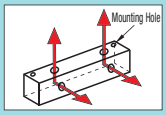
10 Days Express B 8,00 EUR/ piece **P.88**

A Express Charge of 21,60 EUR for 3 or more identical pieces.

No. of Ports	€ Unit Price											
	Vertical Semi-through Hole Type						L-Shaped Hole Type					
	Material: 1.0038/S235JR				Material: EN AW-5052/AlMg2,5		Material: 1.0038/S235JR				Material: EN AW-5052/AlMg2,5	
	30x35		40 Square		30x40	50 Square	30x35		40 Square		30x40	50 Square
	BMZRS	BMZSRM	BMZRF	BMZFRM	BMZARF	BMZARFL	BMZUS	BMZSUM	BMZUF	BMZFUM	BMZAUF	BMZAUFL
1												
2												
3												
4												
5												

Terminal Blocks - Hydraulic / Pneumatic

- L-Shaped Hole Type-



CAD Data

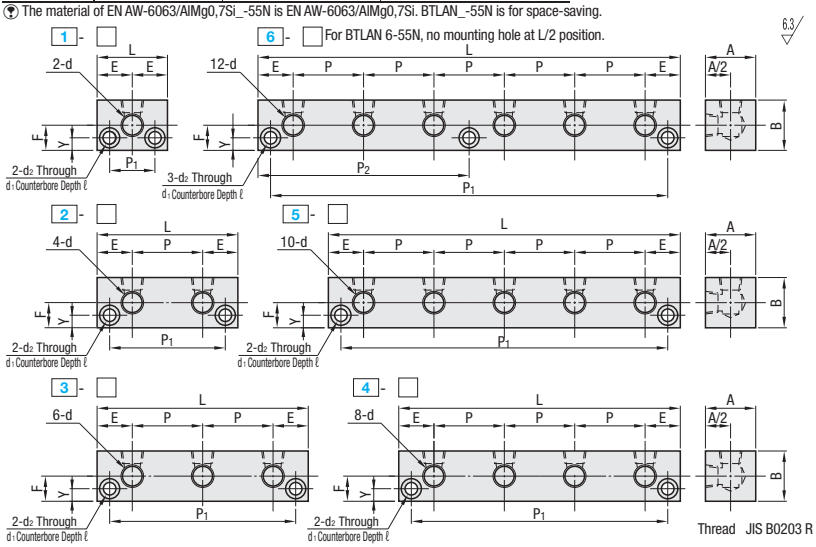
For recommended tapered thread tightening torque and through-pilot hole, please see **P.1082**

RoHS



Type	Material	Surface Treatment	Normal Pressure
BTLSN	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
BTLSNR	1.4301/X5CrNi18-10	-	
BTLAN	EN AW-5052/AlMg2,5	-	1MPa ≈ 10kgf/cm² or less

The material of EN AW-6063/AlMg0,7Si_-55N is EN AW-6063/AlMg0,7Si. BTLAN_-55N is for space-saving.



Part Number Type	No.		d Rc (PT)	A	B	L	P	P1	P2	E	F	Y	d1	d2	ℓ	€ Unit Price BTLSN	€ Unit Price BTLSNR
BTLSN (Oil Hydraulic) BTLSNR (Water Hydraulic)	1	11	1/8	30	30	40	-	25	-	20	15	7	11	6.6	6.5		
		22	1/4														
	2	11	1/8	30	30	75	35	60	-		15						
		22	1/4														
		33N	3/8	40	40						20						
	3	11	1/8	30	30	110	35	95	-		15						
		22	1/4														
		33N	3/8	40	40						20						
	*4	11	1/8	30	30	145	35	130	-		15						
		22	1/4														
		33N	3/8	40	40						20						
	*5	11	1/8	30	30	180	35	165	-		15						
		22	1/4														
		33N	3/8	40	40						20						
*4, 5 and 6 are only available for BTLSN Only	*6	11	1/8	30	30	215	35	200	107.5		15						
		22	1/4														
		33N	3/8	40	40						20						

Part Number Type	No.		d Rc (PT) M (Coarse)	A	B	L	P	P1	P2	E	F	Y	d1	d2	ℓ	€ Unit Price
BTLAN (Pneumatic)	1	11	1/8	25	25	40	-	25	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35						17.5					
		55N	M5	15	15	30	-	20		15	7.5	3.5	-	4.3	-	
	2	11	1/8	25	25	65	25	50	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35						17.5					
		55	M5	25	25						12.5					
		55N		15	15	45	15	35		15	7.5	3.5	-	4.3	-	
	3	11	1/8	25	25	90	25	75	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35						17.5					
		55	M5	25	25						12.5					
		55N		15	15	60	15	50		15	7.5	3.5	-	4.3	-	
	4	11	1/8	25	25	115	25	100	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35						17.5					
		55	M5	25	25						12.5					
		55N		15	15	75	15	65		15	7.5	3.5	-	4.3	-	
	5	11	1/8	25	25	140	25	125	-	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35						17.5					
		55	M5	25	25						12.5					
		55N		15	15	90	15	80		15	7.5	3.5	-	4.3	-	
	6	11	1/8	25	25	165	25	150	82.5	20	12.5	7	9.5	5.5	5.5	
		22N	1/4	35	35						17.5					
		55	M5	25	25						12.5					
		55N		15	15	105	15	95	-	15	7.5	3.5	-	4.3	-	

Order Example

Part Number
BTLSN2-22
BTLAN4-22N

6 Days

P.88

Price

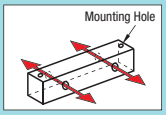
Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Terminal Blocks - Hydraulic / Pneumatic

-Through Hole Type-



CAD Data

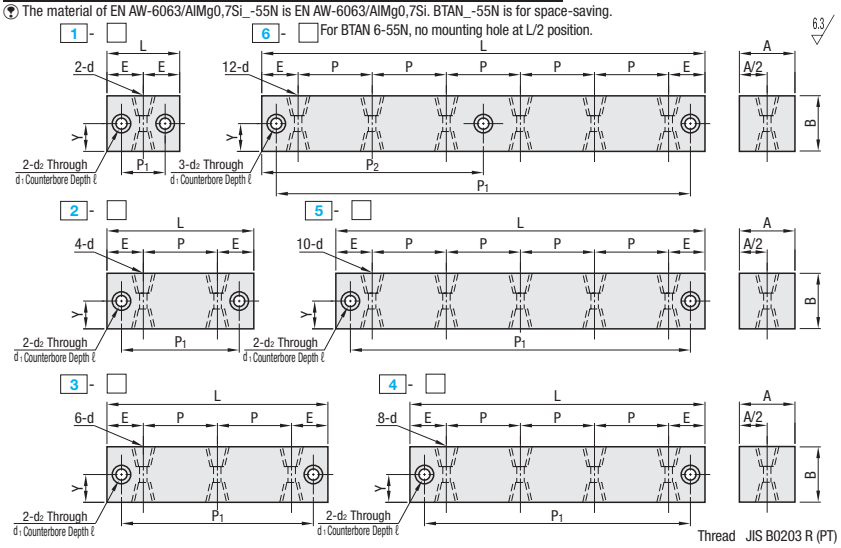
For recommended tapered thread tightening torque and through-pilot hole, please see **P.1082**

RoHS



Type	Material	Surface Treatment	Normal Pressure
BTSN	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
BTSNR	1.4301/X5CrNi18-10	-	
BTAN	EN AW-5052/AlMg2,5	-	1MPa ≈ 10kgf/cm² or less

The material of EN AW-6063/AlMg0,7Si_-55N is EN AW-6063/AlMg0,7Si. BTAN_-55N is for space-saving.



Part Number Type	No.		d Rc (PT)	A	B	L	P	P1	P2	E	Y	d1	d2	ℓ	€ Unit Price BTSN	€ Unit Price BTSNR
BTSN (Oil Hydraulic) BTSNR (Water Hydraulic)	1	11	1/8	30	35	40	35	25	-	20	17.5	11	6.6	6.5		
		22	1/4													
	2	11	1/8			75		60	-							
		22	1/4													
		33	3/8													
	3	11	1/8			110		95	-							
		22	1/4													
		33	3/8													
	*4	11	1/8			145		130	-							
		22	1/4													
		33	3/8													
	*5	11	1/8			180		165	-							
		22	1/4													
		33	3/8													
	*6	11	1/8			215		200	107.5							
		22	1/4													
		33	3/8													

*4, 5 and 6 are only available for BTSN Only

Part Number Type	No.		d Rc (PT) M (Coarse)	A	B	L	P	P1	P2	E	Y	d1	d2	ℓ	€ Unit Price
BTAN (Pneumatic)	1	11	1/8	25	25	40	-	25	-	20	12.5	9.5	5.5	5.5	
		22	1/4												
		55	M5												
		55N		15	15	30		20		15	7.5	-	4.3	-	
	2	11	1/8	25	25	65	25	50	-	20	12.5	9.5	5.5	5.5	
		22	1/4												
		55	M5												
		55N		15	15	45	15	35		15	7.5	-	4.3	-	
	3	11	1/8	25	25	90	25	75	-	20	12.5	9.5	5.5	5.5	
		22	1/4												
		55	M5												
		55N		15	15	60	15	50		15	7.5	-	4.3	-	
	4	11	1/8	25	25	115	25	100	-	20	12.5	9.5	5.5	5.5	
		22	1/4												
		55	M5												
		55N		15	15	75	15	65		15	7.5	-	4.3	-	
	5	11	1/8	25	25	140	25	125	-	20	12.5	9.5	5.5	5.5	
		22	1/4												
		55N	M5	15	15	90	15	80		15	7.5	-	4.3	-	
	6	11	1/8	25	25	165	25	150	82.5	20	12.5	9.5	5.5	5.5	
		22	1/4												
		55	M5												
		55N		15	15	105	15	95	-	15	7.5	-	4.3	-	

Order Example: Part Number BTSN3 - 22

6 Days P.88

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

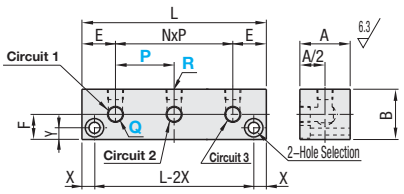
Terminal Blocks - Hydraulic / Pneumatic

- L-Shaped Hole Type-

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BTLS**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**



Type											Material	Surface Treatment	Normal Pressure
Pitch (P) Standard						Pitch (P) Configurable							
20 Square	30 Square	40 Square	50 Square	60 Square	70 Square	30 Square	40 Square	50 Square	60 Square				
BTLSB	BTLS	BTLSK	BTLSFL	BTLSFLK	BTLL	BTLSP	BTLSKP	BTLSFLP	BTLSFLKP		1.0038/S235JR	Trivalent Chromate Electroless Nickel Plating	20.6MPa ≈ 210kgf/cm² or less
-	BTLSM	BTLSMK	BTLSFLM	BTLSFLKM	-	BTLSMP	BTLSMKP	-	-				
BTLSBR	BTLSR	BTLSRK	BTLSFLR	-	-	BTLSRP	-	-	-		1.4301/X5CrNi18-10	-	
-	BTLSS	-	-	-	-	-	-	-	-		1.4401/X5CrNiMo17-12-2		
-	BTLSC	-	-	-	-	-	-	-	-		Brass		1MPa ≈ 10kgf/cm² or less



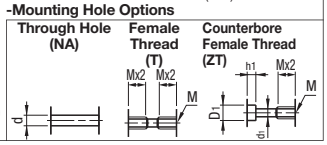
-Standard Mounting Hole

Mounting Holes Dimension	d	D	h	D_1	d_1	h_1
M5	5.5	9.5	5.5	8	*4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

* Only 1.4301/X5CrNi18-10 d_1 dimension is 4.3.

Thread JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

-Mounting Hole Options



Mounting holes can be selected.
For the default Mounting Holes, see **Standard Mounting Hole** above.

* Drawing when 3 Circuit is selected. The total no. of Q and R threads is 6.

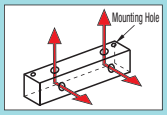
<L Dimension Calculation>
Ex.: In the case of BTLSP3- ~ -P35
L=NXP+2E=(Number of Circuits 3-1)x35+2x20=110

Part Number			*Rc (PT), NPT	Pitch P		No. of Pitches	Q · R						Mounting Holes
Type	Mounting Hole Options	No. of Circuits	Q · R	Standard Type	1mm Increment	N	Total No. of Threads	A	B	E	F	X	Y	M
(x 20) Pitch Standard **BTLSB** **BTLSBR**		1	1(1·8)	25	-	0	2	20	20	20	10	6	6	M5
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							
		7				6	14							
		8				7	16							
(x 30) Pitch Standard **BTLS** **BTLSM** **BTLSR** **BTLSS** **BTLSC** Pitch Configurable **BTLSP** **BTLSMP** **BTLSRP**		1	1(1·8) 2(1·4) 3(3·8) 1N(NPT 1·8) 2N(NPT 1·4) 3N(NPT 3·8)	35	25~60	0	2	30	30	20	15	7.5	7	M6
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							
		7				6	14							
		8				7	16							
(x 40) Pitch Standard **BTLSK** **BTLSMK** **BTLSRK** Pitch Configurable **BTLSKP** **BTLSMKP**	NA(Through) T(Female Thread) ZT(Counterbore Female Thread)	1	1(1·8) 2(1·4) 3(3·8) 1N(NPT 1·8) 2N(NPT 1·4) 3N(NPT 3·8)	35	25~60	0	2	40	40	20	20	7.5	7	M6
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							
		7				6	14							
		8				7	16							
(x 50) Pitch Standard **BTLSFL** **BTLSFLM** **BTLSFLR** Pitch Configurable **BTLSFLP**		1	2(1·4) 3(3·8) 4(1·2) 6(3·4)	60	35~60	0	2	50	50	30	25	7.5	8	M8
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							
(x 60) Pitch Standard **BTLSFLK** **BTLSFLKM** Pitch Configurable **BTLSFLKP**		1	2(1·4) 3(3·8) 4(1·2) 6(3·4)	60	35~60	0	2	60	60	30	30	7.5	8	M8
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							
(x 70) Pitch Standard **BTLL**		1	6(3·4) 8(1)	60	-	0	2	70	70	40	35	10	9	M8
		2				1	4							
		3				2	6							
		4				3	8							

For * marked Q and R, please specify 1, 2, 3, 4, 6, 8, 1, 1N, 2N, or 3N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
For Block Square 30 Type, when 3 / 8 is selected for Q and R, tapered threads may interfere with each other. Select Block Square 40 Type instead.
For Block Square 50 Type, when 3 / 4 is selected for Q and R, tapered threads may interfere with each other. Select Block Square 60 Type instead.
Single Circuit is not available for Pitch Configurable Type.
6 and 8 circuit types have an additional mounting hole at L/2 and 7-circuit type at P/2 of 2 / 3 port, and 5 / 6 port. (Except for 20 square)
1.4401/X5CrNiMo17-12-2 / Brass is up to 6 connections.

No. of Circuits	Pitch (P) Standard € Unit Price															
	20 Square		30 Square					40 Square			50 Square			60 Square		70 Square
	BTLSB	BTLSBR	BTLS	BTLSM	BTLSR	BTLSS	BTLSC	BTLSK	BTLSMK	BTLSRK	BTLSFL	BTLSFLM	BTLSFLR	BTLSFLK	BTLSFLKM	BTLL
1																
2																
3																
4																
5																
6																
7																
8																

No. of Circuits	Pitch (P) Configurable € Unit Price						
	30 Square			40 Square		50 Square	60 Square
	BTLSP	BTLSMP	BTLSRP	BTLSKP	BTLSMKP	BTLSFLP	BTLSFLKP
2							
3							
4							
5							
6							
7							
8							



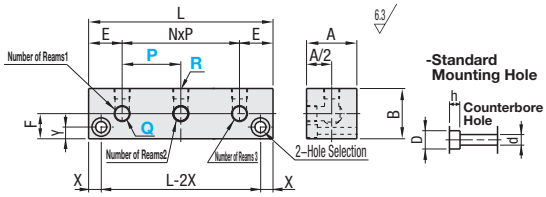
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BTLA**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**



Type									Material	Surface Treatment	Normal Pressure
Pitch (P) Standard					Pitch (P) Configurable						
15 Square	20 Square	25 Square	35 Square	50 Square	20 Square	25 Square	35 Square	50 Square			
BTLAS	BTLAC	BTLA	BTLAK	BTLAL	BTLACP	BTLAP	BTLAKP	BTLALP	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
-	BTLACA	BTLAA	-	-	BTLACAP	BTLAAP	BTLAAKP	BTLALAP		Clear Anodize	

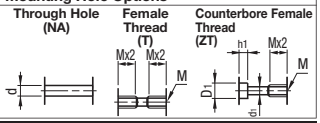
Material of 15 square is EN AW-6063/AlMg0,7Si.



Mounting Holes Dimension	d	D	h	D1	d1	h1
M4	4.3	-	-	-	-	-
M5	5.5	9.5	5.5	8	4.2	4.5
M8	8.5	14	8.5	11	6.8	6.5

Thread JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.1.20.1-1983 (NPT)

-Mounting Hole Options



Mounting holes can be selected.
Standard hole shape is selected when no **hole shape modification** is specified.
Except when 15/20 Square is not specified, through-hole is selected.

*Drawing is for when 3 Circuit type is selected.
The total no. of Q and R threads is 6.

<L Dimension Calculation>
Ex. : In the Case of BTLAP3- ~ -P35
L=NxP+2E=(Number of Circuits 3-1)x35+2x20=110

Part Number			*Rc(PT), NPT, M(Coarse)	Pitch P		No. of	Q · R						Mounting Holes
Type	Mounting Hole Options	No. of Circuits	Q · R	Standard Type	1mm Increment	Pitches N	Total No. of Threads	A	B	E	F	X	Y	M
(x 15) Pitch Standard BTLAS	T(Female Thread)	1	M3(M3) M4(M4) 5(M5)	15	-	0	2	15	15	15	7.5	5	3.5	M4
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							
		7				6	14							
		8				7	16							
(x 20) Pitch Standard BTLAC BTLACA / Pitch Configurable BTLACP BTLACAP		1	1(1·8) M3(M3) M4(M4) 5(M5)	15	15~50	0	2	20	20	20	10	5	4	M5
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							
		7				6	14							
		8				7	16							
(x 25) Pitch Standard BTLA BTLAA / Pitch Configurable BTLAP BTLAAP	NA(Through)	1	1(1·8) 2(1·4) 5(M5) 1N(NPT 1·8) 2N(NPT 1·4)	25	20~60	0	2	25	25	20	12.5	7.5	7	M5
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6			25~60	5	12							
		7				6	14							
		8				7	16							
(x 35) Pitch Standard BTLAK / Pitch Configurable BTLAKP BTLAAKP	T(Female Thread) ZT(Counterbore Female Thread)	1	1(1·8) 2(1·4) 5(M5) 1N(NPT 1·8) 2N(NPT 1·4)	25	20~60	0	2	35	35	20	17.5	7.5	7	M5
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6			25~60	5	12							
		7				6	14							
		8				7	16							
(x 50) Pitch Standard BTLAL / Pitch Configurable BTLALP BTLALAP		1	2(1·4) 3(3·8) 4(1·2)	40	35~60	0	2	50	50	25	25	8.5	8.5	M8
		2				1	4							
		3				2	6							
		4				3	8							
		5				4	10							
		6				5	12							

For * marked Q and R, please specify 1, 2, 3, 4, 5, M3, M4, 1N or 2N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
6 and 8 circuit types have an additional mounting hole at L/2 and 7-circuit type at P/2 of 2 / 3 port, and 5 / 6 port. (Except for 15 and 20 square)
For Block Square 25 Type, if 1 / 4 is selected for both tapered threads at right angles, the threads may interfere with each other. Select Block Square 35 Type instead.
Single Circuit is not available for Pitch Configurable Type.
For 15 Square and 20 Square, only Female Thread Hole is available.

Order Example

Part Number								
Type	Mounting Hole Options	No. of Circuits	-	Q	-	R	-	P
BTLS		5	-	Q3	-	R2		
BTLSFLP	NA	4	-	Q4	-	R3	-	P50
BTLA	T	4	-	Q2	-	R1		
BTLAP	ZT	5	-	Q2	-	R2	-	P50

Days to Ship

-1.4301/C5CrNi18-10 · EN AW-5052/AlMg2,5 · EN AW-6063/AlMg0,7Si
8 Days — Express A — 8,00 EUR00/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

- 1.0038/S235JR Electroless Nickel Plating (Block square 30, 40), 1.4401/ C5CrNiMo17-12-2 Brass · EN AW-5052/AlMg2,5 Clear Anodize
8 Days

- 1.0038/S235JR Trivalent Chromate
1.0038/S235JR Electroless Nickel Plating (Block Square 50, 60)
10 Days — Express B — 8,00 EUR00/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

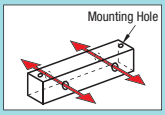
Price

Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Circuits	Pitch (P) Standard € Unit Price							Pitch (P) Configurable € Unit Price							
	15 Square	20 Square		25 Square		35 Square	50 Square	20 Square		25 Square		35 Square		50 Square	
	BTLAS	BTLAC	BTLACA	BTLA	BTLAA	BTLAK	BTLAL	BTLACP	BTLACAP	BTLAP	BTLAAP	BTLAKP	BTLAAKP	BTLALP	BTLALAP
1															
2															
3															
4															
5															
6															
7															
8															

Terminal Blocks - Hydraulic
-Through Hole Type-



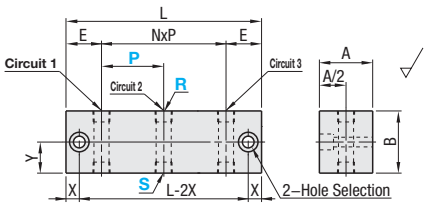
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BTS**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

RoHS



Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
20 Square	30x35	50 Square	60 Square	20 Square	30x35	50 Square			
BTSB	BTS	BTSFL	BTSL	-	BTSP	BTSFLP	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
BTSBM	BTSM	BTSFLM	-	-	-	-		Electroless Nickel Plating	
BTSBR	BTSR	BTSFLR	-	BTSBRP	BTSRP	BTSFLRP	1.4301/X5CrNi18-10	-	
-	BTSS	-	-	-	BTSSP	-	1.4401/X5CrNiMo17-12-2		
-	BTSC	-	-	-	-	-	Brass		1MPa ≈ 10kgf/cm² or less

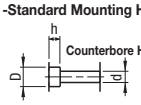


* Drawing when 3 Circuit is selected. The no. of R and S threads is 6.

Mounting holes can be selected.
For the default Mounting Holes, see **Standard Mounting Hole** above.

<L Dimension Calculation>
Ex.: In the case of BTSP3- ~ -P35, L=NxP+2E=(No. of Circuits 3-1)x35+2x20=110

-Standard Mounting Hole

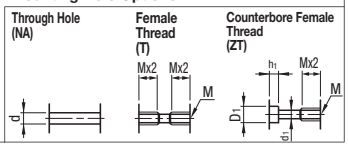


Mounting Holes Dimension	d	D	h	D1	d1	h1
M5	5.5	9.5	5.5	8	*4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5
M8	8.5	14	8.5	11	6.8	6.5

* Only 1.4301/X5CrNi18-10 d1 dimension is 4.3.

Thread JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

-Mounting Hole Options



Part Number			*Rc (PT), NPT	Pitch P		No. of Pitches N	R · S Total No. of Threads	A	B	E	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	R · S	Standard Type	1mm Increment								M
(x 20)		1				0	2						
		2				1	4						
Pitch Standard / Pitch Configurable		3				2	6						
BTSB		4				3	8						
BTSBM		5				4	10						
BTSBR / BTSBRP		6				5	12						
		7				6	14						
		8	1(1·8)	25	15~50	7	16	20	20	20	7.5	10	M5
(30x35)		1				0	2						
		2				1	4						
Pitch Standard / Pitch Configurable		3				2	6						
BTS / BTSP		4				3	8						
BTSM		5				4	10						
BTSR / BTSRP		6				5	12						
BTSS / BTSSP		7				6	14						
BTSC		8				7	16						
	NA(Through)	1	1(1·8)			0	2						
		2	2(1·4)			1	4						
		3	3(3·8)			2	6						
	T(Female Thread)	4	1N(NPT 1·8)			3	8						
		5	2N(NPT 1·4)	35	25~50	4	10	30	35	20	7.5	17.5	M6
		6	3N(NPT 3·8)			5	12						
		7				6	14						
	ZT(Counterbore Female Thread)	8				7	16						
(x 50)		1				0	2						
		2	2(1·4)			1	4						
Pitch Standard / Pitch Configurable		3	3(3·8)			2	6						
BTSFL / BTSFLP		4	4(1·2)	60	35~60	3	8	50	50	30	7.5	25	M8
BTSFLM		5	6(3·4)			4	10						
BTSFLR / BTSFLRP		6			40~60	5	12						
(x 60)		1				0	2						
		2	6(3·4)			1	4						
Pitch Standard		3	8(1)	60	40~60	2	6	60	60	40	10	30	M8
BTSL		4				3	8						

For * marked R and S, please specify 1, 2, 3, 4, 6, 8, 1N, 2N or 3N indicated before ( ).
Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.

Single Circuit is not available for Pitch Configurable Type.
6 and 8 circuit types have an additional mounting hole at L/2, and 7-circuit type at P/2 of 2 / 3 port, and 5 / 6 port. (Except for 20 Square)

1.4401/X5CrNiMo17-12-2 / Brass is up to 6 connections.

Order Example

Part Number								
Type		Mounting Hole Options		No. of Circuits		R	S	P
BTS				4	-	R3	S2	
BTSFLP		NA		4	-	R4	S3	P50

Days to Ship

- 1.4301/X5CrNi18-10
8 Days — Express A 8,00 EUR/piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

- 1.0038/S235JR Electroless Nickel Plating / 1.4401/X5CrNiMo17-12-2 / Brass
8 Days

- 1.0038/S235JR Trivalent Chromate
10 Days — Express B 8,00 EUR/piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

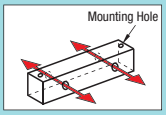
Volume Discount (Round down to one Cent) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

No. of Circuits	Pitch (P) Standard € Unit Price												Pitch (P) Configurable € Unit Price					
	20 Square			30x35					50 Square			60 Square	20 Square	30x35			50 Square	
	BTSB	BTSBM	BTSBR	BTS	BTSM	BTSR	BTSS	BTSC	BTSFL	BTSFLM	BTSFLR	BTSL	BTSBRP	BTSP	BTSRP	BTSSP	BTSFLP	BTSFLRP
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		

Terminal Blocks - Pneumatic

-Through Hole Type-



CAD Data

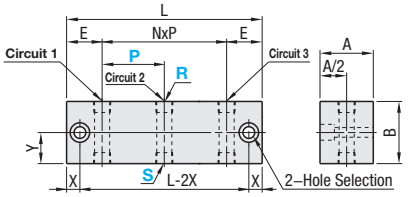
G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BTA**) For details of ordering methods, recommended tapered threads tightening torque and through-pilot hole, please refer to **P.1082**

RoHS



Type							Material	Surface Treatment	Normal Pressure
Pitch (P) Standard				Pitch (P) Configurable					
15 Square	20 Square	25 Square	35 Square	20 Square	25 Square	35 Square			
-	BTANC	BTA	BTANL	BTANCP	BTAP	BTANLP	EN AW-5052/ AlMg2,5	-	1MPa ≈ 10kgf/cm² or less
BTANSA	BTANCA	BTAA	BTANLA	BTANCAP	-	-		Clear Anodize	

Material of 15 square is EN AW-6063/AlMg0,7Si.



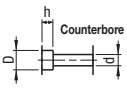
* Drawing when 3 Circuit is selected. The no. of R and S threads is 6.

Mounting holes can be selected.

Standard hole shape is selected when no **hole shape modification** is specified.
Note that the default of 15 Square and 20 Square is Through Hole.

<L Dimension Calculation>
Ex.: In the case of BTSP3- ~ -P35, L=NxP+2E=(No. of Circuits 3-1)x35+2x20=110

-Standard Mounting Hole

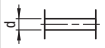


Mounting Holes Dimension	d	D	h	D1	d1	h1
M4	4.3	-	-	-	-	-
M5	5.5	9.5	5.5	8	4.2	4.5
M6	6.6	11	6.5	9.5	5.1	5.5

Thread JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible
ANSI / ASME B.I.20.1-1983 (NPT)

-Mounting Hole Options

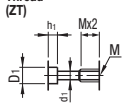
Through Hole (NA)



Female Thread (T)



Counterbore Female Thread (ZT)



Part Number			*Rc(PT), NPT, M(Coarse)	Pitch P		No. of Pitches N	R · S Total No. of Threads	A	B	E	X	Y	Mounting Holes
Type	Mounting Hole Options	No. of Circuits	R · S	Standard Type	1mm Increment								M
(x 15) Pitch Standard **BTANSA**	T(Female Thread)	1	M3(M3) M4(M4) 5(M5)	15	-	0	2	15	15	15	5	7.5	M4
		2				1	4						
		3				2	6						
		4				3	8						
		5				4	10						
		6				5	12						
		7				6	14						
		8				7	16						
(x 20) Pitch Standard **BTANC** **BTANCA** Pitch Configurable **BTANCP** **BTANCAP**	T(Female Thread)	1	1(1/8) M3(M3) M4(M4) 5(M5)	15	15~50	0	2	20	20	20	5	10	M5
		2				1	4						
		3				2	6						
		4				3	8						
		5				4	10						
		6				5	12						
		7				6	14						
		8				7	16						
(x 25) Pitch Standard **BTA** **BTAA** Pitch Configurable **BTAP**	NA(Through) T(Female Thread)	1	1(1/8) 2(1/4) 5(M5) 1N(NPT 1/8) 2N(NPT 1/4)	25	20~60	0	2	25	25	20	7.5	12.5	M5
		2				1	4						
		3				2	6						
		4				3	8						
		5				4	10						
		6			25~60	5	12						
		7				6	14						
		8				7	16						
(x 35) Pitch Standard **BTANL** **BTANLA** Pitch Configurable **BTANLP**	ZT(Counterbore Female Thread)	1	2(1/4) 3(3/8) 4(1/2)	40	35~60	0	2	35	35	25	7.5	17.5	M6
		2				1	4						
		3				2	6						
		4				3	8						
		5				4	10						
		6				5	12						
		7				6	14						
		8				7	16						

For * marked R and S, please specify 1, 2, 3, 4, 5, M3, M4, 1N or 2N indicated before ( ). Single Circuit is not available for Pitch Configurable Type. Specify the pitch taking into consideration the necessary dimensions for fitting the couplings.
6 and 8 circuit types have an additional mounting hole at L/2, and 7-circuit type at P/2 of 2 / 3 port, and 5 / 6 port. (Except for 15 and 20 square)

Order Example

Part Number								
Type	Mounting Hole Options	No. of Circuits	-	R	-	S	-	P
BTA BTAP	T ZT	3 4	-	R1 R2	-	S2 S2	-	P50

Price

Volume Discount (Round down to one Cent) **P.87**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

Days to Ship

- EN AW-5052/AlMg2,5

8 Days — Express A 8,00 EUR/ piece — **P.88**

A Express Charge of 21,60 EUR for 3 or more identical pieces.

- EN AW-5052/AlMg2,5 / EN AW-6063/AlMg0,7Si Clear Anodized Product

8 Days

No. of Circuits	Pitch (P) Standard € Unit Price							Pitch (P) Configurable € Unit Price			
	15 Square	20 Square		25 Square		35 Square		20 Square		25 Square	35 Square
	BTANSA	BTANC	BTANCA	BTA	BTAA	BTANL	BTANLA	BTANCP	BTANCAP	BTAP	BTANLP
1											
2											
3											
4											
5											
6											
7											
8											

Hydraulic · Pneumatic Manifold Blocks / Manifolds with Magnets
-High Pressure / Space Saving Type-

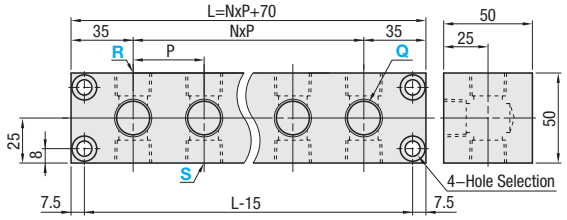
CAD Data

G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMAH**) For details of ordering methods and recommended tapered thread tightening torques and through-pilot holes, please see **P.1082**

■Hydraulic Manifold Block Square 50
-High Pressure- RoHS



Type	M Material	S Surface Treatment	Normal Pressure
BMAH	1.0038/ S235JR	Trivalent Chromate	34.5MPa ≈350kgf/cm² or less

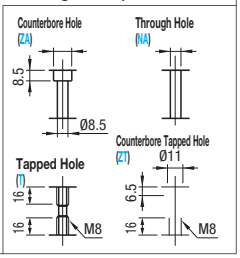


Mounting hole can be selected.

6.3

Thread JIS B0203R (PT)
JIS B0202G (PF): ISO 228-1 Compatible

Mounting Hole Options



Part Number			*Rc (PT)	P	No. of Pitches N	Q·R·S Total No. of Threads	€ Unit Price
Type	Mounting Hole Selection	No. of Circuits	Q·R·S				
BMAH	ZA (Counterbore) NA (Through hole) T (Female Thread) ZT (Counterbore Female Thread)	1	1 (1/8) 2 (1/4) 3 (3/8) 4 (1/2)	50	0	3	
		2			1	6	
		3			2	9	
		4			3	12	
		5			4	15	
		6			5	18	

For * marked Q, R and S, please specify 1, 2, 3, or 4 indicated before ( ).
Only 6 Circuit type has an additional mounting hole at the midpoint of the overall length.

Order Example — Part Number: Type BMAH | Mounting Holes ZT | No. of Circuits 4 | - Q2 - R2 - S2

Days to Ship: **10 Days** — Express B 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price — ■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

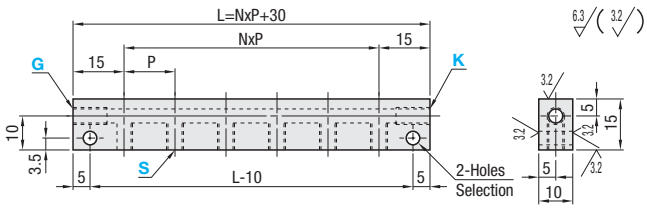
For orders larger than indicated quantity, please request a quotation.

■Manifold Blocks - Pneumatic
-Space Saving Type- RoHS

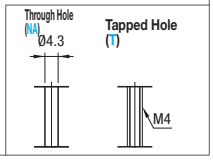


Type	M Material	S Surface Treatment	Normal Pressure
SBMA	EN AW-6063/ AlMg0,7Si	-	1MPa ≈ 10kgf/cm² or less
SBMAA		Clear Anodize	

Mounting holes can be selected.



Mounting Hole Options



Part Number			*M (Coarse)	P	No. of Pitches N	S·G·K Total No. of Threads	€ Unit Price	
Type	Mounting Hole Selection	No. of Circuits	S·G·K				SBMA	SBMAA
SBMA SBMAA	NA (Through hole) T (Female Thread)	1	3 (M3) 5 (M5)	15	0	3		
		2			1	4		
		3			2	5		
		4			3	6		
		5			4	7		
		6			5	8		

For * marked S, G and K, please specify 3 or 5 indicated before ( ).
N indicates no. of pitches.

Order Example — Part Number: Type SBMAA | Mounting Holes T | No. of Circuits 4 | - S3 - G3 - K3

Days to Ship:
■Not Anodized Products: **8 Days**
■Clear Anodized Products: **10 Days** — Express B 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price — ■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

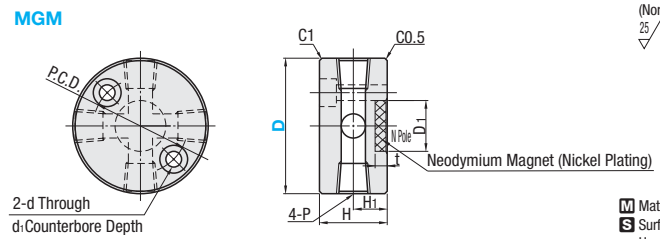
■Manifolds with Magnets
RoHS



MGM

(Normal Pressure: 0.7MPa≈7kgf/cm² or less)

25



M Material: 1.1191/C45E
S Surface Treament: Electroless Nickel Plating
Heat Resistant Temperature : 80°C

Part Number		P	H	H1	P.C.D	D1	t	d	d1	h	Attraction Force N {kgf}	Surface Magnetic Flux Density Gauss [G]	€ Unit Price
Type	D	Rc (PT), M											
MGM	32	M5	15	8	22	16.5	3.0	4.5	8.0	4.5	49.0 { 5}	3300~3600	
	40	1/8	20	11	28	18.5	3.0	4.5	8.0	4.5	98.1 {10}	3400~3600	
	50	1/4	25	14	36	23.0	3.0	5.5	9.5	4.5	196.1 {20}	3400~3600	

Order Example — Part Number: MGM32

Days to Ship: **8 Days** — Express A 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

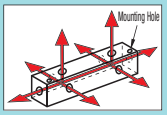
Price — ■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Hydraulic / Pneumatic Manifold Blocks

-Selectable Thread Size-



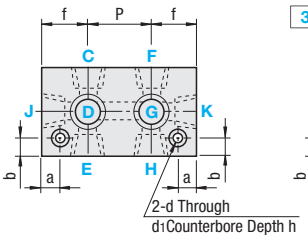
G (PF) thread is added. Orders specified with "G-" before model No. are acceptable. (Ex.**G-BMFRS**)For details of ordering methods and recommended tapered thread tightening torques and through-pilot holes, please see **P.1082**
Diameter of all holes are unified to the selected standard thread size. When hole positions for J~Z are specified, thread diameters can be selected individually.

RoHS



Type	M Material	S Surface Treatment	Normal Pressure
BMFRS	1.0038/S235JR	Trivalent Chromate	20.6MPa~210kgf/cm² or less
BMFRA	EN AW-5052/ AlMg2,5	-	1MPa≈10kgf/cm² or less
BMFRAA		Clear Anodize	

2



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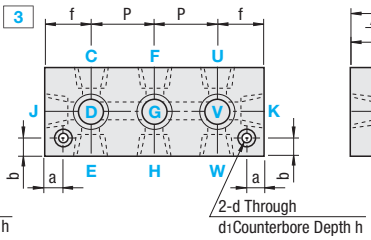

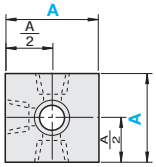

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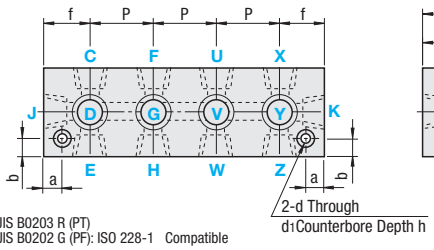
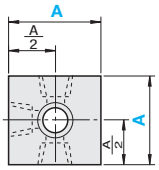




Thread JIS B0203 R (PT)
JIS B0202 G (PF): ISO 228-1 Compatible

Part Number Type	No. of Parts	Block Square A	*Standard Thread size Rc (PT), M (Coarse)	*Alternative Thread size Selection Rc (PT), M (Coarse) JK (0 only) · CDEFGHUVWXYZ	P	f	a	b	d	d1	h
BMFRS BMFRA BMFRAA	2 3 4	25	5 (M5) 1 (1/8)	0 (No Hole) 5 (M5) 1(1/8)	20	16	8	5	4.5	8	4.5
		30	1 (1/8) 2 (1/4)	0 (No Hole) 5 (M5) 1(1/8) 2 (1/4)	25	15	5		4.5	8	4.5
		35	1 (1/8) 2 (1/4)	0 (No Hole) 5 (M5) 1(1/8) 2 (1/4) 3 (3/8) ※3 and 3 at right angles is not applicable.	30	20	6		5.5	9.5	5.5
		40	2 (1/4) 3 (3/8)	0 (No Hole) 5 (M5) 1(1/8) 2 (1/4) 3 (3/8) 4 (1/2) ※4 and 4 at right angles is not applicable.	40	22	6.5		6.6	11	6.5
		50	2 (1/4) 3 (3/8) 4 (1/2)	0 (No Hole) 5 (M5) 1(1/8) 2 (1/4) 3 (3/8) 4 (1/2) 6 (3/4) ※6 and 6 at right angles is not applicable.	50	30	8		8.5	14	8.5
		60	3 (3/8) 4 (1/2) 6 (3/4)	0 (No Hole) 5 (M5) 1(1/8) 2 (1/4) 3 (3/8) 4 (1/2) 6 (3/4)	60	30	10		8.5	14	8.5

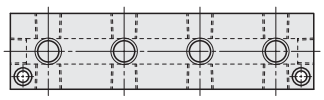
※A=25 is applicable to BMFRA and BMFRAA only, and A=60 for BMFRS only.
※* Please specify 0, 5, 1, 2, 3, 4 or 6 indicated before ( ) for thread diameter selection.

Order Example

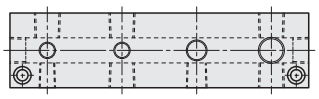
Part Number	-	A	-	Standard Thread size.	-	J	-	K	-	C	-	D	-	E	-	F	-	G	-	H	-	U	-	V	-	W	-	X	-	Y	-	Z
BMFRS4	-	60	-	4								D2	-	E2				G2				U0	-	V3	-	W3						

■Selection Method

[Step I]
Select the most frequently used thread diameter as basic thread diameter.
[Order Example] Select 4 (1/2).



[Step II]
Select ports to change from Standard Thread to desired thread size.
[Order Example]D2-E2-G2-U0-V3-W3



※Diameter of J and K is not changeable. Specify J0-K0 when J and K is not necessary (No through hole for them. Zero selection of either J or K can not be acceptable).

(Ex.)
0 **BMFRS4-60-4-J0-K0-D2**
0 **BMFRS4-60-4 -D2**
x **BMFRS4-60-4-J0 -D2**
x **BMFRS4-60-4 -K0-D2**

Days to Ship **10 Days**

Alterations

Part Number	-	A	...	-	Z	-	(PC · PCW · PCT)
BMFRS4	-	60	...		-		PC40

Alterations	Code	Spec.	Price Adder
P Dimension Change 2 PC 3 PC PCW 4 PC PCW PCT	PC PCW PCT	Changes the P dimension in 1mm increment. (Ex.) PC38-PCW30 ※20≤PC , PCW , PCT≤50 ※In the case of BMFRS, normal pressure falls below 1MPa≈10kgf/cm² when the pitch is shorter than default value. ※L dimension changes as much as the changes in P dimension.	8,00

Price

■Volume Discount (※Round down to one Cent.) **P.88**

Quantity	1~9	10~19
Rate	€ Unit Price	5%

※For orders larger than indicated quantity, please request a quotation.

Type	No. of Parts	Block Square A € Unit Price 25	30	35	40	50	60
BMFRS	2						
	3						
	4						
BMFRA	2						
	3						
	4						
BMFRAA	2						
	3						
	4						

Manifold Blocks - Pneumatic / Aluminum Frame Manifolds

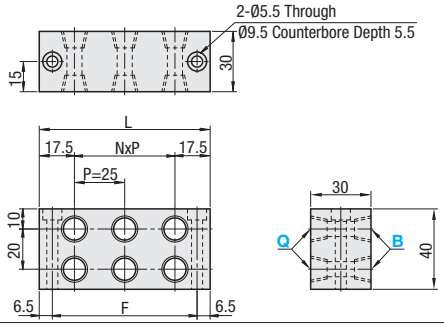
For recommended tapered thread tightening torque and through-pilot hole, please see **P.1082**

RoHS



Type	Material	Surface Treatment	Normal Pressure
BTAW	EN AW-5052/AlMg2,5	-	1MPa ≈ 10kgf/cm² or less

6.3



Thread JIS B0203 R (PT)

Part Number		* Rc (PT), M (Coarse)		L	NxP	F	Number of Ports	€ Unit Price
Type	No. of Circuits	Q	B					
BTAW	1	5(M5) 1(1/8) 2(1/4)	5(M5) 1(1/8) 2(1/4)	35	0	22	4	
	2			60	1x25	47	8	
	3			85	2x25	72	12	
	4			110	3x25	97	16	
	5			135	4x25	122	20	
	6			160	5x25	147	24	

Features
Two-stage piping arrangement saves space in the horizontal direction.

For * marked Q and B, please specify 1, 2 or 5 indicated before ( ). Only 6 Circuit type has an additional M5 screw hole at the midpoint of the overall length.

Order Example

Part Number	-	Q	-	B
BTAW2	-	Q2	-	B2

Price

Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

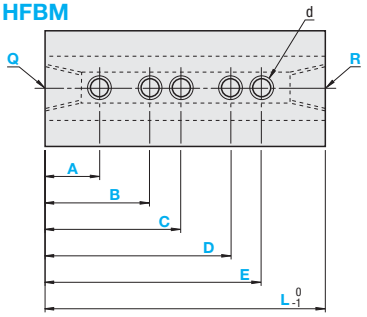
Days to Ship **8 Days**

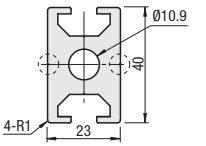
Aluminum Frame Manifolds

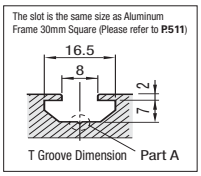
RoHS



HFBM







*When B is appended after A~E, tap is from the opposite direction.

(Ex.) A15



AB15



M Material: EN AW-6063/AlMg0,7Si-T5
S Surface Treatment: Clear Anodize

Part Number		H (No. of Holes)	L 1mm Increment	A·B·C·D·E 1mm Increment	Q·R Rc (PT)	d Rc (PT)	€ Unit Price/m	Hole Machining € Unit Price	
Type	No.							A·B·C·D·E	Q·R
HFBM	1	0H~5H	50~1000	5~995*	0(No Tap) 2(1/4)	1/8			
	2					1/4			

*Sum up the number of the machined holes for 1H~5H and A~E, AB~EB.(0H indicates no hole.)

Order Example

Part Number	-	H (No. of Holes)	-	L	-	A	-	B	-	C	-	D	-	E	-	Q	-	R
HFBM2	-	5H	-	180		A30		B60	-	C90	-	D120		E150	-	Q2	-	R2

Days to Ship **10 Days**

Express B 8,00 EUR/piece **P.88**

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

€ Unit Price/m x Specified Full Length + Hole Machining Charge = Sales € Unit Price
ex: HFBM2-3H-800-A100-B200-C300
36,50 x 0.8m + 12,00 = 41,20 EUR
(Round down to ten Cent.)

Rotary Manifolds

CAD Data

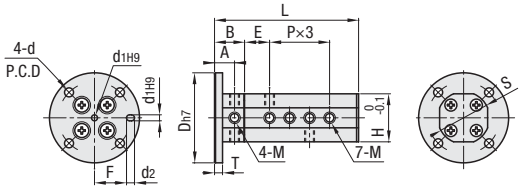
Features: Less air leakage structure

RoHS

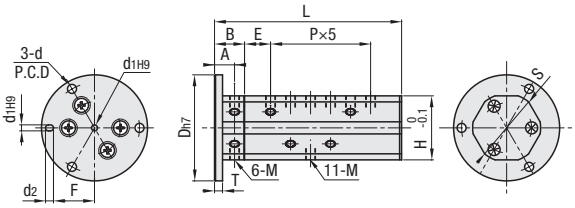
BMRTN



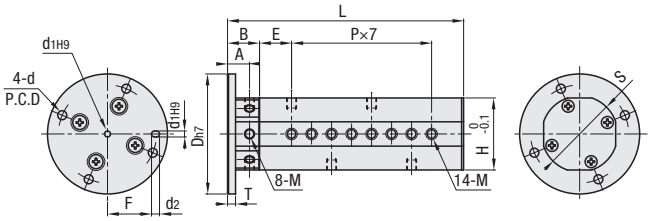
Number of Circuits
4



Number of Circuits
6



Number of Circuits
8



Part Number		Nominal	Thread Size M	L	D_{h7}	T	A	B	E	P	d	P.C.D	d_{1H9}	d_2	F	H	S	Allowable Rotational Speed (min^{-1})	Turning Torque (Nm)	Minimum Sectional Area (mm^2)	Accessory Plug (Size x Quantity)	Allowable Leak Amount* (cm^3 / min)	Mass (g)	€ Unit Price
Type	Number of Circuits																							Qty. 1 ~ 3
BMRTN	4	M5	M5x0.8 Depth 5	72	45	4	10	15	12.5	10	4.5	36	3 Depth 3	4	16	24	26	350	0.05	4.9	M5x3 pcs.	11	110	
		1	Rc1/8	94	60		12.5	20.5	15.5	13.5		49			22.5	35	38	240	0.07	12.5	R1/8x3 pcs.	13	280	
	6	M5	M5x0.8 Depth 5	93.5	53		10	15	13	10		45			20.5	32	34	240	0.12	4.9	M5x5 pcs.	13	160	
		1	Rc1/8	122.5	70		12.5	20.5	17.5	13.5		58			27	41	44	170	0.17	12.5	R1/8x5 pcs.	15	500	
	8	M5	M5x0.8 Depth 5	118	60		11	16	16	10		49			22.5	36	38	200	0.2	4.9	M5x6 pcs.	15	380	
		1	Rc1/8	156	80	7	16	24	17.5	13.5	5.5	67	4 Depth 4	5	31	46	48	140	0.4	12.5	R1/8x6 pcs.	16	900	

*Allowable leak amount is the value at factory shipment.

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number BMRTN4 - Nominal M5

Days to Ship: 6 Days P.88

Features

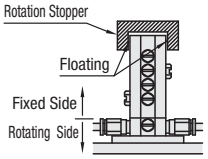
- Can be used for piping on rotary parts such as index tables.
- Bearing is embedded to achieve high rigidity and rotation with low friction.
- Seal portion has a low friction seal structure that ensures low leakage.

Precautions for Use

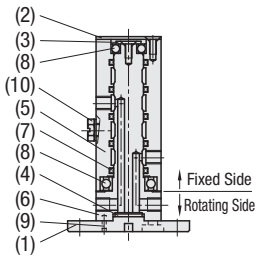
- Use clean air preconditioned with dryer or filter. (Do not use synthetic oil containing chemical and organic solvent, air containing salt and corrosive gas. They cause damage and malfunction.)

Installation Method

- The upper portion of the fixed side should have a rotation stopping measure designed to fit the equipment, and the floating condition should be ensured. Excessive load to the rotating side shaft may cause damages and air leakage.

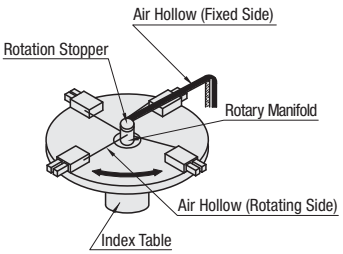


Structure Diagram



No.	Name of Parts	Material
(1)	Mounting Flange	Aluminum Alloy
(2)	Fixed Side Body Cover	Stainless Steel
(3)	Bearing Holder	Stainless Steel
(4)	Gasket	NBR
(5)	Fixed Side	Aluminum Alloy
(6)	Rotating Side	Aluminum Alloy
(7)	Seal	Nitrile Rubber
(8)	Bearings	Bearing Steel
(9)	Dowel Pin	Bearing Steel
(10)	Plug	M5: Brass R1/8: Stainless Steel

Example



Specification

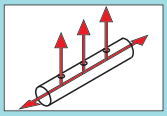
Applicable Fluid	Oil Free Air
Operating Temp. Range	5~60°C
Rotating Angle	Endless
Operating Pressure Range	-100kPa~0.7MPa *

*Cannot retain vacuum condition.

NEW

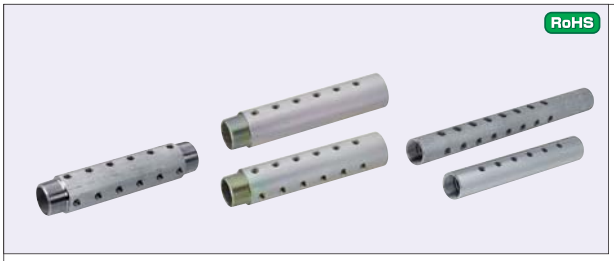
Hollow Manifolds

-Both Ends Female Thread Type / One End Male Thread One End Female Thread Type / Both Ends Male Thread Type-



For recommended tapered thread tightening torque, please refer to **P.1082**

RoHS



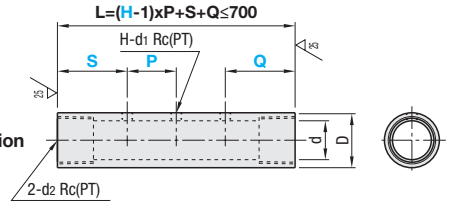
Hole Direction	Type: Both Ends Female Thread	Type: One End Male Thread One End Female Thread	Type: Both Ends Male Thread	M Material	S Surface Treatment
1 Direction		PMMF	-	1.0305/P235G1TH	Trivalent Chromate
	PMFS	PMMFS	-	1.4301/X5CrNi18-10	-
2 Directions 90°	PMFL	-	PMML	1.0305/P235G1TH	Trivalent Chromate
	PMFSL	PMMFSL	PMMSL	1.4301/X5CrNi18-10	-
2 Directions 180°	PMFT	-	-	1.0305/P235G1TH	Trivalent Chromate
	PMFST	-	-	1.4301/X5CrNi18-10	-

Threads JIS B0203 (PT)
Normal Pressure (No.1 / 1S / 2) 20.6MPa≈210kgf/cm² or less
(No. 5) 0.7MPa≈7kgf/cm² or less

- Both Ends Female Thread

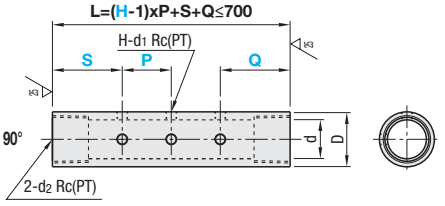
1 Direction

L=(H-1)xP+S+Q≤700



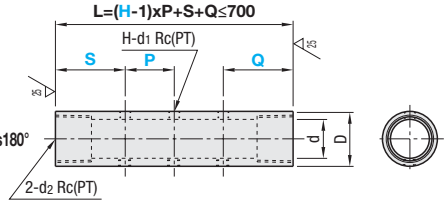
2 Directions 90°

L=(H-1)xP+S+Q≤700



2 Directions180°

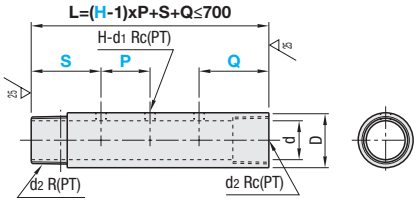
L=(H-1)xP+S+Q≤700



d1 Rc (PT) end face of thread is chamfered.

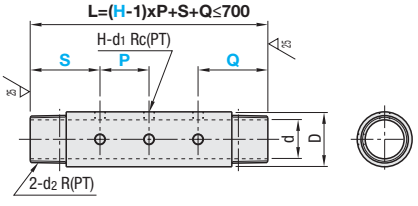
•One End Male Thread, One End Female Thread Type

L=(H-1)xP+S+Q≤700

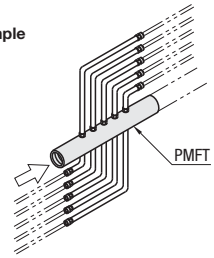


•Both Ends Male Thread Type

L=(H-1)xP+S+Q≤700



Example



Part Number Type	No.	No. of Side Female Thread Holes H	Pitch P 1mm Increment	S · Q 1mm Increment	d1 Rc(PT)	d2 R / Rc (PT)	D	d
(Both Ends Female Thread Type) 1 Direction **PMFS**	1	*1~12	30~50	35~80	1/8	1 1/4	48.6	34.4
	1S					1/2	27.2	16.2
2 Directions 90° **PMFL** **PMFSL**	2				1/4	1 1/4	48.6	34.4
2 Directions180° **PMFT** **PMFST**	5				M5	1/2	27.2	16.2

(One End Male Thread - One End Female Thread) 1 Direction **PMMF** **PMMFS**

(Both Ends Male Thread Type) 2 Directions 90° **PMML** **PMMSL**

2 Directions 90° **PMMFSL**

*When H (the number of side tapped holes) is 1, Pitch P specification is not required. For 2 directions type (90° and 180°), the number of side tapped holes is H x 2.

Order Example

Part Number	H (Number of Holes)	P	S	Q
PMF1	1		S40	Q50
PMML1	12	P30	S35	Q35
PMMF2	5	P40	S35	Q40

Days to Ship

- Material: 1.4301/X5CrNi18-10: 8 Days
- Material: 1.0305/P235G1TH: 10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent) P.87

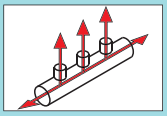
Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

No.	€ Unit Price: 1 Direction Type, Body Material: 1.0305/P235G1TH						1 Direction Type, Body Material; 1.4301/X5CrNi18-10						2 Directions Type (90° & 180°), Body Material: 1.0305/P235G1TH						2 Directions Type (90° & 180°), Body Material; 1.4301/X5CrNi18-10					
	H1 / 2	H3 / 4	H5 / 6	H7 / 8	H9 / 10	H11 / 12	H1 / 2	H3 / 4	H5 / 6	H7 / 8	H9 / 10	H11 / 12	H1 / 2	H3 / 4	H5 / 6	H7 / 8	H9 / 10	H11 / 12	H1 / 2	H3 / 4	H5 / 6	H7 / 8	H9 / 10	H11 / 12
1																								
1S																								
2																								
5																								

Hollow Manifolds

- Socket Configurable Type-





	Type: Sockets Female Thread Type	Type: Sockets Male Thread Type	Material: Body	Material: Sockets – Male Thread Type	Material: Sockets – Female Thread Type	Surface Treatment
Both Ends Male Thread Type	SGFF	-	1.0035/ S185	1.0035/ S185	1.1158/C25E (1.1151/C22E for M5)	Trivalent Chromate / Electroless Nickel Plating
	SGFM	-				
	SUFF	SUFFA	1.4301/ X5CrNi18-10	1.4301/X5CrNi18-10TP (1.4301/X5CrNi18-10 for M5)	1.4301/X5CrNi18-10	-
Both Ends Female Thread Type	SGFMF	SGFMFA	1.0035/S185	1.0035/S185	1.1158/C25E (1.1151/C22E for M5)	Trivalent Chromate
	SUFMF	-	1.4301/ X5CrNi18-10	1.4301/X5CrNi18-10TP (1.4301/X5CrNi18-10 for M5)	1.4301/X5CrNi18-10	-

Ⓟ Welding may cause small deformations that accumulate when the products are used in connected stacks.

* No. 5 is selected in the drawing.

Ⓟ Select A ~ E according to the number of holes (H). Please select from A to B when H=2, up to C when H=3, up to D when H=4 and up to E when H=5.

Thread JISB0203R (PT)
(Normal Pressure: 0.7MPa≈7kgf/cm² or less)

Operating Conditions Water, Air

V₁ / T1 Dimensions

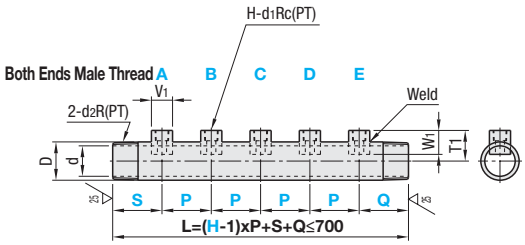
d1 Rc(PT)	V1	W1	T1
5(M5)	10	7.5	D/2+W1-(L-H)
1 (1/8)	15	8.1	
2 (1/4)	20	11.4	
3 (3/8)	25	12	
4 (1/2)	30	15.6	
6 (3/8)	35	17.7	

V₂ / T2 Dimensions

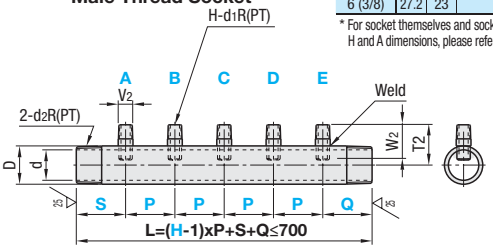
d1 R(PT)	V2	W2	T2
5(M5)	6	7.5	D/2+W2-A
1 (1/8)	10.5	10	
2 (1/4)	13.8	15	
3 (3/8)	17.3	17	
4 (1/2)	21.7	20	
6 (3/8)	27.2	23	

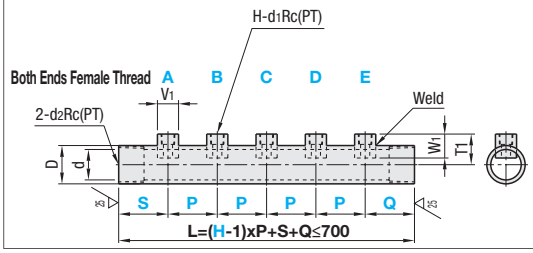
* For socket themselves and socket L, H and A dimensions, please refer to **P.1118**

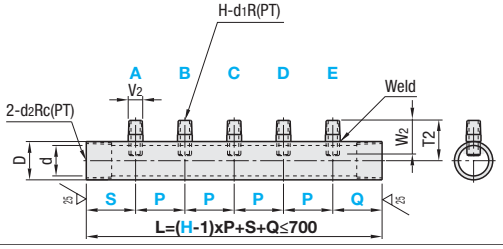
Female Thread Socket



Male Thread Socket







Part Number: Type			No.	H (No. of Holes)	P · S · Q 1mm Increment	Rc (PT) R (PT) M (Coarse Thread) Selection A · B · C · D · E	d2 R(PT)	D	d: Material: 1.0035/S185	d: Material: JIS SUS
Both Ends Male Thread Type	Female Thread Socket	Male Thread Socket	15A	2 3 4 5	35~150	0(No Hole) 5(M5) 1(1/8)	1/2	21.7	16.1	16.1
	SGFF SGFM SUFF	SUFFA	20A		35~150	0(No Hole) 5(M5) 1(1/8) 2(1/4)	3/4	27.2	21.6	21.4
			25A		40~150	0(No Hole) 1(1/8) 2(1/4) 3(3/8)	1	34	27.6	27.2
			32A		50~150	0(No Hole) 2(1/4) 3(3/8) 4(1/2)	1 1/4	42.7	35.7	35.5
			40A		60~150	0(No Hole) 3(3/8) 4(1/2) 6(3/4)	1 1/2	48.6	41.6	41.2
Both Ends Female Thread Type	Female Thread Socket	Male Thread Socket	15A	2 3 4 5	35(45) ~ 150	0(No Hole) 5(M5) 1(1/8)	1/2	21.7	16.1	16.1
	SGFMF SUFMF	SGFMFA	20A		35(45) ~ 150	0(No Hole) 5(M5) 1(1/8) 2(1/4)	3/4	27.2	21.6	21.4
			25A		40(50) ~ 150	0(No Hole) 1(1/8) 2(1/4) 3(3/8)	1	34	27.6	27.2
			32A		50(60) ~ 150	0(No Hole) 2(1/4) 3(3/8) 4(1/2)	1 1/4	42.7	35.7	35.5
			40A		60(70) ~ 150	0(No Hole) 3(3/8) 4(1/2) 6(3/4)	1 1/2	48.6	41.6	41.2

Ⓟ Specify P, S and Q within the range of L= (H-1) x P + S + Q ≦ 700. Ⓟ For both ends tapped type minimum configurable values for S and Q are in ( ).
Ⓟ For A to E, please specify 0, 1, 2, 3, 4, 5 or 6 indicated before ( ). When selecting 0, pitch remains unchanged and the distance between sockets is 2 x P.
Ⓟ All sockets of Female Thread Socket Type are tapped, and all sockets of Male Thread Socket Type are threaded. Ⓟ To order refer to the order example and minimum pitch chart below.

Order Example

Part Number	H (Number of Holes)	P	S	Q	A	B	C	D	E	
SUFFA25A	3	P50	S50	Q50	A3	B2	C2			For 3 sockets
SGFMF25A	5	P50	S50	Q50	A3	B2	C3	D2	E3	For 5 sockets
SGFMF25A	4	P50	S50	Q50	A3	B2	C0	D2		For 4 socket pitch but C port is not needed. (# of sockets will be 3)

Ⓟ Select A ~ E according to the number of holes (H). Specify up to section B for H=2, to C for H=3, to D for H=4, and to E for H=5.

Days to Ship 10 Days

Price

Volume Discount (Ⓟ Round down to one Cent) **P87**

Quantity	1~4	5~9
€ Unit Price	€ Unit Price	5%

Ⓟ For orders larger than indicated quantity, please request a quotation.

No.	€ Unit Price: Female Thread Socket / Male Thread Socket – Body Material: 1.0035/S185 H2	H3	H4	H5	Body Material; 1.4301/X5CrNiMo18-10-TP H2	H3	H4	H5
15A								
20A								
25A								
32A								
40A								

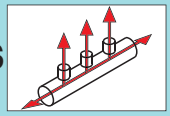
Socket Pitch (P) Minimum Pitch Chart

Size	M5	1/8	1/4	3/8	1/2	3/4
M5	35	35	35	38	40	43
1/8	35	35	38	40	43	45
1/4	35	38	40	43	45	48
3/8	38	40	43	45	48	50
1/2	40	43	45	48	50	53
3/4	43	45	48	50	53	55

Specify a pitch larger than above values.

Hollow Manifolds / Sockets for Hollow Manifolds

-1 Direction Male Thread Type-



CAD Data

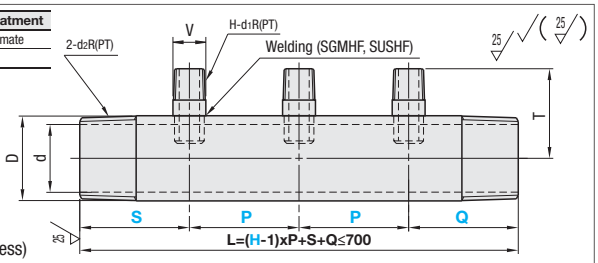
■Hollow Manifolds RoHS



Type	Material	Surface Treatment
SGMHF	1.0035/S185	Trivalent Chromate
SUSHF	1.4301/X5CrNi18-10TP	-

Welding may cause small deformations that accumulate when the products are used in connected stacks.

Thread JIS B0203 R (PT)
(Normal Pressure: 0.7MPa≈7kgf/cm² or less)



Part Number Type	No.	H (No. of Holes)	P · S · Q 1mm Increment	d1 R(PT)	d2 R(PT)	D	d SGMHF	d SUSHF	€ Unit Price SGMHF H2	H3	H4	H5	H6	SUSHF H2	H3	H4	H5	H6
SGMHF SUSHF	15A	2	40~150	1/8	1/2	21.7	16.1	16.1										
	20A	3	40~150	1/4	3/4	27.2	21.6	21.4										
	25A	4	45~150	3/8	1	34	27.6	27.2										
	32A	5	55~150	1/2	1 1/4	42.7	35.7	35.5										
	40A	6	65~150	3/4	1 1/2	48.6	41.6	41.2										

Order Example: Part Number - H (Number of Holes) - P - S - Q
SUSHF32A - 4 - P70 - S60 - Q70

■Usage Conditions
Water, Air

■V, T Dimension

d1 R(PT)	V	T
1(1/8)	10.5	25.8
2(1/4)	13.8	34.6
3(3/8)	17.3	40.0
4(1/2)	21.7	48.3
6(3/4)	27.2	55.3

Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent) P88

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

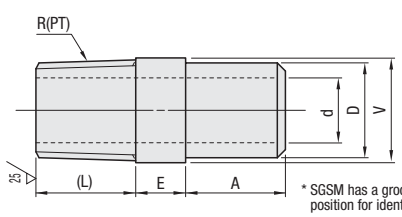
■Sockets for Hollow Manifolds RoHS



Type	Material	Surface Treatment
SGSM	1.0035/S185*	Trivalent Chromate
SUSM	1.4301/X5CrNi18-10TP*	-

*1.1151/C22E (SGSM) for M5 only.
1.4301/X5CrNi18-10 (SUSM) for M5 only.

Thread JIS B0203 R (PT)



* SGSM has a groove (Depth 0.2) at E position for identificaiton.

Part Number Type	No.	R(PT)	E	A	V	d SGSM	d SUSM	D	(L)	SGSM € Unit Price Qty. 1~9	SGSM Volume Discount Qty. 10~19	SUSM € Unit Price Qty. 1~9	SUSM Volume Discount Qty. 10~19
SGSM SUSM	5	M5	4	5.9	6	1.5	1.5	5	7.5				
	1	1/8	5	10	10.5	6.5	5.7	9.5	10				
	2	1/4	6	11	13.8	9.2	7.8	12.8	15				
	3	3/8	6	12	17.3	12.7	10.9	16.3	17				
	4	1/2	7	13	21.7	16.1	16.1	20.7	20				
	6	3/4	8	13.5	27.2	21.6	21.4	26.2	23				

For orders larger than indicated quantity, please request a quotation.

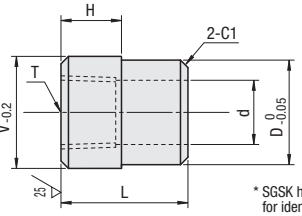
■Sockets for Hollow Manifolds RoHS



Type	Material	Surface Treatment
SGSK	1.1158/C25E*	Trivalent Chromate
SUSK	1.4301/X5CrNi18-10	-

*1.1151/C22E for M5 only

Thread JIS B0203 R (PT)



* SGSK has a groove (depth 0.2) on "H" section for identification.

Part Number Type	No.	T Rc(PT)	V	L	D	d SGSK	d SUSK	H	SGSK € Unit Price Qty. 1~9	SGSK Volume Discount Qty. 10~19	SUSK € Unit Price Qty. 1~9	SUSK Volume Discount Qty. 10~19
SGSK SUSK	5	M5	10	13.4	9	4.3	4.3	7.5				
	1	1/8	15	17	14	8.6	8.6	8.1				
	2	1/4	20	22	19	11.4	11.7	11.4				
	3	3/8	25	24	24	14.9	12.4	12				
	4	1/2	30	28	29	16.3	16.3	15.6				
	6	3/4	35	31	34	21	21	17.7				

■Features Welded sockets used for Hollow Manifolds. Installation is made easy with a step provided on the outer circumference.

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number
SGSM3
SGSK2

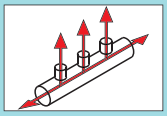
Days to Ship: 8 Days | Express A | 2,00 EUR/ piece | P88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

NEW

Hollow Manifolds

-1 Direction Female Thread Type-



CAD Data

RoHS







	Type				Material	Surface Treatment
	Standard Type		Configurable Type			
	T1 Type	T2 Type	T1 Type	T2 Type		
Both Ends Male Thread	SGM	SGMS	SGMF	-	1.0035/S185*	Trivalent Chromate
	SUMH	-	SUMHF	SUMHSF	1.4301/X5CrNi18-10-TP	-
One End Male Thread One End Female Thread	SGMA	SGMSA	SGMAF	-	1.0035/S185*	Trivalent Chromate
	SUMHA	SUMHH	SUMHAF	SUMHHF	1.4301/X5CrNi18-10-TP	-
Both Ends Female Thread	SGMM	-	SGMFM	-	1.0035/S185*	Trivalent Chromate
	SUMHM	-	SUMHFM	-	1.4301/X5CrNi18-10-TP	-

*Sockets for No.50A is 1.0038/S235JR.

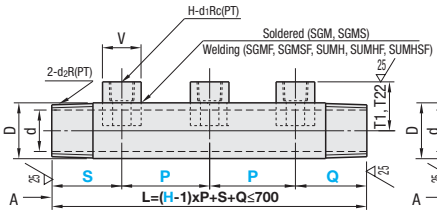
Brazing and welding may cause small deformations that accumulate when the products are used in connected stacks.

Thread JIS B0203 R (PT)
(Normal Pressure: 0.7MPa≈7kgf/cm² or less)

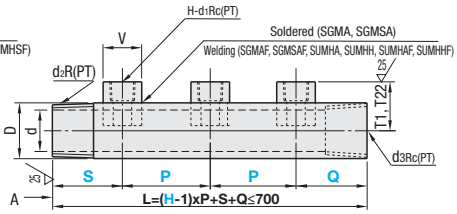
*The drawing is for 3 ports.

√(25)

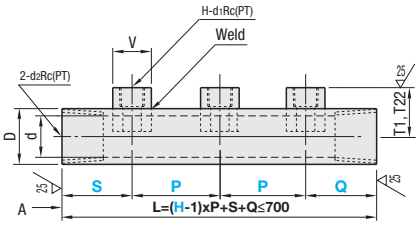
Both Ends Male Thread



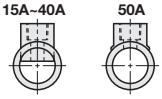
One End Male Thread One End Female Thread



Both Ends Female Thread



‹View A›



Usage Conditions
Water, Air

V, T Dimension

d1 Rc(PT)	V	T1	T2
1(1/8)	15	19	21.7
2(1/4)	20	25	28.4
3(3/8)	25	29	33.4
4(1/2)	30	37	39.9
6(3/4)	35	42	-
8(1)	42	58	-

Both Ends Male Thread Type / One End Male Thread, One End Female Thread Type

Part Number			H (No. of Holes)	P · S · Q		d1	d2	d3	D	d	
Type		No.		Standard Type	Configurable Type 1mm Increment	Rc(PT)		Rc (PT)		Material: 1.0035/S185	Material: JIS SUS
Standard Type	Configurable Type					T1 Type	T2 Type	R (PT)			
T1 Type T2 Type SGM SGMS SUMH	T1 Type T2 Type SGMF SUMHF SUMHSF	15A	2 3 4 5 6	35	35(45) ~ 150	1/8	-	1/2	21.7	16.1	16.1
		20A		35	35(45) ~ 150	1/4	1/8	3/4	27.2	21.6	21.4
		25A		40	40(50) ~ 150	3/8	1/4	1	34	27.6	27.2
SGMA SGMSA SUMHA SUMHH	SGMAF SUMHAF SUMHHF	32A		50	50(60) ~ 150	1/2	3/8	1 1/4	42.7	35.7	35.5
		40A		60	60(70) ~ 150	3/4	1/2	1 1/2	48.6	41.6	41.2
		50A		100	100~150	1	-	2	60.5	52.9	-

For one end threaded one end tapped P / S / Q configurable type, minimum configurable value is in ( ) for Q dimension (tapped end) only.
Specify P, S and Q within the range of L= (H-1) x P + S + Q ≦ 700. Only SGM and SGMF are available for No. 50A.

Both Ends Female Thread Type

Part Number			H (No. of Holes)	P · S · Q		d1	d2	D	d	
Type		No.		Standard Type	Configurable Type 1mm Increment	Rc(PT)	Rc(PT)		Material: 1.0035/S185	Material: JIS SUS
Standard Type	Configurable Type									
T1 Type SGMM SUMHM	T1 Type SGMFM SUMHFM	15A	2 3 4 5 6	45	35(45) ~ 150	1/8	1/2	21.7	16.1	16.1
		20A		45	35(45) ~ 150	1/4	3/4	27.2	21.6	21.4
		25A		50	40(50) ~ 150	3/8	1	34	27.6	27.2
		32A		60	50(60) ~ 150	1/2	1 1/4	42.7	35.7	35.5
		40A		70	60(70) ~ 150	3/4	1 1/2	48.6	41.6	41.2

Specify P, S and Q within the range of L= (H-1) x P + S + Q ≦ 700. For P, S Q Fixed Type minimum required value for S and Q dimensions are in ( ).
T2 type is not available for both ends tapped type.

Order Example

Part Number	-	H (Number of Holes)	-	P	-	S	-	Q
SUMH32A	-	3						
SGMAF32A	-	4	-	P70	-	S60	-	Q70
SUMHM20A	-	3						

Days to Ship

- P · S · Q Standard Type (No.15A~40A) (Other than Both Ends Female Thread Type): 8 Days
- P · S · Q Configurable Type (No.15A~40A) / P · S · Q Standard and Configurable (Both Ends Female Thread Products): 10 Days
- P · S · Q Standard/Configurable Type (No.50A only): 13 Days

Express A 5,00 EUR/ piece P.88
A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent) P.88

Quantity	1~4	5~9
Rate	€ Unit Price	5%

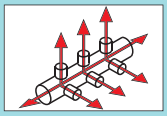
For orders larger than indicated quantity, please request a quotation.

No.	€ Unit Price																			
	Standard Type										Configurable Type									
	Body Material: 1.0035/S185					Body Material; 1.4301/X5CrNi18-10-TP					Body Material: 1.0035/S185					Body Material; 1.4301/X5CrNi18-10-TP				
	H2	H3	H4	H5	H6	H2	H3	H4	H5	H6	H2	H3	H4	H5	H6	H2	H3	H4	H5	H6
15A																				
20A																				
25A																				
32A																				
40A																				
50A																				

No. 50A for SGM / SGMF only.T2 type is not available for both ends tapped type.

Hollow Manifolds

-2 Directions 90° Type / Sockets for 90° Type-



RoHS

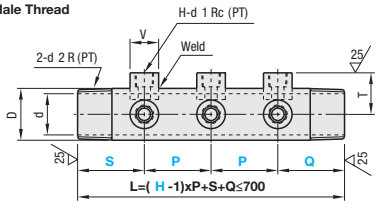




	Type	Material	Surface Treatment
Both Ends Male Thread	SGMLF	1.0035/S185	Trivalent Chromate
	SUMLF	1.4301/X5CrNi18-10-TP	-
Both Ends Female Thread	SGMMLF	1.0035/S185	Trivalent Chromate
	SUMMLF	1.4301/X5CrNi18-10-TP	-

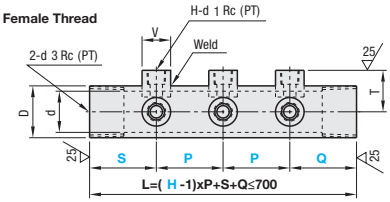
Thread JIS B0203 R (PT)
(Normal Pressure: 0.7MPa≈7kgf/cm² or less)

Both Ends Male Thread





Both Ends Female Thread





* Drawing is for when 3 Port type is selected.

■**Usage Conditions**
Water, Air

■**V, T Dimension**

d1 Rc (PT)	V	T
1(1/8)	15	21.7
2(1/4)	20	28.4
3(3/8)	25	33.4
4(1/2)	30	39.9

■ **Both Ends Male Thread Type / Both Ends Female Thread Type**

Part Number			H (No. of Holes)	P · S · Q	d1	d2	d3	D	d	
Type		No.		1mm Increment	Rc (PT)	R (PT)	Rc (PT)		Material: 1.0035/S185	Material: JIS SUS
Both Ends Male Thread	Both Ends Female Thread									
SGMLF SUMLF	SGMMLF SUMMLF	20A	2 3 4 5 6	35 (45) ~ 150	1/8	3/4	3/4	27.2	21.6	21.4
		25A		40 (50) ~ 150	1/4	1	1	34	27.6	27.2
		32A		50 (60) ~ 150	3/8	1 1/4	1 1/4	42.7	35.7	35.5
		40A		60 (70) ~ 150	1/2	1 1/2	1 1/2	48.6	41.6	41.2

For both ends tapped type, minimum configurable values for S and Q are in ( ).
Specify P, S and Q within the range of L= (H-1) x P + S + Q ≤ 700.

No.	€ Unit Price									
	Body Material: 1.0035/S185					Body Material; 1.4301/X5CrNi18-10				
	H2	H3	H4	H5	H6	H2	H3	H4	H5	H6
20A										
25A										
32A										
40A										

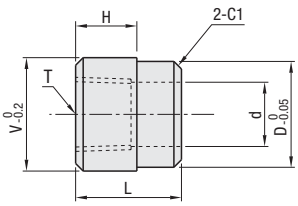
■ 90°Dedicated Sockets

RoHS



Type	Material	Surface Treatment
SGSKK	1.1151/C22E	Zinc Galvanizing
SUSKK	1.4301/X5CrNi18-10	-

Thread JIS B0203 R (PT)



Part Number		T	V	L	D	d	H	SGSKK		SUSKK	
Type	No.	Rc (PT)						€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
								Qty. 1~9	Qty. 10~19	Qty. 1~9	Qty. 10~19
SGSKK SUSKK	1	1/8	15	14	14	8.5	8.1				
	2	1/4	20	18	19	11.5	11.4				
	3	3/8	25	20.5	24	14.5	12				
	4	1/2	30	24.5	29	16.5	15.6				

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	H (Number of Holes)	-	P	-	S	-	Q
SUMLF32A SGSKK1	-	3	-	P50	-	S50	-	Q50

Price

■**Volume Discount** (Round down to one Cent) **P.88**
- Hollow Manifolds

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

■**Hollow Manifolds**
10 Days

■**Sockets for 90° Type**
8 Days

Express A | 2,00 EUR/piece

A Express Charge of 5,40 EUR for 3 or more identical pieces. P.88

Hollow Manifolds
-2 Directions 180° Type-

CAD Data

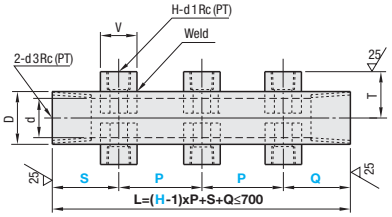
RoHS



Type		Material	Surface Treatment
Standard Type	Configurable Type		
SGMMD	-	1.0035/S185	Trivalent Chromate
SUMMD	SUMMDF	1.4301/X5CrNi18-10-TP	-

Thread JIS B0203 R (PT)
(Normal Pressure: 0.7MPa≈7kgf/cm² or less)

Both Ends Female Thread



Usage Conditions
Water, Air

V, T Dimension

d1 Rc (PT)	V	T
1(1/8)	15	21.7
2(1/4)	20	28.4
3(3/8)	25	33.4
4(1/2)	30	39.9

* Drawing is for when 3 Port type is selected.

Both Ends Female Thread Type

Part Number			H (No. of Holes)	P · S · Q		d1	d3	D	d	
Type		No.		Standard Type	Configurable Type 1mm Increment	Rc (PT)	Rc (PT)		Material: 1.0035/S185	Material: JIS SUS
Standard Type	Configurable Type									
SGMMD SUMMD	SUMMDF	20A	2 3 4 5 6	45	35 (45) ~ 150	1/8	3/4	27.2	21.6	21.4
		25A		50	40 (50) ~ 150	1/4	1	34	27.6	27.2
		32A		60	50 (60) ~ 150	3/8	1 1/4	42.7	35.7	35.5
		40A		70	60 (70) ~ 150	1/2	1 1/2	48.6	41.6	41.2

Specify P, S and Q within the range of L= (H-1) x P + S + Q ≤ 700. For P, S Q Configurable Type, minimum required value for S and Q dimensions are in ( ).

Order Example

Part Number	-	H (Number of Holes)	-	P	-	S	-	Q
SGMMD32A	-	3						
SUMMDF32A	-	4	-	P70	-	S60	-	Q70

Days to Ship

P · S · Q Standard Type

8	Days	Express A	5,00 EUR/piece

A Express Charge of 13,50 EUR for 3 or more identical pieces. P.88

P · S · Q Configurable Type

10	Days

Price

Volume Discount (Round down to one Cent) P.88

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

No.	€ Unit Price														
	Standard Type										Configurable Type				
	SGMMD					SUMMD					SUMMDF				
	H2	H3	H4	H5	H6	H2	H3	H4	H5	H6	H2	H3	H4	H5	H6
20A															
25A															
32A															
40A															

Plates with Fittings / Simplified Manifolds

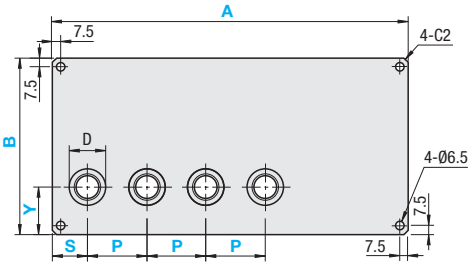
CAD Data

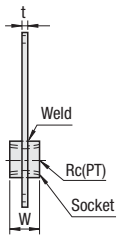
■Plates with Fittings RoHS



Type	Material: Plate	Material: Sockets	S Surface Treatment	Normal Pressure
TGPLA	1.0330/DC01	1.1158/ C25E	Trivalent Chromate	1MPa ≈ 10kgf/cm² or less

Thread JISB0203R (PT)





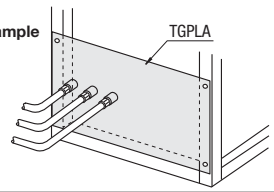
Part Number Type	No.	No. of Sockets H	A 1mm Increment	B 1mm Increment	Y	S 5mm Increment	P 1mm Increment	Rc (PT)	D	W	t	€ Unit Price H1	H2	H3	H4
TGPLA	1	1	150~300	100~150	50	20~200	30~60	1/8	19	22	2.3				
	2	2			60			1/4	22	25					
	3	3			70	25~150	40~60	3/8	28	28					
		4			80										

For No. 1, A–(H–1)xP–S≥20 For No. 2 and 3, A–(H–1)xP–S≥25 If P is not specified, P=30 for No. 1 and P=40 for No. 2 and 3.

Order Example

Part Number	-	H	-	A	-	B	-	Y	-	S	-	P
TGPLA3	-	3	-	A200	-	B120	-	Y50	-	S40	-	P50

Example



Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

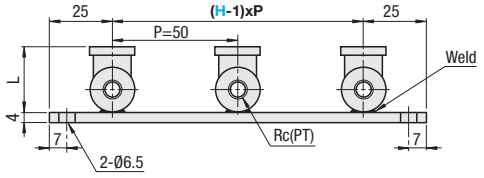
■Simplified Manifolds RoHS

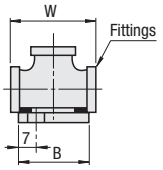


Type: T Fitting Type	Type: Socket	Material: Plate	Material: Joint: T Fitting Type	Material: Joint: Socket	S Surface Treatment	Normal Pressure
TGMF	TGMSF	1.0330/DC01	EN-JM 1010/EN-GJMW-350-4	1.1158/ C25E	Trivalent Chromate	1MPa ≈ 10kgf/ cm² or less
TGMS	TGMSS	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10		-	

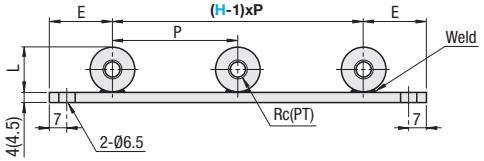
Thread JISB0203R (PT)

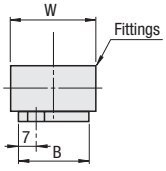
T Fitting Type





Socket Type





Dimensions in ( ) are for TGMSF.

■T Fitting Type

Part Number Type	No.	H (No. of Joints)	Rc (PT)	L TGMF	L TGMS	W TGMF	W TGMS	B	€ Unit Price TGMF 1H	TGMF 2H	TGMF 3H	TGMS 1H	TGMS 2H	TGMS 3H
TGMF TGMS	1	1	1/8	25	25	34	35	28						
	2	2	1/4	29	29.5	38	39	32						
	3	3	3/8	35	36	46.5	47.5	40						

■Socket

Part Number Type	No.	H (No. of Joints)	Pitch P Selection	Rc (PT)	L TGMSF	L TGMSS	W TGMSF	W TGMSS	B TGMSF	B TGMSS	E TGMSF	E TGMSS	€ Unit Price TGMSF 1H	TGMSF 2H	TGMSF 3H	TGMSS 1H	TGMSS 2H	TGMSS 3H
TGMSF TGMSS	1	1	35 50	1/8	19	15	22	23	18	19	25	25						
	2	2		1/4	22	19	25	29	21	25	25	25						
	3	3		3/8	28	22	28	30	24	26	30	25						

When H is 1, Pitch P specification is not required.

Order Example

Part Number	-	H (Number of Joints)	-	P
TGMF2	-	3		
TGMSF1	-	2	-	P35

Days to Ship: 10 Days

Express B 5,00 EUR/ piece P88

A Express Charge of 13,50 EUR for 3 or more identical pieces.
Not applicable to Socket Type

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Brackets with Fittings
-Socket / One-Touch Coupling-

CAD Data

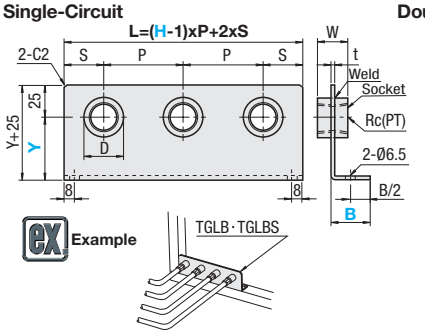
■Brackets with Fittings RoHS –Socket–



Type		Material		Surface Treatment	Normal Pressure
Single-Circuit	Double-Circuit	Bracket	Sockets		
TGLB	TGLBW	1.0330/DC01	1.1158/C25E	Trivalent Chromate	1MPa ≈ 10kgf/cm² or less
TGLBS	TGLBWS	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10	-	

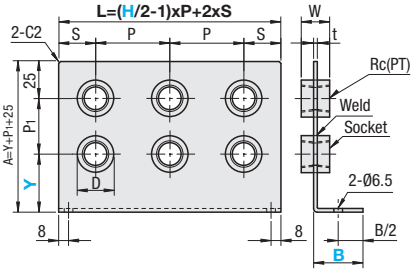
Thread JISB0203R (PT)

Single-Circuit



Example

Double-Circuit



■Single-Circuit

Part Number		No. of Sockets H	Y	B	Rc (PT)	P	S	D		W		t	TGLB € Unit Price				TGLBS € Unit Price			
Type	No.							TGLB	TGLBS	TGLB	TGLBS		H1	H2	H3	H4	H1	H2	H3	H4
TGLB TGLBS	1	1	40 50 60 70	30	1/8	30	20	19	15	22	23	1.0330/DC01 2.3 1.4301/X5CrNi18-10 2.0								
	2	2			1/4	40	25	22	19	25	29									
	3	3		40	3/8			28	22	28	30									
		4																		

■Double-Circuit

Part Number		No. of Sockets H	Y	B	Rc (PT)	P	P1	S	D		W		t	TGLBW € Unit Price				TGLBWS € Unit Price			
Type	No.								TGLBW	TGLBWS	TGLBW	TGLBWS		H2	H4	H6	H8	H2	H4	H6	H8
TGLBW TGLBWS	1	2	40 50 60 70	30	1/8	30	30	20	19	15	22	23	1.0330/DC01 2.3 1.4301/X5CrNi18-10 2.0								
	2	4		40	1/4	40	40	25	22	19	25	29									
	3	6		50	3/8				28	22	28	30									
		8																			

■Brackets with Fittings RoHS –One-Touch Coupling–





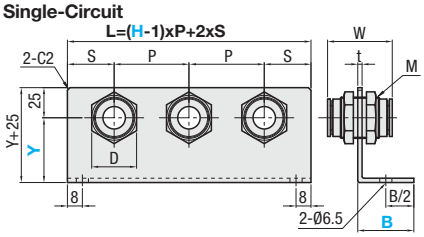
Type		Bracket		One-Touch Couplings
Single-Circuit	Double-Circuit	Material	Surface	Material
-	TGLCW	1.0330/DC01	Trivalent Chromate	CW614N/CuZn39Pb3 (Ring: PBT)
TGLCS	-	1.4301/X5CrNi18-10	-	1.4305/X10CrNiS18-9 (Ring: PBT)

■Specification

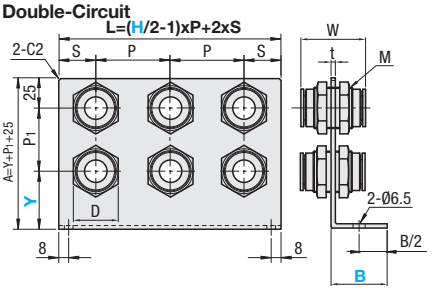
Applicable Fluid	Compressed Air	Water
Operating Temp. Range	-5 ~ 60°C	5 ~ 40°C
Max. Operating Pressure	1MPa	0.3MPa
Operating Vacuum Level	-100kPa	-

When using water as fluid medium, please use Soft Tube Inserts (**P.1261**) in the Tube.

Single-Circuit



Double-Circuit



■Single-Circuit

Part Number		No. of One-Touch Coupling H	Y	B	P	S	D	W	Thread Size Mx Pitch	Effective Cross Section Area (mm²)	t	€ Unit Price					
Type	No.											H1	H2	H3	H4	H5	H6
TGLCS	4	1	40 50 60 70	30	28	14	14	32.6	M12x1	4.3	2.0						
	6	2			34	17	17		M14x1	12.7							
	8	3			38	19	19		M16x1	23.4							
	10	4		40	48	24	24		M20x1	37.4							
	12	5 6			48	24	24	34.6	M22x1	53.6							

■Double-Circuit

Part Number		No. of One-Touch Coupling H	Y	B	P	P1	S	D	W	Thread Size Mx Pitch	Effective Cross Section Area (mm²)	t	€ Unit Price					
Type	No.												H2	H4	H6	H8	H10	H12
TGLCW	4	2	40 50 60 70	30	28	28	14	14	33	M12x1	4.3	2.3						
	6	4			34	34	17	17	36	M14x1	12.7							
	8	6			38	38	19	19	39	M16x1	23.4							
	10	8 10		40	48	48	24	23	44.5	M20x1	37.4							
	12	12			48	48	24	26	47	M22x1	53.6							

Order Example

Part Number	-	H	-	Y	-	B
TGLB3	-	2	-	Y60	-	B40
TGLBW3	-	4	-	Y60	-	B40

Days to Ship 10 Days

Price

■Volume Discount (Round down to one Cent.) **P87**

Quantity	1~9	10~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Pipes / Fittings / Hoses / Valves

Pipes / Fittings / Hoses / Valves









Product Name	Steel Pipes -Wrench Flats-	L-Shaped Angles for Steel Pipes	Pipe Supports
Page	1125~1127	1128	1129~1131





Low Pressure Screw Fittings -With Seal Coating Type-	Low Pressure Screw Fittings -Equal / Unequal Pipe Diameters-
1132	1133~1136





High Pressure Steel Pipe Fittings	Screw Fittings -Brass Type-
1137,1138	1139~1141



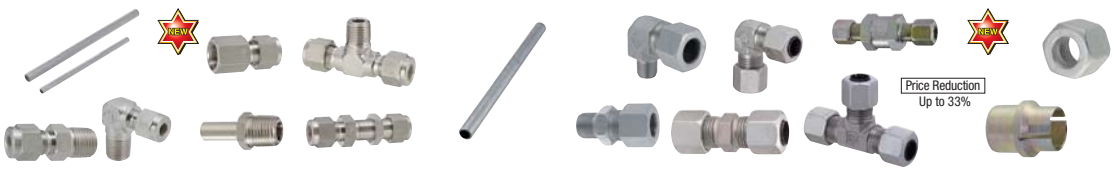
Extension Fittings	Screw Conversion Fittings	-L-shaped / T-shaped Type-	Heat, Cold Retention Pipe Covers	PVC Pipes	PVC Fittings -TS Fittings-
1142	1143	1144	1145	1146	1147,1148



PVC Fittings -HI Fittings-	Compound Fittings	Welded Fittings	Accessories for Plumbing Clamps
1149,1150	1151	1152	1153,1154



Plumbing Terminals	Tapered Screw Plugs	Copper Pipes / Copper Pipe Fittings	Needle Valves for Copper Pipes	Annealed Copper Pipes / Fittings for Annealed Copper Pipes
1155	1156	1157~1159	1159	1160



Stainless Steel Pipes / Stainless Steel Pipe Fittings	Steel Pipe for Hydraulics	Swage Sleeve Type Fittings for Hydraulics
1161~1164	1165	1165,1166



Hydraulic Rubber / Resin Hoses	Flexible Hoses -High Pressure / Medium Pressure / Low Pressure-	Fluoro Resin Flexible Hoses
1169~1171	1172, 1173	1174



Oil Hydraulic / Water Hydraulic Fittings	Hoses for Food	Silicone Hose	Non-PVC Hoses	Fluororesin Hoses -High-Flex Type-
1175~1178	1181	1182	1183	1184



-Conductive-	Resin Hoses for Ordinary Purposes -St-	-Oil-proof Type-	-High Strength-	-Withstanding Pressure Type-	Hose Fixing Connector
1184	1185	1185	1185	1185	1186



Fittings for Hoses	Coil Hose	Air Hoses	Hose Bands
1187~1189	1190	1190	1191



High Pressure Blower	Duct Hoses -Lightweight Type-	-Swivel Type-	-Flexible Type-	-Friction Resistant, Antistatic Duct Hoses-	-Oil-resistance Type-	-Non-PVC Type-	Cuff for Duct Hoses
1192	1194	1194	1195	1195	1196	1196	1196



Plumbing Parts for Duct Hoses	Duct Hose -Aluminum Type-	-Heat Resistance, Low Particulate Generation Type-	-Heat Resistant Type-	Plumbing Parts for Aluminum Duct Hoses
1197	1198	1198	1199	1199~1201



Duct Boxes	Ball Valves -Stainless Steel Type-	-Brass Type-	Globe Valve	Check Valve	Strainer
1202	1203	1204	1205	1205	1205



Oil Hydraulic Valve	Compact Ball Valves	Compact Needle Valves	Needle Valve
1205	1206~1209	1209	1210

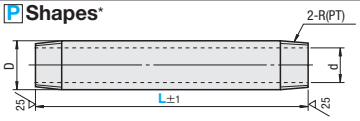
Steel Pipes



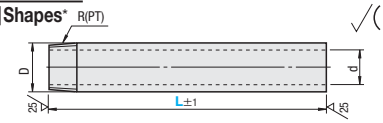
Part Number	Material	Standard	Usage	Surface Treatment
SGG_	1.0035/S185	JIS G3452	Low Operating Pressure Steam - Water - Oil - Gas - Pneumatic Hollow	-
SGP_ _	1.0035/S185	JIS G3442	Hollows for draining water - air conditioning etc.	Zinc Plating
SUT_ _	1.4301/X5CrNi18-10	JIS G3459	Corrosion Resistant Hollows - Low Temperature - High Temperature	-
SUTS_	1.4401/X5CrNiMo17-12-2	JIS G3459		-
STPG_	1.0254/S235 (Sch40)	JIS G3454	Pressure Pipes to be used under 350°C	-
SGHP_	1.0254/S235 (Sch80)	JIS G3454		-

*No surface treatment on male portion of 1.0035/S185_.
*Male ends are covered with sealing tapes before shipping.
*Excessive tightening may deform the internal thread portion. Wrap with sealing tape for air tightness, fit the hand-tight nozzle, and then tighten it up by giving one rotation or so.
*Marks may be left on the surface when tightening screws.

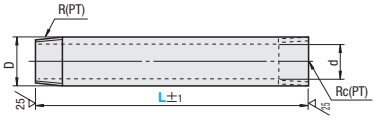
P Shapes*



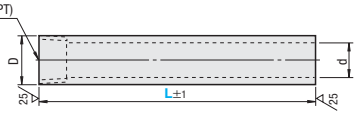
D Shapes*



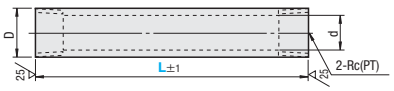
A Shapes*



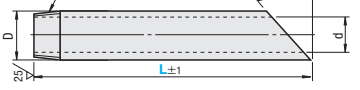
E Shapes*



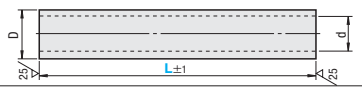
W Shapes*



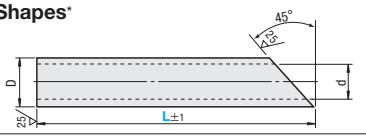
F Shapes*



C Shapes*



G Shapes*



L Dimension Selectable (C-Shape · Unpainted)

Part Number Type	No.	L	SGPPK D	SGPPK d	SUTPK D	SUTPK d	SGPPK € Unit Price Qty. 1~9	SGPPK Volume Discount Qty. 10~	SUTPK € Unit Price Qty. 1~9	SUTPK Volume Discount Qty. 10~
	6A	500	-	-	10.5	5.7				
SGPPK (1.0035/S185)	8A		13.8	9.2	13.8	7.8				
	10A		17.3	12.7	17.3	10.9				
SUTPK (1.4301/X5CrNi18-10)	15A		21.7	16.1	21.7	16.1				
	20A		27.2	21.6	27.2	21.4				
	25A		34.0	27.6	34.0	27.2				

Order Example

Part Number
SUTPK10A

Days to Ship

6 Days

P. 87

L Dimension Configurable

Part Number Type	Shape	No.	Coating Color Selection	L 1mm Increment	R (PT) Rc (PT)	SGG_ D	SGG_ d	1.0035/S185_ D	1.0035/S185_ d	SUT_/SUTS_ D	SUT_/SUTS_ d	STPG_ D	STPG_ d	SGHP_ D	SGHP_ d
SGG SGP SUT SUTS STPG SGHP	P A W C D E F G	6A	None Specified (Unpainted) W (White) BR (Brown) BL (Blue) Y (Light Yellow) R (Dark Red) B (Black)	30~2000	1/8	10.5	6.5	-	-	10.5	5.7	10.5	7.1	10.5	5.5
		8A		40~2000	1/4	13.8	9.2	13.8	9.2	13.8	7.8	13.8	9.4	13.8	7.8
		10A		40(43)~2000	3/8	17.3	12.7	17.3	12.7	17.3	10.9	17.3	12.7	17.3	10.9
		15A		50(55)~2000	1/2	21.7	16.1	21.7	16.1	21.7	16.1	21.7	16.1	21.7	14.3
		20A		50(65)~2000	3/4	27.2	21.6	27.2	21.6	27.2	21.4	27.2	21.4	27.2	19.4
		25A		60(75)~2000	1	34.0	27.6	34.0	27.6	34.0	27.2	34.0	27.2	34.0	25.0
		32A		60(80)~2000	11/4	42.7	35.7	42.7	35.7	42.7	35.5	42.7	35.5	42.7	32.9
		40A		60(90)~2000	11/2	48.6	41.6	48.6	41.6	48.6	41.2	48.6	41.2	48.6	38.4
		50A		60(150)~1500	2	60.5	52.9	60.5	52.9	60.5	52.7	-	-	-	-

(P)L Dimensions in ( ) are for F and G Shape. L Dimensions 1501 ~ 2000 is available for 1.0035/S185_, SGP_ and SUT_ only (Except No.50A).
(P)Painted pipes are available for No.6A~25A (L dimension 1500 or less) of SGG_, SUT_, STPG_ and SGHP_. (P)The shapes A, W and E are not available for No.50A.

Order Example

Part Number - Coating Color - L
SGGP8A - 200
SUTD15A - BR - 500

Days to Ship

- Unpainted
8 Days

Express A | 2,00 EUR/ piece

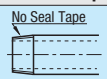
P.88

(P)A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations

Part Number - Coating Color - L - (NS)
SUTA20A - BL - 300 - NS

- When "Painted" is selected
10 Days

Alterations	No Seal Tape
	
Code	NS
Spec.	Shipped without regular sealing tape on external threads. (P)Applicable to P, A, D and F shape only.
Price Adder	Free of Charge

(P)For wrench flats alteration, refer to P.1127

Types of Coating Colors (Japan Paint Manufactures' Association 1997 U No.): For Internal Fluid Identification

- Male portion is not painted. - Inner surface of pipes may not be painted.

White	Brown	Blue
UN-95 Approx. Munsell No. N9.5	U17-50L Approx. Munsell No. 7.5YR5/6	U72-50P Approx. Munsell No. 2.5PB5/8
Light Yellow	**Dark Red**	**Black**
U22-80L Approx. Munsell No. 2.5Y8/6	U07-30L Approx. Munsell No. 7.5R3/6	UN-10 Approx. Munsell No. N1

[Reference] Hollow Identification (JIS Z9102)

Material Types	Identification Color	Munsell Value (Reference)
Air	White	N9.5
Oil	Brown	7.5YR5/6
Water	Blue	2.5PB5/8
Gas	Light Yellow	2.5Y8/6
Steam	Dark Red	7.5R3/6

(*Color samples are printed and look somewhat blocky.)

Price

Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

€ Unit Price without Painting

Part Number		€ Unit Price P · A · W · F Shapes						€ Unit Price C Shapes						€ Unit Price D · E · G Shapes					
Type	No.	Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500	L1501 ~2000	Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500	L1501 ~2000	Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500	L1501 ~2000
SGG_	6A																		
	8A																		
	10A																		
	15A																		
	20A																		
	25A																		
	32A																		
	40A																		
	50A																		
SGP_	6A																		
	8A																		
	10A																		
	15A																		
	20A																		
	25A																		
	32A																		
	40A																		
	50A																		
SUT_	6A																		
	8A																		
	10A																		
	15A																		
	20A																		
	25A																		
	32A																		
	40A																		
	50A																		
SUTS_	6A																		
	8A																		
	10A																		
	15A																		
	20A																		
	25A																		
STPG_	6A																		
	8A																		
	10A																		
	15A																		
	20A																		
	25A																		
	32A																		
	40A																		
SGHP_	6A																		
	8A																		
	10A																		
	15A																		
	20A																		
	25A																		
	32A																		
	40A																		

Painting Charge

- SGG_ · STPG_ · SGHP_

No.	€ Unit Price Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500
6A					
8A					
10A					
15A					
20A					
25A					

- SUT_(1.4301X5CrNi18-10)

No.	€ Unit Price Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500
6A					
8A					
10A					
15A					
20A					
25A					

The unit price with painting is the unit price without painting plus painting charge. Painted Hollows are not available for L dimension 1501 ~ 2000.
Volume discount rate is applicable to painting charge.

(Ex.) Part Number - Coating Color - L (Price without painting) + (Painting Charge) = (Price with Painting)

SUTP6A - R - 200 8,40 + 4,70 = 13,10

Steel Pipes
-Wrench Flat-

CAD Data

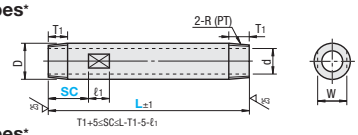
RoHS



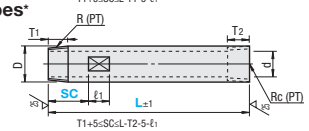
Part No.	Material	Usage	Surface Treatment
SSGG_	1.0035/S185	Low Operating Pressure Steam - Water - Oil - Gas - Pneumatic Hollow	-
SSGP_	1.0035/S185	Hollows for draining water - air conditioning etc.	Zinc Plating
SSUT_	1.4301/X5CrNi18-10	Corrosion Resistant Hollows - Low Temperature - High Temperature	-
SSUTS_	1.4401/X5CrNiMo17-12-2		-

*No surface treatment on male portion of SSGP_.
*Male ends are covered with sealing tapes before shipping.
*Excessive tightening may deform the internal thread portion. Wrap with sealing tape for air tightness, fit the hand-tight nozzle, and then tighten it up by giving one rotation or so.
*Marks may be left on the surface from threading operations.

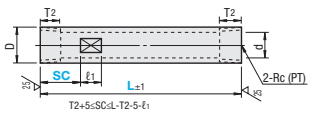
P Shapes*



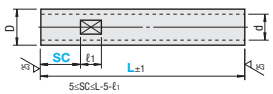
A Shapes*



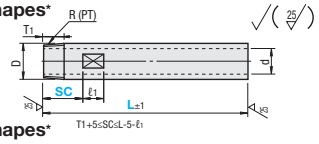
W Shapes*



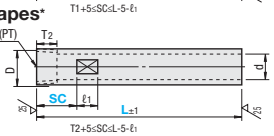
C Shapes*



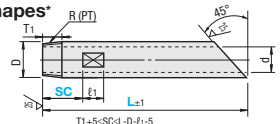
D Shapes*



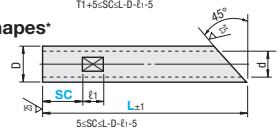
E Shapes*



F Shapes*



G Shapes*



Wrench flats are not surface treated or colored. T1=External Threads, T2=Internal Threads

Part Number Type	Shape	No.	Coating Color Selection	L 1mm Increment	1mm Increment	W	ℓ1	R (PT) Rc (PT)	T1	T2	SSGG_ D	SSGG_ d	SSGP_ D	SSGP_ d	SSUT_/SSUTS_ D	SSUT_/SSUTS_ d
SSGG SSGP SSUT SSUTS	P	6A	None Specified (Unpainted)	30~1500	5~100	8	8	1/8	10	15	10.5	6.5	-	-	10.5	5.7
	A	8A	W (White)	40~1500	Specification range is limited depending on the shape. Refer to formula below.	12	10	1/4	15	20	13.8	9.2	13.8	9.2	13.8	7.8
	W	10A	BR (Brown)	40(43)~1500		16	10	3/8	17	16	17.3	12.7	17.3	12.7	17.3	10.9
	C	15A	BL (Blue)	50(55)~1500		19	10	1/2	20	18	21.7	16.1	21.7	16.1	21.7	16.1
	D	20A	Y (Light Yellow)	50(65)~1500		24	15	3/4	23	20	27.2	21.6	27.2	21.6	27.2	21.4
	E	25A	R (Dark Red)	60(75)~1500		30	15	1	25	22	34.0	27.6	34.0	27.6	34.0	27.2
	F		B (Black)													
	G															

L Dimensions in ( ) are for F and G Shape.
Painted pipes are available for No.6A~25A of SSGG_and SSUT_.

Order Example

Part Number		Coating Color		L		SC
SSGGP8A				200		SC20
SSUTD15A	-	BR	-	500	-	SC50

Days to Ship

- Unpainted: 8 Days
- When "Painted" is selected: 10 Days

Express A 2,00 EUR/ piece P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

€ Unit Price without Painting

Part Number Type	No.	€ Unit Price P · A · W · F Shapes Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500	€ Unit Price C Shapes Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500	€ Unit Price D · E · G Shapes Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500
SSGG_	6A															
	8A															
	10A															
	15A															
	20A															
	25A															
SSGP_	6A															
	8A															
	10A															
	15A															
	20A															
	25A															
SSUT_	6A															
	8A															
	10A															
	15A															
	20A															
	25A															
SSUTS_	6A															
	8A															
	10A															
	15A															
	20A															
	25A															

Painting Charge

- SSGG_

No.	€ Unit Price Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500
6A					
8A					
10A					
15A					
20A					
25A					

- SSUT_ (1.4301/X5CrNi18-10)

No.	€ Unit Price Min. L ~250	L251 ~500	L501 ~750	L751 ~1000	L1001 ~1500
6A					
8A					
10A					
15A					
20A					
25A					

For price of the painted pipes, painting charge will be added to the unit price of unpainted pipe.

(Ex.) Part No. - Coating Color - L
SSUTP6A - R - 200
(Price without painting) + (Painting Charge) = (Price with Painting)
12,40 + 4,70 = 17,10

For detailed paint colors, refer to P.1125

L-Shaped Angles for Steel Pipes

-Single Slot · Double Slot / Cantilever-

CAD Data

■ Single Slot Type Double Slot Type

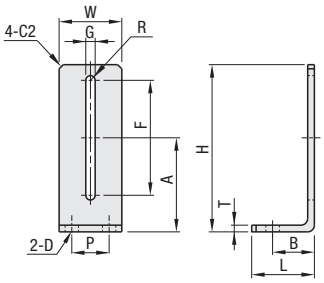
RoHS



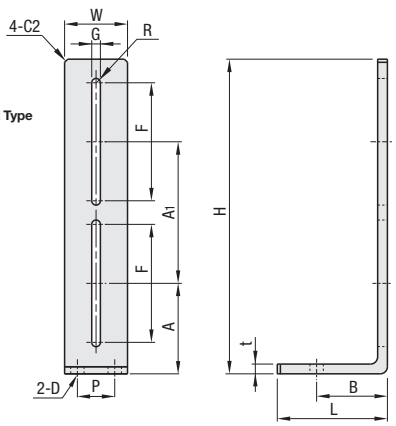
Type		Material	Surface Treatment
Single Slot Type	Double Slot Type		
SGPL	SGPLD	1.0330/DC01	Black Oxide
SGPLS	SGPLDS	1.4301/X5CrNi18-10-D	-

The material of SGPLD is 1.0320/St.22.

Single Slot Type



Double Slot Type



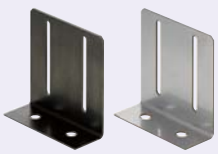
Part Number		T		H	L	W	D		P	B	A	F	G		R	€ Unit Price	
Type	U-Bolt Thread Size M	SGPL	SGPLS				Hole Dia.	Applicable Screws					Slotted Hole	Applicable Screws		SGPL	SGPLS
Single Slot Type	4	3.2	3	80	30	30	5.5	M5	20	20	45	55	4.5	M4	2.25		
SGPL	5			100	40	40			25	30	55	70	5.5	M5	2.75		
SGPLS	6						6.5	M6					6.5	M6	3.25		

Part Number		T		H	L	W	D		P	B	A	A_1	F	G		R	€ Unit Price	
Type	U-Bolt Thread Size M	SGPLD	SGPLDS				Hole Dia.	Applicable Screws						Slotted Hole	Applic. Screws		SGPLD	SGPLDS
Double Slot Type	4	4.5	4	160	50	40	6.5	M6	25	35	45	75	60	4.5	M4	2.25		
SGPLD	5													5.5	M5	2.75		
SGPLDS	6			200	70	40	8.5	M8		45	57.5	90	75	6.5	M6	3.25		

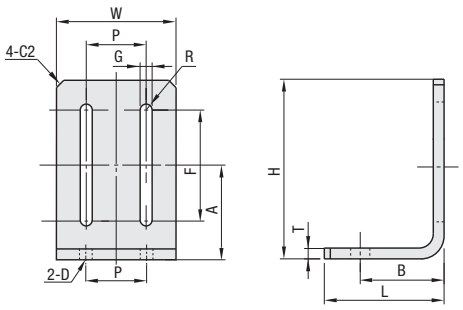
Use with flat washers (PWF · SPWF) on **P.232**. is recommended. For detailed U bolt dimensions, refer to **P.1130**

■ Cantilever Type

RoHS



Type	Material	Surface Treatment
SGPLK	1.0330/DC01	Black Oxide
SGPLKS	1.4301/X5CrNi18-10	-



Part Number		T		H	L	W	D		B	A	F	G		R	P	€ Unit Price	
Type	U-Bolt Thread Size M	SGPLK	SGPLKS				Hole Dia.	Applicable Screws				Slotted Hole	Applicable Screws			SGPLK	SGPLKS
SGPLK	4	3.2	3	80	30	80	8.5	M8	20	45	55	4.5	M4	2.25	40		
SGPLKS	5			100	40	90			30	55	70	5.5	M5	2.75	50		

Use with flat washers (PWF · SPWF) on **P.232**. is recommended. For detailed U bolt dimensions, refer to **P.1130**

Order Example

Part Number
SGPL5
SGPLKS4

Days to Ship

6 Days P 87

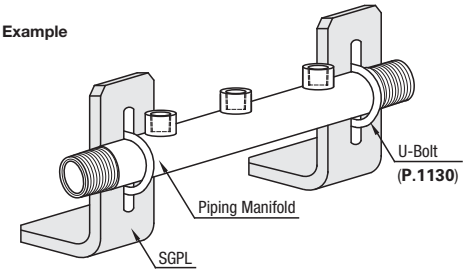
Price

Volume Discount (Round down to one Cent.) **P. 87**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example



Add. Spec.

Pipe Supports

-Vertical Hollow Bands · Paddle Shaped Legs · T Shaped Legs-

Spec.Change Printed in Purple

Price Reduction Up to 6%

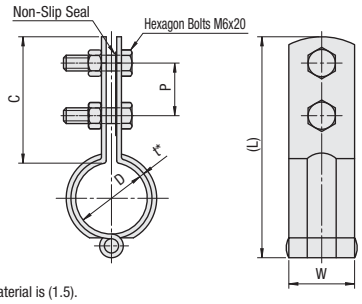
CAD Data

■Vertical Pipe Bands



RoHS

Type		Material		Surface Treatment
Standard	With Protection Material	Body	Protection Materials	
KBND	KBNDD	1.0320/St.22	Flexible PVC (White)	Trivalent Chromate
KBNDS	-	1.4301/ X5CrNi18-10	-	-



* t of KBNDD means thickness of sheet metal. Thickness of protection material is (1.5).

Part Number Type	No.	Hollow Outer Dia. D	(L)	t KBND	t KBNDS	t KBNDD	W	C	P	KBND € Unit Price 1~39 pieces	KBND Volume Discount 40 pieces~	KBNDS € Unit Price Qty. 1~9	KBNDS Volume Discount Qty. 10~	KBNDD € Unit Price Qty. 1~9	KBNDD Volume Discount Qty. 10~
Standard Type KBND KBNDS With Protection material KBNDD	10A	17.3	73	1.8	2	-	25	45	20						
	15A	21.7	77			0.6									
	20A	27.2	84												
	25A	34	88												
	32A	42.7	98			0.8									
	40A	48.6	104												
	50A	60.5	116			-									

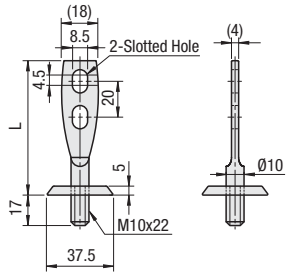
Be sure to use KBNDD in ambient temperature up to 60°C for the properties of flexible PVC.

■Paddle Shaped Legs



RoHS

Type	Material	Surface Treatment
HGA	1.0038/S235JR	Trivalent Chromate
HGAS	1.4301/X5CrNi18-10	-



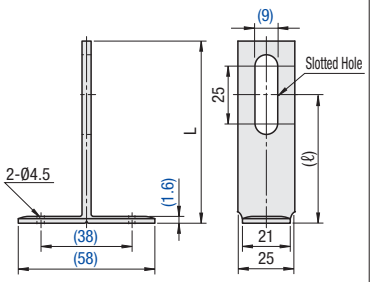
Part Number Type	No.	L	HGA € Unit Price Qty. 1~9	HGA Volume Discount Qty. 10~	HGAS € Unit Price Qty. 1~9	HGAS Volume Discount Qty. 10~
HGA HGAS	1	50				
	2	75				
	3	100				

■T-Shaped Legs



RoHS

Type	Material	Surface Treatment
TGA	1.0320/St.22	Trivalent Chromate
TGAS	1.4301/X5CrNi18-10	-



Part Number Type	No.	L	(ℓ)	TGA € Unit Price 1~39 pieces	TGA Volume Discount 40 pieces~	TGAS € Unit Price Qty. 1~9	TGAS Volume Discount Qty. 10~
TGA TGAS	1S	50	26				
	1	60	36				
	2	80	56				
	3	100	76				

Order Example

Part Number
KBND25A
TGA2

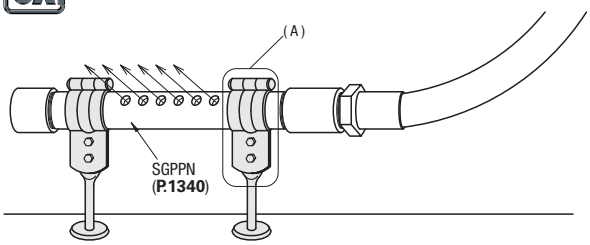
Days to Ship

6 Days

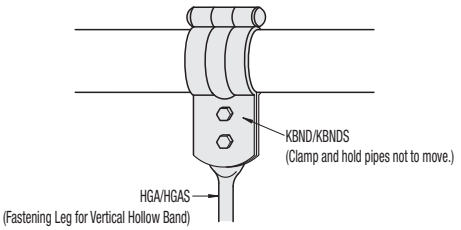
P.87

Example

Suitable for holding pipes, such as a steel pipe nozzle.



• Enlarged View of A



Add. Spec.

Pipe Supports

-Saddle Bands · Plumbing U-Bolt Sets-

Part Number & Spec.Change Printed in Purple

Price Reduction Up to 28%

CAD Data

■ RSDL has been changed into RSDLN, RSDLS into RSDLNS, KSDL into KSDLN.

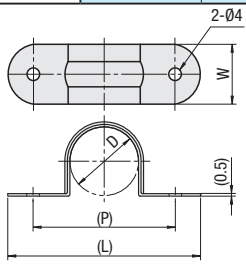
■Saddle Bands



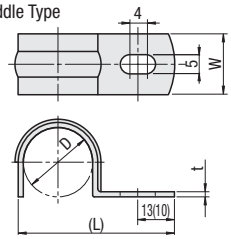
RoHS

Type		M Material	S Surface Treatment
Double Saddles	Single Saddle		
RSDLN	KSDLN	1.0320/St.22	Trivalent Chromate
RSDLNS	KSDLS	1.4301/X5CrNi18-10	-

Double Saddles Type



Single Saddle Type



As this product is made of thin sheet metal, L and P dimensions are just for reference. Adjust them as required for actual use.

KSDLN32A~50A has no rib. Diameter of mounting hole is Ø5, and distance from the end is (10).

■Double Saddles Type

Part Number Type	No.	Hollow Outer Dia. D	(L) RSDLN	(L) RSDLNS	(P) RSDLN	(P) RSDLNS	W	RSDLN € Unit Price Qty. 1~9	RSDLN Volume Discount Qty. 10~	RSDLNS € Unit Price Qty. 1~9	RSDLNS Volume Discount Qty. 10~
RSDLN RSDLNS	15A	21.7	60	60	47	47	19				
	20A	27.2	65	65	52	52					
	25A	34.0	73	72	60	59					
	32A	42.7	81	86	68	73	27				
	40A	48.6	86	88	73	75					
	50A	60.5	100	102	87	89					

■Single Saddle Type

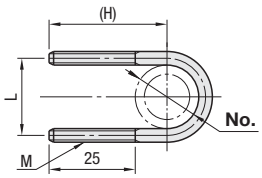
Part Number Type	No.	Hollow Outer Dia. D	(L) KSDLN	(L) KSDLS	t KSDLN	t KSDLS	W KSDLN	W KSDLS	KSDLN € Unit Price 1~9	KSDLN Volume Discount 10~	KSDLS € Unit Price 1~9	KSDLS Volume Discount 10~
KSDLN KSDLS	15A	21.7	45	49	1.6	1.2	25	20				
	20A	27.2	50	54.5								
	25A	34	57	67		1.5		25				
	32A	42.7	71	75								
	40A	48.6	77	82		2						
	50A	60.5	89	99								

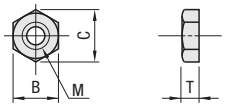
■U-Bolts for Plumbing



RoHS

UB
UBSU
(Stainless Steel)





UB
M Material: 1.0038/S235JR
S Surface Treatment: Trivalent Chromate
A Accessory: Nut 2 pcs.

UBSU
M Material: 1.4301/X5CrNi18-10
A Accessory: Nut 2 pcs. (1.4301/X5CrNi18-10)

Outer diameter (mm) of pipes is for reference only.

Part Number Type	No.	Applicable Hollows Applicable Diameter of Hollows	Applicable Hollows * Outer Dia. of Hollows (mm)	M (Coarse)	(H)	L	UB € Unit Price 1~49 pieces	UB Volume Discount 50 pieces~	UBSU € Unit Price 1~49 pieces	UBSU Volume Discount 50 pieces~
UB UBSU	3	10A	17.3	M4	34	21.3				
	4	15A	21.7	M4	37	25.7				
	4-M5			M5		26.7				
	6	20A	27.2	M4	39	31.2				
	6-M5			M5		32.2				
	8	25A	34.0	M4	43	38				
	8-M5			M5		39				
	10	32A	42.7	M5	47	47.7				
	10-M6			M6		48.7				
	12	40A	48.6	M5	50	53.6				
	16	50A	60.5	M5	57	65.5				

■Nut Size

M (Coarse)	B	C	T
M4	7	8.1	3.2
M5	8	9.2	4
M6	10	11.5	5

Order Example

Part Number
RSDLN15A
UB4
UBSU10-M6

Days to Ship: 6 Days P.87

NEW

Pipe Supports

-Hanger Bands Standard Type · With Eye Bolt Type / Eye Bolt-

CAD Data

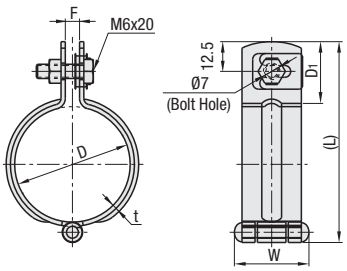
■Hanging Band

RoHS

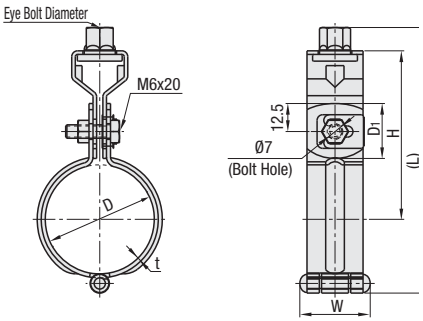


Type		Material	Surface Treatment
Standard	With eye bolt hole	Body	
TBND	TBNDA	1.0320/St.22	Trivalent Chromate
TBNDS	TBNDAS	1.4301	-

Standard



With eye bolt hole



Part Number		Hollow Outer Dia. D	(L)	t	W	D1	F	TBND		TBNDS	
Type	No.							€ Unit Price 1~19 pieces	Volume Discount 20 pieces~	€ Unit Price 1~19 pieces	Volume Discount 20 pieces~
Standard TBND TBNDS	15A	21.7	62	1.8 (2)	25	26	6 (8)				
	20A	27.2	65								
	25A	34	72								
	32A	42.7	81								
	40A	48.6	87								

(P)Dimensions in ( ) are applicable to 1.4301/X5CrNi18-10.

Part Number		Hollow Outer Dia. D	(L)	t	W	D1	H	Diameter of Eye Bolt	TBNDA		TBNDAS	
Type	No.								€ Unit Price 1~39 pieces	Volume Discount 40 pieces~	€ Unit Price 1~19 pieces	Volume Discount 20 pieces~
With eye bolt hole TBNDA TBNDAS	15A	21.7	95	1.8 (2)	25	26	65	(P)W3/8				
	20A	27.2	98				68					
	25A	34	105				71(72)					
	32A	42.7	114				76					
	40A	48.6	120				79					

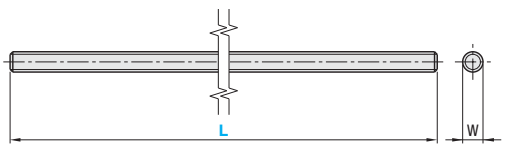
(P)Dimensions in ( ) are applicable to 1.4301/X5CrNi18-10.
(P)Diameter of eye bolt W3/8 inditates BSW. For fixing, use eye bolts.

■Eye Bolt

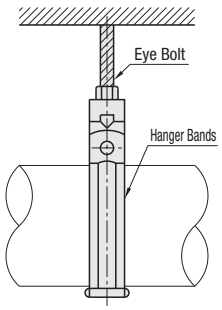
RoHS



Type	Material	Surface Treatment
TBNN	1.0320/St.22	Trivalent Chromate
TBNNS	1.4301/X5CrNi18-10	-



ex. Example



Part Number		Applicable Diameter of Eye Bolt W	TBNN		TBNNS	
Type	L		€ Unit Price Qty. 1~9	Volume Discount Qty. 10~	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
TBNN TBNNS	1000	(P)W3/8				

(P) Diameter of eye bolt 3/8. indicates BSW.

Order Example **Part Number**
TBND25A
TBNDAS32A
TBNNS1000

Days to Ship **6 Days**

P.87

NEW

Low Pressure Screw Fittings

-With Seal Coating Type-

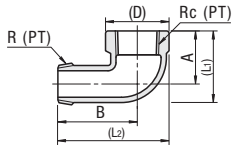
CAD Data

Features: Seal coating on thread part. Provides immediate out of the box operation.

Steel Hollow Fittings -Female / Male Elbow- RoHS



Type	Material	Surface Treatment
SGCEL	EN-JM 1010	Hot Zinc Plating
SUCEL	1.4301/X5CrNi18-10	-



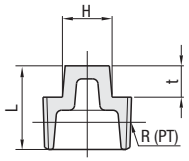
Allowable temperature for With Seal Coating Type is 150℃

Part Number Type	No.	R Rc (PT)	SGCEL (D)	(L1)	(L2)	A	B	SUCEL (D)	(L1)	(L2)	A	B	SGCEL € Unit Price	SGCEL Volume Discount	SUCEL € Unit Price	SUCEL Volume Discount
													1~9	10~	1~19	20~
	6A	1/8	19	23	36	17	26	14.5	22	33	17	26				
	8A	1/4	22	26	42	19	30	21	26	41	19	30				
SGCEL	10A	3/8	27	31	48	23	35	25	32	48	23	35				
SUCEL	15A	1/2	31	38	56	27	40	29	38	55	27	40				
	20A	3/4	36	45	66	32	47	36	46	65	32	47				
	25A	1	45	55	76.5	38	54	44	55	76	38	54				

Steel Hollow Fittings -Plug- RoHS



Type	Material	Surface Treatment
SGCPP	EN-JM 1010	Hot Zinc Plating
SUCPP	1.4301/X5CrNi18-10	-



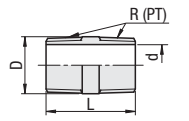
Allowable temperature for With Seal Coating Type is 150℃

Part Number Type	No.	R(PT)	Opposite Side H	t	L SGCPP	L SUCPP	SGCPP € Unit Price	SGCPP Volume Discount	SUCPP € Unit Price	SUCPP Volume Discount
							1~9	10~	1~19	20~
	6A	1/8	7	7	16	16				
	8A	1/4	9	8	19	19				
SGCPP	10A	3/8	12	9	21	21				
SUCPP	15A	1/2	14	10	26	25				
	20A	3/4	17	11	29	28				
	25A	1	19	12	31	31				

Steel Hollow Fittings -Round Nipples- RoHS



Type	Material	Surface Treatment
SGCNP	1.0035/S185	Hot Zinc Plating
SUCNP	1.4301/X5CrNi18-10	-



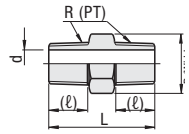
Allowable temperature for With Seal Coating Type is 150℃

Part Number Type	No.	R (PT)	D	L	d SGCNP	d SUCNP	SGCNP € Unit Price	SGCNP Volume Discount	SUCNP € Unit Price	SUCNP Volume Discount
							1~9	10~	1~19	20~
	6A	1/8	10.5	24	6.5	6.5				
	8A	1/4	13.8	26	8.7	9.7				
SGCNP	10A	3/8	17.3	28	12.1	13.1				
SUCNP	15A	1/2	21.7	34	15.8	15.5				
	20A	3/4	27.2	38	21.6	21.3				
	25A	1	34	42	27.8	28.1				

Steel Hollow Fitting -Hexagon Nipples- RoHS



Type	Material	Surface Treatment
SGCNR	EN-JM 1010	Hot Zinc Plating
SUCNR	1.4301/X5CrNi18-10	-



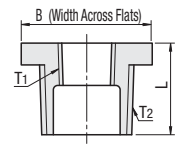
Allowable temperature for With Seal Coating Type is 150℃

Part Number Type	No.	R (PT)	B	L	(ℓ)	d SGCNR	d SUCNR	SGCNR € Unit Price	SGCNR Volume Discount	SUCNR € Unit Price	SUCNR Volume Discount
								1~9	10~	1~19	20~
	8A	1/4	17	34	12	7	7				
SGCNR	10A	3/8	21	36	13	9	9				
SUCNR	15A	1/2	26	42	16	13	13				
	20A	3/4	32	47	18	18	16				
	25A	1	38	52	20	24	22				

Steel Hollow Fittings -Bushings- RoHS



Type	Material	Surface Treatment
SGCPB	EN-JM 1010	Hot Zinc Plating
SUCPB	1.4301/X5CrNi18-10	-



Allowable temperature for With Seal Coating Type is 150℃

Part Number Type	No.	Rc (PT) T1	R (PT) T2	SGCPB L	SGCPB B	SUCPB L	SUCPB B	SGCPB € Unit Price	SGCPB Volume Discount	SUCPB € Unit Price	SUCPB Volume Discount
								1~9	10~	1~19	20~
	12	1/8	1/8	17	17	17	20				
	13	1/8	3/8	18	21	18	24				
	23	1/4	3/8	18	21	18	24				
SGCPB	24	1/4	1/2	21	26	21	30				
SUCPB	34	3/8	1/2	21	26	21	30				
	36	3/8	3/4	24	32	24	37				
	46	1/2	3/4	24	32	24	37				

Order Example — Part Number: SGCEL25A, SGCPP20A

Days to Ship: 6 Days

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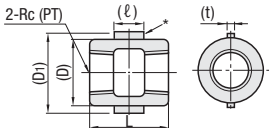
Cautions

1. Not applicable for steam plumbing.
2. Used Fittings cannot be reused (due to impaired function of the seal coating resin)

Low Pressure Screw Fittings
-Equal Pipe Threads-

■Steel Hollow Fittings - Socket- RoHS

Type	Material	Surface Treatment
SGPPS	EN-JM1110/EN-GJMB-300-6	Hot Zinc Plating
SUTPS	1.4301/X5CrNi18-10	-
SUTPSS	1.4401/X5CrNiMo17-12-2	-

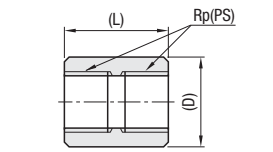


*Only SGPPS has claws on the circumference.

Part Number Type	No.	Rc (PT)	SGPPS (D)	L	(D1)	(ℓ)	(t)	SUTPS / SUTPSS (D)	L	SGPPS € Unit Price Qty. 1~9	SGPPS Volume Discount Qty. 10~	SUTPS € Unit Price 1~19 pieces	SUTPS Volume Discount 20 pieces~	SUTPSS € Unit Price 1~19 pieces	SUTPSS Volume Discount 20 pieces~
SGPPS SUTPS SUTPSS	6A	1/8	15	23	19	13	4	15	23						
	8A	1/4	19	26	22	17	4	19	29						
	10A	3/8	24	31	27	18	5	22	30						
	15A	1/2	28	35	31	20	6	27	38						
	20A	3/4	34	41	37	24	6	33	40						
	25A	1	43	45	46	25	8	40	45						
	32A	1 1/4	51	50	54	28	8	49	51						
	40A	1 1/2	57	55	61	32	9	55.5	54						
	50A	2	70	60	75	34	9	68	64						

■Steel Hollow Fittings -Parallel Female Thread (PS) -Socket- RoHS

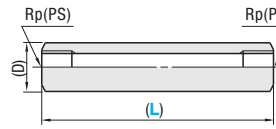
Type	Material	Surface Treatment
SGPRP	JIS STKM Hollows	Hot Zinc Plating
SUTRP	1.4301/X5CrNi18-10	-



Part Number Type	No.	Rp(PS)	SGPRP (D)	SGPRP (L)	SUTRP (D)	SUTRP (L)	SGPRP € Unit Price 1~9	SGPRP Volume Discount 10~	SUTRP € Unit Price 1~9	SUTRP Volume Discount 10~
SGPRP SUTRP	6A	1/8	15	19	13.8	20				
	8A	1/4	19	27	17	25				
	10A	3/8	23	28	21	26				
	15A	1/2	28	37	25	33				
	20A	3/4	34.5	39	31	36				
	25A	1	41.5	46	38	43				
	32A	1 1/4	51	51	47	48				

■Steel Hollow Fittings -Long Sockets- RoHS

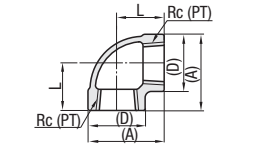
Type	Material	Surface Treatment
SUTPSR	1.4301/X5CrNi18-10	-



Part Number Type	No.	(L) Selection	Rp (PS)	(D)	€ Unit Price 1~9 L=50	€ Unit Price 1~9 L=75	€ Unit Price 10~ L=50	€ Unit Price 10~ L=75
SUTPSR	6A	50	1/8	10.5				
	8A		1/4	13.4				
	10A	75	3/8	17.4				
	15A		1/2	21.9				
	20A		3/4	27.2				

■Steel Hollow Fittings -Elbow- RoHS

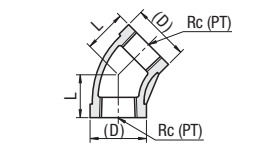
Type	Material	Surface Treatment
SGPPE	EN-JM1110/EN-GJMB-300-6	Hot Zinc Plating
SUTPE	1.4301/X5CrNi18-10	-
SUTPES	1.4401/X5CrNiMo17-12-2	-



Part Number Type	No.	Rc (PT)	SGPPE (D)	L	(A)	SUTPE / SUTPES (D)	L	(A)	SGPPE € Unit Price Qty. 1~9	SGPPE Volume Discount Qty. 10~	SUTPE € Unit Price Qty. 1~9	SUTPE Volume Discount Qty. 10~	SUTPES € Unit Price 1~19 pieces	SUTPES Volume Discount 20 pieces~
SGPPE SUTPE SUTPES	6A	1/8	15	17	24.5	22	19	30						
	8A	1/4	19	19	28.5	22	19	30						
	10A	3/8	24	23	35	26	23	36						
	15A	1/2	28	27	41	30	27	42						
	20A	3/4	34	32	49	36	32	50						
	25A	1	43	38	59.5	44	38	60						
	32A	1 1/4	51	46	71.5	53	46	74						
	40A	1 1/2	57	48	76.5	60	48	78						
	50A	2	70	57	92	73	57	95						

■Steel Hollow Fittings - 45° Elbow- RoHS

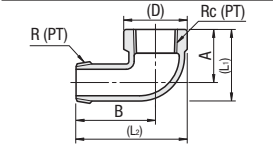
Type	Material	Surface Treatment
SGPHE	EN-JM 1010/EN-GJMW-350-4	Hot Zinc Plating
SUTHE	1.4301/X5CrNi18-10	-



Part Number Type	No.	RC (PT)	SGPHE (D)	L	SUTHE (D)	L	SGPHE € Unit Price Qty. 1~9	SGPHE Volume Discount Qty. 10~	SUTHE € Unit Price 1~19 pieces	SUTHE Volume Discount 20 pieces~
SGPHE SUTHE	6A	1/8	18	16	17	16				
	8A	1/4	22	17	21	17				
	10A	3/8	26	19	25	19				
	15A	1/2	30	21	28	21				
	20A	3/4	36	25	35	25				
	25A	1	44	29	42	29				

■Steel Hollow Fittings -Female / Male Elbow- RoHS

Type	Material	Surface Treatment
SGPPEL	EN-JM1110/EN-GJMB-300-6	Hot Zinc Plating
SUTPEL	1.4301/X5CrNi18-10	-



Part Number Type	No.	R, Rc (PT)	SGPPEL (D)	(L1)	(L2)	A	B	SUTPEL (D)	(L1)	(L2)	A	B	SGPPEL € Unit Price Qty. 1~9	SGPPEL Volume Discount Qty. 10~	SUTPEL € Unit Price 1~19 pieces	SUTPEL Volume Discount 20 pieces~
SGPPEL SUTPEL	6A	1/8	19	23	36	17	26	14.5	22	33	17	26				
	8A	1/4	22	26	42	19	30	21	26	41	19	30				
	10A	3/8	27	31	48	23	35	25	32	48	23	35				
	15A	1/2	31	38	56	27	40	29	38	55	27	40				
	20A	3/4	36	45	66	32	47	36	46	65	32	47				
	25A	1	45	55	76.5	38	54	44	55	76	38	54				
	32A	1 1/4	55	67	89.5	46	62	53	68	89	46	62				
	40A	1 1/2	62	72	99	48	68	60	73	98	48	68				
	50A	2	75	87	116.5	57	79	73	88	116	57	79				

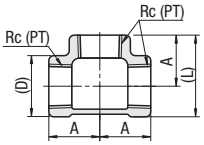
Price Reduction
Up to 82%

CAD Data

Steel Hollow Fittings -Tees- RoHS

Type	Material	Surface Treatment
SGPPT	EN-JM1110/EN-GJMB-300-6	Hot Zinc Plating
SUTPT	1.4301/X5CrNi18-10	-



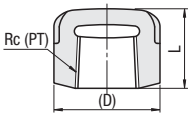


Part Number Type	No.	Rc (PT)	SGPPT (D)	SGPPT (L)	SGPPT A	SUTPT (D)	SUTPT (L)	SUTPT A	SGPPT € Unit Price Qty. 1~9	SGPPT Volume Discount Qty. 10~	SUTPT € Unit Price 1~19 pieces	SUTPT Volume Discount 20 pieces~
SGPPT SUTPT	6A	1/8	16	25.5	17	22	30	19				
	8A	1/4	20	29	19	22	30	19				
	10A	3/8	24	35.5	23	26	36	23				
	15A	1/2	28	42	27	30	42	27				
	20A	3/4	34	50	32	36	50	32				
	25A	1	43	59.5	38	44	60	38				
	32A	1 1/4	51	71.5	46	53	73	46				
	40A	1 1/2	57	76.5	48	60	78	48				
	50A	2	70	92	57	73	94	57				

Steel Hollow Fittings -Caps- RoHS

Type	Material	Surface Treatment
SGPPC	EN-JM1110/EN-GJMB-300-6	Hot Zinc Plating
SUTPC	1.4301/X5CrNi18-10	-



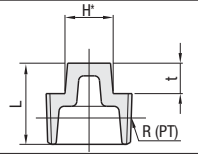


Part Number Type	No.	Rc (PT)	SGPPC (D)	SGPPC L	SUTPC (D)	SUTPC L	SGPPC € Unit Price Qty. 1~9	SGPPC Vol. Discount Qty. 10~	SUTPC € Unit Price 1~19 pieces	SUTPC Vol. Discount 20 pieces~
SGPPC SUTPC	6A	1/8	19	14	18	16				
	8A	1/4	23	15	22	18				
	10A	3/8	26	17	26	20				
	15A	1/2	31	20	30	21				
	20A	3/4	37	24	36	24				
	25A	1	45	28	44	28				
	32A	1 1/4	54	30	53	30				
	40A	1 1/2	61	32	60	32				
	50A	2	74	36	73	36				

Steel Hollow Fittings -Plug- RoHS

Type	Material	Surface Treatment
SGPPP	EN-JM1110/EN-GJMB-300-6	Hot Zinc Plating
SUPPP	1.4301/X5CrNi18-10	-





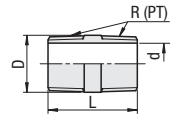
Part Number Type	No.	R (PT)	Opposite Side H	t	L SGPPP	L SUPPP	SGPPP € Unit Price Qty. 1~9	SGPPP Volume Discount Qty. 10~	SUPPP € Unit Price 1~19 pieces	SUPPP Volume Discount 20 pieces~
SGPPP SUPPP	6A	1/8	7	7	16	16				
	8A	1/4	9	8	19	19				
	10A	3/8	12	9	21	21				
	15A	1/2	14	10	26	25				
	20A	3/4	17	11	29	28				
	25A	1	19	12	31	31				
	32A	1 1/4	23	13	35	35				
	40A	1 1/2	26	14	36	36				
	50A	2	32	15	41	41				

* Shape of H Part: No.6A ~ 50A = Square

Steel Hollow Fittings -Round Nipples- RoHS

Type	Material	Surface Treatment
SGPNP	1.0035/S185	Hot Zinc Plating
SUTNP	1.4301/X5CrNi18-10	-



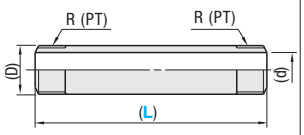


Part Number Type	No.	R (PT)	D	L	d SGPNP	d SUTNP	SGPNP € Unit Price Qty. 1~9	SGPNP Volume Discount Qty. 10~	SUTNP € Unit Price 1~19 pieces	SUTNP Volume Discount 20 pieces~
SGPNP SUTNP	6A	1/8	10.5	24	6.5	6.5				
	8A	1/4	13.8	26	8.7	9.7				
	10A	3/8	17.3	28	12.1	13.1				
	15A	1/2	21.7	34	15.8	15.5				
	20A	3/4	27.2	38	21.6	21.3				
	25A	1	34.0	42	27.8	28.1				
	32A	1 1/4	42.7	50	35.9	35.8				
	40A	1 1/2	48.6	50	41.9	41.8				
	50A	2	60.5	58	53.2	53.6				

Steel Hollow Fittings -Double Long Nipples- RoHS

Type	Material	Surface Treatment
SGPNPR	1.0035/S185	Hot Zinc Plating
SUTNPR	1.4301/X5CrNi18-10	-



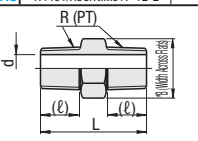


Part Number Type	No.	(L) Selection	R (PT)	(D) SGPNPR	(D) SUTNPR	(d) SGPNPR	(d) SUTNPR	€ Unit Price SGPNPR L50	SGPNPR L75	SGPNPR L100	SGPNPR L125	€ Unit Price SUTNPR L50	SUTNPR L75	SUTNPR L100	SUTNPR L125
SGPNPR SUTNPR	6A	50 75 100 125	1/8	10.5	-	6.2	-								
	8A		1/4	13.4	13.6	9.2	8.4								
	10A		3/8	17.4	17.2	12.9	13.2								
	15A		1/2	21.9	21.7	16.5	16.0								
	20A		3/4	27.2	27.4	21.5	21.4								

Steel Hollow Fitting -Hexagon Nipples- RoHS

Type	Material	Surface Treatment
SGPNR	EN-JM1110/EN-GJMB-300-6	Hot Zinc Plating
SUTNR	1.4301/X5CrNi18-10	-
SUTNRS	1.4401/X5CrNiMo17-12-2	-





Part Number Type	No.	R (PT)	B	L	(ℓ)	d SGPNR	d SUTNR	d SUTNRS	SGPNR € Unit Price Qty. 1~9	SGPNR Volume Discount Qty. 10~	SUTNR € Unit Price 1~19 pieces	SUTNR Volume Discount 20 pieces~	SUTNRS € Unit Price 1~19 pieces	SUTNRS Volume Discount 20 pieces~
SGPNR SUTNR SUTNRS	6A	1/8	14	32	11	5	5	5.0						
	8A	1/4	17	34	12	7	7	6.8						
	10A	3/8	21	36	13	9	9	9.0						
	15A	1/2	26	42	16	13	13	13.2						
	20A	3/4	32	47	18	18	16	15.8						
	25A	1	38	52	20	24	22	21.7						
	32A	1 1/4	46	56	22	32	30	30.1						
	40A	1 1/2	54	60	23	37	35	35.3						
	50A	2	63	66	25	48	47	47.1						

* Shape of B Part: No.6A ~ 40A=Hexagon 50A=Octagon

Operating Conditions of Joints

Fluid State	Max. Operating Pressure MPa (kgf/cm²)
Steam · Air · Gas · Oil: Up to 300°C	1.0 (10.2)
Steam · Air · Oil · Pulsating Water: Up to 200°C	1.4 (14.3)
Static Flow Water: Up to 120°C	2.0 (20.4)

*Pulsating water is a stream of water that is generated under steady operating conditions and variation of pressure and flow rate occurs in cycles. (Except for transitional change)
*Static Flow Water is a non-pulsating stream of water.

Order Example

Part Number	-	L
SGPPT8A		
SGPNPR8A	-	75

Days to Ship: 6 Days

P.87

NEW

Low Pressure Screw Fittings

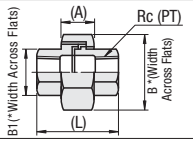
-Equal Pipe Threads-

Price Reduction Up to 51%

CAD Data

Steel Pipe Fittings -Unions- RoHS

Type	Material	Surface Treatment
SGPPU	EN-JM 1010	Hot Zinc Plating
SUTPU	1.4301	-

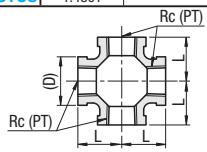


Part Number Type	No.	Rc (PT)	SGPPU B1	SGPPU (L)	SGPPU (A)	SGPPU B	SUTPU B1	SUTPU (L)	SUTPU (A)	SUTPU B	SGPPU € Unit Price Qty. 1~9	SGPPU Volume Discount Qty. 10~	SUTPU € Unit Price Qty. 1~9	SUTPU Volume Discount Qty. 10~
SGPPU SUTPU	6A	1/8	15	30	13	25	16	30	13	27				
	8A	1/4	19	33.5	13.5	31	20	34	14	34				
	10A	3/8	23	38	16	37	25	38	16	40				
	15A	1/2	27	41	17	42	30	41	17	46				
	20A	3/4	33	51	18.5	49	34	43	17	55				
	25A	1	41	54	20	59	44	51	20	64				

* Shape of B1 Part SUTPU6A, 8A=2-FlatSUTPU10A, 15A=Hexagon SUTPU20A, 25A=Octagon SGPPU is octagon.

Steel Pipe Fittings -Cross- RoHS

Type	Material	Surface Treatment
SGPCS	EN-JM 1010	Hot Zinc Plating
SUTCS	1.4301	-

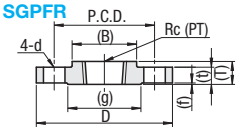


Part Number Type	No.	Rc (PT)	SGPCS (D)	SGPCS L	SUTCS (D)	SUTCS L	SGPCS € Unit Price Qty. 1~9	SGPCS Volume Discount Qty. 10~	SUTCS € Unit Price Qty. 1~9	SUTCS Volume Discount Qty. 10~
SGPCS SUTCS	8A	1/4	22	19	22	19				
	10A	3/8	26	23	26	23				
	15A	1/2	30	27	30	27				
	20A	3/4	36	32	36	32				
	25A	1	44	38	44	38				

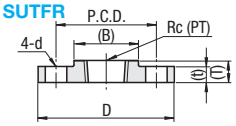
Steel Pipe Fittings -Flange- RoHS

Type	Material	Surface Treatment
SGPFR	EN-JM 1010	Hot Zinc Plating
SUTFR	1.4301	-

SGPFR



SUTFR



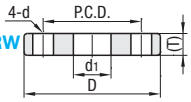
Part Number Type	No.	Rc (PT)	D	(T)	(t)	(B)	(f)	(g)	P.C.D.	d	Applicable Bolt Diameter	€ Unit Price 1~9	Volume Discount Qty. 10~
SGPFR	15A	1/2	95	16	12	38	1	51	70	15	M12		
	20A	3/4	100	18	14	42	1	56	75	15	M12		
	25A	1	125	18	14	49	1	67	90	19	M16		
	32A	1 1/4	135	21	16	64	2	76	100	19	M16		
	40A	1 1/2	140	21	16	68	2	81	105	19	M16		
	50A	2	155	22	16	82	2	96	120	19	M16		

Part Number Type	No.	Rc (PT)	D	(T)	(t)	(B)	P.C.D.	d	Applicable Bolt Diameter	€ Unit Price 1~9	Volume Discount Qty. 10~
SUTFR	15A	1/2	95	16	10	30	70	15	M12		
	20A	3/4	100	18	12	36	75	15	M12		
	25A	1	125	18	12	43	90	19	M16		
	32A	1 1/4	135	21	14	54	100	19	M16		
	40A	1 1/2	140	21	14	60	105	19	M16		
	50A	2	155	22	14	74	120	19	M16		

Steel Pipe Fittings -Flange for Welding- RoHS

Type	Material	Surface Treatment
SGPFRW	1.0038	-
SUTFRW	1.4301	-

SUTFRW

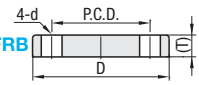


Part Number Type	No.	D	(T)	P.C.D.	d	d1	Applicable Bolt Diameter	SGPFRW € Unit Price Qty. 1~9	SGPFRW Volume Discount Qty. 10~	SUTFRW € Unit Price Qty. 1~9	SUTFRW Volume Discount Qty. 10~
SGPFRW SUTFRW	10A	90	12	65	15	17.8	M12				
	15A	95	12	70	15	22.2	M12				
	20A	100	14	75	15	27.7	M12				
	25A	125	14	90	19	34.5	M16				

Steel Pipe Fittings -Blind Flanged for Welding- RoHS

Type	Material	Surface Treatment
SGPFRB	1.0038	-
SUTFRB	1.4301	-

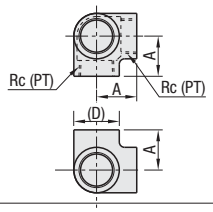
SUTFRB



Part Number Type	No.	D	(T)	P.C.D.	d	Applicable Bolt Diameter	SGPFRB € Unit Price Qty. 1~9	SGPFRB Volume Discount Qty. 10~	SUTFRB € Unit Price Qty. 1~9	SUTFRB Volume Discount Qty. 10~
SGPFRB SUTFRB	10A	90	12	65	15	M12				
	15A	95	12	70	15	M12				
	20A	100	14	75	15	M12				
	25A	125	14	90	19	M16				

Steel Pipe Fittings -3-Way Elbow- RoHS

Type	Material	Surface Treatment
SGSTL	EN-JM 1010	Hot Zinc Plating



Part Number Type	No.	Rc (PT)	(D)	A	€ Unit Price Qty. 1~9	Volume Discount
SGSTL	15A	1/2	28	26		
	20A	3/4	34	30		
	25A	1	43	38		

EX Operating Conditions of Fittings

Fluid State	Max. Operating Pressure MPa (kgf/cm²)
Steam · Air · Gas · Oil: Up to 300°C	1.0 (10.2)
Steam · Air · Oil · Pulsating Water: Up to 200°C	1.4 (14.3)
Static Flow Water: Up to 120°C	2.0 (20.4)

*Pulsating water is a stream of water that is generated under steady operating conditions and variation of pressure and flow rate occurs in cycles. (Except for transitional change)*Static Flow Water is a non-pulsating stream of water.

Order Example

Part Number
SGPFR25A
SUTFRW10A

Days to Ship

6 Days

P.87

Low Pressure Screw Fittings

-Unequal DIA. Pipe Threads-

Price Reduction
Up to 70%

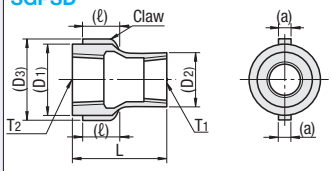
CAD Data

Steel Pipe Fittings -Reducing Sockets- RoHS

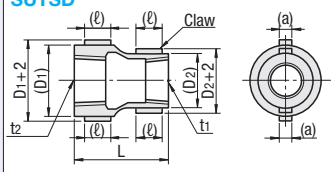
Type	Material	Surface Treatment
SGPSD	EN-JM 1010	Hot Zinc Plating
SUTSD	1.4301	-



SGPSD



SUTSD



Part Number Type	No.	RC (PT) T1	RC (PT) T2	SGPSD L	SGPSD (D1)	SGPSD (d2)	SGPSD (D3)	SGPSD (a)	SGPSD (ℓ)	SUTSD L	SUTSD (D1)	SUTSD (d2)	SUTSD (a)	SUTSD (ℓ)
SGPSD SUTSD	12	1/8	1/4	26	23	19	-	-	-	25	19	15	4	8
	13	1/8	3/8	29	27	19	-	-	-	28	23	19	5	9
	23	1/4	3/8	29	27	23	-	-	-	28	23	19	5	9
	24	1/4	1/2	35	31	23	-	-	-	34	27	23	5	11
	34	3/8	1/2	35	31	27	-	-	-	34	27	23	5	11
	36	3/8	3/4	38	38	27	-	-	-	38	33	27	6	12
	46	1/2	3/4	38	34	28	38	6	18	38	33	27	6	12
	48	1/2	1	43	42	28	46	7	20	42	41	33	6	14
	68	3/4	1	43	42	34	46	8	20	42	41	33	6	14

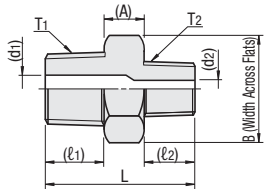
No.	€ Unit Price SGPSD 1~9	€ Unit Price SGPSD Qty. 10~	€ Unit Price SUTSD 1~9	€ Unit Price SUTSD Qty. 10~
12				
13				
23				
24				
34				
36				
46				
48				
68				

SGPSD12~36 and SUTSD13 have no claws.

Steel Pipe Fittings -Reducing Nipples- RoHS

Type	Material
STUNPS	1.4301/X5CrNi18-10
STUNPSS	1.4401/X5CrNiMo17-12-2



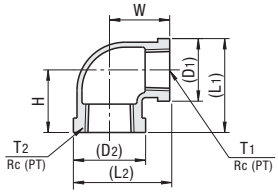


Part Number Type	No.	R (PT) T1	R (PT) T2	B	STUNPS L	STUNPS (A)	STUNPS (ℓ1)	STUNPS (ℓ2)	STUNPS (D1)	STUNPS (d2)	STUNPSS L	STUNPSS (A)	STUNPSS (ℓ1)	STUNPSS (ℓ2)	STUNPSS (D1)	STUNPSS (d2)	€ Unit Price STUNPS 1~9	€ Unit Price STUNPS Qty. 10~	€ Unit Price STUNPSS 1~9	€ Unit Price STUNPSS Qty. 10~
STUNPS STUNPSS	12	1/4	1/8	16	33	10.0	12.0	10.0	7.0	5.0	28	8.0	12.0	7.6	7.5	5.0				
	13	3/8	1/8	19	34	9.3	13.0	11.2	9.0	5.1	29	7.8	13.1	7.6	10.9	4.9				
	23	3/8	1/4	19	35	9.8	12.9	11.9	8.9	6.9	33	8.1	12.9	12.0	10.9	7.4				
	24	1/2	1/4	24	38	10.5	15.7	11.7	13.0	7.0	36	8.1	16.3	11.9	14.5	4.6				
	34	1/2	3/8	24	39	10.0	16.0	12.9	13.1	9.1	37	8.5	15.5	12.9	14.4	10.9				
	36	3/4	3/8	29	42	11.3	18.3	13.0	15.8	9.0	39	8.5	17.5	12.3	19.9	11.0				
	46	3/4	1/2	29	45	11.5	18.5	16.3	16.0	13.0	42	8.2	17.9	15.5	20.0	14.5				
	48	1	1/2	36	48	12.0	20.2	16.4	22.0	13.1	45	8.3	20.8	15.9	25.5	14.5				
	68	1	3/4	36	50	11.8	20.1	18.0	22.1	16.1	47	8.4	20.9	17.6	25.5	20.0				

Steel Pipe Fittings -Stepped Elbows- RoHS

Type	Material	Surface Treatment
SGPED	EN-JM 1010	Hot Zinc Plating
SUTED	1.4301	-



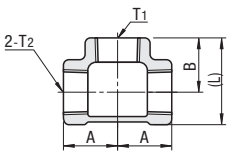


Part Number Type	No.	RC (PT) T1	RC (PT) T2	SGPED (D1)	SGPED (d2)	SGPED (L1)	SGPED (L2)	SGPED W	SGPED H	SUTED (D1)	SUTED (d2)	SUTED (L1)	SUTED (L2)	SUTED W	SUTED H	SGPED € Unit Price Qty. 1~9	SGPED Volume Discount Qty. 10~	SUTED € Unit Price Qty. 1~9	SUTED Volume Discount Qty. 10~
SGPED SUTED	24	1/4	1/2	23	31	36	40	24	24	22	30	35	39	24	24				
	34	3/8	1/2	27	31	39	42	25	26	26	30	39	40	25	26				
	36	3/8	3/4	27	37	42	47	28	28	26	36	41	46	28	28				
	46	1/2	3/4	28	35	44	49	30	29	30	36	44	48	30	29				
	48	1/2	1	28	42	46	54	33	32	30	44	47	55	32	33				
	68	3/4	1	34	43	52	57	35	34	36	44	52	57	35	34				

Steel Pipe Fittings -Reducing Tees- RoHS

Type	Material	Surface Treatment
SGPPTD	EN-JM 1010	Hot Zinc Plating
SUTPTD	1.4301	-



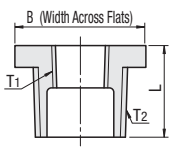


Part Number Type	No.	RC (PT) T1	RC (PT) T2	SGPPTD (L)	SGPPTD A	SGPPTD B	SUTPTD (L)	SUTPTD A	SUTPTD B	SGPPTD € Unit Price Qty. 1~9	SGPPTD Volume Discount Qty. 10~	SUTPTD € Unit Price Qty. 1~9	SUTPTD Volume Discount Qty. 10~
SGPPTD SUTPTD	24	1/4	1/2	40.5	24	24	39	24	24				
	34	3/8	1/2	41	26	25	40	26	25				
	36	3/8	3/4	47	28	28	46	28	28				
	46	1/2	3/4	48	29	30	48	29	30				

Steel Pipe Fittings -Bushings- RoHS

Type	Material	Surface Treatment
SGPPB	EN-JM 1010	Hot Zinc Plating
SUTPB	1.4301	-





Part Number Type	No.	RC (PT) T1	R (PT) T2	SGPPB L	SGPPB B	SUTPB L	SUTPB B	SGPPB € Unit Price Qty. 1~9	SGPPB Volume Discount Qty. 10~	SUTPB € Unit Price 1~19 pieces	SUTPB Volume Discount 20 pieces~
SGPPB SUTPB	12	1/8	1/4	17	17	17	20				
	13	1/8	3/8	18	21	18	21				
	14	1/8	1/2	21	26	21	30				
	23	1/4	3/8	18	21	18	24				
	24	1/4	1/2	21	26	21	30				
	26	1/4	3/4	24	32	24	37				
	28	1/4	1	27	38	27	44				
	34	3/8	1/2	21	26	21	30				
	36	3/8	3/4	24	32	24	37				
	38	3/8	1	27	38	27	44				
	46	1/2	3/4	24	32	24	37				
	48	1/2	1	27	38	27	44				
	68	3/4	1	27	38	27	44				
	610	3/4	1 1/4	30	46	30	53				
	810	1	1 1/4	30	46	30	53				
	812	1	1 1/2	32	54	32	62				
	1012	1 1/4	1 1/2	32	54	32	62				
	1016	1 1/4	2	36	63	36	68				
	1216	1 1/2	2	36	63	36	68				

No. 1016 and 1216 have octagonal B part. All other parts are hexagonal.

Operating Conditions of Joints

Fluid State	Max. Operating Pressure MPa (kgf/cm²)
Steam · Air · Gas · Oil: Up to 300°C	1.0 (10.2)
Steam · Air · Oil · Pulsating Water: Up to 200°C	1.4 (14.3)
Static Flow Water: Up to 120°C	2.0 (20.4)

*Pulsating water is a stream of water that is generated under steady operating conditions and variation of pressure and flow rate occurs in cycles. (Except for transitional change)*Static Flow Water is a non-pulsating stream of water.

Order Example | Part Number SGPSD12 | Days to Ship 6 Days | P.87

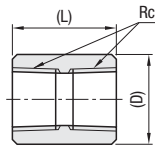
High Pressure Steel Hollow Fittings

-Equal · Unequal Pipe Threads-

■High Pressure - Socket- RoHS

Type	Material
SGPPSH	1.1158/C25E
SUTPSH	1.4301/X5CrNi18-10



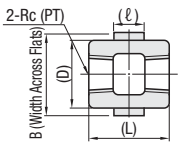


Part Number Type	No.	Rc (PT)	SGPPSH (D)	SGPPSH (L)	SUTPSH (D)	SUTPSH (L)	SGPPSH € Unit Price Qty.1-4	SGPPSH Volume Discount Qty. 5~	SUTPSH € Unit Price Qty.1-4	SUTPSH Volume Discount Qty. 5~
SGPPSH / SUTPSH	6A	1/8	19	22	19	26				
	8A	1/4	22	25	22	28				
	10A	3/8	28	28	25	33				
	15A	1/2	32	32	32	37				
	20A	3/4	38	38	38	42				
	25A	1	46	45	45	45				
	32A	1 1/4	58	50	55	52				
	40A	1 1/2	63	55	65	56				
	50A	2	76	60	75	66				

■Steel Pipe Fitting -Hexagon Socket- RoHS

Type	Material
SGPSH	1.1158/C25E



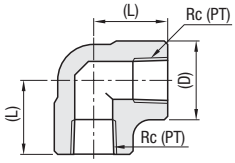


Part Number Type	No.	Rc(PT)	B	(ℓ)	(D)	(L)	€ Unit Price 1~4	Volume Discount 5~
SGPSH	8A	1/4	22	8	22	28		
	10A	3/8	27	9	27	33		
	15A	1/2	32	9	32	37		
	20A	3/4	38	12	38	42		
	25A	1	46	13	46	45		
	32A	1 1/4	58	14	56	52		

■High Pressure -Elbow- RoHS

Type	Material
SGPPEH	1.1158/C25E
SUPESH	1.4301/X5CrNi18-10



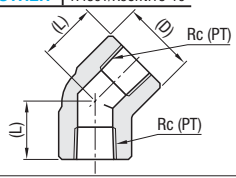


Part Number Type	No.	Rc (PT)	SGPPEH (D)	SGPPEH (L)	SUPESH (D)	SUPESH (L)	SGPPEH € Unit Price Qty.1-4	SGPPEH Volume Discount Qty. 5~	SUPESH € Unit Price Qty.1-4	SUPESH Volume Discount Qty. 5~
SGPPEH / SUPESH	6A	1/8	23	21.6	23	21.6				
	8A	1/4	23	21.6	23	21.6				
	10A	3/8	27	25.5	27	25.5				
	15A	1/2	34	28.9	34	28.9				
	20A	3/4	39	33.1	39	33.1				
	25A	1	47	38.2	47	38.2				
	32A	1 1/4	56	44.6	56	45.0				
	40A	1 1/2	63	51.1	63	50.8				
	50A	2	76	58.0	76	60.1				

■High Pressure - 45° Elbow- RoHS

Type	Material
SGPHEH	1.1158/C25E
SUTHEH	1.4301/X5CrNi18-10



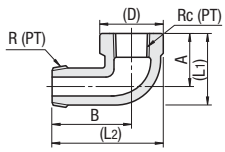


Part Number Type	No.	Rc (PT)	SGPHEH (D)	SGPHEH (L)	SUTHEH (D)	SUTHEH (L)	SGPHEH € Unit Price Qty.1-4	SGPHEH Volume Discount Qty. 5~	SUTHEH € Unit Price Qty.1-4	SUTHEH Volume Discount Qty. 5~
SGPHEH / SUTHEH	8A	1/4	23	18.4	23	18.4				
	10A	3/8	27	18.9	27	18.9				
	15A	1/2	34	24.1	34	24.1				
	20A	3/4	39	26.7	39	26.7				
	25A	1	47	30.3	47	30.3				
	32A	1 1/4	56	35.5	56	35.5				
	40A	1 1/2	63	39.6	63	39.6				
	50A	2	76	46.4	76	46.4				

■Steel Pipe Fitting -Female / Male Elbow- RoHS

Type	Material
SGPELH	1.1158/C25E
SUTELH	1.4301/X5CrNi18-10



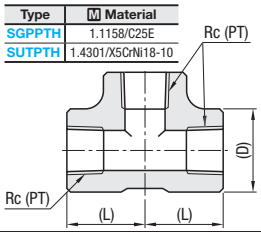


Part Number Type	No.	R Rc (PT)	SGPELH (D)	SGPELH (L1)	SGPELH (L2)	SGPELH A	SGPELH B	SUTELH (D)	SUTELH (L1)	SUTELH (L2)	SUTELH A	SUTELH B	SGPELH € Unit Price 1~9	SGPELH Volume Discount 10~	SUTELH € Unit Price 1~19	SUTELH Volume Discount 20~
SGPELH / SUTELH	8A	1/4	24	30	41	21	27	23	31	43	18	30				
	10A	3/8	24	35	41	25	28	28	34	52	26	36				
	15A	1/2	32	41	51	29	35	33	43	58	29	43				
	20A	3/4	36	47	59	33	40	38	49	70	37	50				
	25A	1	46	57	74	38	48	47	59	80	40	57				

■High Pressure -Tees- RoHS

Type	Material
SGPPTH	1.1158/C25E
SUTPTH	1.4301/X5CrNi18-10



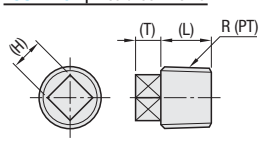


Part Number Type	No.	Rc (PT)	SGPPTH (D)	SGPPTH (L)	SUTPTH (D)	SUTPTH (L)	SGPPTH € Unit Price Qty.1-4	SGPPTH Volume Discount Qty. 5~	SUTPTH € Unit Price Qty.1-4	SUTPTH Volume Discount Qty. 5~
SGPPTH / SUTPTH	8A	1/4	23	21.6	23	21.6				
	10A	3/8	27	25.5	27	25.5				
	15A	1/2	34	28.9	34	28.9				
	20A	3/4	39	33.1	39	33.1				
	25A	1	47	38.2	47	38.2				
	32A	1 1/4	56	44.6	56	45.0				
	40A	1 1/2	63	51.1	63	50.8				
	50A	2	76	58.0	76	60.1				

■High Pressure -Plug- RoHS

Type	Material
SGPPPJ	1.1158/C25E
SUPPPJ	1.4301/X5CrNi18-10





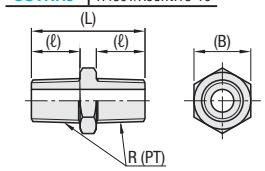
Part Number Type	No.	R (PT)	SGPPPJ (L)	SGPPPJ (T)	SGPPPJ (H)	SUPPPJ (L)	SUPPPJ (T)	SUPPPJ (H)	SGPPPJ € Unit Price Qty.1-4	SGPPPJ Volume Discount Qty. 5~	SUPPPJ € Unit Price Qty.1-4	SUPPPJ Volume Discount Qty. 5~
SGPPPJ / SUPPPJ	8A	1/4	11	9	9	11	7	9				
	10A	3/8	12	10	12	12	9	12				
	15A	1/2	15	11	14	15	10	14				
	20A	3/4	17	12	17	17	11	17				
	25A	1	19	13	19	20	12	21				
	32A	1 1/4	22	14	23	22	13	23				
	40A	1 1/2	22	15	26	22	14	28				
	50A	2	26	16	32	26	15	33				

Price Reduction
Up to 75%

CAD Data

High Pressure -Hexagon Nipples- RoHS

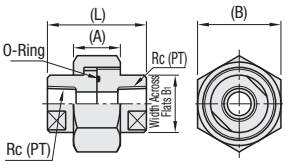
Type	Material
SGPNRJ	1.1158/C25E
SUTNRJ	1.4301/X5CrNi18-10



Part Number Type	No.	R (PT)	SGPNRJ (ℓ)	SGPNRJ (L)	SGPNRJ (B)	SUTNRJ (ℓ)	SUTNRJ (L)	SUTNRJ (B)	SGPNRJ € Unit Price Qty.1-4	SGPNRJ Volume Discount Qty. 5~	SUTNRJ € Unit Price Qty.1-4	SUTNRJ Volume Discount Qty. 5~
SGPNRJ / SUTNRJ	6A	1/8	11	27	12	10	28	12				
	8A	1/4	15	35	17	12	34	14				
	10A	3/8	15	37	19	13	36	19				
	15A	1/2	17	43	23	16	42	23				
	20A	3/4	20	49	29	18	47	29				
	25A	1	22	54	35	20	52	35				
	32A	1 1/4	22	56	46	22	56	46				
	40A	1 1/2	25	62	50	23	60	50				
	50A	2	29	72	63	25	66	63				

High Pressure - Union (with O-Ring)- RoHS

Type	Material
SGPPUJ	1.1158/C25E
SUTPUJ	1.4301/X5CrNi18-10



Part Number Type	No.	RC (PT)	SGPPUJ B1	SGPPUJ (L)	SGPPUJ (A)	SGPPUJ (B)	SUTPUJ B1	SUTPUJ (L)	SUTPUJ (A)	SUTPUJ (B)	O-Ring	SGPPUJ € Unit Price Qty.1-4	SGPPUJ Volume Discount Qty. 5~	SUTPUJ € Unit Price Qty.1-4	SUTPUJ Volume Discount Qty. 5~
SGPPUJ / SUTPUJ	8A	1/4	22	38	18	32	22	38	18	32	P18				
	10A	3/8	26	40	20	41	26	40	20	41	P20				
	15A	1/2	32	44	22	46	32	44	22	46	G25				
	20A	3/4	38	50	26	54	38	50	26	54	G30				
	25A	1	47	56	28	63	47	56	28	63	G35				
	32A	1 1/4	58	62	30	74	58	62	30	74	G45				
	40A	1 1/2	63	70	32	80	63	70	32	80	G50				
	50A	2	76	76	36	95	76	76	36	95	G65				

Steel Pipe Fittings -Reducing Sockets- RoHS

Type	Material
SGPSDJ	1.1158/C25E
SUTSSJ	1.4301/X5CrNi18-10



Part Number Type	No.	RC (PT) T1	RC (PT) T2	SGPSDJ L	SGPSDJ (D)	SUTSSJ L	SUTSSJ (D)	SGPSDJ € Unit Price Qty. 1~9	SGPSDJ Volume Discount Qty. 10~	SUTSSJ € Unit Price Qty. 1~9	SUTSSJ Volume Discount Qty. 10~
SGPSDJ / SUTSSJ	12	1/8	1/4	25	22	28	22				
	23	1/4	3/8	28	28	33	25				
	24	1/4	1/2	32	32	32	32				
	34	3/8	1/2	32	32	37	32				
	36	3/8	3/4	38	38	42	38				
	46	1/2	3/4	38	38	42	38				
	48	1/2	1	45	46	45	45				
	68	3/4	1	45	46	45	45				

Steel Pipe Fittings -Reducing Nipples- RoHS

Type	Material
SGPNPJ	1.1158/C25E
STUPDJ	1.4301/X5CrNi18-10



Part Number Type	No.	R (PT) T1	R (PT) T2	L	SGPNPJ A	SGPNPJ (B)	SGPNPJ (ℓ1)	SGPNPJ (ℓ2)	STUPDJ A	STUPDJ (B)	STUPDJ (ℓ1)	STUPDJ (ℓ2)	SGPNPJ € Unit Price Qty. 1~9	SGPNPJ Volume Discount Qty. 10~	STUPDJ € Unit Price Qty. 1~9	STUPDJ Volume Discount Qty. 10~
SGPNPJ / STUPDJ	12	1/4	1/8	32	8	17	14	10	-	-	-	-				
	23	3/8	1/4	36	9	21	14	13	9	19	14	13				
	24	1/2	1/4	39	9	26	17	13	9	23	17	13				
	34	1/2	3/8	40	9	26	17	14	9	23	17	14				
	36	3/4	3/8	43	10	32	19	14	-	-	-	-				
	46	3/4	1/2	46	10	32	19	17	10	29	19	17				
	48	1	1/2	49	11	35	21	17	12	35	20	17				
	68	1	3/4	51	11	35	21	19	11	35	21	19				

Steel Pipe Fittings -Reducing Tees- RoHS

Type	Material
SGPTDJ	1.1158/C25E



Part Number Type	No.	RC (PT) T1	RC (PT) T2	(A)	(B)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SGPTDJ	24	1/4	1/2	28.5	33		
	34	3/8	1/2	28.9	33		
	36	3/8	3/4	35.1	38		
	46	1/2	3/4	35.1	38		

Steel Pipe Fittings -Bushings- RoHS

Type	Material
SGPPBJ	1.1158/C25E
SUTPBJ	1.4301/X5CrNi18-10



Part Number Type	No.	T1 RC (PT)	T2 R (PT)	SGPPBJ (B)	SGPPBJ L	SGPPBJ C	SGPPBJ (ℓ)	SUTPBJ (B)	SUTPBJ L	SUTPBJ C	SUTPBJ (ℓ)	SGPPBJ € Unit Price Qty. 1~9	SGPPBJ Volume Discount Qty. 10~	SUTPBJ € Unit Price Qty. 1~9	SUTPBJ Volume Discount Qty. 10~
SGPPBJ / SUTPBJ	12	1/8	1/4	17	20	5	15	14	17	5	12				
	23	1/4	3/8	19	22	7	15	19	18	5	13				
	24	1/4	1/2	23	26	9	17	23	21	5	16				
	26	1/4	3/4	29	29	9	20	29	24	6	18				
	34	3/8	1/2	23	26	9	17	23	21	5	16				
	36	3/8	3/4	29	29	9	20	29	24	6	18				
	38	3/8	1	35	32	10	22	35	27	7	20				
	46	1/2	3/4	29	29	9	20	29	24	6	18				
	48	1/2	1	35	32	10	22	35	27	7	20				
	68	3/4	1	35	32	10	22	35	30	7	20				

Fitting Specifications

Material	Steel1025 JIS STKM of JIS G4051 Stainless Steel 1.4301/X5CrNi18-10 of JIS G3459 or Equivalent
Max. Operating Temp.	1.1158/C25E 350°C 1.4301/X5CrNi18-10 800°C
Max. Operating Pressure	20.6MPa (210kgf/cm²)
Applicable Hollows	Plumbing with JIS STKM Hollows, JIS G3454 · 3455 · 3456 Plumbing with Stainless Steel Hollows, JIS G3459

Order Example

Part Number
SGPPEH6A
SGPSDJ12

Days to Ship
6 Days

P.87

NEW

Screw Fittings
-Brass Type-

Spec,Change Printed in Purple

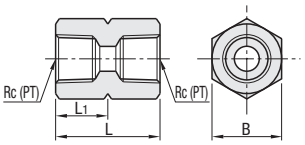
Reduced Delivery Time

CAD Data

Steel Pipe Fittings - Socket- RoHS

Type	Material
SJSFS	CW614N/CuZn39Pb3





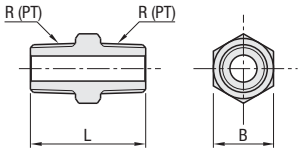
Part Number Type	No.	Rc (PT)	L	L1	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SJSFS	6A	1/8	21	10.5	14		
	8A	1/4	28	14	17		
	10A	3/8	32	16	21		
	15A	1/2	40	20	26		

For orders larger than indicated quantity, please request a quotation.

Steel Pipe Fittings - Nipples- RoHS

Type	Material
SJSRN	CW614N/CuZn39Pb3





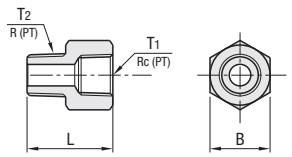
Part Number Type	No.	R (PT)	L	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SJSRN	6A	1/8	22	12		
	8A	1/4	28	14		
	10A	3/8	33	17		
	15A	1/2	38	22		

For orders larger than indicated quantity, please request a quotation.

Steel Pipe Fittings -Female · Male Socket- RoHS

Type	Material
SJSXS	CW614N/CuZn39Pb3





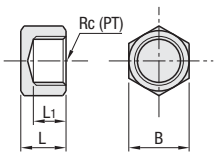
Part Number Type	No.	RC (PT) T1	R (PT) T2	L	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SJSXS	6A	1/8	1/8	20	14		
	8A	1/4	1/4	24	17		
	10A	3/8	3/8	28	21		
	15A	1/2	1/2	33	26		

For orders larger than indicated quantity, please request a quotation.

Steel Pipe Fittings -Caps- RoHS

Type	Material
SJSCP	CW614N/CuZn39Pb3





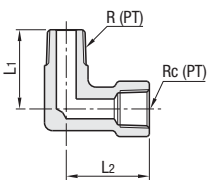
Part Number Type	No.	Rc (PT)	L	L1	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SJSCP	6A	1/8	9	7	12		
	8A	1/4	11	9	16		
	10A	3/8	14	12	19		
	15A	1/2	15	13	24		

For orders larger than indicated quantity, please request a quotation.

Steel Pipe Fittings -Female / Male Elbow- RoHS

Type	Material
SJSXL	CW617N/CuZn40Pb2





Part Number Type	No.	R, Rc (PT)	L1	L2	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SJSXL	6A	1/8	19	22		
	8A	1/4	24	25		
	10A	3/8	28	29		
	15A	1/2	32	34		

For orders larger than indicated quantity, please request a quotation.

Fitting Specifications

Operation Temperature Range-50°C~280°C	-50 ~ 150°C (Not to be frozen)
Max. Operating Pressure	6.9MPa

Order Example

Part Number SJSFS6A

Days to Ship 6 Days

P.87

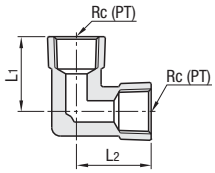
Screw Fittings
-Brass Type-

CAD Data

Steel Pipe Fittings -Elbow- RoHS



Type	Material
SJSFL	CW617N/CuZn40Pb2

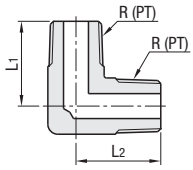


Part Number Type	No.	Rc (PT)	L1	L2	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSFL	6A	1/8	22	22		
	8A	1/4	25	25		
	10A	3/8	29	29		
	15A	1/2	34	34		

Steel Pipe Fittings -Male Elbow- RoHS



Type	Material
SJSML	CW617N/CuZn40Pb2

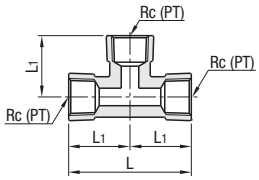


Part Number Type	No.	R (PT)	L1	L2	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSML	6A	1/8	17	17		
	8A	1/4	22	22		
	10A	3/8	25	25		
	15A	1/2	29	29		

Steel Pipe Fittings -Tees- RoHS



Type	Material
SJSFT	CW617N/CuZn40Pb2

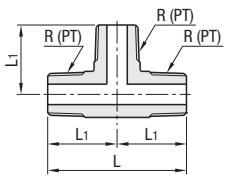


Part Number Type	No.	Rc (PT)	L	L1	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSFT	6A	1/8	44	22		
	8A	1/4	50	25		
	10A	3/8	58	29		
	15A	1/2	68	34		

Steel Pipe Fittings -Male Tees- RoHS



Type	Material
SJSMT	CW617N/CuZn40Pb2

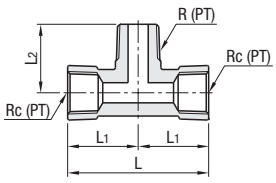


Part Number Type	No.	R (PT)	L	L1	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSMT	6A	1/8	34	17		
	8A	1/4	44	22		
	10A	3/8	50	25		
	15A	1/2	58	29		

Steel Pipe Fittings -Female Tees · Male Tees- RoHS



Type	Material
SJSXT	CW617N/CuZn40Pb2



Part Number Type	No.	R, Rc (PT)	L	L1	L2	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSXT	6A	1/8	44	22	19		
	8A	1/4	50	25	24		
	10A	3/8	58	29	28		
	15A	1/2	68	34	32		

Fitting Specifications

Operation Temperature Range-50°C~280°C	-50 ~ 150°C (Not to be frozen)
Max. Operating Pressure	6.9MPa

Order Example

Part Number
SJSFL10A
SJSFT15A

Days to Ship: 6 Days P. 87

Screw Fittings
-Brass Type-

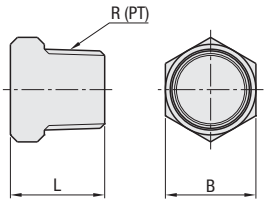
CAD Data

■Steel Pipe Fitting -Plug-

RoHS



Type	Material
SJSPG	CW614N/CuZn39Pb3



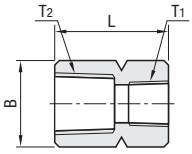
Part Number Type	No.	R (PT)	L	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSPG	6A	1/8	14	12		
	8A	1/4	18	16		
	10A	3/8	21	19		
	15A	1/2	25	21		

■Steel Pipe Fitting -Hexagon Socket of Different Ø-

RoHS



Type	Material
SJSFSD	CW614N/CuZn39Pb3



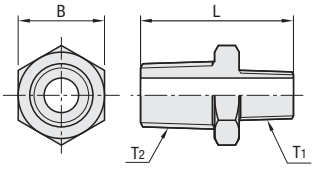
Part No. Type	No.	Rc (PT) T1	Rc (PT) T2	L	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSFSD	12	1/8	1/4	26	17		
	13	1/8	3/8	28	21		
	23	1/4	3/8	30	21		
	24	1/4	1/2	36	26		
	34	3/8	1/2	38	26		
	36	3/8	3/4	44	32		
	46	1/2	3/4	46	32		

■Steel Pipe Fitting -Hexagon Nipples-

RoHS



Type	Material
SJSRND	CW614N/CuZn39Pb3



Part No. Type	No.	R (PT) T1	R (PT) T2	L	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSRND	12	1/8	1/4	26	14		
	13	1/8	3/8	29	17		
	23	1/4	3/8	31	17		
	24	1/4	1/2	34	22		
	34	3/8	1/2	36	22		
	36	3/8	3/4	41	27		
	46	1/2	3/4	43	27		

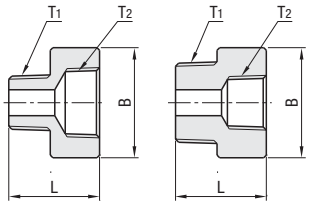
■Steel Pipe Fitting -Female / Male Socket of Different Ø-

RoHS



Type	Material
SJSXSD	CW614N/CuZn39Pb3

No.12 · 23 · 34 No.21 · 32 · 43



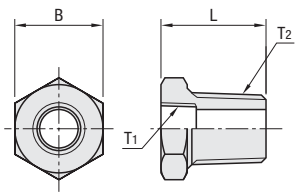
Part No. Type	No.	R (PT) T1	RC (PT) T2	L	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSXSD	12	1/8	1/4	22	17		
	21	1/4	1/8	22	14		
	23	1/4	3/8	26	21		
	32	3/8	1/4	26	17		
	34	3/8	1/2	31	26		
	43	1/2	3/8	30	22		

■Steel Pipe Fitting -Bushings-

RoHS



Type	Material
SJSPB	CW614N/CuZn39Pb3



Part No. Type	No.	RC (PT) T1	R (PT) T2	L	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SJSPB	12	1/8	1/4	16	17		
	13	1/8	3/8	19	19		
	23	1/4	3/8	19	19		
	24	1/4	1/2	21	24		
	34	3/8	1/2	21	24		
	36	3/8	3/4	25	30		
	46	1/2	3/4	25	30		

Specifications of Fittings

Operation Temperature Range-50°C~280°C	-50 ~ 150°C (Not to be frozen)
Max. Operating Pressure	6.9MPa

Order Example

Part Number
SJSFSD12
SJSRND23

Days to Ship

6 Days

P. 87

Extension Joints
-L Dimension Selectable-

CAD Data

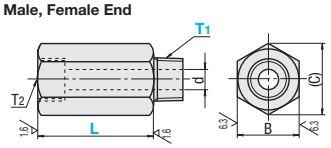
RoHS



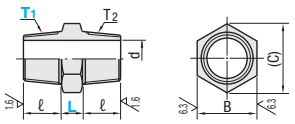
Thread JIS B 0203 R (PT); ANSI / ASME B.1.20.1-1983 (NPT)

Type						Material	Surface Treatment	Normal Pressure
Male · Female End		Both Ends Male		Both Ends Female				
Equal Ø Type	Unequal Ø Type	Equal Ø Type	Unequal Ø Type	Equal Ø Type	Unequal Ø Type			
-	EXTGBD	EXMGB	-	-	-	1.0038/S235JR	Black Oxide	20.6MPa ≈ 210kgf/cm2 or less
EXTG	EXTGD	EXMG	-	EXFG	EXFGD		Electroless Nickel Plating	
EXTGS	EXTGSD	EXMGS	EXMGSD	EXFGS	EXFGSD	1.4305/X10CrNiS18-9	-	

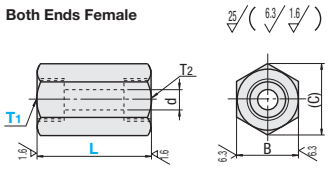
Male, Female End



Both Ends Male



Both Ends Female



*Normal pressure of No.5 is less than 1MPa≈10kgf/cm2.
*No. 5 (M5 Type) is provided with a nylon washer.

*For No. 5-L15, the thread may go through.

Male, Female End

Part Number Type	No.	L Selection	R/Rc (PT) · M (Coarse) T1 · T2	B	(C)	d	€ Unit Price EXTG	€ Unit Price EXTGS
Equal Dia. Type EXTG EXTGS	1	20 25 30	1/8	14	16.2	4.5		
	2	25 30 35	1/4	19	21.9	6.5		
	3	30 35 40	3/8	24	27.7	9.0		
	4	35 40 45	1/2	27	31.2	10.0		
	5	15 20	M5	8	9.2	2.0		

Male, Female Type I.D. d

T1	d	T1	d
M5	2.0(3.0)	NPT1/8	4.5
R1/8	4.5	NPT1/4	6.5
R1/4	6.5	NPT3/8	9.0
R3/8	9.0	NPT1/2	10.0
R1/2	10.0		

() is applicable to Unequal Ø Type.

Part Number Type	No.	M (Coarse), R (PT), NPT Selection T1	L Selection	Rc (PT) T2	B	(C)	€ Unit Price EXTGBD	€ Unit Price EXTGD	€ Unit Price EXTGSD
Unequal Dia. Type EXTGBD EXTGD EXTGSD	1	5 (M5) 1N (NPT1/8)	20 25 30	1/8	14	16.2			
	2	1 (1/8) 2N (NPT1/4)	25 30 35	1/4	19	21.9			
	3	1(1/8) 2 (1/4) 3N (NPT3/8)	30 35 40	3/8	24	27.7			
	4	2 (1/4) 3 (3/8) 4N (NPT1/2)	35 40 45	1/2	27	31.2			

Both Ends Male

Part Number Type	No.	L Selection	R (PT) / M (Coarse) T1 / T2	B	(C)	d	ℓ	€ Unit Price EXMGB	€ Unit Price EXMG	€ Unit Price EXMGS
Equal Dia. Type EXMGB EXMG EXMGS	1	10 15 20	1/8	14	16.2	4.5	10			
	2		1/4	19	21.9	6.5	10			
	3		3/8	24	27.7	9.0	12			
	4		1/2	27	31.2	10.0	17			
	5	5 10 15	M5	8	9.2	3.0	7.5			

Part Number Type	No.	M (Coarse), R (PT), NPT Selection T1	L Selection	R (PT) T2	B	(C)	ℓ	d	€ Unit Price
Unequal Dia. Type EXMGSD	1	5(M5) 1N(NPT1/8)	10 15 20	1/8	14	16.2	10	3	
	2	1(1/8) 2N(NPT1/4)		1/4	19	21.9	10	4.5	
	3	1(1/8) 2(1/4) 3N(NPT3/8)		3/8	24	27.7	12	4.5	
	4	2(1/4) 3(3/8) 4N(NPT1/2)		1/2	27	31.2	17	6.5	

Both Ends Female

Part Number Type	No.	L Selection	Rc (PT) · M (Coarse) T1 · T2	B	(C)	d	€ Unit Price EXFG	€ Unit Price EXFGS
Equal Dia. Type EXFG EXFGS	1	20 25 30	1/8	14	16.2	8.2		
	2	25 30 35	1/4	19	21.9	10.9		
	3	30 35 40	3/8	24	27.7	14.4		
	4	35 40 45	1/2	27	31.2	18.0		
	5	15 20 25	M5	8	9.2	4.2		

Part Number Type	No.	M (Coarse), R (PT), NPT Selection T1	L Selection	Rc (PT) T2	B	(C)	d	€ Unit Price EXFGD	€ Unit Price EXFGSD
Unequal Dia. Type EXFGD EXFGSD	1	5(M5) 1N(NPT1/8)	20 25 30	1/8	14	16.2	4.2		
	2	1(1/8) 2N(NPT1/4)	25 30 35	1/4	19	21.9	8.2		
	3	1(1/8) 2(1/4) 3N(NPT3/8)	30 35 40	3/8	24	27.7	8.2		
	4	2(1/4) 3(3/8) 4N(NPT1/2)	35 40 45	1/2	27	31.2	10.9		

Order Example

Part Number	-	T1	-	L
EXTG3			-	30
EXTGSD4	-	3	-	40

Days to Ship

8 Days — Express A — 5,00 EUR/ piece — P. 88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Screw Conversion Joints
-L Dimension Fixed · L Dimension Configurable-

CAD Data

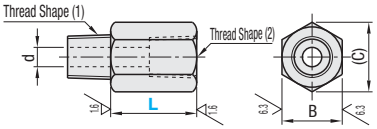


RoHS

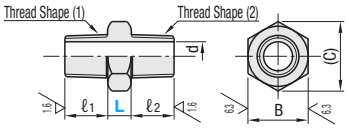
Type						M Material	S Surface Treatment	Pressure Normal
L Dimension Fixed			L Dimension Configurable					
Male · Female End	Both Ends Male	Both Ends Female	Male · Female End	Both Ends Male	Both Ends Female			
APMTF	APMMF	APMFF	APMTFL	APMMFL	APMFFL	1.0038/S235JR	ElectrolessA Nickel Plating	20.6MPa ≈ 210kgf/cm² or less
APMTS	APMMS	APMFS	APMTSL	APMMSL	APMFSL	1.4305/X10CrNiS18-9	-	
APMTY	APMMY	APMFY	APMTYL	APMMYL	APMFYL	Brass	-	

Thread JIS B 0203 R (PT)

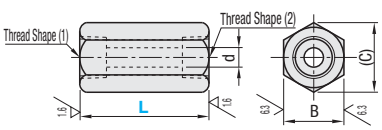
Male · Female End



Both Ends Male



Both Ends Female



25 / (6.3 / 1.6 /)

*Normal pressure of M5 is less than 1MPa≈10kgf/cm2.
*Male Side of M5 Type is provided with a nylon washer.

■Male · Female End

Part Number / Type	Thread Shape (1)	No.	T (PT) G (PF) N (NPT)	Thread Shape (2)	No.	T (PT) G (PF) N (NPT)	L Fixed	L 1mm Increment	B	(C)	d	€ Unit Price L Dimension Fixed Type APMTF	APMTS	APMTY	L Dimension Configurable APMTFL	APMTSL	APMTYL
L Dimension Fixed Type APMTF APMTS APMTY / L Dimension Configurable APMTFL APMTSL APMTYL	T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	-	M5	-	15	16~30	13	14.4	4.2						
				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	15	16~30	13	14.4	4.5						
					2	1/4	20	21~35	17	19.6	4.5						
		2	1/4	-	M5	-	15	16~30	17	19.6	4.2						
				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	15	16~30	17	19.6	4.5						
					2	1/4	20	21~35	17	19.6	6.5						
					3	3/8	20	21~35	19	21.9	6.5						
		3	3/8		2	1/4	20	21~35	19	21.9	9						
					3	3/8	20	21~35	19	21.9	9						
					4	1/2	25	26~40	24	27.7	9						
		4	1/2		3	3/8	20	21~35	24	27.7	10						
					4	1/2	25	26~40	24	27.7	10						

■Both Ends Male

Part Number / Type	Thread Shape (1)	No.	T (PT) G (PF) N (NPT)	Thread Shape (2)	No.	T (PT) G (PF) N (NPT)	L Fixed	L 1mm Increment	B	(C)	ℓ1	ℓ2	d	€ Unit Price L Dimension Fixed Type APMMF	APMMS	APMMY	L Dimension Configurable APMMFL	APMMSL	APMMYL
L Dimension Fixed Type APMMF APMMS APMMY / L Dimension Configurable APMMFL APMMSL APMMYL	T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	-	M5	-	10	11~30	13	14.4	10	7.5	3						
				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8			13	14.4	10	10	4.5						
					2	1/4			17	19.6	10	12	4.5						
		2	1/4	-	M5	-			17	19.6	12	7.5	3						
				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8			17	19.6	12	10	4.5						
					2	1/4			17	19.6	12	12	6.5						
					3	3/8			19	21.9	12	13	6.5						
		3	3/8		2	1/4			19	21.9	13	12	6.5						
					3	3/8			19	21.9	13	13	9						
					4	1/2			24	27.7	13	17	9						
		4	1/2		3	3/8			24	27.7	17	13	9						
					4	1/2			24	27.7	17	17	10						

■Both Ends Female

Part Number / Type	Thread Shape (1)	No.	T (PT) G (PF) N (NPT)	Thread Shape (2)	No.	T (PT) G (PF) N (NPT)	L Fixed	L 1mm Increment	B	(C)	d	€ Unit Price L Dimension Fixed Type APMFF	APMFS	APMFY	L Dimension Configurable APMFFL	APMFSL	APMFYL
L Dimension Fixed Type APMFF APMFS APMFY / L Dimension Configurable APMFFL APMFSL APMFYL	T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	-	M5	-	20	21~35	13	14.4	4.2						
				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	20	21~35	13	14.4	8.2						
					2	1/4	20	21~35	17	19.6	8.2						
		2	1/4	-	M5	-	25	26~40	17	19.6	4.2						
				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	25	26~40	17	19.6	8.2						
					2	1/4	25	26~40	17	19.6	10.9						
					3	3/8	25	26~40	19	21.9	10.9						
		3	3/8		2	1/4	25	26~40	19	21.9	10.9						
					3	3/8	30	31~45	19	21.9	14.2						
					4	1/2	35	36~50	24	27.7	14.2						
		4	1/2		3	3/8	35	36~50	24	27.7	14.2						
					4	1/2	35	36~50	24	27.7	17.8						

Order Example

Part Number	-	Thread Shape (1)	-	Thread Shape (2)	-	L
APMTF	-	T2	-	G3		
APMMSL	-	G1	-	M5	-	L20

Days to Ship 8 Days

Price

■Volume Discount (Round down to one Cent.) P87

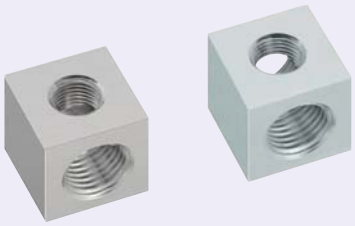
Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Screw Conversion Fittings
-L-Shaped · T-Shaped-

CAD Data

RoHS

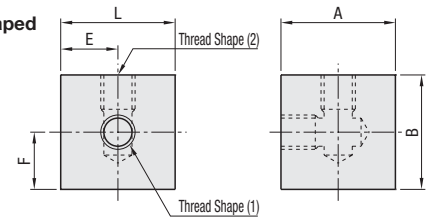


Type		Material	Surface Treatment	Normal Pressure
L-shaped Type	T-shaped Type			
APBLM	APBTM	1.0038/S235JR	Electroless Nickel Plating	20.6MPa ≈ 210kgf/cm² or less
APBLS	APBTS	1.4301/X5CrNi18-10	-	
APBLA	APBTA	EN AW-5052/AlMg2,5	-	1MPa ≈ 10kgf/cm² or less

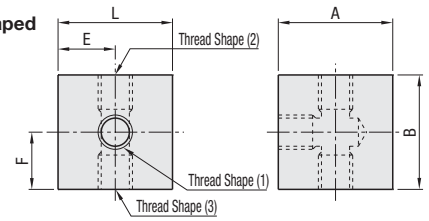
Thread JIS B 0203 R (PT)

6.3

L-shaped Type



T-shaped Type



■L-shaped Type

Part Number Type	Thread Shape (1)	No.	T (PT) G (PF) N (NPT)	Thread Shape (2)	No.	T (PT) G (PF) N (NPT)	L	A	B	E	F	€ Unit Price APBLM	APBLS	APBLA
APBLM	T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	-	M5	-	25	25(30)	25(30)	15	15			
APBLS				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	25	25(30)	25(30)	15	15			
APBLA					2	1/4	30	30	30	15	15			
		2	1/4	-	M5	-	30	30	30	15	15			
					1	1/8	30	30	30	15	15			
					2	1/4	35	35(40)	35(40)	20	20			
					3	3/8	40	40	40	20	20			
		3	3/8		2	1/4	40	40	40	20	20			
					3	3/8	40	40	40	20	20			
					4	1/2	50	50	50	25	25			
		4	1/2		3	3/8	50	50	50	25	25			
					4	1/2	50	50	50	25	25			

■T-shaped Type

Part Number Type	Thread Shape (1)	No.	T (PT) G (PF) N (NPT)	Thread Shape (2)	No.	T (PT) G (PF) N (NPT)	Thread Shape (3)	No.	T (PT) G (PF) N (NPT)	L	A	B	E	F	€ Unit Price APBTM	APBTS	APBTA
APBTM	T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	-	M5	-	-	M5	-	25	25(30)	25(30)	12.5	12.5			
APBTS				T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	T (PT Thread) G (PF Thread) N (NPT Thread)	1	1/8	25	25(30)	25(30)	12.5	12.5			
APBTA					2	1/4		1	1/8	30	30	30	15	15			
								2	1/4	30	30	30	15	15			
		2	1/4	-	M5	-	-	M5	-	30	30	30	15	15			
					1	1/8		1	1/8	30	30	30	15	15			
					2	1/4		1	1/8	30	30	30	15	15			
								2	1/4	35	35(40)	35(40)	20	20			
					3	3/8		2	1/4	40	40	40	20	20			
								3	3/8	40	40	40	20	20			
		3	3/8		2	1/4		1	1/8	40	40	40	20	20			
								2	1/4	40	40	40	20	20			
					3	3/8		2	1/4	40	40	40	20	20			
								3	3/8	40	40	40	20	20			
					4	1/2		3	3/8	50	50	50	25	25			
								4	1/2	50	50	50	25	25			
		4	1/2		3	3/8		2	1/4	50	50	50	25	25			
								3	3/8	50	50	50	25	25			
					4	1/2		3	3/8	50	50	50	25	25			
								4	1/2	50	50	50	25	25			

Dimensions in ( ) are applicable to 1.4301/X5CrNi18-10.

Order Example

Part Number	-	Thread Shape (1)	-	Thread Shape (2)	-	Thread Shape (3)
APBLM	-	T1	-	T2		
APBTA	-	T1	-	M5	-	M5

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship 8 Days

Heat, Cold Retention Pipe Covers

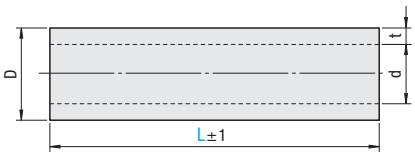
CAD Data

Heat, Cold Retention Pipe Covers -For Steel Pipes-



RoHS

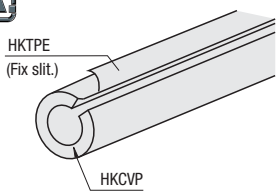
HKCVP



Operation Temperature Range: -20~120°C Material: Heat Resistant Polyethylene Foam

Part Number Type	No.	L 1mm Increment	D	d	t	€ Unit Price L30~250	L251~500	L501~750	L751~1000	L1001~1500
HKCVP	6A	30~1500	26	10	8					
	8A		29	13	8					
	10A		38	18	10					
	15A		42	22	10					
	20A		48	28	10					
	25A		55	35	10					
	32A		63	43	10					
	40A		69	49	10					
	50A		81	61	10					

Example



Order Example: Part Number HKCVP10A - L 500

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days — Express A 3,00 EUR/ piece — P.88

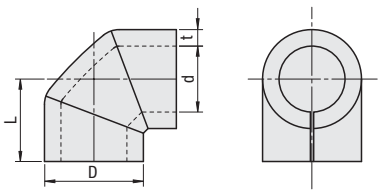
A Express Charge of 8,10 EUR for 3 or more identical pieces.

Heat, Cold Retention Pipe Covers -For Elbow-



RoHS

HKCVE (For Elbow)



Operation Temperature Range: -20~120°C Material: Heat Resistant Polyethylene Foam

Part Number Type	No.	D	d	t	L	€ Unit Price
HKCVE	6A	32	16	8	24	
	8A	36	20	8	26	
	10A	44	24	10	32	
	15A	48	28	10	34	
	20A	54	34	10	36	
	25A	63	43	10	40	

Order Example: Part Number HKCVE10A

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days — Express A 3,00 EUR/ piece — P.88

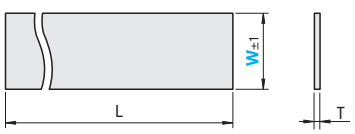
A Express Charge of 8,10 EUR for 3 or more identical pieces.

Tapes for Pipe Covers



RoHS

HKTPE



Operation Temperature Range: -20~80°C
Material: Polypropylene

Part Number Type	W(mm)	L (m)	T (mm)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
HKTPE	25	55	0.12		
	50				

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number HKTPE25

Days to Ship: 8 Days — Express A 3,00 EUR/ piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

PVC Pipes, Fittings / PVC Pipes
-Overview-

CAD Data

Operation Temperature and Pressure

Application	Main Pipe	Main Pipe Fittings			Tensil Yield Strength
For tap water	Unplasticized poly (vinyl chloride) (PVC-U) pipes VP for tap water	TSFittings	Normal temperature (5~35°C)	0.75MPa (StaticWater)	45MPa or more (23°C)
For force-feed	Unplasticized poly (vinyl Chloride) (PVC-U) pipes VP	TSFittings		1.0MPa (StaticWater+Water Impact Resistance)	
For water supply	Unplasticized poly (vinyl chloride) (PVC-U) pipes HI-VP for tap water Impact Resistance	HIFittings		0.75MPa (StaticWater)	40MPa or more (23°C)

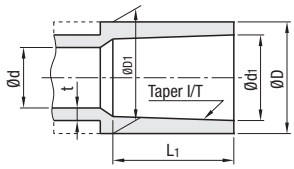
(Note)1.Operating temperature and pressure may vary depending on the type of joints and conjugation methods.
2.Note that the faster the flow within pipes, the higher the pessure of water is. Keep the flow rate under 2m/s as a principle. 2m/sor more
3.Pipes that exposure PVC should be treated for expansion and contraction due to elasticity of PVC pipes by temperature difference.

Performance Standards (TSJoints · HIJoints Common)

Item	Performance Standards
turbidity	0.5 or less
Color	1 or less
Organic (TOC)	1mg/L or less
Lead	0.008mg/L or less
Zinc	0.5mg/L or less
Reduction of residual chlorine	0.7mg/L or less

Characteristics	Item	Unit	VP Pipes · TS Fittings	HI-VP Pipes · HI Fittings	Testing Method
Physical Properties	Color	-	Gray	Blue Gray	-
	Specific Gravity	-	1.43	1.4	JIS K 7112 density gradient centrifugation 20°C
	Hardness	Rockwell R	115	115	ASTM D 785 20°C
	Moisture Absorption Ratio	For a week in normal temperature mg/cm²	0.15 or lower	0.15 or lower	-
Mechanical Properties	Tensile Strength	MPa (kgf/cm²)	49~54(500~550)	49~52(500~530)	JIS K6742 23°C or others
	Young's Modulus	MPa (kgf/cm²)	2942(3x10000)	2942(3x10000)	JIS K7113 20
	Tensile Elongation at Breakage	%	50~150	50~150	JIS K6741 23°C
	Flexural Strength	MPa (kgf/cm²)	78.5~98.1(800~1000)	78.5~98.1(800~1000)	JIS K 7203 20°C 65%RH
	Elastic Modulus	MPa (kgf/cm²)	2746(2.8x10000)	2746(2.8x10000)	JIS K 7203 20°C 65%RH
	Compression Strength	MPa (kgf/cm²)	69(700)	64(650)	JIS K 7208 20°C 65%RH
	Poisson ratio	-	0.35~0.4	0.35~0.4	-
	Charpy Impact Strength	kj/m2 (kgf-cm²)	6.9~9.8(7~10)	17.7 or more	-
Thermal Characteristics	Vicat Softening Temperature	°C	76 or more	76 or more	JIS K6742
	Linear Thermal Expansion Coefficient	1/°C	6~8x10-5	6~8x10-5	-
	Specific Heat	J(kg·K)(cal/g·°C)	1.05x1000(0.25)	1.05x1000(0.25)	-
	Heat Transfer Coefficient	W(mK) (kcal/m h °C)	0.15(0.13)	0.15(0.13)	DIN 8061
	Combustibility	-	Self-extinguishing	Self-extinguishing	-
Electrical Characteristics	Withstanding Voltage	kV/mm	40 or more	40 or more	-
	Specific Volume Resistivity	Ωcm	5.3x1015	5.3x1015	30°C 65%RH
	Dielectric Constant 60MHz	-	3.2	3.2	30°C 55%RH
	Dielectric Constant 1000 Hz	-	3.1	3.1	-
	Dielectric Constant 1000000 Hz	-	3	3	-
	Power Factor 60Hz	100	1.18	1.18	30°C 55%RH
	Power Factor 1000 Hz	100	1.91	1.91	-
	Power Factor 1000000 Hz	100	1.72	1.72	-

Listed Values are for reference, not guaranteed.

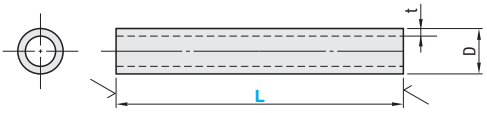


Nominal	d1	Tolerance of d1	D / D1	Tolerance of D ~ D1	l/T	L1	d (Min.)	t (Min.)
13	18.4	±0.2	24	-0.6	1/30	26	13	2.7
16	22.4	±0.2	29	-0.7	1/34	30	16	2.7
20	26.45	±0.2	33	-0.8	1/34	35	20	3.2
25	32.55	±0.25	40	-1.0	1/34	40	25	3.6
30	38.6	±0.25	46	-1.0	1/34	44	31	3.6

■PVC Pipes RoHS



Type	Material	Standards	Color
PVCT	Vinyl Chloride	JIS K 6742	Gray
PVCH			Blue Gray



Note that outer diameter of pipes may have some scratches or small flaws on its surface.

Part Number Type	No.	L 1mm Increment	Outer Diameter D	D Tolerance	Thickness t	t Tolerance	Inner Diameter (Reference Value)	€ Unit Price PVCT L50~200	201~400	401~600	601~800	801~1000	1001~1250	1251~1500
PVCT PVCH	13	50~1500	18	±0.2	2.5	±0.2	13							
	16		22	±0.2	3	±0.3	16							
	20		26	±0.2	3	±0.3	20							
	25		32	±0.2	3.5	±0.3	25							
	30		38	±0.3	3.5	±0.3	31							

The tolerance of L dimension will be +1~3 for 50~1000, +2~5 for 1001~1500. * The price of PVCH is the price in the table above plus 1,00 EUR

Order Example

Part Number	-	L
PVCT20	-	500
PVCH25	-	1000

Days to Ship: 8 Days

Express A 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

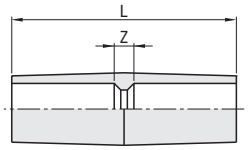
Quantity	1~9	10~14	15~19	20~29
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

PVC Fittings
-TS Fittings-

■Sockets RoHS — PVCTS





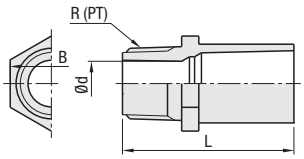
Material: PVC

Part Number Type	No.	Z	L	St	€ Unit Price 1~49
PVCTS	13	5	57	JIS K 6743	
	16	7	67		
	20	7	77		
	25	7	87		
	30	7	95		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■Sockets for Valve Sockets RoHS — PVCTSB





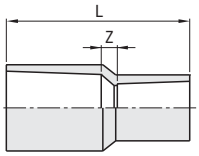
Material: PVC

Part Number Type	No.	R (PT)	d	B	L	St	€ Unit Price 1~49
PVCTSB	13	1/2	13	24	50	JIS K 6743	
	16	1/2	13	29	57		
	20	3/4	18	33	64		
	25	1	23	40	71		
	30	1 1/4	31	46	80		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■Different Diameter Sockets RoHS — PVCTSD





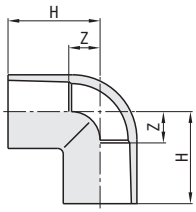
Material: PVC

Part Number Type	No.	Z	L	St	€ Unit Price 1~49
PVCTSD	1613	5	61	JIS K 6743	
	2016	6	71		
	2516	15	85		
	2520	9	84		
	3025	9	93		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■90° Elbow RoHS — PVCTE





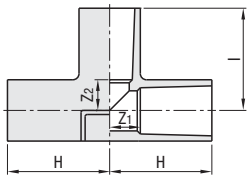
Material: PVC

Part Number Type	No.	Z	H	St	€ Unit Price 1~49
PVCTE	13	10	36	JIS K 6743	
	16	13	43		
	20	15	50		
	25	18	58		
	30	21	65		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■Tees RoHS — PVCTT





Material: PVC

Part Number Type	No.	Z_1	Z_2	H	I	St	€ Unit Price 1~49
PVCTT	13	10	10	36	36	JIS K 6743	
	16	13	13	43	43		
	20	15	15	50	50		
	25	18	18	58	58		
	30	21	21	65	65		

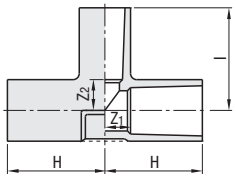
For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

CAD Data

Reducing Tees RoHS

PVCTTD





Material: PVC

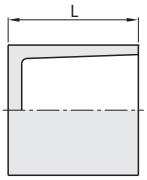
Part Number Type	No.	Z1	Z2	H	I	St	€ Unit Price 20~49
PVCTTD	1613	11	12	41	38	JIS K 6743	
	2016	13	15	48	45		
	2516	13	18	53	48		
	2520	15	18	55	53		
	3025	18	21	62	61		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

Cap RoHS

PVCTC





Material: PVC

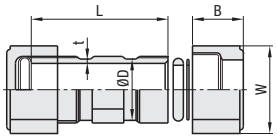
Part Number Type	No.	L	St	€ Unit Price 1~49
PVCTC	13	29	JIS K 6743	
	16	33.5		
	20	38.5		
	25	44		
	30	48		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

Elastic Fittings RoHS

PVCTY





Material: PVC

Part Number Type	No.	D	t	L	B	W	St	€ Unit Price 1~9
PVCTY	13	26	3	68	25	38	JIS K 6743	
	16	34	5.5	110	29	42	-	
	20	35	3.5	78	29	50		
	25	43	4	89	29	56	JIS K 6743	
	30	48	4	98	33.5	63		

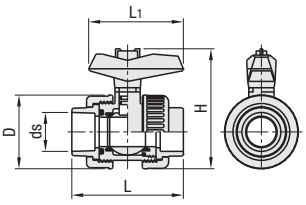
For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

For PVCTY16 the shape of joint part is round instead hexagonal!

Valve RoHS

PVCTB





Material: PVC

Part Number Type	No.	D	ds	H	L	L1	St	€ Unit Price 1~9	Volume Discount 10~
PVCTB	16	50	22	78	109	77	JIS K 6743		
	20	59	26	89.5	125	97			
	25	68	32	101	142	97			
	30	80	38	119	158	129			

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

Adhesive RoHS



Part Number Type	No.	Weight by Volume (g)	€ Unit Price 1~19
	100	100	
	500	500	

Not Available

Order Example Part Number PVCTS25 PVCTE30

Days to Ship 6 Days P. 87

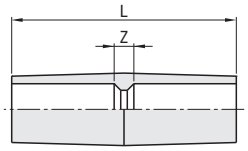
Price

For orders larger than indicated quantity, please request a quotation.

PVC Fittings
-HI Fittings-

■Sockets RoHS — PVCHS





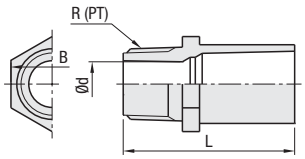
Material: Impact resistance PVC

Part Number Type	No.	Z	L	St	€ Unit Price 1~49 pieces
PVCHS	13	5	57	JIS K 6743	
	16	7	67		
	20	7	77		
	25	7	87		
	30	7	95		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■Sockets for Valve RoHS — PVCHSB





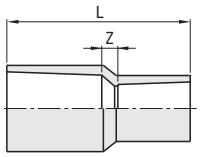
Material: Impact resistance PVC

Part Number Type	No.	R(PT)	d	B	L	St	€ Unit Price 1~49 pieces
PVCHSB	13	1/2	13	24	50	JIS K 6743	
	16	1/2	13	29	57		
	20	3/4	18	33	64		
	25	1	23	40	71		
	30	1 1/4	31	46	80		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■Reducing Socket RoHS — PVCHSD





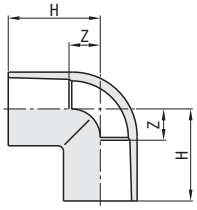
Material: Impact resistance PVC

Part Number Type	No.	Z	L	St	€ Unit Price 1~49 pieces
PVCHSD	1613	5	61	JIS K 6743	
	2016	6	71		
	2516	15	85		
	2520	9	84		
	3025	9	93		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■90° Elbow RoHS — PVCHE





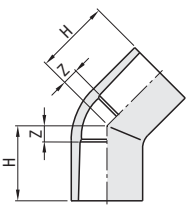
Material: Impact resistance PVC

Part Number Type	No.	Z	H	St	€ Unit Price 1~49 pieces
PVCHE	13	10	36	JIS K 6743	
	16	13	43		
	20	15	50		
	25	18	58		
	30	21	65		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■45° Elbow RoHS — PVCHHE





Material: Impact resistance PVC

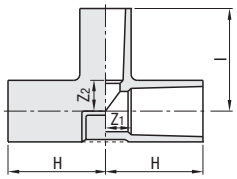
Part Number Type	No.	Z	H	St	€ Unit Price 1~49 pieces
PVCHHE	13	7	33	JIS K 6743	
	20	9	44		
	25	11	51		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

CAD Data

■Tees RoHS PVCHT





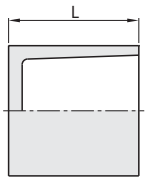
Material: Impact resistance PVC

Part Number Type	No.	Z_1	Z_2	H	I	St	€ Unit Price 1~49 pieces
PVCHT	13	10	10	36	36	JIS K 6743	
	16	13	13	43	43		
	20	15	15	50	50		
	25	18	18	58	58		
	30	21	21	65	65		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■Cap RoHS PVCHC





Material: Impact resistance PVC

Part Number Type	No.	L	St	€ Unit Price 20~49 pieces
PVCHC	13	29	JIS K 6743	
	16	33.5		
	20	38.5		
	25	44		
	30	48		

For dimension of the junction on fittings, see Dimension Table on overview in **P.1146**.

■Adhesive RoHS PVCHBN



Part Number Type	No.	Weight by Volume (g)	€ Unit Price 1~19 pieces
PVCHBN	100	100	
	500	500	

Order Example

Part Number
PVCHSB20
PVCHBN100

Days to Ship

6 Days

P 87

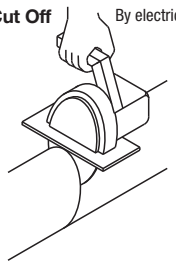
Price

For orders larger than indicated quantity, please request a quotation.

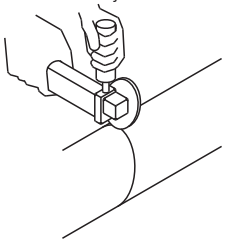
Example

-How to Cut Off

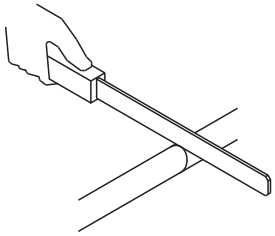
By electric circular saw



By disk sander



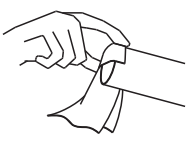
By PVC pipe saw



Cut perpendicular to axis of pipe, using cut line as a guide.

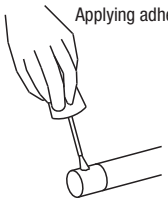
- How to Bond

Cleaning



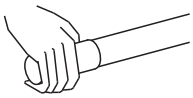
Clean the inside of joints and outer surface of insertion part with dry cloth.

Applying adhesive



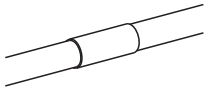
Apply adhesive evenly with the inside of joints, and then outer surface of insertion part in circular order.

Insertion



Insert the pipe into the joint up to the marking line in one stroke after applying adhesive, and hold it for 30 seconds or more.

Completed



Wipe off extra adhesive immediately, and prevent excessive pressure on the junction.

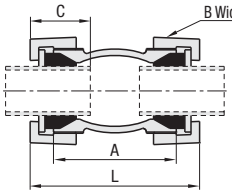
Compound Fittings

CAD Data

Features: These joints can connect steel pipes (**P. 1125**), PVC pipes (**P. 1146**) and polyethylene pipes (not dealt). Be able to insert pipe without removing the nut.

Sockets RoHS — CJMAS



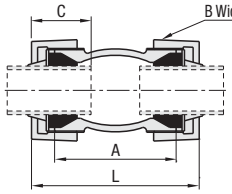


Part No. Type	No.	L	A	B Width Across Flats	No. of Nut Square	C Insert Length	€ Unit Price 1~9	Vol. Discount 10~
CJMAS	13	77	57	46.5	8	30		
	20	83	63	53	8	35		
	25	88.5	67.5	60	8	35		
	25A	88.5	67.5	60	8	35		
	30	95	73	71	10	35		
	30A	95	73	71	10	35		

(P)25 and 30 can connect steel pipe, PVC pipe and polyethylene pipe; 25A and 30A can connect steel pipe and polyethylene pipe.

Sockets With Lock Ring RoHS — CJMASH



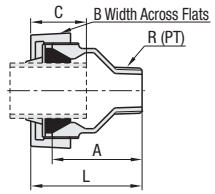


Part Number Type	No.	L	A	B Width Across Flats	No. of Nut Square	C Insert Length	€ Unit Price 1~9	Vol. Discount 10~
CJMASH	13	87	57	46.5	8	35		
	20	93	63	53	8	40		
	25	98.5	67.5	60	8	40		
	25A	98.5	67.5	60	8	40		
	30	107	73	71	10	40		
	30A	107	73	71	10	40		

(P)25 and 30 can connect steel pipe, PVC pipe and polyethylene pipe; 25A and 30A can connect steel pipe and polyethylene pipe.

Male Adapter RoHS — CJMAMH

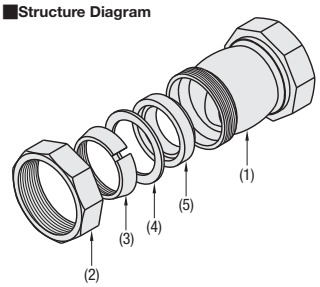




Part No. Type	No.	L	A	R (PT)	B Width Across Flats	No. of Nut Square	C Insert Length	€ Unit Price 1~9	Vol. Discount 10~
CJMAMH	13	71	56	1/2	46.5	8	35		
	20	73	58	3/4	53	8	40		
	25	80.5	65	1	60	8	40		
	25A	80.5	65	1	60	8	40		
	30	85	68	1 1/4	71	10	40		
	30A	85	68	1 1/4	71	10	40		

(P)25 and 30 can connect steel pipe, PVC pipe and polyethylene pipe; 25A and 30A can connect steel pipe and polyethylene pipe.

Structure Diagram



Surface Treatment

No.	Name	M Material	S Surface Treatment
(1)	Fitting Body	Black Malleable Cast Iron Steel EN-JM1110/EN-GJMB-300-6	Hot Zinc Planting
(2)	Nut		
(3)	Lock Ring	Steel	Electrolytic Zinc Plating
(4)	Washer		
(5)	Rubber gasket	NBR	-

Conditions of Use

Pipes	Fluid	Max. Operating Pressure MPa(kgf/cm²)	Temp.
Steel Pipe	Water / Oil	1.0(10.2)	60°C
	Air	0.3(3.1)	
PVC Pipe Polyethyl. Pipe	Water	Depending on Max. Operating pressures of each pipe	40°C

Information about applicable pipes

St	Pipes	CJMAS	CJMASH CJMAMH
JIS G 3452	Carbon-steel Pipe for Plumbing	Connect-able	Connect-able
JIS G 3442	Galvanized Steel Pipe for Water Piping		
JWWA K 116	Rigid PVC-lined Steel Pipe for Tap Water (VA, VB)		
JWWA K 132	Polyethyl. Powder-lined Steel Pipe for Tap Water (PA, PB)		
JIS K 6741	Rigid PVC Pipe (VP)		
JIS K 6742	Rigid PVC Pipe for Tap Water (VP, HIVP)		
JIS K 6762	Polyethylene Pipe for Tap Water (Type 1, 2)	Connect-able	
JIS K 6761	Polyethylene Pipe for Gereral Use (Type 1, 2)		

Applicable fluid

Fluid	Joint Pipe Steel Pipe	Joint Pipe PVC · Polyethylene P.
Water / Warm Water	○	○
Air, Proopane, Natural Gas	○	X
Lubricant Operation Oil	○	X
Gasoline, Karosene, Light Oil	Δ	X
Heavy Oil	X	X

(P) ○~X Application is relatively evaluated.

Applicable Pipe Size and Recommended Tightening Torque for Each Diameter

No. (Dia.)	Operation Temperature and Pressure: SteelPipe (P.1125)	PVC Pipe for tap water (P.1146)	PVC Pipe (P.1146)	Polyethylene Pipe for tap water (Not Dealt)	Polyethylene Pipe (Not Dealt)	Recommended tightening torque (N·m): Applicable Pipe: Steel Pipe CJMAS	Steel Pipe CJMASH CJMAMH	Applicable Pipe: PVC Pipe CJMAS	PVC Pipe CJMASH CJMAMH	Applicable Pipe: Polyethylene Pipe All
13	15	16	16	13	13	70	40	40	30	Add 180° rotation after closing the opening of lock ring.
20	20	20	20	20	20	80	60	60	40	
25	25	25	25	25	25	100	70	80	40	
30	32	30	30	30	30	120	80	80	40	

Step and Cautions

STEP1: Cut off the pipe.

(1)Be sure to wipe off burr or flush which generate at the cut off, using file or reamer.

(2)Inserting pipe into compound joint while generating burr or flush may damage rubber packing and cause leakage.

STEP2: Insert the pipe.

(1)Specify the line with marker fit to insert length (C). Do not remove the nut when inserting the pipe. Be sure to follow the insert length.

(2)Inserting pipe too deep may cause leakage due to inadequate tightening.

STEP3: Tightening

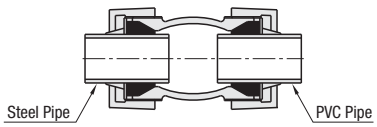
(1)Tighten the nut by hand after inserting pipe. Afterwards, use a pipe wrench to tighten until standard tightening torque.

(2)Inadequate tightening may cause the pipe pull-outs and leakages. Be sure to tighten until standard tightening torque.

Order Example — Part Number: CJMAS13

Days to Ship: 6 Days P. 87

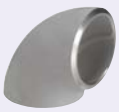
Example



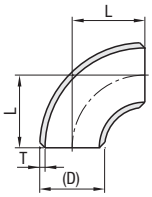
Welded Joints
-Butt Welding Type-

CAD Data

■90° Elbow Short RoHS



Type	Material
WEJES	1.4301/X5CrNi18-10-W

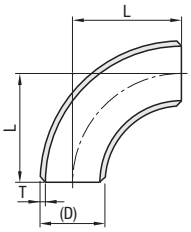


Part Number Type	No.	(D)	L	T	€ Unit Price 1~9	Volume Discount 10~
WEJES	25A	34	25.4	2.8		
	32A	42.7	31.8	2.8		

■90° Elbow Long RoHS



Type	Material
WEJELS	1.4301/X5CrNi18-10-W

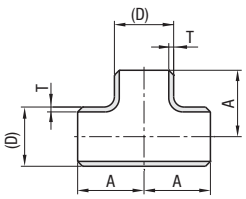


Part Number Type	No.	(D)	L	T	€ Unit Price 1~9	Volume Discount 10~
WEJELS	15A	21.7	38.1	2.1		
	20A	27.2	38.1	2.1		
	25A	34	38.1	2.8		
	32A	42.7	47.6	2.8		

■Tees RoHS



Type	Material
WEJTS	1.4301/X5CrNi18-10-W

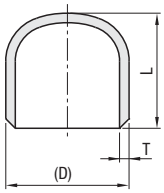


Part Number Type	No.	(D)	A	T	€ Unit Price 1~9	Volume Discount 10~
WEJTS	15A	21.7	25.4	2.1		
	20A	27.2	28.6	2.1		
	25A	34	38.1	2.8		
	32A	42.7	47.6	2.8		

■Cap RoHS



Type	Material
WEJCS	1.4301/X5CrNi18-10



Part Number Type	No.	(D)	L	T	€ Unit Price 1~9	Volume Discount 10~
WEJCS	15A	21.7	25.4	2.1		
	20A	27.2	25.4	2.1		
	25A	34	38.1	2.8		
	32A	42.7	38.1	2.8		

Order Example — Part Number: WEJES25A

Days to Ship — 6 Days P. 87

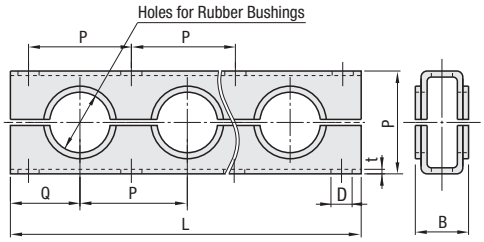
Plumbing Clamps
-Multi Type-

CAD Data



RoHS

MTC



Material: 1.0320/St.22
* Black Plated

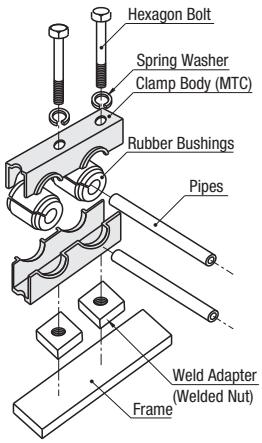
Part Number		N (No. of Holes)	L	P	Q	B	D	T	Recommended Assembly Bolt (Coarse)		€ Unit Price	Volume Discount
Type	No.	Selection							For 1-Stack	For 2-Stacks	Qty. 1~9	Qty. 10~49
MTC	38	1	55	37.5	27.5	26	9	2.3	M8-50	M8-90		
		2	92.5									
		3	130									
		4	167.5									
		5	205									
	50	1	70	50	35	26	9	2.3	M8-65	M8-115		
		2	120									
		3	170									
		4	220									
		5	270									
	75	1	100	75	50	38	11	3.2	M10-90	M10-170		
		2	175									
		3	250									
		4	325									
		5	400									
	100	1	130	100	65	42	11	4	M10-120	-		
		2	230									

L dimension of recommended bolts for assembling are for using weld adapters (MCWA **P.1154**).
Please be sure to confirm the length for each assembling method before use.

For orders larger than indicated quantity, please request a quotation.

Example

When fixing the clamp body by welding the weld-adapter (weld-nut) on the frame



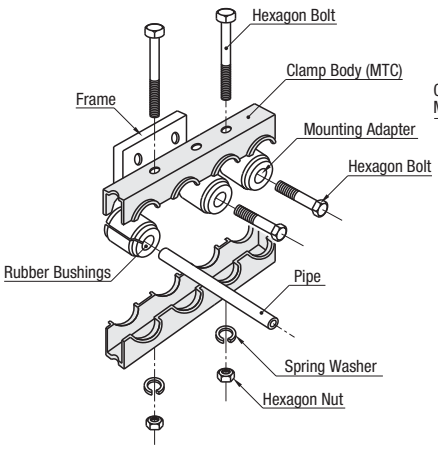
Order Example

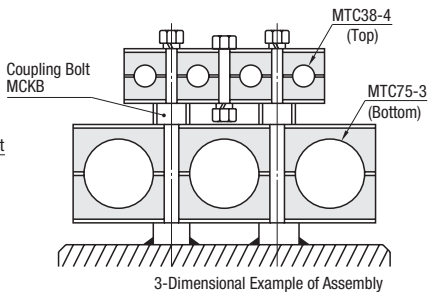
Part Number	-	N (No. of Holes)
MTC50	-	4

Days to Ship 6 Days P. 87

Example

When fixing the clamp on the frame by assembling a mounting adapter on the clamp body.





3-Dimensional Example of Assembly

* Assembly is possible with recommended hexagon bolts for assembling (For 2-Stacks Type).
○: Assembling is possible using coupling bolts (MCKB).
X : Assembling is not possible.

The number of possible combinations

Top / Bottom	38	50	75	100
38	*○	X	X	X
(MCKB)	38-8			
50	X	*○	X	X
(MCKB)		50-8		
75	○	○	*○	X
(MCKB)	75-8	75-8	75-10	
100	X	○	X	○
(MCKB)		100-8		100-10

Accessories for Plumbing Clamps

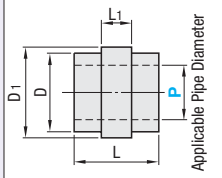
CAD Data

Rubber Bushings



RoHS

MCBR(For Inch Pipes)
MCBM(For Metric Pipes)



Inch Pipe O.D.	
Nominal	mm
1/8	10.5
1/4	13.8
3/8	17.3
1/2	21.7
3/4	27.2
1	34.0
1 1/4	42.7
1 1/2	48.6
2	60.5

M Material: Neoprene Rubber

Part Number Type	No.	P=Applicable Pipe Dia. Selection (For inch pipes, select numbers above ( ).	L	L1	D	D1	Applicable Body No.
MCBR (For Inch Pipes)	38	1 (1/8) 2 (1/4) 3 (3/8)	36	13.2	22.8	28.8	38
	50	1 (1/8) 2 (1/4) 3 (3/8) 4 (1/2) 6 (3/4)	36	13.2	33.2	40.8	50
	75	3 (3/8) 4 (1/2) 6 (3/4) 8 (1) 10 (1, 1/4)	48	19.3	56	64.4	75
	100	6 (3/4) 8 (1) 10 (1, 1/4) 12 (1, 1/2) 16 (2)	52	17.8	76	88	100
MCBM (For Metric Pipes)	38	6 8 10 12 15 16 18	36	13.2	22.8	28.8	38
	50	10 12 15 16 18 20 22 25 30	36	13.2	33.2	40.8	50
	75	10 12 15 16 18 20 22 25 28 30 32 34 35 38 40 42	48	19.3	56	64.4	75
	100	28 30 32 35 38 40 42 50	52	17.8	76	88	100

MCBR(For Inch Pipes)

No.	P	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
38	1		
	2		
	3		
50	1		
	2		
	3		
	4		
	6		
75	3		
	4		
	6		
	8		
	10		
100	6		
	8		
	10		
	12		
	16		

MCBM(For Metric Pipes)

No.	P	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
38	6		
	8		
	10		
	12		
	15		
	16		
	18		
50	10		
	12		
	15		
	16		
	18		
	20		
	22		
	25		
	30		
75	10		
	12		
	15		
	16		
	18		

MCBM(For Metric Pipes)

No.	P	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
75	20		
	22		
	25		
	28		
	30		
	32		
	34		
	35		
	38		
	40		
	42		
100	28		
	30		
	32		
	35		
	38		
	40		
	42		
	50		

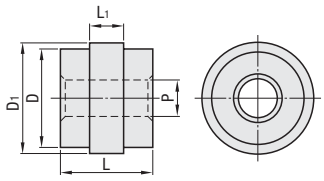
For orders larger than indicated quantity, please request a quotation.

Mounting Adapters



RoHS

MCMA



M Material: Aluminum Alloy Diecast (JIS-ADC12)

Part Number Type	No.	P	L	L1	D	D1	Applicable Body	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
MCMA	38	8.5	32	13.3	21.2	28.8	38		
	50	8.5	32	13.3	31.2	40.8	50		
	75	13	43	19.5	54	64.4	75		

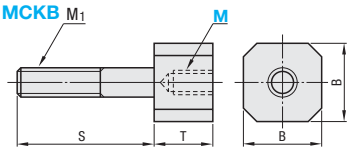
For orders larger than indicated quantity, please request a quotation.

Coupling Bolts



RoHS

MCKB



* Details of Applicable Clamps **Refer to P.1153 "Example of Use".**

M Material: M=8 1.1191/C45E
M=10 1.7220/34CrMo4

S Surface Treatment: Trivalent: Chromate

Part Number Type	No.	M (Coarse)	S	T	B	M1 (Coarse)	Applicable Body No.	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
MCKB	38	8	50	23	17	M8	38		
	50	8	65	23	17	M8	50		
	75	8	90	23	17	M10	75		
		10	90	33	17	M10	75		
	100	8	120	23	17	M10	100		
		10	120	33	17	M10	100		

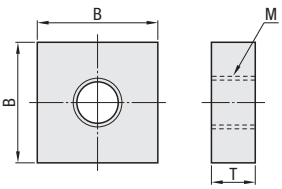
For orders larger than indicated quantity, please request a quotation.

Weld Adapters



RoHS

MCWA



M Material: 1.0038/S235JR

Part Number Type	No.	M (Coarse)	T	B	Applicable Body No.	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
MCWA	38	M8	16	25	38		
	50	M8	16	25	50		
	75	M10	19	38	75		
	100	M10	25	44	100		

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	P or M
MCBM38	-	10
MCMA50		
MCKB100	-	8
MCWA75		

Days to Ship

6 Days P. 87

Plumbing Terminals

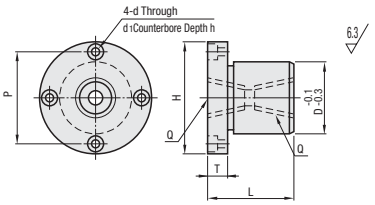
CAD Data

■Flanged Type

RoHS



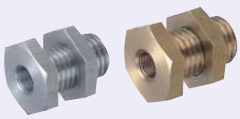
Type	M Material	S Surface Treatment	A Accessory	Normal Pressure
BTLF	1.1191/C45E	Trivalent Chromate	Hexagon Socket Head Cap Screw (Stainless Steel) 4 pcs.	20.6MPa ≈ 210kgf/cm² or less
BTLFA	EN AW-5052/AlMg2,5	-		1MPa ≈ 10kgf/cm² or less
BTLFC	Free-Cutting Brass	-		20.6MPa ≈ 210kgf/cm² or less
BTLFS	1.4301/X5CrNi18-10	-		



Part Number Type	No.	Rc (PT) Q	H	D	T	L	P	d	d1	h	Included Screws (4 pcs.)	€ Unit Price BTLF	BTLFA	BTLFC	BTLFS
BTLF BTLFA BTLFC BTLFS	1	1/8	35	15	7	20	25	4.5	8	4.4	SCB4-10				
	2	1/4	50	25	8	30	38	5.5	9.5	5.4	SCB5-10				
	3	3/8													
	4	1/2	65	35	10	45	50	6.6	11	6.5	SCB6-12				

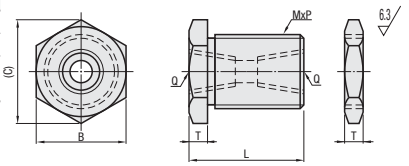
■Hexagon Type

RoHS



Type	M Material	S Surface Treatment	A Accessory	Normal Pressure
BTLH	1.1191/C45E	Trivalent Chromate	Hexagon nut 1 pc.	20.6MPa ≈ 210kgf/cm² or less
BTLHA	EN AW-5052/AlMg2,5	-		1MPa ≈ 10kgf/cm² or less
BTLHC	Free-Cutting Brass	-		20.6MPa ≈ 210kgf/cm² or less
BTLHS	1.4301/X5CrNi18-10	-		

*Normal pressure of No. 5 / 5-S is less than 1MPa≈10kgf/cm².



Part Number Type	No.	Rc (PT) Q	B	(C)	MxP	L	T	Included Nuts t	€ Unit Price BTLH	BTLHA	BTLHC	BTLHS
Standard BTLH BTLHA BTLHC BTLHS	1	1/8	24	26.8	16x2.0	30	5	8				
	2	1/4	46	50.9	30x3.5	45	8	15				
	3	3/8	46	50.9	30x3.5	45	8	15				
	4	1/2	55	60.8	36x4	60	10	18				
	5	M5	24	26.8	16x2.0	30	5	8				

Part Number Type	No.	Rc (PT) Q	B	(C)	MxP	L	T	Included Nuts t	€ Unit Price BTLH	BTLHC	BTLHS
L Dimension Short BTLH BTLHC BTLHS	1-S	1/8	22	25.4	16x1.5	16	5	7			
	2-S	1/4	27	31.2	20x1.5	22	5	7			
	3-S	3/8	32	36.9	24x1.5	26	8	10			
	4-S	1/2	36	41.6	30x1.5	31	8	10			
	5-S	M5	19	21.9	12x1.5	15	5	7			

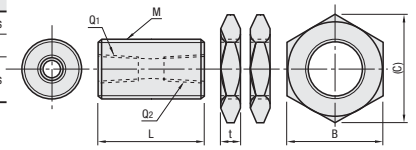
■Full Thread Type

RoHS



Type	M Material	S Surface Treatment	A Accessory	Normal Pressure
BTLR	1.1191/C45E	Trivalent Chromate	Hexagon nut 2 pcs.	20.6MPa ≈ 210kgf/cm² or less
BTLRA	EN AW-5052/AlMg2,5	-		1MPa ≈ 10kgf/cm² or less
BTLRC	Free-Cutting Brass	-		20.6MPa ≈ 210kgf/cm² or less
BTLRS	1.4301/X5CrNi18-10	-		

*Tips have steps for identification on NPT side.
*Normal pressure of No. 5 · 1-5 is less than 1MPa≈10kgf/cm².



Part Number Type	No.	Rc (PT) Q1	Rc (PT) Q2	M (Coarse)	L	Included Nuts t	Included Nuts B	Included Nuts (C)	€ Unit Price BTLR	BTLRA	BTLRC	BTLRS
BTLR BTLRA BTLRC BTLRS	1	1/8		16	30	8	24	26.8				
	1-1N	1/8	NPT1/8									
	1-2	1/8	1/4	30	45	15	46	50.9				
	2	1/4										
	2-2N	1/4	NPT1/4									
	3	3/8										
	4	1/2		36	60	18	55	60.8				
	5	M5		16	30	8	24	26.8				
	1-5	1/8	M5									

Order Example Part Number: BTLF3, BTLR1-2

Days to Ship 6 Days P.87

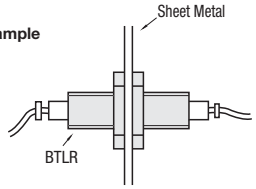
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example



Can be positioned freely because it has no shoulder.

Tapered Screw Plugs

Price Reduction
Up to 20%

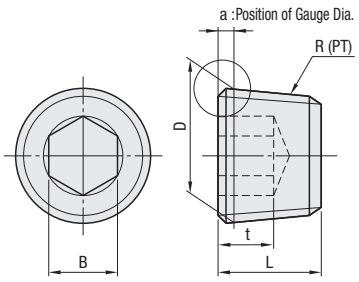
CAD Data

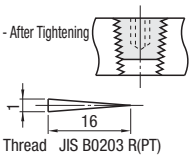
RoHS

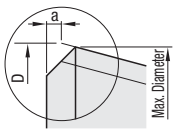


Type		M Material	H Hardness	S Surface Treatment
Without Seal Coating	With Seal Coating			
MSWT	MSWTK	1.7220/34CrMo4	32~42HRC	Black Oxide
MSWTM	MSWTMK	1.7220/34CrMo4		Electroless Nickel Plating
MSWTS	MSWTSK	1.4567/X3CrNiCu18-9-4	-	-
MSWTP	-	PEEK	-	-

Exporting MSWTP (Resin, PEEK) requires export application to the Ministry of Economy, Trade and Industry.







Gauge diameter at the position a is a theoretical value.
For No. J · S · 1, actual maximum screw diameter may be smaller due to end chamfering.

Allowable temperature for With Seal Coating Type is 150°C

Part Number Type	No.	D	a	L	B	t	R (PT)
MSWT MSWTM	*J	7.723	0.45	6	4	3.0	1/16
	*S	7.779	0.47	6.4	$4^{+0.03}_{-0.032}$	3.1	
MSWT MSWTM MSWTS MSWTP / MSWTK MSWTMK MSWTSK	1	9.728	0.45(1.5)	7(8)	5	3.5(5)	1/8
	2	13.157	0.7(1.8)	8.9(11)	6	4.5(7.6)	1/4
	3	16.662	0.7(2.0)	10(12)	8	5(8)	3/8
	4	20.955	0.9	12	10	6	1/2
	6	26.441		14	14	7	3/4
	8	33.249	1.1	16.5	17	9	1

* S of MSWT is an ANSI standard screw. For installation, use hex key wrench 5/32 inch. J of MSWT is a JIS standard screw. Dimensions in ( ) are for MSWTP.

Price

No.	MSWT		MSWTM		MSWTS		MSWTP	
	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
	Qty.15-99	100~	Qty. 1~99	100~	Qty. 1~99	100~	1~49 pieces	50~
*J								
*S								
1								
2								
3								
4								
6								
8								

No.	MSWTK		MSWTMK		MSWTSK	
	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
	Qty. 1~99	100~	Qty. 1~99	100~	Qty. 1~99	100~
1						
2						
3						
4						
6						
8						

Order Example
Part Number
MSWTJ
MSWTSK3

Days to Ship
6 Days
P.87

Copper Pipes / Copper Pipe Fittings

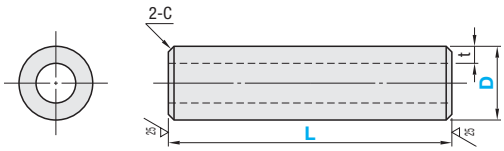
CAD Data

Copper Pipes



RoHS

Type	Material	Standards
DKE	Copper Phosphate (CW024A/Cu-DHP)	JIS H : 3100



Part Number Type	D	L 1mm Increment	t	€ Unit Price L10 ~100	L101 ~200	L201 ~400	L401 ~600	L601 ~800	L801 ~1000
DKE	3	10~250	1						
	4	10~500							
	5								
	6								
	8	10~900							
	10								
	12								
	14		1.5						
	15	10~1000							
	16		2						
	18								

Tolerance for D dimension and L dimension

or More	or Less	D	L
3	6	±0.1	±0.1
7	30	±0.2	±0.2
31	120	±0.3	±0.3
121	400	±0.5	±0.5
401	1000	±0.8	±0.8

C Dimension

or More	or Less	C
D3	D12(12.7)	0.3
D14	D18	0.5

Order Example: Part Number DKE10 - L 300

Days to Ship: 8 Days — Express A 2,00 EUR/piece P.88

For A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price — **Volume Discount** (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

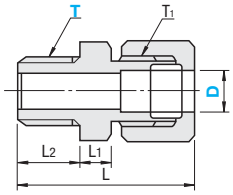
For orders larger than indicated quantity, please request a quotation.

Copper Pipe Fittings -Male End and Union End Connector-



RoHS

DKPT



Material: Brass

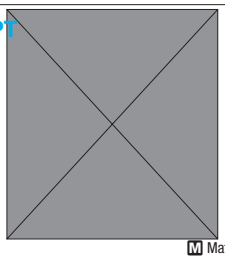
Part Number Type	D: Pipe Outer Dia.	T R (PT) Selection	T R (PT)	Approx. L	L1	L2	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKPT	3	1	1/8	28	5	9	1/8	12	12	
		2	1/4	32	6	12	1/8	14	12	
	4	1	1/8	28	5	9	1/8	12	12	
		2	1/4	32	6	12	1/8	14	12	
	5	1	1/8	28	5	9	1/8	12	12	
		2	1/4	32	6	12	1/8	14	12	
	6	1	1/8	33	6	9	1/4	14	16	
		2	1/4	36	6	12	1/4	16	16	
		3	3/8	39	8	13	1/4	19	16	
	8	1	1/8	33	6	9	1/4	14	16	
		2	1/4	36	6	12	1/4	16	16	
		3	3/8	39	8	13	1/4	19	16	
	10	2	1/4	40	8	12	3/8	19	19	
		3	3/8	41	8	13	3/8	19	19	
		4	1/2	46	10	16	3/8	22	19	
	12	2	1/4	46	10	12	1/2	22	24	
		3	3/8	47	10	13	1/2	22	24	
		4	1/2	50	10	16	1/2	24	24	
	14	3	3/8	48	10	13	1/2	22	24	
		4	1/2	51	10	16	1/2	24	24	
	15	3	3/8	50	10	13	5/8	24	27	
		4	1/2	54	11	16	5/8	27	27	
	16	3	3/8	50	10	13	5/8	24	27	
		4	1/2	54	11	16	5/8	27	27	

Copper Pipe Fittings -External Thread End and Union End Connector - Elbow-



RoHS

DKLPT



Material: Brass

Part Number Type	D: Pipe Outer Dia.	T R (PT) Selection	T R (PT)	L1	Approx. L2	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKLPT	3	1	1/8	20	25	1/8	12	12	
		2	1/4	25	27	1/8	16	12	
	4	1	1/8	20	25	1/8	12	12	
		2	1/4	25	27	1/8	16	12	
	5	1	1/8	20	25	1/8	12	12	
		2	1/4	25	27	1/8	16	12	
	6	1	1/8	22	31	1/4	16	16	
		2	1/4	25	31	1/4	16	16	
		3	3/8	28	33	1/4	19	16	
	8	1	1/8	22	31	1/4	16	16	
		2	1/4	25	31	1/4	16	16	
		3	3/8	28	33	1/4	19	16	
	10	2	1/4	27	35	3/8	19	19	
		3	3/8	28	35	3/8	19	19	
		4	1/2	34	38	3/8	24	19	
	12	2	1/4	30	42	1/2	24	24	
		3	3/8	31	42	1/2	24	24	
		4	1/2	34	42	1/2	24	24	
	14	3	3/8	31	43	1/2	24	24	
		4	1/2	34	43	1/2	24	24	
	15	3	3/8	31	45	5/8	24	27	
		4	1/2	34	45	5/8	24	27	
	16	3	3/8	31	45	5/8	24	27	
		4	1/2	34	45	5/8	24	27	

Order Example: Part Number DKPT8 - T 2

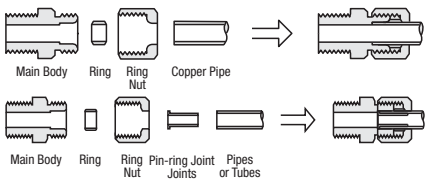
Days to Ship: 6 Days P.87

Price — **Volume Discount** (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example



- Pin-ring joint (P.1158) is available when thin metal pipes and hard tubes are used with copper pipe fittings.
- Set a ring nut and a ring in a joint pipe, insert the pipe into the main body all the way until the pipe end touches the pipe stopper and tighten the nut by hand. Afterwards use a wrench or a spanner for further tightening.
- As annealed copper pipes are soft, use fittings for annealing copper pipes (P.1160), instead of this Ring Type coupling.

Fitting Specifications

Applicable Fluid	Air · Water · Industrial Oil
Normal Operating Pressure	3.5MPa (35kgf/cm²)
Max. Operating Pressure	7.0MPa (70kgf/cm²)
Operation Temperature Range	-20 ~ 150°C (Not to be frozen)

Copper Pipe Fittings

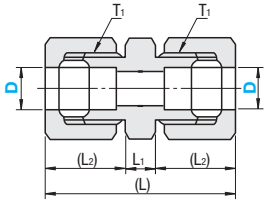
CAD Data

Copper Pipe Fittings -Unions-



RoHS

DKUS



Material: Brass

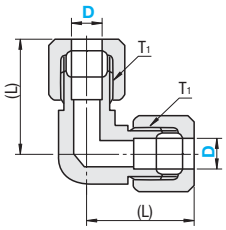
Part Number Type	D: Pipe Outer Dia.	(L)	L1	(L2)	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKUS	3	33	5	14.0	1/8	12	12	
	4	33	5	14.0	1/8	12	12	
	5	33	5	14.0	1/8	12	12	
	6	41	6	17.5	1/4	16	16	
	8	41	6	17.5	1/4	16	16	
	10	48	8	20.0	3/8	19	19	
	12	58	10	24.0	1/2	24	24	
	14	60	10	25.0	1/2	24	24	
	15	65	11	27.0	5/8	27	27	
	16	65	11	27.0	5/8	27	27	

Copper Pipe Fittings -90 Deg. Elbow with Union Connector-



RoHS

DKUE



Material: Brass

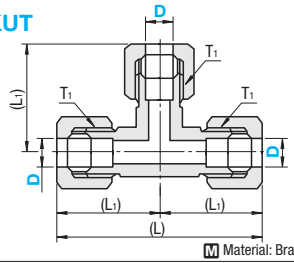
Part Number Type	D: Pipe Outer Dia.	(L)	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKUE	3	25	1/8	12	12	
	4	25	1/8	12	12	
	5	25	1/8	12	12	
	6	31	1/4	16	16	
	8	31	1/4	16	16	
	10	35	3/8	19	19	
	12	42	1/2	24	24	
	14	43	1/2	24	24	
	15	45	5/8	24	27	
	16	45	5/8	24	27	

Copper Pipe Fittings -Tee with 3 Union End Connector-



RoHS

DKUT



Material: Brass

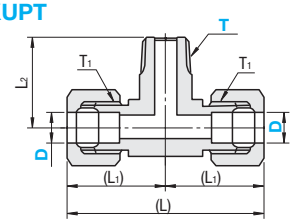
Part Number Type	D: Pipe Outer Dia.	(L)	(L1)	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKUT	3	50	25	1/8	12	12	
	4	50	25	1/8	12	12	
	5	50	25	1/8	12	12	
	6	62	31	1/4	16	16	
	8	62	31	1/4	16	16	
	10	70	35	3/8	19	19	
	12	84	42	1/2	24	24	

Copper Pipe Fittings -Tee with 2 Union End Connector-



RoHS

DKUPT



Material: Brass

Part Number Type	D: Pipe Outer Dia.	T R (PT) Selection	T R (PT)	(L)	(L1)	L2	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKUPT	4	1	1/8	50	25	20	1/8	12	12	
		2	1/4	54	27	25	1/8	16	12	
	5	1	1/8	50	25	20	1/8	12	12	
		2	1/4	54	27	25	1/8	16	12	
	6	1	1/8	62	31	22	1/4	16	16	
		2	1/4	62	31	25	1/4	16	16	
		3	3/8	66	33	28	1/4	19	16	
	8	1	1/8	62	31	22	1/4	16	16	
		2	1/4	62	31	25	1/4	16	16	
		3	3/8	66	33	28	1/4	19	16	
	10	2	1/4	70	35	27	3/8	19	19	
		3	3/8	70	35	28	3/8	19	19	
		4	1/2	76	38	34	3/8	24	19	
	12	3	3/8	84	42	31	1/2	24	24	
		4	1/2	84	42	34	1/2	24	24	

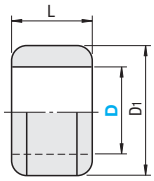
The PT thread size marked on Copper Hollow Fittings body might be different from actual size.

Copper Pipe Fittings -Gland Ring-



RoHS

DKRG



Material: Brass

Part Number Type	D: Hollow Outer Dia.	D1	L	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
DKRG	3	5	5		
	4	6	5		
	5	7	5.5		
	6	8.5	7		
	8	10.5	7.5		
	10	12.5	8.5		
	12	15	10		
	14	17	11		
	15	18	11.5		
	16	19	12		

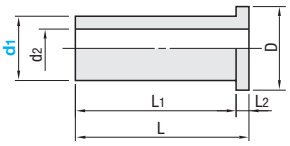
For orders larger than indicated quantity, please request a quotation.

Pin-ring Joint



RoHS

DKPRJ



Material: Brass

Part Number Type	d1	d2	D	L	L1	L2	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
DKPRJ	4	3.0	6.0	15.0	14.0	1.0		
	6	4.5	8.0	16.0	15.0	1.0		
	8	6.0	10.0	19.0	17.5	1.5		
	10	8.0	12.0	22.0	20.0	2.0		

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number - T

DKUS3

DKUPT8 - 2

Days to Ship

•DKUS · DKUE · DKUT · DKUPT · DKRG: 6 Days P.87

DKPRJ: 8 Days

Express A | 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

⊗DKRG · DKPRJ is not applicable to the volume discount rate.

Fitting Specifications

Applicable Fluid	Air · Water · Industrial Oil
Normal Operating Pressure	3.5MPa (35kgf/cm²)
Max. Operating Pressure	7.0MPa (70kgf/cm²)
Operation Temperature Range	-20 ~ 150°C (Not to be frozen)

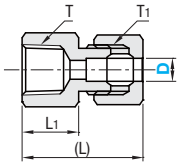
Fittings for Copper Pipes / Needle Valves for Copper Pipes

CAD Data

Copper Pipe Fittings -Coupling End and Union End Connector-

DKFR





RoHS

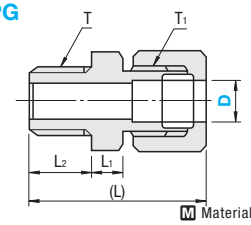
Material: Brass

Part Number Type	D: Pipe Outer Dia.	T R (PT)	(L)	L1	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKFR	3	1/8	26	12	1/8	14	12	
	4	1/8	26	12	1/8	14	12	
	5	1/8	26	12	1/8	14	12	
	6	1/4	33	15	1/4	17	16	
	8	1/4	33	15	1/4	17	16	
	10	3/8	39	19	3/8	22	19	
	12	1/2	46	22	1/2	27	24	

Copper Pipe Fittings -Male End and Union End Connector- (G Thread Type)

DKPG





RoHS

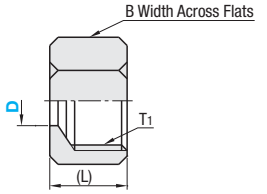
Material: Brass

Part Number Type	D: Pipe Outer Dia.	T G (PF)	(L)	L1	L2	T1 G (PF)	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKPG	3	1/8	25.5	5	6.5	1/8	12	12	
	4	1/8	25.5	5	6.5	1/8	12	12	
	5	1/8	25.5	5	6.5	1/8	12	12	
	6	1/4	32.5	6	8.5	1/4	16	16	
	8	1/4	32.5	6	8.5	1/4	16	16	
	10	3/8	38.0	8	10.0	3/8	19	19	
	12	1/2	46.0	10	12.0	1/2	24	24	

Copper Pipe Fittings -Ring Nut-

DKRGN





RoHS

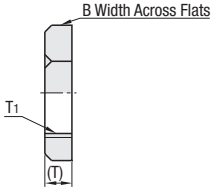
Material: Brass

Part Number Type	D: Pipe Outer Dia.	T1 G(PF)	(L)	B Width Across Flats	€ Unit Price
DKRGN	6	1/4	13	16	
	8	1/4	14	16	
	10	3/8	16	19	
	12	1/2	19.5	24	
	15	5/8	21	27	

Copper Pipe Fittings -Lock Nut-

DKRKN





RoHS

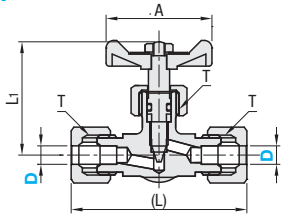
Material: Brass

Part Number Type	No.	T1 G(PF)	(T)	B Width Across Flats	€ Unit Price
DKRKN	1	1/8	4	12	
	2	1/4	5	16	
	3	3/8	6	19	
	4	1/2	7	24	

Needle Valves for Copper Pipe

DKVBN



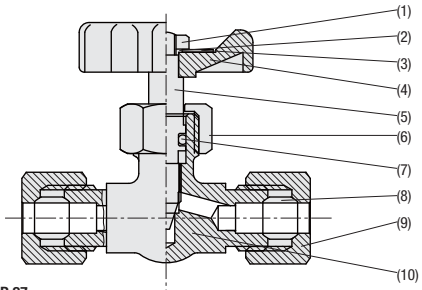


RoHS

Part Number Type	D: Pipe Outer Dia.	T G (PF)	A	(L)	L1	Opposite Side Body	Opposite Side Nuts	€ Unit Price
DKVBN	6	1/4	35	60	42	12	16	
	8	1/4	35	60	49	14	16	
	10	3/8	45	70	58	17	19	
	12	1/2	55	84	78	23	24	

DKVBN Parts and Materials

No.	Name of Parts	Material
(1)	Wheel Tightening Nut	Free-Cutting Brass
(2)	Washers	JIS G3506 JIS C43 ~
(3)	Rotation Regulator	JIS H4000 EN AW-1070/Al99,7
(4)	Handles	Aluminum Die Casting
(5)	Stem	Free-Cutting Brass
(6)	Gland Nut	Free-Cutting Brass
(7)	O-Ring	NBR
(8)	Ring	Free-Cutting Brass
(9)	Ring Nut	Free-Cutting Brass
(10)	Body	Forging Brass



Fitting Specifications

Applicable Fluid	Air / Water / Industrial Oil
Normal Operating Pressure	3.5MPa (35kgf/cm²)
Max. Operating Pressure	7.0MPa (70kgf/cm²)
Operation Temperature Range	-20 ~ 100°C (Not to be frozen)

Order Example Part Number: DKFR3, DKVBN8

Days to Ship

-DKRGN / DKRKN: 6 Days P. 87

-DKFR / DKPG / DKVBN: 8 Days

Express A 5,00 EUR/piece P. 88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Annealed Copper Pipes / Fittings for Annealed Copper Pipes

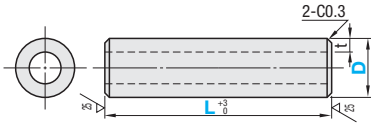
CAD Data

Annealed Copper Pipes

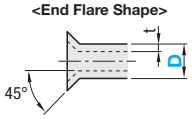


RoHS

DKEN
DKENF (End Flare Type)



<End Flare Shape>



■D Dimension Tolerance

D	Tolerance
3~6	±0.1
8 or 10	±0.2

DKENF End Flare Type is flared only at one end.

Material: Brass

Part Number Type	D	L Selection				t	DKEN € Unit Price L100	L200	L300	L500	DKENF € Unit Price L100	L200	L300	L500
DKEN DKENF	3	100	200	300		1								
	4													
	5													
	6	100	200	300	500									
	8													
	10													

DKEN is shipped unrolled and may arrive a little distorted.
When DKEN and Fitting for Annealed Copper Pipe are combined, expand the pipe end to 45° using the flare ring tool.

Order Example: Part Number DKEN8 - L 300

Days to Ship: 8 Days — Express A 2,00 EUR/ piece — P. 88

A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Serviceis not available for DKENF.

Price

■Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

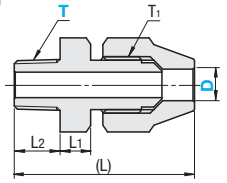
For orders larger than indicated quantity, please request a quotation.

Fittings for Annealed Copper Pipes -Straight-



RoHS

DKNT



Material: Brass

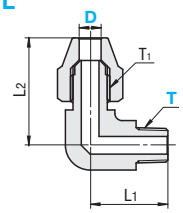
Part Number Type	D	T R (PT) Selection	T R (PT)	(L)	L1	L2	T1(UNF) Unify Fine Thread	Opposite Side Body	Nuts	€ Unit Price
DKNT	6	1	1/8	34	6	9	7/16-20UNF	16	17	
		2	1/4	37	6	12		16	17	
		3	3/8	40	8	13		19	17	
	8	1	1/8	35	6	9	1/2-20UNF	16	19	
		2	1/4	38	6	12		16	19	
		3	3/8	41	8	13		19	19	
	10	2	1/4	43	8	12	5/8-18UNF	19	22	
		3	3/8	44	8	13		19	22	
		4	1/2	49	10	16		22	22	

Fittings for Annealed Copper Pipes -Elbow-



RoHS

DKNTL



Material: Brass

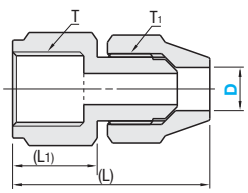
Part Number Type	D	T R (PT) Selection	T R (PT)	L1	Approx. L2	T1(UNF) Unify Fine Thread	Opposite Side Body	Nuts	€ Unit Price
DKNTL	6	1	1/8	22	32	7/16-20UNF	16	17	
		2	1/4	25	32		16	17	
		3	3/8	28	34		19	17	
	8	1	1/8	22	33	1/2-20UNF	16	19	
		2	1/4	25	33		16	19	
		3	3/8	28	35		19	19	
	10	2	1/4	27	38	5/8-18UNF	19	22	
		3	3/8	28	38		19	22	
		4	1/2	34	41		24	22	

Fittings for Annealed Copper Pipes -Female Connector (G Thread Type)-



RoHS

DKFGF



Material: Brass

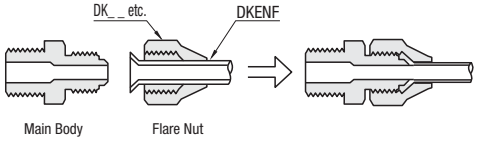
Part Number Type	D	T G (PF)	(L)	(L1)	T1(UNF) Unify Fine Thread	Opposite Side Body	Nuts	€ Unit Price
DKFGF	6	1/4	34	15	7/16-20UNF	17	17	
	8	1/4	35	15	1/2-20UNF	17	19	
	10	3/8	42	19	5/8-18UNF	22	22	

Specifications of Joints

Applicable Fluid	Air · Water · Industrial Oil
Normal Operating Pressure	3.5MPa (35kgf/cm²)
Max. Operating Pressure	7.0MPa (70kgf/cm²)
Operation Temperature Range	-20 ~ 150°C (Not to be frozen)

■Features Suitable for plumbing that requires air tightness such as refrigerant gas pipe.

Example



•Align the coupling body to the copper pipe, end to end, hand tighten the flare nut, then tighten it securely with using a wrench and adjustable spanner.

Order Example: Part Number DKNT8 - T 2

Days to Ship: 6 Days — P. 87

Price

■Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Stainless Steel Pipes / Stainless Steel Pipe Fittings

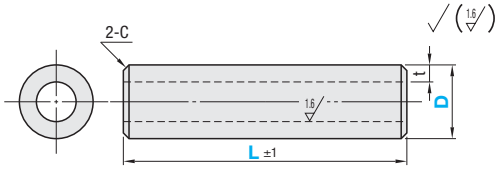
CAD Data

■Stainless Steel Pipes



RoHS

Type	Material	Standards	Annealing	Gloss
SKHR	1.4301/ X5CrNi18-10	JIS G3459	Atmospheric Annealing	Not provided
SKH			Bright Annealing (BA Pipe)	Provided
SKER	1.4401/ X5CrNiMo17-12-2		Atmospheric Annealing	Not provided
SKE			Bright Annealing (BA Pipe)	Provided



Values in ( ) are for t dimension of SKE.

D	t
4	1
6	1
6.35 (1/4 Inch)	1
8	1 (1.2)
9.53 (3/8 Inch)	1
10	1 (1.5)
12	1 (1.5)
12.7 (1/2 Inch)	1
16	1

Part Number Type	D	L 1mm Increment	€ Unit Price SKHR L20 ~100	SKHR L101 ~200	SKHR L201 ~300	SKHR L301 ~400	SKHR L401 ~500	SKH L20 ~100	SKH L101 ~200	SKH L201 ~300	SKH L301 ~400	SKH L401 ~500	SKER L20 ~100	SKER L101 ~200	SKER L201 ~300	SKER L301 ~400	SKER L401 ~500	SKE L20 ~100	SKE L101 ~200	SKE L201 ~300	SKE L301 ~400	SKE L401 ~500
SKHR SKH SKER SKE	4	20~500																				
	6																					
	6.35 (1/4 Inch)																					
	8																					
	9.53 (3/8 Inch)																					
	10																					
	12																					
	12.7 (1/2 Inch)																					
	16																					

Order Example: Part Number SKE10 - L 300

Days to Ship: 8 Days

Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~29	30~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Refer to P.1164 for tightening procedure and structure of joint portion, applicable pipe specification.

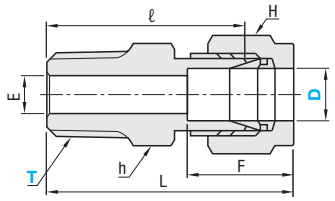
■Stainless Steel Pipe Fittings

-Connector-



RoHS

SKTGK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	R (PT) T Selection	T R (PT)	L	E	F	ℓ	Opposite Side Body h	Opposite Side Nut H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKTGK	4	1	1/8	35.8	3.5	15.3	28.5	14	14		
		2	1/4	37.8	3.5	15.3	30.5	14	14		
	6	1	1/8	35.9	5	15.4	28.5	14	14		
		2	1/4	37.9	5	15.4	30.5	14	14		
		3	3/8	38.9	5	15.4	31.5	17	14		
		4	1/2	44.4	5	15.4	37	22	14		
	6.35 (1/4)	1	1/8	35.9	5	15.4	28.5	14	14		
		2	1/4	37.9	5	15.4	30.5	14	14		
		3	3/8	38.9	5	15.4	31.5	17	14		
	8	1	1/8	36.8	5	16.8	29	14	15.9		
		2	1/4	38.8	6	16.8	31	14	15.9		
		3	3/8	39.8	6	16.8	32	17	15.9		
		4	1/2	45.3	6	16.8	37.5	22	15.9		
	9.53 (3/8)	2	1/4	39.8	7	17.8	32	17	19		
		3	3/8	40.8	7.5	17.8	33	17	19		
		4	1/2	46.3	7.5	17.8	38.5	22	19		
	10	2	1/4	39.8	7	17.8	32	17	19		
		3	3/8	40.8	8	17.8	33	17	19		
		4	1/2	46.3	8	17.8	38.5	22	19		
	12	2	1/4	42.8	7	22.8	32	22	23		
		3	3/8	43.8	9	22.8	33	22	23		
		4	1/2	49.3	10	22.8	38.5	22	23		
	12.7 (1/2)	2	1/4	42.8	7	22.8	32	22	23		
		3	3/8	43.8	9	22.8	33	22	23		
		4	1/2	49.3	10	22.8	38.5	22	23		

L and F are dimensions for hand clamping.

Values in ( ) for D dimension are by inch.

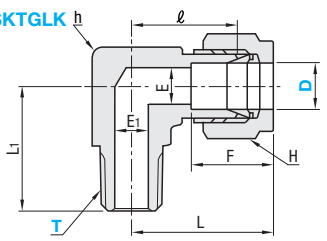
■Stainless Steel Pipe Fittings

-Elbow-



RoHS

SKTGLK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	R (PT) T Selection	T R (PT)	L	L1	E	E1	F	ℓ	Opposite Side Body h	Opposite Side Nut H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKTGLK	4	1	1/8	27.8	22	3.5	5	15.3	20.5	14	14		
		2	1/4	27.8	24	3.5	5	15.3	20.5	14	14		
	6	1	1/8	27.9	22	5	5	15.4	20.5	14	14		
		2	1/4	27.9	24	5	5	15.4	20.5	14	14		
		3	3/8	28.9	27	5	5	15.4	21.5	17	14		
		4	1/2	30.9	35	5	5	15.4	23.5	22	14		
	6.35 (1/4)	1	1/8	27.9	22	5	5	15.4	20.5	14	14		
		2	1/4	27.9	24	5	5	15.4	20.5	14	14		
		3	3/8	28.9	27	5	5	15.4	21.5	17	14		
	8	1	1/8	28.8	22	5	5	16.8	21	14	15.9		
		2	1/4	28.8	24	6	6	16.8	21	14	15.9		
		3	3/8	29.8	27	6	6	16.8	22	17	15.9		
		4	1/2	31.8	35	6	6	16.8	24	22	15.9		
	9.53 (3/8)	2	1/4	30.8	27	7.5	7	17.8	23	17	19		
		3	3/8	30.8	27	7.5	8	17.8	23	17	19		
		4	1/2	32.8	35	7.5	8	17.8	25	22	19		
	10	2	1/4	30.8	27	7	7	17.8	23	17	19		
		3	3/8	30.8	27	8	8	17.8	23	17	19		
		4	1/2	32.8	35	8	8	17.8	25	22	19		
	12	2	1/4	35.8	28	7	7	22.8	25	22	23		
		3	3/8	35.8	30	9	9	22.8	25	22	23		
		4	1/2	35.8	35	10	10	22.8	25	22	23		
	12.7 (1/2)	2	1/4	35.1	28	10	7	22.8	25	22	23		
		3	3/8	35.1	30	10	9	22.8	25	22	23		
		4	1/2	35.1	35	10	10	22.8	25	22	23		

L and F are dimensions for hand clamping.

Values in ( ) for D dimension are by inch.

Order Example: Part Number SKTGK6 - T 3; SKTGLK9.53 - 4

Days to Ship: 6 Days P.87

Stainless Steel Pipe Fittings

CAD Data

■ Refer to **P.1164** for tightening procedure and structure of joint portion, applicable pipe specification.

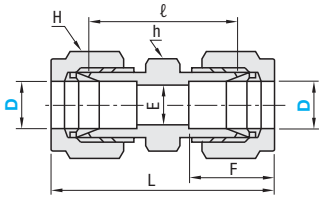
■Stainless Steel Pipe Fittings

-Unions-



RoHS

SKUSK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	L	E	F	ℓ	Opposite Side Body h	Nut H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKUSK	4	42.6	3.5	15.3	28	14	14		
	6	42.8	5	15.4	28	14	14		
	6.35 (1/4)	42.8	5	15.4	28	14	14		
	8	44.6	6	16.8	29	14	15.87		
	9.53 (3/8)	46.6	8	17.8	31	17	19		
	10	46.6	8	17.8	31	17	19		
	12	52.6	10	22.8	31	22	23		
	12.7 (1/2)	52.6	10	22.8	31	22	23		

Ⓥ L and F are dimensions for hand clamping.
Ⓥ Values in ( ) for D dimension are by inch.

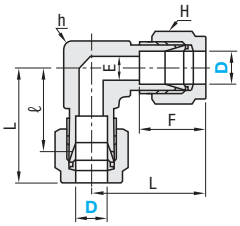
■Stainless Steel Pipe Fittings

-Union Elbow-



RoHS

SKUEK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	L	E	F	ℓ	Opposite Side Body h	Nut H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKUEK	4	27.8	3.5	15.3	20.5	14	14		
	6	27.9	5	15.4	20.5	14	14		
	6.35 (1/4)	27.9	5	15.4	20.5	14	14		
	8	28.8	6	16.8	21	14	15.87		
	9.53 (3/8)	30.8	8	17.8	23	17	19		
	10	30.8	8	17.8	23	17	19		
	12	34.8	10	22.8	24	22	23		
	12.7 (1/2)	34.8	10	22.8	24	22	23		

Ⓥ L and F are dimensions for hand clamping.
Ⓥ Values in ( ) for D dimension are by inch.

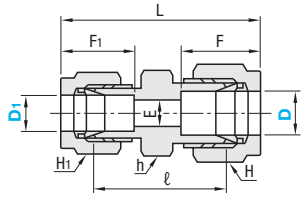
■Stainless Steel Pipe Fittings

-Stepped Union-



RoHS

SKUSDK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	D1	L	E	F	F1	ℓ	Opposite Side Body h	Nut H	Nut H1	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKUSDK	6	4	42.7	3.5	15.4	15.3	28	14	14	14		
	8	4	43.6	3.5	16.8	15.3	28.5	14	15.87	14		
		6	43.7	5	16.8	15.4	28.5	14	15.87	14		
	9.53 (3/8)	6.35 (1/4)	44.7	5	17.8	15.4	29.5	17	19	14		
	10	6	44.7	5	17.8	15.4	29.5	17	19	14		
		8	45.6	6	17.8	16.8	30	17	19	15.87		
	12	6	47.7	5	22.8	15.4	29.5	22	23	14		
		10	49.6	8	22.8	17.8	31	22	23	19		
	12.7 (1/2)	6.35 (1/4)	47.7	5	22.8	15.4	29.5	22	23	14		

Ⓥ L and F are dimensions for hand clamping.
Ⓥ Values in ( ) for D dimension / D_1 are by inch.

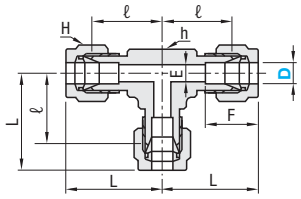
■Stainless Steel Pipe Fittings

-Union Tee-



RoHS

SKUTK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	L	E	F	ℓ	Opposite Side Body h	Nut H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKUTK	4	27.8	3.5	15.3	20.5	14	14		
	6	27.9	5	15.4	20.5	14	14		
	6.35 (1/4)	27.9	5	15.4	20.5	14	14		
	8	29.4	6	16.8	22	14	15.87		
	9.53 (3/8)	30.8	8	17.8	23	17	19		
	10	30.8	8	17.8	23	17	19		
	12	38.3	10	22.8	27.5	22	23		
	12.7 (1/2)	38.3	10	22.8	27.5	22	23		

Ⓥ L and F are dimensions for hand clamping.
Ⓥ Values in ( ) for D dimension are by inch.

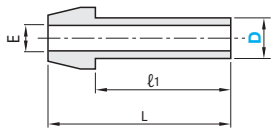
■Stainless Steel Pipe Fittings

-Port Connector-



RoHS

SKPCK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	L	E	ℓ1	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKPCK	4	26	2.5	19		
	6	27	4	20		
	6.35 (1/4)	27	4.8	20		
	8	28	6.4	21		
	9.53 (3/8)	29	7.6	22		
	10	29	8	22		
	12	37	9.5	26.7		
	12.7 (1/2)	37	9.9	26.7		

Ⓥ Values in ( ) for D dimension are by inch.

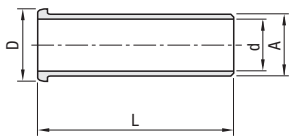
■Stainless Steel Pipe Fittings

-Tube Insert-



RoHS

SKITK



Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	Tube Outer Dia. (mm)	D	A	d	L	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~
SKITK	4	4	2	1.0	18		
	6	5.6	4	3.0	18		
	8	7	6	4.8	19		
	10	9	8	6.5	20		
	12	11	10	8	25		

Ⓥ Insert SKITK into Tubes for plumbing Fluororesin Tubes with Fittings for Stainless Steel Hollows.

Order Example

Part Number	-	D1
SKUSK6		
SKUSDK12.7	-	6.35

Days to Ship

6 Days ☞ P.87

Stainless Steel Pipe Fittings

CAD Data

■ Old product standards the "Fittings for stainless steel pipes" has been moved to our web product listings.

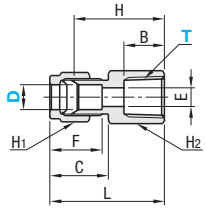
Refer to **P.1164** for tightening procedure and structure of joint portion, applicable pipe specification.

■Stainless Steel Pipe Fittings -Female Union-



RoHS

SKUF



M Material: 1.4401/X5CrNiMo17-12-2

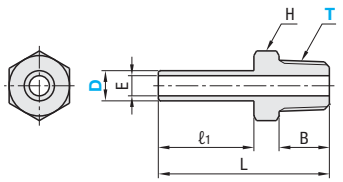
Part Number Type	D	R (PT) T Selection	T Rc (PT)	L	B	C	F	E	H	Opposite Side H1	Opposite Side H2	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKUF	4	1	1/8	34.8	11	17.8	15.3	3.5	27.5	14	14		
		2	1/4	35.8	13	17.8	15.3	3.5	28.5	14	17		
	6	1	1/8	34.9	11	17.9	15.4	5	27.5	14	14		
		2	1/4	35.9	13	17.9	15.4	5	28.5	14	17		
		3	3/8	37.9	14	17.9	15.4	5	30.5	14	22		
	8	2	1/4	36.8	13	18.8	16.8	6	29	15.87	17		
		3	3/8	38.8	14	18.8	16.8	6	31	15.87	22		
	10	2	1/4	37.8	13	19.8	17.8	8	30	19	17		
		3	3/8	39.8	14	19.8	17.8	8	32	19	22		
	12	3	3/8	42.8	14	22.8	22.8	10	32	23	22		

■Stainless Steel Pipe Fittings -Male Adapter-



RoHS

SKMA



M Material: 1.4401/X5CrNiMo17-12-2

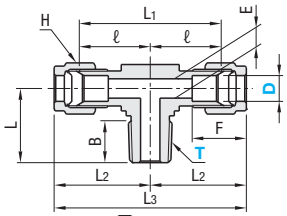
Part Number Type	D	R (PT) T Selection	R R (PT)	L	E	B	ℓ1	H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKMA	4	1	1/8	30.5	2.5	9	18	10		
	6	1	1/8	34	3	10	19	12		
		2	1/4	39	3	13	19	14		
	8	1	1/8	34	6	10	19	14		
		2	1/4	34	6	12	18	14		
		3	3/8	40	6	14	19	17		
	10	2	1/4	44	8	13	24	14		
		3	3/8	45	8	14	24	17		
	12	3	3/8	49	10	14	28	17		

■Stainless Steel Pipe Fittings -Male Branch Tee-



RoHS

SKUTM



M Material: 1.4401/X5CrNiMo17-12-2

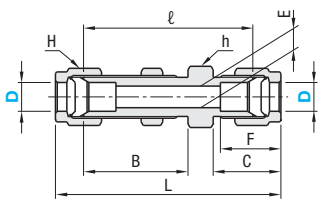
Part Number Type	D	R (PT) T Selection	T R (PT)	L	L1	L2	L3	ℓ	B	F	E	H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKUTM	4	1	1/8	21	41	27.8	55.6	20.5	11	15.3	3.5	14		
	6	1	1/8	21	41	27.9	55.8	20.5	11	15.4	5	14		
		2	1/4	23	43	28.9	57.8	21.5	13	15.4	5	14		
	8	1	1/8	22	44	29.8	59.6	22	11	16.8	5	15.87		
		2	1/4	23	44	29.8	59.6	22	13	16.8	6	15.87		
	10	2	1/4	25	46	30.8	61.6	23	13	17.8	7	19		
	12	3	3/8	30	55	38.3	76.6	27.5	14	22.8	9	23		

■Stainless Steel Pipe Fittings -Union for partition-



RoHS

SKUWE



M Material: 1.4401/X5CrNiMo17-12-2

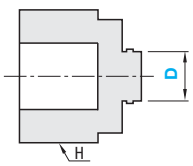
Part Number Type	D	L	B	C	F	E	h	H	ℓ	Installation Hole Dia.	Max. plate thickness for installation	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKUWE	4	59.6	28	17.8	15.3	3.5	17	14	45	11.5	13		
	6	59.8	28	17.9	15.4	5	17	14	45	11.5	13		
	8	62.6	29	18.8	16.8	6	17	15.87	47	13.2	13.5		
	10	64.6	30	19.8	17.8	8	22	19	49	16.2	14.5		
	12	73.6	32	22.8	22.8	10	26	23	52	19.5	16		

■Stainless Steel Pipe Fittings -Plug-



RoHS

SKPGK

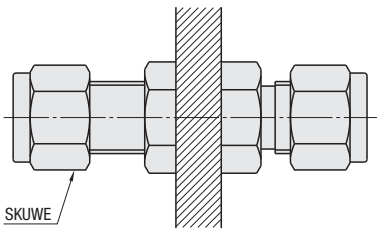


Select D dimension same as that of stainless steel pipe fittings.

M Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	D	Opposite Side Nut H	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SKPGK	4	14		
	6	14		
	6.35 (1/4 Inch)	14		
	8	15.87		
	9.53 (3/8 Inch)	19		
	10	19		
	12	23		
	12.7 (1/2 Inch)	23		

Example



Order Example

Part Number	-	T
SKUF4 SKUWE6	-	2

Days to Ship

6 Days

P. 87

Stainless Steel Pipe Fittings

CAD Data

■Unable to use in combination with products of old part numbers.

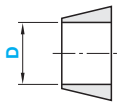
■Stainless Steel Pipe Fittings -Ferrule Pack-



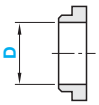
RoHS

SKFPK

Front Ferrule



Back Ferrule

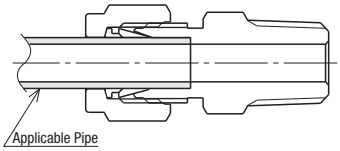


*Front and back ferrules come in a set of one each.

M Material: 1.4401/X5CrNiMo17-12-2

■Features and Structure of Fittings

A stainless steel pipe fitting is composed of a body, a front ferrule, a back ferrule and a nut.
Operating temperature range of Stainless Steel Hollow Fitting is -196~600°C.



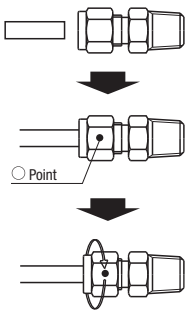
Components Figure

Part Number		€ Unit Price	Volume Discount
Type	D	1~9 Pkgs.	10 Pkgs.~
SKFPK	4		
	6		
	6.35 (1/4 Inch)		
	8		
	9.53 (3/8 Inch)		
	10		
	12		
	12.7 (1/2 Inch)		

■Allowable Operating Pressure by Thickness of Stainless Steel Pipe (MPa)

Pipe Outer Dia. (mm)	Thickness (mm)			
	0.5	1.0	1.5	2.0
4	36.1	77.1	-	-
6	-	49.5	77.1	-
8	-	36.1	56.4	-
10	-	28.1	44.0	-
12	-	23.2	36.1	49.5

■Tightening procedure of joints



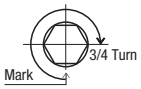
(1)Insert the pipe into the fitting till the tip hits the shoulder inside without removing the nut.

(2)Hand start and tighten the nut in till the end of its rotation. Put a mark on this position as ○ Point.

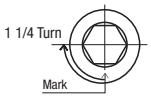
(3)Fix the fitting body firmly with a screw wrench etc. and tighten the nut with another screw wrench by the rotation number on the right.

Note:For plastic tube connections, use Insert (SKITK) for tubes together without fail and tighten Ø4~Ø12.7 tubes by 1 1/4~1 1/2 rotations.

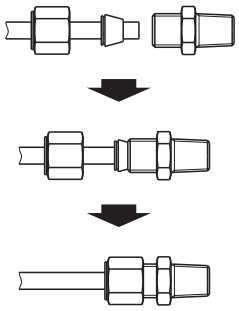
Ø4 Model



Ø6~Ø12.7 Model



■How to Tighten after Removing



(1)Be sure to confirm the position of the nut (the standard position for rotation) before loosening it to remove the nut.
Make sure that front ferrule is applied at the appropriate position.
Make sure that there is no foreign object on the tapered surface, front and rear of the body.

(2)Insert the pipe all the way until the front ferrule contacts closely, and then tighten the nut by hand.
(Insert carefully to prevent the pipe end from damaging the tapered part on the main body.

(3)Tighten with a little more rotation than before by a wrench.



Position before tighten the nut



Position of retightening
(Tighten with a little more rotation)

[Applicable Pipe Specification]
- Applicable Type of Pipe: Stainless Steel Pipe
  Stainless steel pipes for plumbing (JIS G3459) subject to 1.4301/X5CrNi18-10 and 1.4401/X5CrNiMo17-12-2 for stainless steel pipes.
- Outer Diameter Tolerance ±0.05mm - Pipe Surface Hardness HV190 or less (HRB90 or Less)
- Condition of Pipe Surface: Avoid using pipes with defects such as surface roughness and scratches.

Pipe Outer Dia. (mm)	Thickness (mm)		
	1.0	1.5	2.0
6.35 (1/4 Inch)	46.4	72.6	-
9.53 (3/8 Inch)	29.8	46.4	-
12.7 (1/2 Inch)	21.8	33.8	46.4

Order Example

Part Number
SKFPK12.7

Days to Ship

6 Days

P. 87

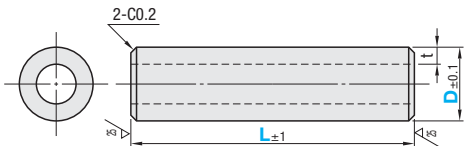
Steel Pipe for Hydraulics / Swaging Sleeve Type Fittings for Hydraulics

■Steel Pipe for Hydraulics

RoHS

OST





M Material: OST-2 (STPS-2 (JIS B2351))

Part Number Type	D	L 1mm Increment	t	€ Unit Price Qty. 1~4 L20~250	L251~500	L501~750	L751~1000	L1001~1500
OST	6	20~1500	1.0					
	8		1.0					
	10		1.2					
	12		1.5					

Order Example Part Number OST8 - L 250

Days to Ship 8 Days — Express A 2,00 EUR/piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

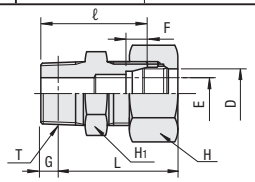
Quantity	1~4	5~9	10~19	20~49
Rate	Price List	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

■Swage Sleeve Type Fittings for Hydraulics -Connector-

RoHS

Type	M Material	S Surface Treatment
KTGS	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-



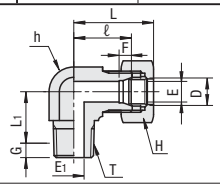
Part Number Type	No	Applicable Pipe Outer Diameter D	T R (PT)	E	Reference Diameter G	When tightening by hand Approx. L	Hexagon Opposite Side H1	Hexagon Opposite Side H	F	ℓ	€ Unit Price Qty. 1~9	Qty. 10~
KTGS	6-1	6	1/8	4	3.97	34.5	14	14	7	28		
	6-2	6	1/4	4	6.01	37.5	17	14	7	33		
	8-1	8	1/8	4	3.97	35.5	17	17	7	29		
	8-2	8	1/4	6	6.01	37.5	17	17	7	33		
	10-2	10	1/4	7	6.01	38.5	17	19	7	33		
	10-3	10	3/8	8	6.35	39.0	19	19	7	34		
	12-2	12	1/4	7	6.01	38.5	19	22	7	33		
	6A-2	10.5	1/4	7	6.01	34.5	17	19	7	33		
	8A-3	13.8	3/8	9	6.35	40	22	24	7.5	37		
	10A-4	17.3	1/2	12	8.16	44.5	27	32	8	41		
	15A-6	21.7	3/4	16	9.53	48	32	36	9	45		

Use No.6A · 8A · 10A · 15A with the same No. of SUT_, STPG_ (**P.1125**).
No. 8 · 10 · 12 has approx. 1.4mm protrusion for improving pressure resistance.

■Swage Sleeve Type Fittings for Hydraulics -Elbow Nipples-

RoHS

Type	M Material	S Surface Treatment
KTGE	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-



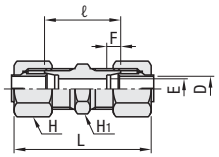
Part Number Type	No	Applicable Pipe Outer Diameter D	T R (PT)	E	E1	Reference Diameter G	When tightening by hand Approx. L	L1	Width across flats h	Hexagon Opposite Side H	F	ℓ	€ Unit Price Qty. 1~9	Qty. 10~
KTGE	6-1	6	1/8	4	4	3.97	30.5	14	14	14	7	20		
	6-2	6	1/4	4	7	6.01	33.5	17	17	14	7	23		
	8-1	8	1/8	6	4	3.97	33.5	16	17	17	7	23		
	8-2	8	1/4	6	7	6.01	33.5	18	17	17	7	23		
	10-2	10	1/4	8	7	6.01	34.5	19	17	19	7	23		
	10-3	10	3/8	8	9	6.35	35.5	19.5	19	19	7	24		
	12-2	12	1/4	10	7	6.01	35.5	20.5	19	22	7	24		
	6A-2	10.5	1/4	8	7	6.01	34.5	19	17	19	7	23		
	8A-3	13.8	3/8	11	9	6.35	40	22.5	22	24	7.5	28		
	10A-4	17.3	1/2	14	12	8.16	44.5	30	27	32	8	32		
	15A-6	21.7	3/4	18	16	9.53	46.5	32.5	32	36	9	34		

Use No.6A · 8A · 10A · 15A with the same No. of SUT_, STPG_ (**P.1125**).
No. 8 · 10 · 12 has approx. 1.4mm protrusion for improving pressure resistance.

■Swage Sleeve Type Fittings for Hydraulics -Unions-

RoHS

Type	M Material	S Surface Treatment
KTGR	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-

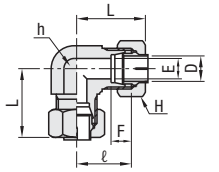


Part Number Type	No	Applicable Pipe Outer Diameter D	E	Hexagon Opposite Side H1	Hexagon Opposite Side H	F	ℓ	When tightening by hand Approx. L	€ Unit Price Qty. 1~9	Qty. 10~
KTGR	6	6	4	14	14	7	30	51		
	8	8	6	17	17	7	31	52		
	10	10	8	17	19	7	31	54		
	12	12	10	19	22	7	31	54		

■Swage Sleeve Type Fittings for Hydraulics -Elbow-

RoHS

Type	M Material	S Surface Treatment
KTGLB	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-

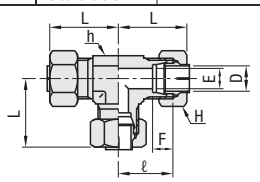


Part Number Type	No	Applicable Pipe Outer Diameter D	E	Width across flats h	Hexagon Opposite Side H	F	ℓ	When tightening by hand Approx. L	€ Unit Price Qty. 1~9	Qty. 10~
KTGLB	6	6	4	14	14	7	20	30.5		
	8	8	6	17	17	7	23	33.5		
	10	10	8	17	19	7	23	34.5		
	12	12	10	19	22	7	24	35.5		

■Swage Sleeve Type Fittings for Hydraulics -Tees-

RoHS

Type	M Material	S Surface Treatment
KTGTE	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-



Part Number Type	No.	Applicable Pipe Outer Diameter D	E	Width across flats h	Hexagon Opposite Side H	F	ℓ	When tightening by hand Approx. L	€ Unit Price Qty. 1~9	Qty. 10~
KTGTE	6	6	4	14	14	7	20	30.5		
	8	8	6	17	17	7	23	33.5		
	10	10	8	17	19	7	23	34.5		
	12	12	10	19	22	7	24	35.5		

Price Reduction
Up to 33%

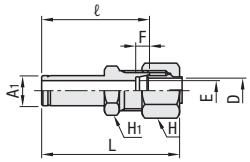
CAD Data

■Swage Sleeve Type Fittings for Hydraulics
-Reducers-



RoHS

Type	Material	Surface Treatment
KTGRE	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-



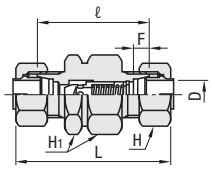
Part Number Type	No.	Applicable Nominal Diameter of Joint A1	Applicable Pipe Outer Diameter D	E	Hexagon Opposite Side H1	Hexagon Opposite Side H	F	ℓ	When tightening by hand Approx. L	€ Unit Price Qty. 1~9	€ Unit Price Qty. 10~
KTGRE	8-6	8	6	4	14	14	7	39	49.5		
	10-6	10	6	4	14	14	7	40	50.5		
	10-8	10	8	6	17	17	7	40	50.5		
	12-6	12	6	4	14	14	7	41	51.5		
	12-8	12	8	6	17	17	7	41	51.5		
	12-10	12	10	8	17	19	7	41	52.5		

■Swage Sleeve Type Fittings for Hydraulics
-Check Union-



RoHS

Type	Material	Surface Treatment
KTGZR	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-



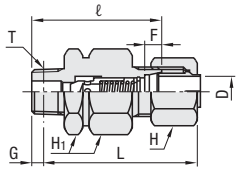
Part Number Type	No.	Applicable Pipe Outer Diameter D	Rating Flow ℓ/min	Cracking Pressure Mpa	Hexagon Opposite Side H1	Hexagon Opposite Side H	F	ℓ	When tightening by hand Approx. L	€ Unit Price Qty. 1~9	€ Unit Price Qty. 10~
KTGZR	10-05	10	18	0.05	24	19	7	49	72		
	10-45			0.45							
	12-05	12	18	0.05	24	22	7	51	74		
	12-45			0.45							

■Swage Sleeve Type Fittings for Hydraulics
-Check Connector-



RoHS

Type	Material	Surface Treatment
KTGZC	Body, Nut: 1.1158/C25E	Trivalent Chromate
	Sleeve: JIS STKM	-



Part Number Type	No.	Applicable Pipe Outer Diameter D	Rating Flow ℓ/min	Cracking Pressure Mpa	T R (PT)	Position of Gauge Dia. G	Hexagon Opposite Side H1	Hexagon Opposite Side H	F	ℓ	When tightening by hand Approx. L	€ Unit Price Qty. 1~9	€ Unit Price Qty. 10~
KTGZC	10-05	10	18	0.05	1/4	6.01	24	19	7	53	58.5		
	10-45			0.45									
	12-05	12	18	0.05	3/8	6.35	24	22	7	55	60		
	12-45			0.45									

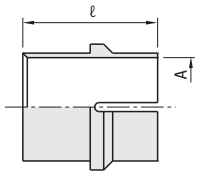
■**Features of KTGZR and KTGZC**: Fitting with a built-in reverse flow prevention structure

■Swage Sleeve Type Fittings for Hydraulics
-Sleeve-



RoHS

Type	Material	Surface Treatment
KTGSL	Carbon steel	Trivalent Chromate



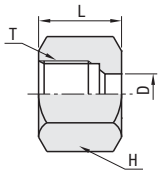
Part Number Type	No.	A	ℓ	€ Unit Price Qty. 1~9	€ Unit Price Qty. 10~
KTGSL	6	6	14		
	8	8	14		
	10	10	15		
	12	12	15		

■Swage Sleeve Type Fittings for Hydraulics
-Nuts-



RoHS

Type	Material	Surface Treatment
KTGNT	1.1158/C25E	Trivalent Chromate



Part Number Type	No.	D	T	H Hexagon Opposite Side	L	€ Unit Price Qty. 1~9	€ Unit Price Qty. 10~
KTGNT	6	7.3	M10x1.25	14	15		
	8	9.3	M14x1.5	17	15		
	10	11.3	M16x1.5	19	16		
	12	13.3	M18x1.5	22	16		

Order Example — Part Number: KTGS8-1, KTGR6

Days to Ship: 6 Days P.87

Structure and Tightening Procedure of Swaging Sleeve Type Fittings

Swaging Sleeve Type Fittings are composed of a body, a sleeve and a nut.

[Tightening Procedure]

For utilizing performance of Swaging Sleeve Type Fittings for steel pipe, use of appropriate pipe and accurate tightening of joint are required. The following pre-tightening will make plumbing smooth and secure.

(1) Pre-tightening

(1)Insert the pipe with nut and sleeve inserted as shown in right figure into the fitting body. Make sure that pipe end contacts abutment part. Inadequate swaging due to the inadequate tightening may cause the pipe to pull out.

(2) Tighten the nut by hand.

(3)Tighten the nut with a wrench while rotating the pipe to the end of its rotation. Put a mark on this position of joint body and the nut.

(4)Further tighten the nut by a wrench with1-1/4 turn at this mark.

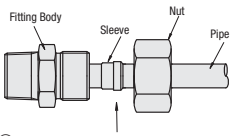
(5)Loosen the nut once to see the state of the sleeve in order to confirm the following.

1) There is some millimeter distance between pipe end and sleeve end.

2)No substantial movement of the sleeve toward the direction of pipe axis is allowable. Moving toward circumferential direction is acceptable.

(2) Full Tightening

Attach the pre-tightened pipe with joint body and tighten the nut by a wrench until you feel sudden resistance. Further tighten the nut by 1/4 turn, and tightening will be done.



Make sure that the tapered end of the sleeve is facing fitting body.
If inserted backwards, pipe will not be properly swaged and may pull-off.

[Standard Specifications]

Applicable Pipe Diameter		Pressure Rating	Operating Temp.
8mm	8	50MPa≈500kgf/cm²	-20°C~250°C
6A	10.5		
10 or 12mm	10 or 12		
8A	13.8		
10A	17.3	40MPa≈400kgf/cm²	
15A	21.7		

■Specifications (KTGZR / KTGZC)

Applicable Fluid Hydraulic Operation Oil
Rated Pressure 3MPa
Operating Temp. -20 ~120°C

[Applicable Pipes]

(1) 1.0254/S235 G 3454 JIS STKM Hollow for Pressure Service 1.0254/S235
(2) JIS G 3454 STKM Hollow for High Pressure Service 1.0305/P235G1TH
(3) 1.0305/P235G1TH G 3456 JIS STKM Hollow for High Temperature Service 1.0305/P235G1TH
(4) 1.4401/X5CrNiMo17-12-2 G 3459 Stainless steel pipes for plumbing 1.4301/X5CrNi18-10 and 1.4401/X5CrNiMo17-12-2
(5) Japan Fluid Power Association Standard JOHS-102

Accurate JIS STKM Hollows for Hydraulics OST

[Disassembly · Retightening]

-Can be disassembled just by loosening the nut. However, never tighten and loosen the nut while pressurized as it is very dangerous.

-8 or more disassemblies and retightening are possible by following the Full Tightening Procedure as shown in (2).

Hydraulic Hose · Flexible Hoses
-Overview-

■Hydraulic Hoses Specification Chart

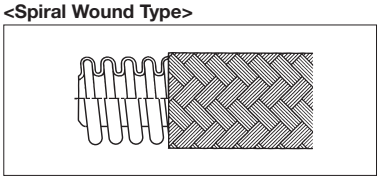
		HOS_	HOKT	HOM_
		Hydraulic Rubber Hoses Standard Type	Hydraulic Rubber Hoses Quick Swage Type	Hydraulic Resin Hoses Standard Type
		P.1169	P.1170	P.1171
Type				
Operating Pressure		7.0MPa 14.0MPa 20.6MPa	10.3~20.7MPa (Depends on size.)	13.5~20.6MPa (Depends on size.)
Operation Temperature Range		-40 ~ 100°C	-40 ~ 93°C	-40 ~ 100°C (60°C for water)
Applicable Fluid		General Hydraulic Oil	General Hydraulic Oil	General Hydraulic Oil – Water
Material Shapes	Hose Body	Synthetic Rubber Reinforcement: Hard Steel Wire	Weather Resistant Synthetic Rubber Reinforcement: Wire Braid : Spiral Wires	Polyester Elastomer Reinforcement: Polyester Fiber
Material Shapes	Swaging Parts	1.1158/C25E / 1.4301/X5CrNi18-10	1.1158/C25E	1.1158/C25E
Features		-Excels in flexibility, durability and abrasion resistance, and can be laid in a space-saving. -Usable in a wide temperature range.	-Length can be determined based on applications, and assembled. For assembly process,refer to **P.1170**	-Lightweight and excels in flexibility and durability. -Reduces the generation of kinks and can be laid in narrow spaces.

■Flexible Hose Specifications Chart

		HOSLTR	HOEMF/HOEMFG	HOELF/HOELFS	HOEJF/HOEJFS
		High Pressure Type	Medium Pressure Type	Low Pressure (Non-Welded) Type	Low Pressure (Non-Welded) Type
		P.1172	P.1172	P.1173	P.1173
Type					
Operating Pressure		3.4~6.4MPa (Depends on size.)	2.0MPa	1.0MPa	1.0MPa
Operation Temperature Range		-50 ~ 280°C	0 ~ 200°C	0 ~ 100°C	0 ~ 100°C
Applicable Fluid		High Pressure Steam · Air · Gas · Water · Oil	Steam · Air · Gas · Water · Oil	Steam · Air · Gas · Water · Oil	Steam · Air · Gas · Water · Oil
Material Shapes	Hose / Braid	1.4301/X5CrNi18-10 Spiral Wound Type	1.4301/X5CrNi18-10 Spiral Wound Type	1.4301/X5CrNi18-10 Annular Type	1.4301/X5CrNi18-10 Spiral Wound Type
Material Shapes	Swaging Parts	1.4301/X5CrNi18-10 Hose Adapter	1.0038/S235JR / 1.4301/X5CrNi18-10 Hose Adapters	JIS FCMB / 1.4301/X5CrNi18-10 Union Joint	1.0038/S235JR / 1.4301/X5CrNi18-10 Hose Adapters
Usage		-Plumbing in high ambient temperature (for steam etc.) -Absorbs variation in elongation of pipe due to temperature change. -Plumbing that utilizes the benefit of zero penetration leakages.	-General purpose plumbing with misalignment prevention. -Thermal expansion absorption.	-General purpose plumbing with misalignment prevention. -Equipment that require flexibility. (Reciprocating Motion - Thermal Expansion Absorbing)	-General purpose plumbing with misalignment prevention. -Thermal expansion absorption.
Features		-Excellent in pressure · heat and chemical resistance. -Suitable for carrying a variety of fluids · such as high-pressure steam · air · gas · water · oil · gasoline and chemicals.	-Lightweight compared to High Pressure Type. -Positive Metal Seating Type which requires no maintenance. -Excellent in flexibility.	-Excellent in corrosion resistance · as joint of fittings is not welded. -Superior in heat and pressure resistance · anti-vibration property and has high flexibility of motion. -Suitable for carrying a variety of fluids · such as high-pressure steam · air · gas · water · oil · gasoline and chemicals.	-Non-welded Type which excels in corrosion resistance. -Positive Metal Seating Type which requires no maintenance. -Excellent in flexibility.

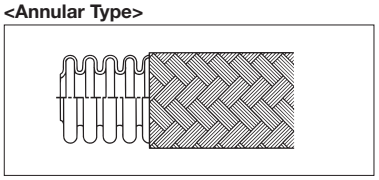
- Hose Braiding Types

<Spiral Wound Type>



-Spiral reinforcement provides smooth bend around a small radius.
-Suitable for general purpose, as kink may occur if tension or compression is applied during movement.

<Annular Type>

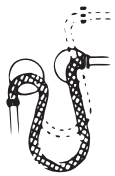
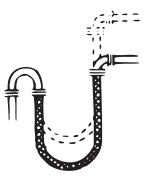
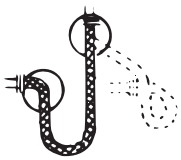
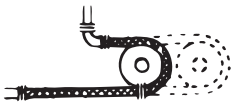
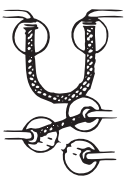
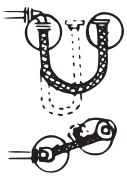
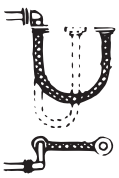


-Convolutions are a series of complete rings (bellows)
-Unlikely to cause twist even it is stretched during operation.

■Fluoro Resin Flexible Hoses Specification Chart

		HOSFR/HOSFRS	HOSJRS
		Standard Type	High-Flex Type
		P.1174	P.1174
Type			
Operating Pressure		17.0~20.5MPa (Depends on size.)	1.0MPa
Operation Temperature Range		-54 ~ 232 °C (When using with steam: 198°C)	-100 ~ 120°C
Applicable Fluid		Air · Gas · Water · Solvent	Air · Gas · Water · Solvent
Material Shapes	Hose Body	Fluorine Resin Reinforcement: 1.4301/X5CrNi18-10	Fluorine Resin Reinforcement: 1.4301/X5CrNi18-10
	Swaging Parts	1.0038/S235JR / 1.4301/X5CrNi18-10	1.4301/X5CrNi18-10
Features		-Excellent in heat resistance and chemical resistance. -Having non-viscous property · it is suitable for use with viscid materials such as adhesive and paints · with fluids for which a high level of cleanliness is required such as fluids used in food processing equipments · and steam.	-Hose is formed from a continuous spiral corrugation into tubing · which allows for flexibility of the hose. -Suitable for high vibration environment and applications where damages from deformation are expected.

■How to Mount Flexible Hoses Appropriately

Wrong			Right		
Excessively small bend radius will dramatically shorten the hose's service life.		X	Use pipes for tight radius sections and keep the hoses within allowed bend radius ranges.		O
Repeatedly flexed sections require extra cautions.		X	Use the curved pipes, and mount tubes in order to form U-shapes.		O
Hose twisting loads due to repeated horizontal motion are very dangerous.		X	Avoid excessive curvatures by attaching rollers that turn with movements of the hose.		O
The hose will be twisted if rotary motions are applied to the mounting points.		X	Avoid the hose twists by mounting rotary joints.		O
The hose will twist if not mounted in-line with the direction of motion.		X	Be sure to mount the hose in-line with the direction of motion.		O

Hydraulic Rubber Hoses

NEW

Price Reduction
Up to 25%

Hydraulic Hoses



RoHS

Type			Application
7.0MPa Type	14.0MPa Type	20.6MPa Type	
HOSTR	HOSCR	HOSYR	Both Ends Swaged
HOSTW	HOSCW	HOSYRW	Both End Swaged (Wire Braided: Material 1.1158/C25E)
HOSTS	HOSCS	HOSYRS	Both Ends Swaged (Wire Braided: Material 1.4301/X5CrNi18-10)

Hose

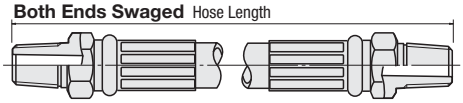
M Material	Temp. Range
Synthetic Rubber (Reinforcement, Hard Steel Wire)	-40°C~100°C

Swage Fitting Shapes

M Material	S Surface Treatment
1.1158/C25E	Trivalent Chromate
1.4301/ X5CrNi18-10	-

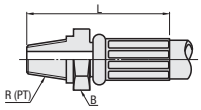
(1) Hydraulic Hose (with Spring Guard)
(2) Hydraulic Hose (Wire Braided Type)

Both Ends Swaged Hose Length

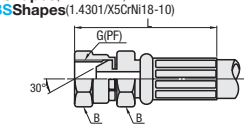


Swage Fitting Shapes

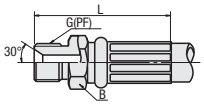
A Shapes(1.1158/C25E)
AS Shapes(1.4301/X5CrNi18-10)



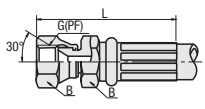
B Shapes(1.1158/C25E)
BS Shapes(1.4301/X5CrNi18-10)



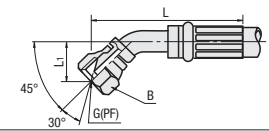
C Shapes(1.1158/C25E)



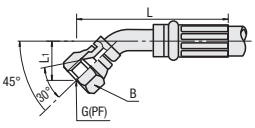
D Shapes(1.1158/C25E)
DS Shapes(1.4301/X5CrNi18-10)



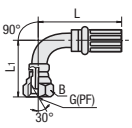
E Shapes (45° PF Fitting 30° Male)



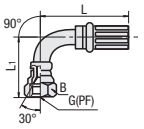
F Shapes (45° PF Fitting 30° Female)



G Shapes (90° PF Fitting 30° Male)



H Shapes (90° PF Fitting 30° Female)



Hose Dimension

Hose Nominal Inner Dia.	HOST_			HOSC_			HOSYR_		
	Inner Diameter (mm)	Min. Bending Radius (mm)	Normal Pressure (Mpa)	Inner Diameter (mm)	Min. Bending Radius (mm)	Normal Pressure (Mpa)	Inner Diameter (mm)	Min. Bending Radius (mm)	Normal Pressure (Mpa)
6	6.3	60	7.0 or Less	6.3	50	14 or Less	6.3	60	20.6 or Less
9	9.5	75		9.5	65		9.5	80	
12	12.7	90		12.7	70		12.7	90	
15	15.9	120		15.9	110		15.9	120	
19	19.0	140		19.0	130		19.0	140	
25	25.4	170		25.4	170		25.4	180	

*Normal pressure is the Max. operating pressure at 20°C.

Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape		B Shape		C Shape		D Shape		E Shape			F Shape			G Shape			Shape H		
		B (Width Across Flats)	L	B (Width Across Flats)	L	B (Width Across Flats)	L	B (Width Across Flats)	L	B (Width Across Flats)	L	L1	B (Width Across Flats)	L	L1	B (Width Across Flats)	L	L1	B (Width Across Flats)	L	L1
6	1/4	19	51.5	19	51.5	19	48.0	19	51.5	19	69.0	26.0	19	69.0	26.0	19	52.0	44.5	19	52.0	44.5
9	3/8	22	62.5	22	62.5	22	59.0	22	62.5	22	88.0	28.5	22	88.0	28.5	22	68.0	51.5	22	68.0	51.5
12	1/2	27	69.5	27	69.5	27	67.0	27	69.5	27	96.0	33.0	27	96.0	33.0	27	76.0	59.5	27	76.0	59.5
15	3/4	36	71.9	36	76	36	71.9	36	76	36	116.0	41.5	36	116.0	41.5	36	99.0	77.0	36	99.0	77.0
19	3/4	36	78.5	36	78.5	36	75.0	36	78.5	36	118.0	41.5	36	118.0	41.5	36	98.5	77.0	36	98.5	77.0
25	1	41	86.5	41	90	41	86.5	41	90	41	131.0	47.5	41	131.0	47.5	41	116.0	90.5	41	116.0	90.5

Hose nominal inner diameter 15 is not selectable for 1.4301/X5CrNi18-10 swaging metals.

Part Number Type	Hose Inner Dia.	Hose Length 0.1m Increment	L Left End Swaged	R Right End Swaged	Hose Protection Spring Guard
Both Ends Swaged HOSTR HOSCR HOSYR	6 9 12 15 19 25	0.3~20.0	LA LB LC LD LE LF LG LH LAS LBS LDS	RA RB RC RD RE RF RG RH RAS RBS RDS	LSG(Left) RSG(Right)
Wire Braided Both Ends Swaged (1.1158/C25E) HOSTW HOSCW HOSYRW (1.4301/X5CrNi18-10) HOSCS HOSYRS HOSTS	6 9 12 15 19 25				-

Hose length includes the Swaging Parts
For One End Hose Protection, specify LSG (left) for Spring Guard.
Spring Guard (Hose Protection) is 300mm longer than Swaging Part.
Hose length 0.3~0.6m with Both Ends of Springs it total hose length plus springs.

<Price Calculation Example>
For HOSYR6-2.5-LA-RF: Hose unit price per m: 8,70
8,70x2.5+14,50+34,80=71,05
By rounding it down to the nearest ten Cent, it is 71,00 EUR

Price

Volume Discount (Round down to one Cent.) P. 87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the unit price/m for hose only.

€ Unit Price of Hose

Hose Inner Dia.	Hose € Unit Price/m								
	HOSTR	HOSCR	HOSYR	HOSTW	HOSCW	HOSYRW	HOSTS	HOSCS	HOSYRS
6									
9									
12									
15									
19									
25									

Charges for Swaging / Spring Guard

Hose Inner Dia.	Metal Shape A · B · C · D		Metal Shape AS · BS · DS		Metal Shape E · F · G · H		Spring Guard	
	One End Swaged	Both Ends Swaged	One End Swaged	Both Ends Swaged	One End Swaged	Both Ends Swaged	One Side Guard	Both Sides Guard
6								
9								
12								
15								
19								
25								

Order Example

Part Number	Hose Length	Shape L	Shape R	Hose Protection (Left)	Hose Protection (Right)
HOSYR9	1.2	LB	RA	LSG	RSG

Days to Ship

8 Days — Express A 5,00 EUR/piece — P. 88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Alterations

Part Number	Hose Length	Shape L	Shape R	Hose Protection (Left)	Hose Protection (Right)	(EAS)
HOSYR9	1.0	LE	RG	LSG	RSG	EAS180

Alterations	Elbow Angle
Code	EAS
Spec.	When couplers selected for both ends are elbow type (E · F · G or H) · their angles are open to choice. Specifies the angle of the right elbow from left elbow angle (RE · RF · RG · RH) as the basis.
	(When not specified) Both left and right elbows are in the same direction
	(To specify angle) 180° 270° 90° 0° Left elbow angle as basis
	Ordering Code EAS90 · EAS180 Select from EAS270
Price Adder	Free of Charge

Hydraulic Rubber Hoses
-Quick Swaging-

■Quick Swage Type



RoHS

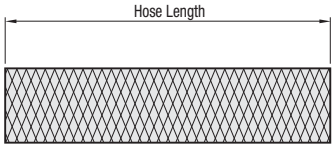
HOKT
(Hose Body)

■Hose

Material	Temp. Range
Weather Resistant Synthetic Rubber Reinforcement: Wire Braid : Spiral Wires	-40°C~93°C

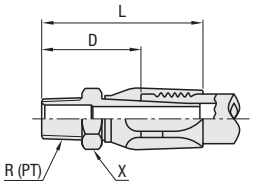
■Swage Fitting Shapes

Material	Surface Treatment
1.1158/C25E	Trivalent Chromate

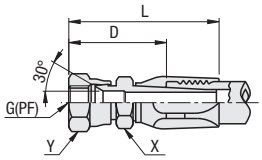


■Swage Fitting Shapes

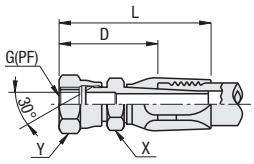
HOKTA (A Shape)



HOKTC (C Shape)



HOKTD (D Shape)



■Hose Dimension

Hose Nominal Inner Dia.	Inner Diameter	Outer Diameter	HOKT Min. Bending Radius (mm)	HOKT Max. Operating Pressure (Mpa)	HOKT Min. Destructive Pressure (Mpa)
6	6.4	14.7	85	20.7	82.7
7	7.9	17.1	100	15.5	62.0
12	12.7	23.4	140	12.1	48.3
15	15.9	27.4	165	10.3	41.4

Order Example

Part Number	-	Hose Length
HOKT12 HOKTA12	-	1.8

Days to Ship: 8 Days — Express A 5,00 EUR/piece — P. 88

(?)A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount ((?)Round down to one Cent.) P. 87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

(?) Volume discount rate is applicable to the unit price/m for hose only.

■Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	HOKTA (A Shape) X (Width Across Flats)	D	L	HOKTC (C Shape) X (Width Across Flats)	Y (Width Across Flats)	D	L	HOKTD (D Shape) X (Width Across Flats)	Y (Width Across Flats)	D	L
6	1/4	17	32	52	17	19	37	57	17	19	37	57
7	3/8	19	36	59	19	22	41	64	19	22	41	64
12	1/2	22	43	76	22	27	47	80	22	27	47	80
15	3/4	30	48	88	30	36	53	93	30	36	53	93

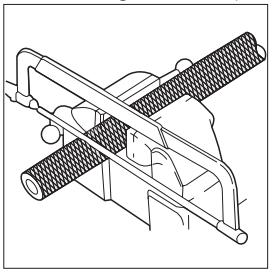
Part Number Type	Part Number Hose Nominal Inner Dia.	Hose Length 0.1m Increment	€ € Unit Price of Hose/m € € Unit Price
HOKT	6	0.3~10.0	
	7		
	12		
	15		

Part Number Type	Part Number Hose Nominal Inner Dia.	€ Unit Price HOKTA HOKTC	€ Unit Price HOKTD
HOKTA HOKTC HOKTD	6		
	7		
	12		
	15		

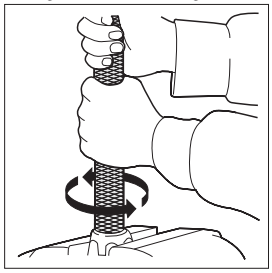
■Features
- Length is determined based on machine in order to assemble.

■Precautions for Use
- Due to customer assembly, it is not applicable to PL Law (Product Liability Law). Please note that any trouble after assembly will be self-responsibility.

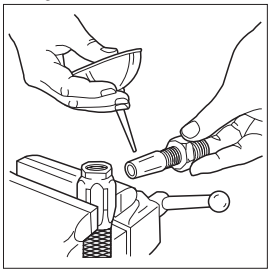
■Assembling Procedure ((?) The cut length of hose is the length of hose with fitting deducted of D dimension of both ends fitting.)



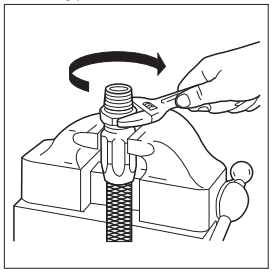
(1)Hose is cut perpendicular to axial direction. Use saw to cut the hose, thereafter, remove to clear cutting chips from inside the hose.



(2)Nip the socket into the vice, insert the hose. While rotating counterclockwise, screw all the way completely, then return 1/4 rotation.



(3)Apply assembly lubricant to nipple outer surface and hose inner surface.



(4)While rotating the nipple clockwise, screw into the socket, and make the clearance between hexagon of nipple and socket to become 0.2 to 1.0mm.

Hydraulic Resin Hoses

Hydraulic Resin Hose



RoHS

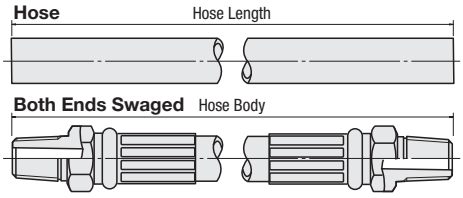
Type		Application
14.0MPa Type	20.6MPa Type	
HOMC	HOMY	Hose Body
HOMCR	HOMYR	Both Ends Swaged

Hose

Material			Temp. Range
Inner Tube	Reinforcement	Outer Covering	
Polyester Elastomer	Polyester Fiber	Polyurethane Elastomer	-40 ~ 100°C (60°C for water)

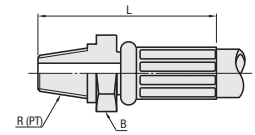
Swage Fitting Shapes

M Material	S Surface Treatment
1.1158/C25E	Trivalent Chromate

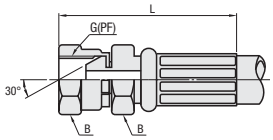


Swage Fitting Shapes

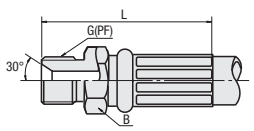
A Shape



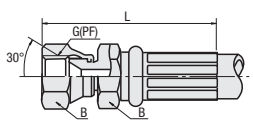
B Shape



C Shape



D Shape



Hose Dimension

Hose Nominal Inner Dia.	HOMC/HOMCR				HOMY/HOMYR			
	Inner Diameter (mm)	Min. Bending Radius (mm)	Max. Operating Pressure (Mpa)	Weight (g/m)	Inner Diameter (mm)	Min. Bending Radius (mm)	Max. Operating Pressure (Mpa)	Weight (g/m)
6	6.3	30	19.0	110	6.3	50	20.6 or Less	130
9	9.5	50	15.5	140	9.5	65		200
12	12.7	60	13.5	200	12.7	80		250

Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape		B Shape		C Shape		D Shape	
		B (Width Across Flats)	L	B (Width Across Flats)	L	B (Width Across Flats)	L	B (Width Across Flats)	L
6	1/4	19	51.5	19	51.5	19	48.0	19	51.5
9	3/8	22	62.5	22	62.5	22	59.0	22	62.5
12	1/2	27	69.5	27	69.5	27	67.0	27	69.5

Part Number		Hose Length 0.1m Increment	L Left End Swaged	R Right End Swaged
Type	Hose Nominal Inner Dia.			
Hose Body: HOMC HOMY / Both Ends Swaged: HOMCR HOMYR	6	0.3~20.0	LA LB LC LD	RA RB RC RD
	9			
	12			

(?) Hose length includes the Swaging Parts

Features

- Excels in flexibility and durability due to the polyurethane elastomer coverings applied inside and outside.
- Minimizes the occurrence of kinks (bends), and enables uses in narrow spaces.
- Lightweight and can be installed compactly.

Price

Volume Discount ((?)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

(?) Volume discount rate is applicable to the unit price/m for hose only.

(?) For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>
For HOMCR6-2.5-LA-RB: Hose unit price per m: 10,50
10,50x2.5+29,00=55,25
By rounding it down to the nearest ten Cent, it is 55,20 EUR

€ Unit Price of Hose

Hose Nominal Inner Dia.	Hose € Unit Price/m	
	HOMC/HOMCR	HOMY/HOMYR
6		
9		
12		

Additional Charge for Caulking

Hose Nominal Inner Dia.	Caulking Additional
	Metal Shape A · B · C · D Both Ends Swaged
6	
9	
12	

Order Example

Part Number	-	Hose Length	-	Shape L	-	Shape R
HOMC6	-	1.2				
HOMCR12	-	1.2	-	LB	-	RA

Days to Ship

8 Days — Express A — 5,00 EUR/piece — P.88

(?) A Express Charge of 13,50 EUR for 3 or more identical pieces.

Flexible Hoses
-High Pressure Type / Medium Pressure Type-

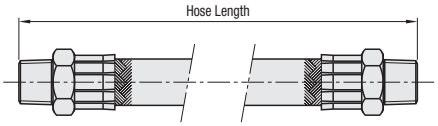
CAD Data

Flexible Hoses -High Pressure Type-



RoHS

Type	Material	
	Hose	Swaging Parts
HOSLTR	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10



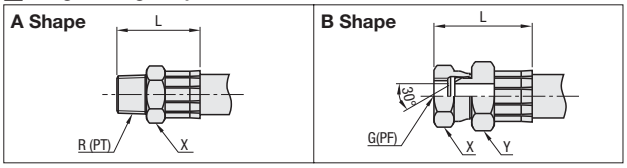
- Permissible Fluid: High Pressure Steam · Air · Gas · Water · Oil
- Operation Temperature Range: -50 ~ 280℃
- Maximum Operating Pressure: Depends on size.

Features
- Excellent in heat resistance and pressure resistance.

Purposes of Use
- Plumbing in places where ambient temperature is high (with vapor etc.).
- Plumbing to absorb variation in elongation of pipe due to temperature change.

CAUTION
- Avoid use in places where hose is constantly moved.

Swage Fitting Shapes



Part Number		Hose Length 0.1m Increment	L Left End Swaged Shapes	R Right End Swaged Shapes	Hose Inner Diameter (mm)	€ Unit Price	
Type	Hose Nominal Inner Dia.					Hose € Unit Price/m	Swaging Additional
HOSLTR	8A	0.3~10.0	LA LB	RA RB	7.0		
	10A				10.5		
	15A				13.2		
	20A				19.2		
	25A				25.5		

Hose length includes the Swaging Parts

Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape		B Shape		
		X (Width Across Flats)	L	X (Width Across Flats)	Y (Width Across Flats)	L
8A	1/4	17	36	17	19	41
10A	3/8	19	38	19	22	43
15A	1/2	22	45	22	27	49
20A	3/4	30	64	30	36	68
25A	1	36	68	36	41	72

Hose Dimension

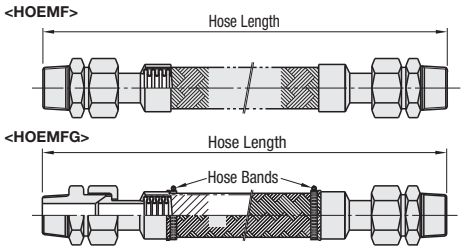
Hose Nominal Inner Dia.	Inner Diameter	Min. Bending Radius (mm)	Normal Pressure (Mpa)
8A	7.0	25	6.4
10A	10.5	30	6.4
15A	13.2	35	4.4
20A	19.2	40	3.4
25A	25.5	50	3.4

Flexible Hoses -Medium Pressure Type-



RoHS

Type	Material	
	Hose	Metal Fitting
HOEMF	1.4301/X5CrNi18-10	1.4301/ X5CrNi18-10
HOEMFG	1.4301/X5CrNi18-10+Glass Cloth+Hose Bands (2 pcs.)	

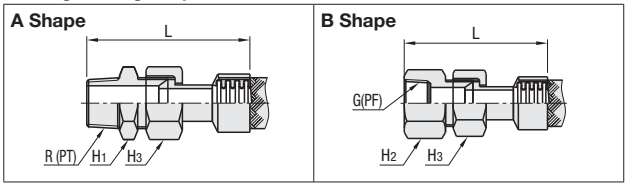


Specifications
- Applicable Fluid: Steam, Air, Gas, Water and Oil
- Operation Temperature Range: -0 ~ 200°C
- Max. Operating Pressure: 2.0MPa

Features
- Lightweight compared to High Pressure Type.
- Positive Metal Seat Type which requires no maintenance.

Purposes of Use
- General purpose plumbing, such as control of pipe displacement.

Swage Fitting Shapes



Part Number		Hose Length 0.1m Increment	L Left End Swaged Shapes	R Right End Swaged Shapes
Type	Hose Nominal Inner Dia.			
HOEMF HOEMFG (Glass Cloth Protection)	8A	0.3~2.0	LA LB	RA RB
	10A			
	15A			
	20A			
	25A			

Hose length includes the Swaging Parts

Order Example: Part Number HOSLTR8A - Hose Length 1.0 - Shape L LA - Shape R RB

Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape			B Shape		
		H1	H3	L	H2	H3	L
8A	1/4	14	17	44.5	17	17	44.5
10A	3/8	17	21	48.5	21	21	48.5
15A	1/2	22	26	58.0	26	26	58.0
20A	3/4	27	32	63.2	32	32	63.2
25A	1	35	38	72.0	38	38	72.0

Hose Dimension Table

Hose Nominal Inner Dia.	Inner Diameter (mm)	Outer Diameter (mm)	Min. Bending Radius (mm)	Spring Constant (N/mm)	Normal Pressure (MPa {kgf/cm2})
8A	7.2	12.1	25	1677.1	2.0
10A	10.5	16.3	35	2494.1	
15A	13	19.6	50	1894.1	
20A	19	26.9	65	3789.9	
25A	25.2	34	80	2550.1	

Days to Ship: 8 Days | Express A 5.00 EUR/piece | P88

A Express Charge of 13,50 EUR for 3 or more identical pieces.
Express Serviceis available for HOSLTR only.

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.
Volume discount rate is applicable to the unit price/m for hose only.

<Price Calculation Example>
For HOEMF8A-1.5-LA-RB
Hose € Unit Price/0.1m: 2,80
2,80x15+22,00+8,00=72,00
By rounding it down to the nearest ten Cent, it is 72,00 EUR

Hose € Unit Price

Hose Nominal Inner Dia.	HOEMF € Unit Price		HOEMFG € Unit Price	
	€ Unit Price	Hose € Unit Price/0.1m	€ Unit Price	Hose € Unit Price/0.1m
8A				
10A				
15A				
20A				
25A				

Additional Charge for Swaging

Hose Nominal Inner Dia.	Additional charge for swaging		
	Metal Fitting Shape A-A	Metal Fitting Shape A-B	Metal Fitting Shape B-B
8A			
10A			
15A			
20A			
25A			

Flexible Hoses
-Low Pressure (Non-Welded) Type-

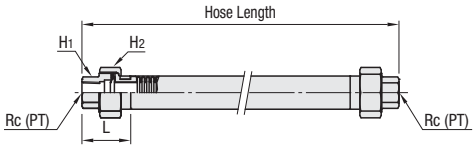
CAD Data

■Flexible Hoses
- Low Pressure (Non-Welded)
Type- PT Female / PT Female



RoHS

Type	Material	
	Hose	Union Joint
HOELF	1.4301/X5CrNi18-10	JIS FCMB
HOELFS	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10



■Specifications
- Permissible fluid: Steam · Air · Gas · Water · Oil
- Operation Temperature Range: 0 ~ 100˚C
- Maximum Operating Pressure 1.0MPa

■Features
- Excellent in corrosion resistance, as joint of fittings is not welded.
- Suitable to absorb vibration.

■Purposes of Use
- General purpose plumbing, such as control of pipe displacement.

■CAUTION
- Tolerance of a hose length is 0 ~ 3% of the full length.

■Hose Dimension

Hose Nominal Inner Dia.	Inner Diameter (mm)	Outer Diameter (mm)	Min. Bending Radius (mm)	Spring Constant (N/mm)	Normal Pressure (MPa {kgf/cm²})
10A	17	23	60	1534.6	1.0
15A	19.2	25	65	1858.2	
20A	24.1	31	80	1179.9	
25A	29.5	39	100	1510.6	
32A	38.6	47.5	120	1785	
40A	44.8	54	120	3471	
50A	56.4	66	140	3684	

■Swaging Part Size List

Hose Nominal Inner Dia.	RC (PT)	L	H1	H2
10A	3/8	33	23	37
15A	1/2	39	27	42
20A	3/4	40	33	49
25A	1	49	41	59
32A	1 1/4	53	50	69
40A	1 1/2	58	56	78
50A	2	65	69	93

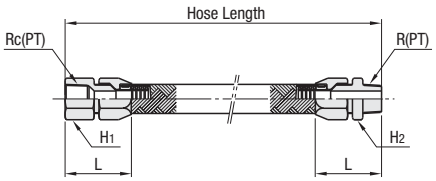
Part Number		Hose Length 0.1m Increment	HOELF € Unit Price		HOELFS € Unit Price	
Type	Hose Nominal Inner Dia.		€ Unit Price	Hose € Unit Price/0.1m	€ Unit Price	Hose € Unit Price/0.1m
HOELF HOELFS	10A	0.3~2.0				
	15A					
	20A					
	25A					
	32A					
	40A					
	50A					

■Flexible Hoses
- Low Pressure (Non-Welded)
Type - PT Male / PT Female



RoHS

Type	Material	
	Hose	Metal Fitting
HOEJF	1.4301/X5CrNi18-10	JIS FCMB
HOEJFS	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10



■Specifications
- Permissible fluid: Steam · Air · Gas · Water · Oil
- Operation Temperature Range: 0 ~ 100˚C
- Maximum Operating Pressure 1.0MPa

■Features
- Excellent in corrosion resistance, as joint of fittings is not welded.
- Suitable to absorb vibration.

■Purposes of Use
- General purpose plumbing, such as control of pipe displacement.

■CAUTION
- Tolerance of a hose length is 0 ~ 3% of the full length.

■Hose Dimension

Hose Nominal Inner Dia.	Inner Diameter (mm)	Outer Diameter (mm)	Min. Bending Radius (mm)	Spring Constant (N/mm)	Normal Pressure (MPa {kgf/cm²})
10A	10.5	16.3	35	2494.1	1.0
15A	13	19.6	50	1894.1	
20A	19	26.9	65	3789.9	
25A	25.2	34	80	2550.1	

■Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) Rc (PT)	L	H1	H2
10A	3/8	51.0	24	24
15A	1/2	56.5	27	27
20A	3/4	61.5	32	32
25A	1	68.5	41	41

Part Number		Hose Length 0.1m Increment	HOEJF € Unit Price		HOEJFS € Unit Price	
Type	Hose Nominal Inner Dia.		€ Unit Price	Hose € Unit Price/0.1m	€ Unit Price	Hose € Unit Price/0.1m
HOEJF HOEJFS	10A	0.3~2.0				
	15A					
	20A					
	25A					

Order Example

Part Number	-	Hose Length
HOELF10A	-	1.0
HOEJFS25A	-	0.5

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.
Volume discount rate is applicable to the unit price/0.1m for hose only.

<Price Calculation Example>
For HOELF10A-1.0,
€ Unit Price: 22,00
Hose € Unit Price/0.1m: 3,00
22,00+3,00x10=52,00
By rounding it down to the nearest ten Cent, it is 52,00 EUR

Fluoro Resin Flexible Hoses

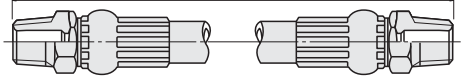
Flexible Fluororesin Hoses



RoHS

Type	Material			Surface Treatment
	Hose	Hose Reinforcement	Swaging Parts	Swaging Parts
HOSFR	Fluorine Resin	1.4301/X5CrNi18-10	1.0038/S235JR	Trivalent Chromate
HOSFRS			1.4301/X5CrNi18-10	-

Hose Length (Swaging Metal Included)



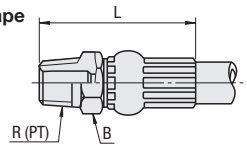
Specifications
- Permissible fluid: Air · gas · water · solvent
- Operation Temperature Range: -54 ~ 232°C
- Maximum Operating Pressure: Depends on size.
- When using with steam: Operation Temperature 198°C
  Operating Pressure 1.4MPa or lower

Features
- Excellent in heat resistance and chemical resistance.
- Suitable for use with viscid materials, such as adhesives and paints.

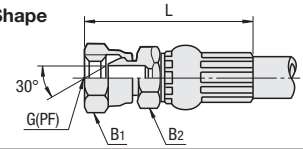
CAUTION
- Avoid using the same hose for steam and water or for steam and nitrogen.

Swage Fitting Shapes

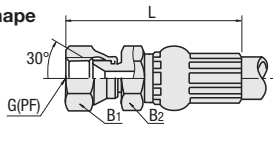
A Shape



B Shape



C Shape



Hose Specifications

Hose Nominal Inner Dia.	Max. Operating Pressure (Mpa)	Min. Destructive Pressure (Mpa)	Min. Bending Radius (mm)	Approx. Mass (g/m)
4	20.5	82.0	51	105
6	20.5	82.0	76	120
8	17.0	68.0	102	145

Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape		B Shape			C Shape		
		B (Width Across Flats)	L	B1 (Width Across Flats)	B2 (Width Across Flats)	L	B_1 (Width Across Flats)	B_2 (Width Across Flats)	L
4	1/4	17	43	19	17	48	19	17	48
6	1/4	17	43	19	17	48	19	17	48
8	3/8	19	48	22	19	53	22	19	53

Part Number Type	Part Number Hose Nominal Inner Dia.	Hose Length 0.1m Increment	L Left End Swaged	R Right End Swaged	Hose Inner Dia. (mm)	Hose Outer Dia. (mm)	€ Unit Price of Hose/m	€ Unit Price Additional Charge for Swaging Fittings for Both Ends HOSFR	€ Unit Price Additional Charge for Swaging Fittings for Both Ends HOSFRS
HOSFR HOSFRS	4	0.3~20.0	LA	RA	4.8	7.7			
	6		LB	RB	6.4	9.5			
	8		LC	RC	7.9	10.9			

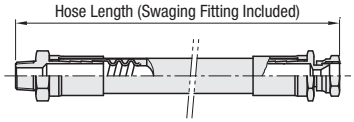
Flexible Fluororesin Hoses -High-Flex Type-



RoHS

Type	Material		
	Hose	Wire Braided	Swaging Parts
HOSJRS	Fluorine Resin	1.4301/X5CrNi18-10	1.4301/X5CrNi18-10

Hose Length (Swaging Fitting Included)

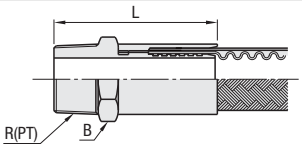


Specifications
- Permissible fluid: Air · gas · water · solvent
- Operation Temperature Range: -100 ~ 120°C
- Maximum Operating Pressure 1.0MPa

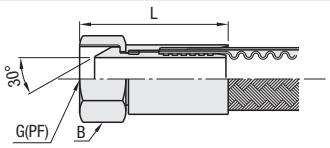
Features
- Spiral corrugated hose provides superior flexibility.
- Suitable for high vibration environment and applications where damages from deformation are expected.

Swage Fitting Shapes

AShape



BShape



Hose Specifications

Hose Nominal Inner Dia.	Inner Diameter (mm)	Outer Diameter (mm)	Min. Bending Radius (mm)	Normal Pressure (Mpa)
6A	4.0	7.0	20	3.0
8A	5.0	8.5	20	2.5
10A	9.0	13.0	25	2.0
15A	11.0	16.5	30	2.0

Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape		B Shape	
		B (Width Across Flats)	L	B (Width Across Flats)	L
6A	1/8	12	39	14	37
8A	1/4	14	47	17	43
10A	3/8	19	53	21	49
15A	1/2	24	60	26	57

Part Number Type	Part Number Hose Nominal Inner Dia.	Hose Length 0.1m Increment	L Left End Swaged	R Right End Swaged	€ Unit Price Hose € Unit Price/0.1m	€ Unit Price of One End Swaged Parts A Shape	€ Unit Price of One End Swaged Parts B Shape
HOSJRS	6A	0.3~2.0	LA	RA			
	8A		LB	RB			
	10A						
	15A						

Order Example

Part Number		Hose Length		Shape L		Shape R
HOSFR6	-	1.0	-	LA	-	RB
HOSJRS8A	-	1.5	-	LB	-	RA

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.
Volume discount rate is applicable to the unit price/0.1m for hose only.

<Price Calculation Example>
· For HOSFR6-2.5-LA-RB
Hose € Unit Price/m: 58,10
58,10x2.5+59,40=204,65
By rounding it down to the nearest ten Cent, it is 204,60 EUR
· For HOSJRS8A-1.5-LB-RA
Hose € Unit Price/0.1m: 9,00
9,00x15+81,60+66,90=283,50
By rounding it down to the nearest ten Cent, it is 283,50 EUR

Days to Ship

•HOSFR · HOSFRS: 8 Days

Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

•HOSJRS: 10 Days

Hydraulic Fittings
-Straight-

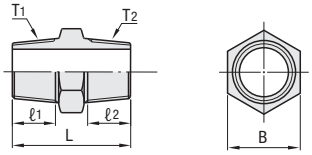
CAD Data

■PT · PT Both-Side Male -Straight-



RoHS

Type	Material	Surface Treatment
YCPT	1.1181/C35E	Trivalent Chromate
YCPTS	1.4301/X5CrNi18-10	-



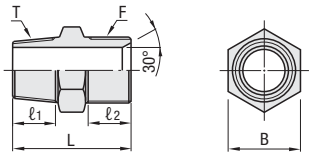
Part Number Type	No.	T1 R (PT)	T2 R (PT)	L	ℓ1	ℓ2	B	€ Unit Price YCPT	€ Unit Price YCPTS
YCPT YCPTS Dimension in ( ) are for YCPTS.	11	1/8	1/8	26	10	10	12		
	12	1/8	1/4	31	10	13	17		
	13	1/8	3/8	33	10	15	21		
	22	1/4	1/4	34	13	13	17		
	23	1/4	3/8	36	13	15	21		
	33	3/8	3/8	37	15	15	21		
	34	3/8	1/2	40(46)	14(16)	17(19)	26(22)		
	44	1/2	1/2	43	17	17	26(22)		
	46	1/2	3/4	46(48)	17(18)	19	32(27)		
	66	3/4	3/4	48	19	19	32(27)		

■PT · PF Both-Side Male -Straight, Female-



RoHS

Type	Material	Surface Treatment
YCPF	1.1181/C35E	Trivalent Chromate
YCPFS	1.4301/X5CrNi18-10	-



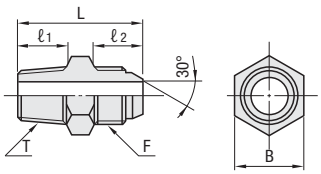
Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	ℓ2	B	€ Unit Price YCPF	€ Unit Price YCPFS
YCPF YCPFS	11F	1/8	1/8	27	10	11	14		
	12F	1/8	1/4	32	10	13	19		
	13F	1/8	3/8	34	10	15	22		
	21F	1/4	1/8	32	13	11	14		
	22F	1/4	1/4	34	13	13	19		
	23F	1/4	3/8	36	13	15	22		
	31F	3/8	1/8	34	15	11	19		
	32F	3/8	1/4	36	15	13	19		
	33F	3/8	3/8	38	15	15	22		
	34F	3/8	1/2	42	15	17	27		
	44F	1/2	1/2	47	18	18	27		
	46F	1/2	3/4	50	18	20	32		
	64F	3/4	1/2	47	20	17	27		
	66F	3/4	3/4	53	20	20	36		

■PT · PF Both-Side Male -Straight, Male-



RoHS

Type	Material	Surface Treatment
YCPFP	1.1181/C35E	Trivalent Chromate
YCPFPS	1.4301/X5CrNi18-10	-



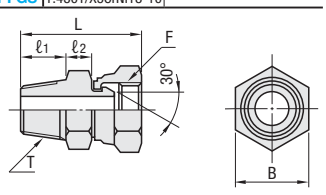
Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	ℓ2	B	€ Unit Price YCPFP	€ Unit Price YCPFPS
YCPFP YCPFPS	11F	1/8	1/8	31	10	13	14		
	12F	1/8	1/4	34	10	16	19		
	13F	1/8	3/8	37	10	17.5	22		
	21F	1/4	1/8	34	13	13	14		
	22F	1/4	1/4	37	13	16	19		
	23F	1/4	3/8	38.5	13	17.5	22		
	31F	3/8	1/8	37	15	13	19		
	32F	3/8	1/4	38.5	15	16	19		
	33F	3/8	3/8	40.5	15	17.5	22		
	34F	3/8	1/2	45	15	20	27		
	44F	1/2	1/2	48	18	20	27		
	46F	1/2	3/4	52	18	22	32		
	64F	3/4	1/2	50	20	20	27		
	66F	3/4	3/4	54	20	22	36		

■PT Male · PF Female -Straight, Male-



RoHS

Type	Material	Surface Treatment
YCPFG	1.1181/C35E	Trivalent Chromate
YCPFGS	1.4301/X5CrNi18-10	-



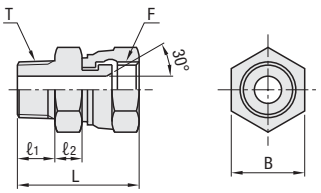
Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	ℓ2	B	€ Unit Price YCPFG	€ Unit Price YCPFGS
YCPFG YCPFGS	11F	1/8	1/8	31	10	6	14		
	12F	1/8	1/4	34	10	8	19		
	21F	1/4	1/8	34	13	6	14		
	22F	1/4	1/4	38	13	8	19		
	23F	1/4	3/8	39	13	8	22		
	32F	3/8	1/4	39	15	8	19		
	33F	3/8	3/8	42	15	8	22		

■PT Male · PF Female -Straight, Female-



RoHS

Type	Material	Surface Treatment
YCPFGP	1.1181/C35E	Trivalent Chromate



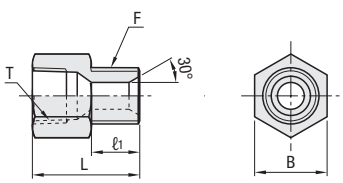
Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	ℓ2	B	€ Unit Price YCPFGP
YCPFGP	22F	1/4	1/4	38	13	8	19	
	33F	3/8	3/8	42	15	8	22	
	44F	1/2	1/2	50	18	10	27	

■PT Female · PF Male -Straight, Female-



RoHS

Type	Material	Surface Treatment
YCPFF	1.1181/C35E	Trivalent Chromate
YCPFFS	1.4301/X5CrNi18-10	-



Part Number Type	No.	T Rc (PT)	F G (PF)	L	ℓ1	B	€ Unit Price YCPFF	€ Unit Price YCPFFS
YCPFF YCPFFS	22F	1/4	1/4	30	13	19		
	33F	3/8	3/8	34	15	22		
	44F	1/2	1/2	40	18	27		

Order Example Part Number: YCPT11

Days to Ship 6 Days P87

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~19	20~29
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Specification
Applicable Fluid Oil, Water
Normal Operating Pressure 20.6MPa (210kgf/cm² or less)

Hydraulic Fittings

-Straight Type · 45°Elbow Type-

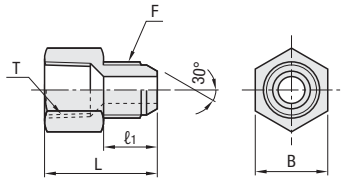
CAD Data

■PT Female · PF Male -Straight, Male-



RoHS

Type	Material	Surface Treatment
YCPFFP	1.1181/C35E	Trivalent Chromate
YCPFFSP	1.4301/X5CrNi18-10	-



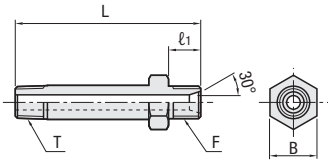
Part Number Type	No.	T Rc (PT)	F G (PF)	L	ℓ1	B	€ Unit Price YCPFFP	€ Unit Price YCPFFSP
YCPFFP YCPFFSP	22F	1/4	1/4	33	16	19		
	33F	3/8	3/8	37	18	22		
	44F	1/2	1/2	42	20	27		

■PT · PF Both-Side Male -Long Straight, Female-



RoHS

Type	Material	Surface Treatment
YCPLF	1.1181/C35E	Trivalent Chromate



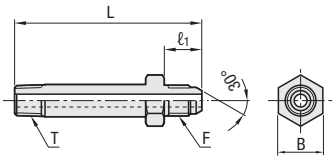
Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	B	€ Unit Price YCPLF
YCPLF	22F	1/4	1/4	75	13	19	
	33F	3/8	3/8	78	15	22	
	44F	1/2	1/2	93	18	27	

■PT · PF Both-Side Male -Long Straight, Male-



RoHS

Type	Material	Surface Treatment
YCPLFP	1.1181/C35E	Trivalent Chromate



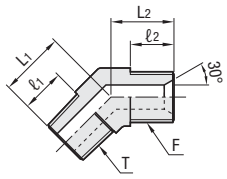
Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	B	€ Unit Price YCPLFP
YCPLFP	22F	1/4	1/4	74	16	19	
	33F	3/8	3/8	80	18	22	
	44F	1/2	1/2	95	20	27	

■PT · PF Both-Side Male -45° Elbow, Female-



RoHS

Type	Material	Surface Treatment
YCWPF	1.1158/C25E	Trivalent Chromate
YCWPFS	1.4301/X5CrNi18-10	-



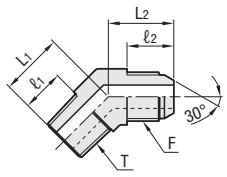
Part Number Type	No.	T R (PT)	F G (PF)	L1	L2	ℓ1	ℓ2	€ Unit Price YCWPF	€ Unit Price YCWPFS
YCWPF YCWPFS	11F	1/8	1/8	18	17	12	11		
	22F	1/4	1/4	21	21	13	13		
	33F	3/8	3/8	23	23	15	15		
	44F	1/2	1/2	29	28	18	18		

■PT · PF Both-Side Male -45° Elbow, Male-



RoHS

Type	Material	Surface Treatment
YCWPFP	1.1158/C25E	Trivalent Chromate
YCWPFPS	1.4301/X5CrNi18-10	-



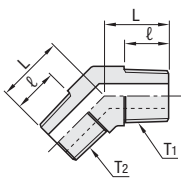
Part Number Type	No.	T R (PT)	F G (PF)	L1	L2	ℓ1	ℓ2	€ Unit Price YCWPFP	€ Unit Price YCWPFPS
YCWPFP YCWPFPS	11F	1/8	1/8	19	19	12	13		
	22F	1/4	1/4	20	22	13	16		
	33F	3/8	3/8	23	26	15	18		
	44F	1/2	1/2	28	29	18	20		

■PT · PT Both-Side Male - 45° Elbow-



RoHS

Type	Material	Surface Treatment
YCWPT	1.1158/C25E	Trivalent Chromate



Part Number Type	No.	T1 R (PT)	T2 R (PT)	L	ℓ	€ Unit Price YCWPT
YCWPT	11	1/8	1/8	17	12	
	22	1/4	1/4	19	14	
	33	3/8	3/8	22	15	
	44	1/2	1/2	28	18	

Order Example Part Number: YCPFFP22F

Days to Ship 6 Days P87

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~19	20~29
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Specification Applicable Fluid Oil, Water
Normal Operating Pressure 20.6MPa (210kgf/cm² or less)

Hydraulic Fittings
-Elbow Type-

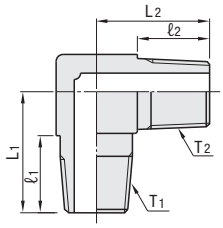
CAD Data

■PT, PT Male
-Elbow-



RoHS

Type	Material	Surface Treatment
YCLPT	1.1158/C25E	Trivalent Chromate
YCLPTS	1.4301/X5CRNI18-10	-



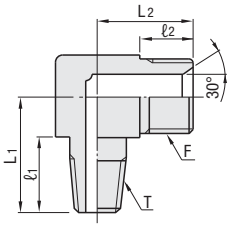
Part Number Type	No.	T1 R (PT)	T2 R (PT)	L1	L2	ℓ1	ℓ2	€ Unit Price YCLPT	€ Unit Price YCLPTS
YCLPT YCLPTS	11	1/8	1/8	20	20	13	13		
	12	1/8	1/4	20	24	13	16		
	13	1/8	3/8	20	27	13	17		
	22	1/4	1/4	24	24	16	16		
	23	1/4	3/8	24	27	16	17		
	33	3/8	3/8	27	27	17	17		
	34	3/8	1/2	30	30	17	18		
	44	1/2	1/2	30	30	19	19		
	66	3/4	3/4	36	36	23	23		

■PT, PF Female
-Elbow · Female-



RoHS

Type	Material	Surface Treatment
YCLPF	1.1158/C25E	Trivalent Chromate
YCLPFS	1.4301/X5CRNI18-10	-



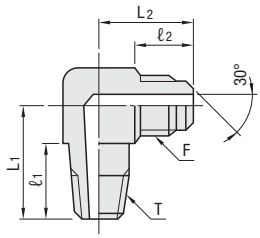
Part Number Type	No.	T R (PT)	F G (PF)	L1	L2	ℓ1	ℓ2	€ Unit Price YCLPF	€ Unit Price YCLPFS
YCLPF YCLPFS	11F	1/8	1/8	21	18	14	11		
	12F	1/8	1/4	22	21	14	13		
	13F	1/8	3/8	24	25	14	15		
	21F	1/4	1/8	22	19	15	11		
	22F	1/4	1/4	25	21	17	13		
	23F	1/4	3/8	27	25	17	15		
	31F	3/8	1/8	30	21	20	11		
	32F	3/8	1/4	30	23	20	13		
	33F	3/8	3/8	30	25	20	15		
	34F	3/8	1/2	32	30	20	18		
	44F	1/2	1/2	36	30	24	18		
	46F	1/2	3/4	38	34	24	20		
	64F	3/4	1/2	42	32	28	18		
	66F	3/4	3/4	43	35	28	20		

■PT, PF Male
-Elbow · Male-



RoHS

Type	Material	Surface Treatment
YCLPFP	1.1158/C25E	Trivalent Chromate
YCLPFPS	1.4301/X5CRNI18-10	-



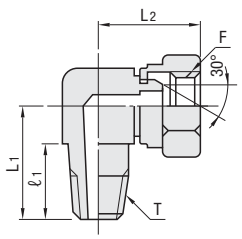
Part Number Type	No.	T R (PT)	F G (PF)	L1	L2	ℓ1	ℓ2	€ Unit Price YCLPFP	€ Unit Price YCLPFPS
YCLPFP YCLPFPS	11F	1/8	1/8	21	20	14	13		
	12F	1/8	1/4	22	24	14	16		
	21F	1/4	1/8	22	21	15	13		
	22F	1/4	1/4	25	24	17	16		
	23F	1/4	3/8	27	27.5	17	17.5		
	32F	3/8	1/4	30	26	20	16		
	33F	3/8	3/8	30	27.5	20	17.5		
	34F	3/8	1/2	32	32	20	20		
	44F	1/2	1/2	36	32	24	20		
	46F	1/2	3/4	38	36	24	22		
	64F	3/4	1/2	42	34	28	20		
	66F	3/4	3/4	43	37	28	22		

■PT, PF Female
-Elbow · Male-



RoHS

Type	Material	Surface Treatment
YCLPFG	1.1158/C25E	Trivalent Chromate



Part Number Type	No.	T R (PT)	F G (PF)	L1	L2	ℓ1	€ Unit Price YCLPFG
YCLPFG	22F	1/4	1/4	25	28	17	
	33F	3/8	3/8	30	33	20	

■Specifications Applicable Fluid Oil, Water
Normal Operating Pressure 20.6MPa (210kgf/cm² or less)

Order Example Part Number YCLPT11

Days to Ship 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Hydraulic Fittings
-Swivel Elbow Type-

CAD Data

Hydraulic Couplings -Elbow-

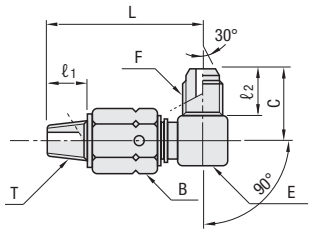


-Straight-

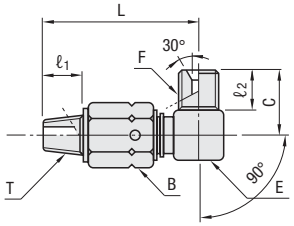


RoHS

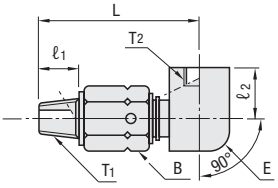
KCLPFP SKCLPFP



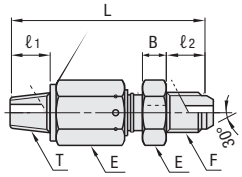
KCLPF SKCLPF



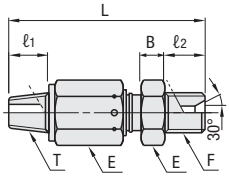
KCLPT SKCLPT



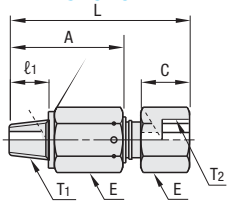
SKCRGP



SKCRGF



SKCRCT



Type	Material	Surface Treatment	Normal Operating Pressure
KCLP_	1.0038/S235JR	Trivalent Chromate	20.6MPa ≈ 210kgf/cm² or less
SKCLP_	1.4301/X5CRNI18-10	-	
SKCR_	1.4301/X5CRNI18-10	-	

Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	ℓ2	C	E (Width Across Flats)	B (Width Across Flats)	KCLPFP € Unit Price Qty.1-4	KCLPFP Volume Discount Qty. 5~19	SKCLPFP € Unit Price Qty.1-4	SKCLPFP Volume Discount Qty. 5~19
KCLPFP SKCLPFP	2	1/4	1/4	52	13	16	24	14	19				
	3	3/8	3/8	57	15	18	28	20	22				
	4	1/2	1/2	66	18	20	32	24	27				

Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	B	ℓ2	E (Width Across Flats)	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
SKCRGP	2	1/4	1/4	68	13	8	16	19		
	3	3/8	3/8	72	15	8	18	22		
	4	1/2	1/2	84	18	10	20	27		

Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	ℓ2	C	E (Width Across Flats)	B (Width Across Flats)	KCLPF € Unit Price Qty.1-4	KCLPF Volume Discount Qty. 5~19	SKCLPF € Unit Price Qty.1-4	SKCLPF Volume Discount Qty. 5~19
KCLPF SKCLPF	2	1/4	1/4	52	13	13	21	14	19				
	3	3/8	3/8	57	15	14	24	20	22				
	4	1/2	1/2	66	18	17	29	24	27				

Part Number Type	No.	T R (PT)	F G (PF)	L	ℓ1	B	ℓ2	E (Width Across Flats)	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
SKCRGF	2	1/4	1/4	68	13	8	13	19		
	3	3/8	3/8	72	15	8	15	22		
	4	1/2	1/2	82	18	10	18	27		

Part Number Type	No.	T1 R (PT)	T2 RC (PT)	L	ℓ1	ℓ2	E (Width Across Flats)	B (Width Across Flats)	KCLPT € Unit Price Qty.1-4	KCLPT Volume Discount Qty. 5~19	SKCLPT € Unit Price Qty.1-4	SKCLPT Volume Discount Qty. 5~19
KCLPT SKCLPT	2	1/4	1/4	53	13	18	19	19				
	3	3/8	3/8	59	15	18	23	22				
	4	1/2	1/2	69	18	26	30	27				

Part Number Type	No.	T1 R (PT)	T2 RC (PT)	L	A	ℓ1	C	E (Width Across Flats)	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
SKCRCT	2	1/4	1/4	61	39	13	17	19		
	3	3/8	3/8	66	41	15	19	22		
	4	1/2	1/2	76	48	18	22	27		

For orders larger than indicated quantity, please request a quotation.

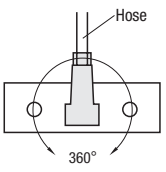
Order Example Part Number: KCLPFP4

Days to Ship 8 Days

Express A 3,00 EUR/ piece P.87

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Example



Can be tuned by 360° when connected with manifolds, etc.

Resin Hose
-Overview-

■Selection Table of Resin Hoses for Food

Type		HOFW_	HOGFW_	HOSSW_	SNHT_	HOSPW_ SNHRW_	SNHB_
		Hoses for Food Standard Type	Hoses for Food Vacuum Type	Silicone Hose Standard Type	Silicone Hose Vacuum Type	Non-PVC Hoses Standard Type	Non-PVC Hoses Vacuum Type
		P.1181	P.1181	P.1182	P.1182	P.1183	P.1183
Material	Main Material Rein-forcement	Polyvinyl Chloride Polyester Yarn	Polyvinyl Chloride PET	Silicone Rubber Polyester Yarn	Silicone Rubber Polyester Yarn +1.4301	Polyolefin+Styrene Resin Polyester Yarn	Polyolefin+Styrene Resin Hard Steel Wire
Inner Diameter (mm)		6~50	15~50.8	6.3~50.8	25.4~50.8	6~50	25~50
Max Operation Temperature Range (°C)		-5~70	-5~70	-30~150	-30~150	-5~60	-5~60
Max. Operating Pressure (Mpa)		0.3~1.0	0.2~0.4	0.3~1.0	0.3~0.7	0.2~1.0	0.1~0.3
Suction		X	○ (-0.1MPa)	X	○ (-0.1MPa)	X	○ (-0.1MPa)
Transparency		○	○	Δ	Δ	Δ	Δ
Flexibility		○	○	○	○	X	X

Type		HOJFR_	HOJSR_	HOEFR
		Fluororesin Hoses Reinforcing Type	Fluororesin Hoses Spring Type	Fluororesin Hoses Conductive Type
		P.1184	P.1184	P.1184
Material	Main Material Rein-forcement	Fluorine Resin Polyester Yarn	Fluorine Resin Spring Wire	Fluorine Resin Polyester Yarn
Inner Diameter (mm)		9~25	12~25	12~25
Max Operation Temperature Range (°C)		-20~70	-20~70	-5~70
Max. Operating Pressure (Mpa)		0.3~1.0	0.2~0.5	0.3~1.0
Suction		X	○ (-0.1MPa)	X
Transparency		○	○	○
Flexibility		○	○	○

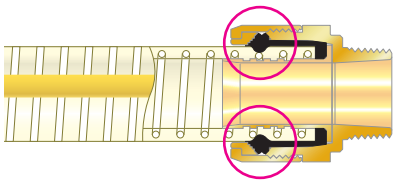
[Cautions]

Scent and taste may generate as a result of reaction with the hose itself or with the fluids (water, food, detergent etc.) during or after operation. Check these factors before use.

Hoses including PVC material may generate dioxin during combustion under 800°C.

When using PVC hose with high concentration alcohol, hose may harden quicker.

■Features of Hose Fixing Connector

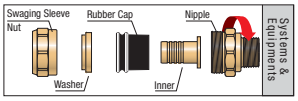


*Rubber cap inside the joint holds the circumference. Rubber gasket continues to hold the hose even if hose thins and prevents fluid from leaking and hose from falling off.

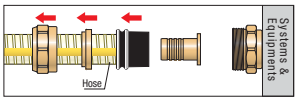
■How to Insert Connector

* Assembling methods are common in every hose.

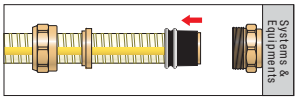
1 Attach a nipple on the machine side.



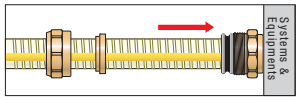
2 Insert a domed nut and a washer into hose (make sure to insert toward right direction) and put a rubber cap (until it touches the end of rubber cap).



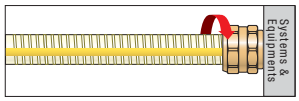
3 Insert inner into hose.



4 Insert the hose including rubber cap into the main body.



5 Tighten the domed nut until there is no clearance.



⚠ For tightening, use a wrench (adjustable wrench).
Do not use a "pipe wrench". It may cause damage the nut.
For reuse, replacement of rubber cap will be required.

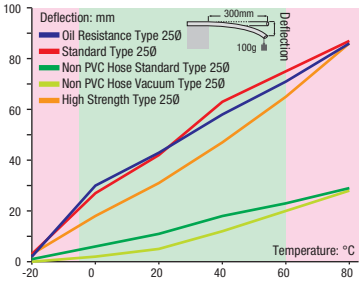
Selection Table of Resin Hoses for Ordinary Purposes

Type		HOTR_	HOTRS_	HOTG_	HOTSG_
		Standard Type	Oil-proof Type	High Strength	High Pressure Type
		P.1185	P.1185	P.1185	P.1185
Material	Main Material Reinforcement	Polyvinyl Chloride Polyester Yarn	Polyvinyl Chloride Polyester Yarn	Polyvinyl Chloride PET	Polyvinyl Chloride Polyester Yarn
	Inner Diameter (mm)	9~25	9.5~25	9~25.4	9~25
	Max Operation Temperature Range (°C)	-5~60	-5~60	-5~60	-5~60
	Max. Operating Pressure (Mpa)	0.6~1.0	0.6~1.0	0.4~0.8	1.0~1.5
	Flexibility	★★★★★	★★★★★	★★★	★★★
	Transparency	★★★★★	★★★★	★★★★	★★
	Oil Resistance	★★★★	★★★★★	★★★★★	★★★★★
	Property of Withstanding Pressure	★★★★	★★★★	★★★	★★★★★
	Crush Strength	★★	★★	★★★★	★★
	Vacuum Strength			★★★★★	
	Lightness	★★★★	★★★★★	★★★	★★★★

Comparison Graph for Performance of Resin Hoses for Ordinary Purpose

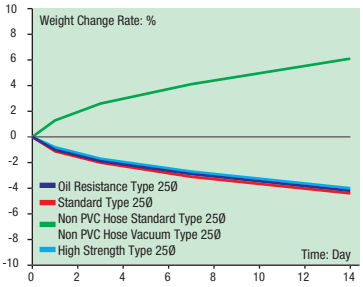
Flexibility

Measurement:
Measures deflection of sample hose with 300mm protrusion after loaded with 100g load.



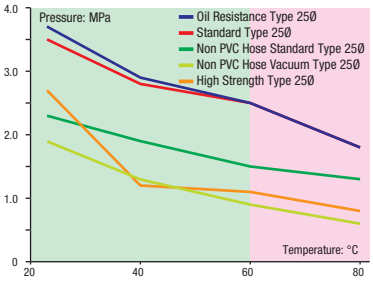
Oil Resistance

Measurement:
Conforms to JIS6723.
Soaking Temperature: 40°C Soakinfg Oil: Compressor Oil



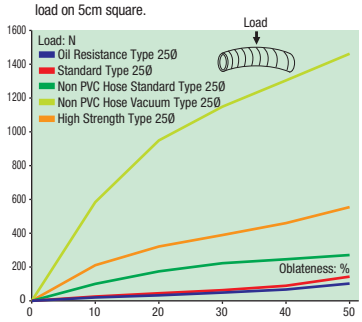
Property of Withstanding Pressure

Measurement:
Measures after putting sample for 30 minutes under each temperature condition.



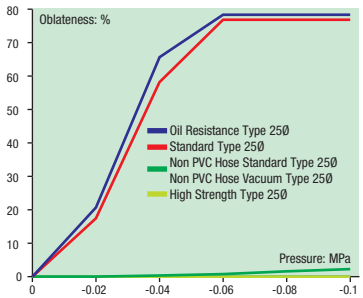
Crush Strength

Measurement:
Measures variation rate of outer diameter when providing load on 5cm square.



Vacuum Strength

Measurement:
Measure after keeping samples for 5 minutes under each negative pressure (Temperature 23°C±3°C)



*-0.1MPa is an approximate value. It may be not applicable depending on application and conditions.

NEW

Hoses for Food

-Standard / Vacuum-

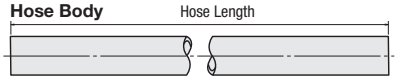
■Hoses for Food



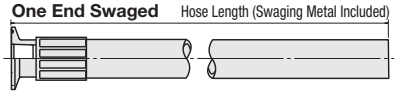
RoHS

Type			Material		
Hose Only	One End Swaged	Both Ends Swaged	Main Material	Reinforcement	Swaging Parts
HOFW	HOFWK	HOFWR	Polyvinyl Chloride	Polyester Yarn	Joint Nipples:1.4404/X2CrNiMo17-12-2 Joint Covers:1.4301/X5CrNi18-10
HOGFW	HOGFWK	HOGFWR	Polyvinyl Chloride	PET	

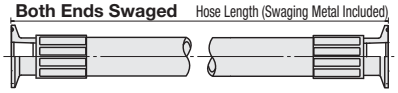
Hose Body Hose Length



One End Swaged Hose Length (Swaging Metal Included)

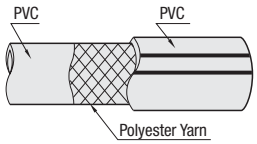


Both Ends Swaged Hose Length (Swaging Metal Included)

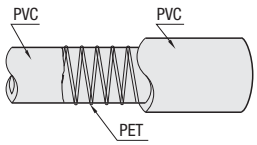


■Structure

HOFW
(Standard Type)

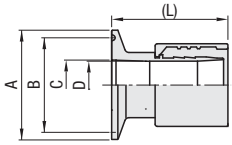


HOGFW
(Vacuum Type)



■Swage Fitting Shapes

CShape



Hose Nominal Inner Dia.	C Shape				
	A	B	C	D	(L)
1S	50.5	43.5	23.0	21.0	56.0
1.5S	50.5	43.5	35.7	33.0	73.0
2S	64.0	56.5	47.8	45.0	75.0

■Hose Specifications

No.	HOFW HOFW_					
	Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure MPa	Operation Temperature Range °C
6	6	11	2.5	30	0~1.0	-5~70
9	9	15	3	45	0~1.0	
12	12	18	3	65	0~0.8	
15	15	22	3.5	95	0~0.8	
19	19	26	3.5	120	0~0.6	
1S	25	33	4	165	0~0.6	
1.5S	38	48	5	300	0~0.4	
2S	50	62	6	440	0~0.3	

No.	HOGFW HOGFW_						
	Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure Mpa		Operation Temperature Range °C
					50°C	70°C	
15	15	22	3.5	60	-0.1~0.4	-0.1~0.3	-5~70
19	19	26	3.5	80	-0.1~0.4	-0.1~0.3	
1S	25.4	33.4	4	100	-0.1~0.4	-0.1~0.3	
1.5S	38	48	5	150	-0.1~0.3	-0.1~0.2	
2S	50.8	62.8	6	200	-0.1~0.3	-0.1~0.2	

Part Number		Hose Length	L	R	€ Unit Price		
Type	Hose Nominal Inner Dia.	0.1m Increment	Left End Swaged	Right End Swaged	€ Unit Price of Hose/m	Additional Charge for Swaging	
						One End Swaged	Both Ends Swaged
HOFW (Hose Only) HOFWK (One End Swaged) HOFWR (Both Ends Swaged)	6	0.5~100.0	-	-			
	9						
	12						
	15						
	19	0.5~50.0					
	1S	0.6~50.0	LC	RC			
	1.5S						
	2S	0.6~40.0					
HOGFW (Hose Only) HOGFWK (One End Swaged) HOGFWR (Both Ends Swaged)	15	0.5~50.0	-	-			
	19						
	1S	0.6~50.0	LC	RC			
	1.5S	0.6~40.0					
	2S						

Order Example

Part Number	-	Hose Length	-	Shape L	-	Shape R
HOFW6	-	1.5				
HOFWK1.5S	-	2.0	-	LC		
HOFWR2S	-	1.0	-	LC	-	RC

Days to Ship

8 Days | Express A | 8,00 EUR/ piece | P.88

(?)A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

(?)For orders larger than indicated quantity, please request a quotation.

(?)Volume discount rate is applicable to the unit price/m for hose only.

<Price Calculation Example>
For HOFWR1S-2.5-LC-RC,
€ Unit Price of Hose/m: 14,00
14,00x2.5+305,20=340,20
By rounding it down to the nearest ten Cent, it is 340,20 EUR

■Features of HOFW

- Available in high temperature up to 70°C.
- Superior in flexibility.
- Excels in transparency and enables the transferred materials to be observed.
- Conforms to Food Sanitation Laws.

■Features of HOGFW

- Available in high temperature up to 70°C.
- Resistant to deformation and excels in shape-retaining property.
- Excels in transparency and enables the transferred materials to be observed.
- Conforms to Food Sanitation Laws.

■CAUTION

- Cleanse inside the hose.
- Do not soak the hoses or joints in drinking water, food or fluids. Fluid may remain behind the joint and unwanted bacteria may adhere to it.

Silicone Hose
-Standard / Vacuum-

NEW

Price Reduction
Up to 39%

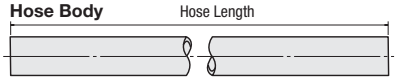
Silicone Hose



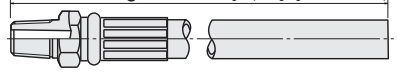
RoHS

Type			Material			
					Swaging Parts	
Hose Only	One End Swaged	Both Ends Swaged	Main Material	Reinforcement	Shape A · B	C Shape
HOSSW	HOSSWK	HOSSWR	Silicone Rubber	Polyester Yarn	Joint Nipples:1.4301/X5CrNi18-10 Joint Covers: Aluminum	Joint Nipples:1.4404/X2CrNiMo17-12-2 Joint Covers:1.4301/X5CrNi18-10
SNHT	SNHTK	SNHTR	Silicone Rubber	Polyester Yarn+1.4301/X5CrNi18-10 Coil	-	Joint Nipples:1.4404/ Joint Covers:1.4301/X5CrNi18-10

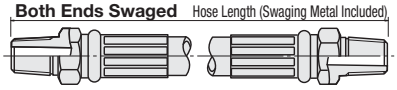
Hose Body Hose Length



One End Swaged Hose Length (Swaging Metal Included)

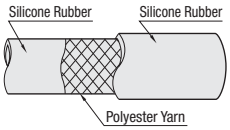


Both Ends Swaged Hose Length (Swaging Metal Included)

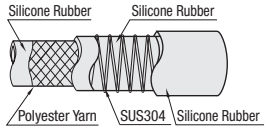


Structure

HOSSW
(Standard Type)

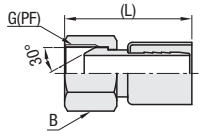


SNHT
(Vacuum Type)

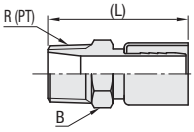


Swage Fitting Shapes

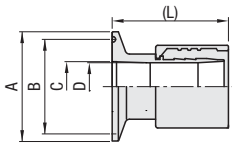
AShape



BShape



CShape



Swage Fitting Shapes

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape		B Shape	
		B (Width Across Flats)	(L)	B (Width Across Flats)	(L)
6	1/4	14	43	17	37
9	3/8	17	47	19	43
12	1/2	22	53	24	49
19	3/4	27	65	30	59

Hose Nominal Inner Dia.	C Shape				
	A	B	C	D	(L)
1S	50.5	43.5	23	22	56
1.5S	50.5	43.5	35.7	34	73
2S	64	56.5	47.8	46	75

Hose Specifications

No.	HOSSW HOSSW_					
	Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure MPa	Operation Temperature Range
6	6.3	12.3	3	80	0~1.0	-30~150
9	9.5	16	3.25	100	0~1.0	
12	12.7	19.5	3.4	130	0~0.5	
19	19.0	28	4.5	180	0~0.5	
1S	25.4	35.5	5.05	220	0~0.5	
1.5S	38.1	50.5	6.2	310	0~0.5	
2S	50.8	64.5	6.85	550	0~0.3	

No.	SNHT SNHT_					
	Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure MPa	Operation Temperature Range
1S	25.4	35.5	5.05	180	-0.1~0.7	-30~150
1.5S	38.1	50.5	6.2	280	-0.1~0.7	
2S	50.8	64.5	6.85	390	-0.1~0.3	

Part Number		Hose Nominal Inner Dia.	Hose Length 0.1m Increment	L Left End Swaged	R Right End Swaged	€ Unit Price		
Type						€ Unit Price of Hose/m	Additional Charge for Caulking	
							One End Swaged	Both Ends Swaged
HOSSW	(Hose Only)	6	0.3~20.0	LA	RA			
		9						
HOSSWK	(One End Swaged)	12	0.3~10.0	LB	RB			
		19						
HOSSWR	(Both Ends Swaged)	1S	0.6~5.0	LC	RC			
		1.5S						
		2S						
SNHT	(Hose Only)	1S	0.6~5.0	LC	RC			
SNHTK	(One End Swaged)	1.5S						
SNHTR	(Both Ends Swaged)	2S						

Order Example

Part Number	-	Hose Length	-	Shape L	-	Shape R
HOSSW6	-	1.5				
HOSSWK1.5S	-	2.0	-	LC		
SNHTR2S	-	1.0	-	LC	-	RC

Days to Ship

8 Days | Express A | 8,00 EUR/piece | P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the unit price/m for hose only.

<Price Calculation Example>
For HOSSWR12-2.5-LA-RB
€ Unit Price of Hose/m: 22,90
22,90x2.5+93,40=150,65
By rounding it down to the nearest ten Cent, it is 150,60 EUR

Feature of HOSSW
- The spirally knitted pressure-resistant reinforcement wire prevents burst due to wire failure near couplings.
- Semi-transparent wall enabling the transfer of materials to be observed
- Excellent in cold resistance and heat resistance.
- Conforms to Food Sanitation Laws.
- FDA compliant.

Features of SNHT
- Provides high level of deformation resistance to enable force-feed and vacuum.
- Semi-transparent wall enabling the transfer of materials to be observed
- Excellent in cold resistance and heat resistance.
- Conforms to Food Sanitation Laws.
- FDA compliant.

CAUTION
- Avoid use with non-polar organic solvents (benzene, toluene, hexane etc.), halogenated hydrocarbon (methylene chloride, trichloroethane etc.), strongly acid condensed agent, strong alkali solution, mineral oil, steam (long-time use) or animal and vegetable oil at 70 °C or warmer.
- Cleanse inside the hose before using with drinking water or food.
- For food plumbing, metal shape C is recommended for its safety in sanitary respect.
- At steam cleansing, apply saturated steam at 0.2MPa or lower for a short time.
- Do not soak hoses or joints in drinking water, food, or fluids.
  Fluid may remain behind the joint and unwanted bacteria may adhere to it.

Non-PVC Hoses
-Standard / Vacuum-

Price Reduction
Up to 46%

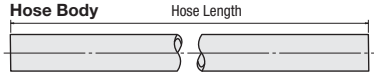
■Non-PVC Hoses



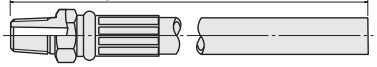
RoHS

Type			Material			
					Swaging Parts	
Hose Only	One End Swaged	Both Ends Swaged	Main Material	Reinforcement	Shape A, B	C Shape
HOSPW	HOSPWK	HOSPWR	Polyolefin+Styrene Resin	Polyester Yarn	Joint Nipples :1.4301/X5CrNi18-10 Joint Covers : Aluminum	-
SNHRW	SNHRWK	SNHRWR	Polyolefin+Styrene Resin	Polyester Yarn	-	Joint Nipples :1.4404/X2CrNiMo17-12-2 Joint Covers :1.4301/X5CrNi18-10
SNHB	SNHBK	SNHBR	Polyolefin+Styrene Resin	Hard Steel Wire	-	Joint Nipples :1.4404/X2CrNiMo17-12-2 Joint Covers :1.4301/X5CrNi18-10

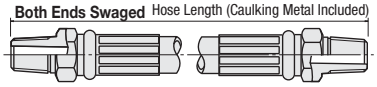
Hose Body — Hose Length



One End Swaged — Hose Length (Caulking Metal Included)

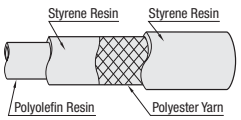


Both Ends Swaged — Hose Length (Caulking Metal Included)

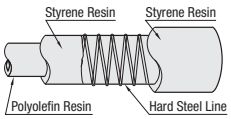


■Structure

HOSPW SNHRW

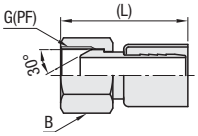


SNHB

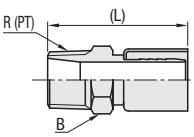


■Swage Fitting Shapes

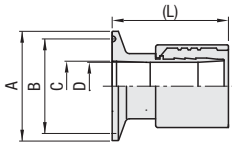
A Shape



B Shape



C Shape



■Swage Fitting Shapes

Hose Nominal Inner Dia.	R (PT) G (PF)	A Shape		B Shape	
		B (Width Across Flats)	(L)	B (Width Across Flats)	(L)
6	1/4	14	43	17	37
9	3/8	17	47	19	43
12	1/2	22	53	24	49
19	3/4	27	65	30	59

Hose Nominal Inner Dia.	C Shape				
	A	B	C	D	(L)
1S	50.5	43.5	23	22	56
1.5S	50.5	43.5	35.7	34	73
2S	64	56.5	47.8	46	75

■Hose Specifications

No.	HOSPW HOSPW_ Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure Mpa 23°C	Operating Pressure Mpa 60°C	Operation Temperature Range
6	6	11	2.5	25	0~1.0	0~0.5	-5~60°C
9	9	15	3	50	0~0.8	0~0.5	
12	12	18	3	70	0~0.8	0~0.4	
19	19	26	3.5	130	0~0.8	0~0.4	
1S	25	33	4	170	0~0.5	0~0.3	
1.5S	38	48	5	230	0~0.4	0~0.2	
2S	50	62	6	290	0~0.3	0~0.2	

No.	SNHB SNHB_ Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure Mpa 23°C	Operating Pressure Mpa 60°C	Operation Temperature Range
1S	25.0	33.0	4.0	180	-0.1~0.3	-0.1~0.1	-5~60°C
1.5S	38.0	48.0	5.0	390	-0.1~0.3	-0.1~0.1	
2S	50.0	62.0	6.0	520	-0.1~0.2	-0.1~0.1	

Part Number Type		Hose Nominal Inner Dia.	Hose Length 0.1m Increment	L Left End Swaged	R Right End Swaged	€ Unit Price € Unit Price of Hose/m	€ Unit Price Additional Charge for Swaging One End Swaged	€ Unit Price Additional Charge for Swaging Both Ends Swaged
HOSPW	(Hose Only)	6	0.3~20.0	LA	RA			
HOSPWK	(One End Swaged)	9						
HOSPWR	(Both Ends Swaged)	12		LB	RB			
		19						
SNHRW	(Hose Only)	1S	0.5~5.0	LC	RC			
SNHRWK	(One End Swaged)	1.5S						
SNHRWR	(Both Ends Swaged)	2S						
SNHB	(Hose Only)	1S	0.5~5.0	LC	RC			
SNHBK	(One End Swaged)	1.5S						
SNHBR	(Both Ends Swaged)	2S						

Order Example

Part Number	-	Hose Length	-	Shape L	-	Shape R
HOSPW6	-	1.5				
SNHRWK1.5S	-	2.0	-	LC		
SNHBR2S	-	1.0	-	LC	-	RC

Days to Ship

8 Days — Express A — 8,00 EUR/ piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the unit price/m for hose only.

<Price Calculation Example>
For HOSPWR12-2.5-LA-RB
€ Unit Price of Hose/m: 5,10
5,10x2.5+93,40=106,15
By rounding it down to the nearest ten Cent, it is 106,10 EUR

■Feature of HOSPW and SNHRW
- Contains no chlorine ingredients.
- Semi-transparent wall enabling the transfer of materials to be observed
- Conforms to Food Sanitation Laws.

■Features of SNHB
- Contains no chlorine ingredients.
- Conforms to Food Sanitation Laws.
- Reinforcement wire of hard steel provides high level of deformation resistance to enable vacuum.

■CAUTION
- Do not use with fuel oils or solvents.
- Cleanse inside the hose before using with drinking water or food.
- For food plumbing, metal shape C is recommended for its safety in sanitary respect.
- Hoses shown above are for indoors only.
- Do not soak hoses or joints in drinking water, food or fluids. Fluid may remain behind the joint and unwanted bacteria may adhere to it.

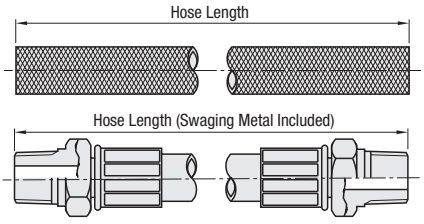
Fluororesin Hoses
-High-Flex Type / Conductive Type-

Fluororesin Hoses -High-Flex Type-

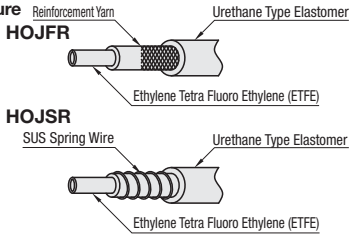


RoHS

Type			Material			
Hose Only	One End Swaged	Both Ends Swaged	Hose Interior	Reinforcement	Hose Exterior	Swaging Parts
HOJFR	HOJFRK	HOJFRR	Fluorine Resin	Polyester Yarn	Urethane Yarn Elastomer	1.4301/ X5CrNi18-10
HOJSR	-	HOJSRR	Fluorine Resin	Spring Wire		

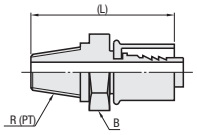


Structure

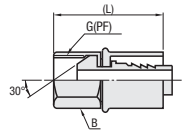


Swage Fitting Shapes

ASShape



BSShape



Part Number		Hose Length 0.1m Increment	L Left End Swaged	R Right End Swaged	€ Unit Price	
Type	Hose Nominal Inner Dia.				Hose € Unit Price/m	Additional Charge for Swaging
						One End Swaged / Both Ends Swaged
(Reinforcing Type) HOJFR HOJFRK HOJFRR	9	0.3~20.0	LAS LBS	RAS RBS		
	12					
	15					
	19					
	25					
(Spring Type) HOJSR HOJSRR	12	0.3~20.0	LAS LBS	RAS RBS		
	15					
	19					
	25					

For One End Swaged, specify LAS and LBS. Swage part is not available for hose with inner diameter 15.

Swaging Part Size List

Hose Nominal Inner Dia.	R (PT) G (PF)	AS Shape		BS Shape	
		B (Width Across Flats)	(L)	B (Width Across Flats)	(L)
9	3/8	19	44	22	40
12	1/2	22	51	27	46
19	3/4	27	64	32	58
25	1	35	75	38	70

Hose Specifications

Hose Nominal Inner Diameter mm	Hose Inner Diameter mm	Hose Outer Diameter mm	Reinforcement			Spring		
			Min. Bending Radius mm	Operating Pressure MPa 20°C	70°C	Min. Bending Radius mm	Operating Pressure MPa 20°C	70°C
9	9	15	63	0~1.0	0~0.5	-	-	-
12	12	18	84			50	-0.1~0.5	-0.1~0.25
15	15	22	105			60		
19	19	26	133			75		
25	25	33	175	0~0.6	0~0.3	100	-0.1~0.4	-0.1~0.2

Features

- Being superior in flexibility, it improves operating efficiency.
- Features non-viscous property and easy to wash.
- Excellent in chemical resistance and transparency.
- Conforms to Food Sanitation Laws.

Specifications

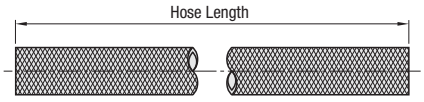
Applicable Fluid	Water · Air · Oil · Solvent · Powder
Operation Temperature Range	-20 ~ 70°C (Not to be frozen)
Normal Operating Pressure	Depends on size & temperature

Fluororesin Hoses -Inductive Type-

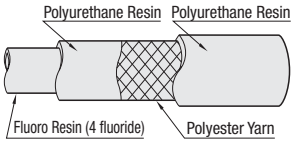


RoHS

Type	Material		
Hose Only	Hose Interior	Reinforcement	Hose Exterior
HOEFR	Fluoro Resin (4 fluoride)	Polyester Yarn	Polyurethane Resin



Structure



Part Number		Hose Length 0.1m Increment	€ Unit Price
Type	Hose Nominal Inner Dia.		Hose € Unit Price/m
HOEFR	12	0.5~20.0	
	15		
	19		
	25		

Hose Specifications

Hose Nominal Inner Diameter mm	Hose Inner Diameter mm	Hose Outer Diameter mm	Reinforcement		
			Min. Bending Radius mm	Operating Pressure Mpa 23°C	70°C
12	12	18	85	0~1.0	0~0.5
15	15	22	105		
19	19	26	135		
25	25	33	175	0~0.6	0~0.3

Order Example

Part Number	-	Hose Length	-	Shape L	-	Shape R
HOJFRK19	-	5.0	-	LBS		
HOJFRR9	-	2.0	-	LAS	-	RBS
HOEFR12	-	10.0				

Price

Days to Ship

-High-Flex Type

8 Days — Express A — 3,00 EUR/piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

-Inductive Type

8 Days — Express A — 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the unit price/m for hose only.

<Price Calculation Example>
For HOJFR9-2.5-LAS-RBS,
Hose m Price/m: 23,50 EUR
23,50x2.5+22,00=80,75 EUR
By rounding it down to the nearest ten Cent, it is 80,70 EUR

Features

- Prevents trouble caused by electrostatic discharge.
- Conforms to Food Sanitation Laws.
- Smooth interior surface helps transfer of high viscosity fluids efficiently, and makes cleaning easy with little residual fluds.

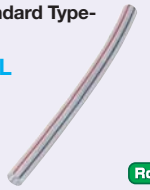
Specifications

Applicable Fluid	Water · Air · Oil · Solvent · Powder
Operation Temperature Range	-5 ~ 70°C
Normal Operating Pressure	Depends on size & temperature

Resin Hoses for Ordinary Purposes

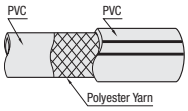
■Resin Hoses for Ordinary Purposes -Standard Type-

HOTR
HOTRL



RoHS

Construction Diagram

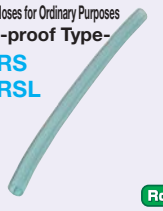


Part Number		Hose Length		Inner Diameter (mm)	Outer Diameter (mm)	Operating Temp. Range	Operating Pressure MPa	Min. Bending Radius (mm)	Mass kg/m	Dimension Selectable Type	Configurable Length
Type	Hose Nominal Inner Dia.	Dimension Selectable Type (m)	Configurable Length (0.1mm Increment)							€ Unit Price	€ Unit Price
										1 ~ 2 Coils	€ Unit Price of Hose/m
HOTR (Dimension Selectable Type)	9	50	0.5~49.9	9	15	-5~60	0~1.0	45	0.15		
		100									
	12	50		12	18		0~0.8	55	0.19		
		100									
HOTRL (Configurable Length)	15	50		15	22			80	0.27		
		100									
	19	50		19	26		0~0.6	95	0.32		
	25	50		25	33			140	0.5		

For orders larger than indicated quantity, please request a quotation.

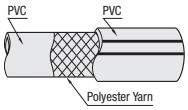
■Resin Hoses for Ordinary Purposes -Oil-proof Type-

HOTRS
HOTRSL



RoHS

Construction Diagram

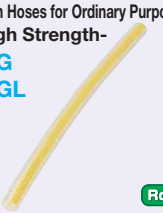


Part Number		Hose Length		Inner Diameter (mm)	Outer Diameter (mm)	Operating Temp. Range	Operating Pressure MPa	Min. Bending Radius (mm)	Mass kg/m	Dimension Selectable Type	Configurable Length
Type	Hose Nominal Inner Dia.	Dimension Selectable Type (m)	Configurable Length (0.1mm Increment)							€ Unit Price	€ Unit Price
										1 ~ 2 Coils	€ Unit Price of Hose/m
HOTRS (Dimension Selectable Type)	9	50	0.5~49.9	9.5	15	-5~60	0~1.0	45	0.14		
		100									
	12	50		12	17		0~0.8	60	0.15		
		100									
HOTRSL (Configurable Length)	15	50		15	21			90	0.23		
		100									
	19	50		19	25		0~0.6	130	0.28		
	25	50		25	32			150	0.42		

For orders larger than indicated quantity, please request a quotation.

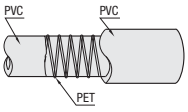
■Resin Hoses for Ordinary Purposes -High Strength-

HOTG
HOTGL



RoHS

Construction Diagram



Part Number		Hose Length		Inner Diameter (mm)	Outer Diameter (mm)	Operating Temp. Range	Operating Pressure MPa	Min. Bending Radius (mm)	Mass kg/m	Dimension Selectable Type	Configurable Length
Type	Hose Nominal Inner Dia.	Dimension Selectable Type (m)	Configurable Length (0.1mm Increment)							€ Unit Price	€ Unit Price
										1 ~ 2 Coils	€ Unit Price of Hose/m
HOTG (Dimension Selectable Type)	9	50	0.5~49.9	9	15	-5~60	-0.1~0.8	40	0.14		
		100									
	12	50		12	18		-0.1~0.5	50	0.185		
		100									
HOTGL (Configurable Length)	15	50		15	22			60	0.25		
		100									
	19	50		19	26		-0.1~0.4	80	0.34		
	25	50		25.4	33.4			100	0.5		

For orders larger than indicated quantity, please request a quotation.

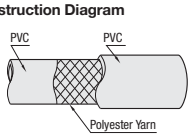
■Resin Hoses for Ordinary Purposes -Withstanding Pressure Type-

HOTSG
HOTSGL



RoHS

Construction Diagram



Part Number		Hose Length		Inner Diameter (mm)	Outer Diameter (mm)	Operating Temp. Range	Operating Pressure MPa	Min. Bending Radius (mm)	Mass kg/m	Dimension Selectable Type	Configurable Length
Type	Hose Nominal Inner Dia.	Dimension Selectable Type (m)	Configurable Length (0.1mm Increment)							€ Unit Price	€ Unit Price
										1 ~ 2 Coils	€ Unit Price of Hose/m
HOTSG (Dimension Selectable Type)	9	50	0.5~49.9	9	15	-5~60	0~1.5	45	0.15		
		100									
	12	50		12	18			55	0.19		
		100									
HOTSGL (Configurable Length)	15	50		15	22			80	0.27		
		100									
	19	50		19	26		0~1.0	95	0.32		
	25	50		25	33			140	0.5		

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	Hose Length
HOTR9	-	100
HOTRSL19	-	45.9

Days to Ship

8 Days

Express A 8,00 EUR/piece

P. 88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P. 87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the unit price/m for hose only.

<Price Calculation Example>
For HOTRS12-11.5, € Unit Price of Hose/m: 2,70 EUR
2,70x11.5=31,05
By rounding it down to the nearest ten Cent, it is 31,00 EUR

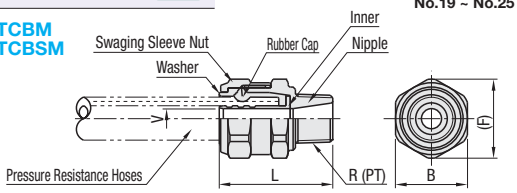
Hose Fixing Connector



Type	Material					Applicable Hose
	Nipple	Inner	Rubber Cap	Washer	Swaging Sleeve Nut	
TCBM	Brass	Brass	NBR	Brass	Brass	HOTR_ / HOTSG_ / HOTG_
TCBSM	Brass	Brass	NBR	Brass	Brass	HOTRS_
TCPM	POM	POM	NBR	POM	POM	HOTR_ / HOTSG_ / HOTG_
TCPSM	POM	POM	NBR	POM	POM	HOTRS_

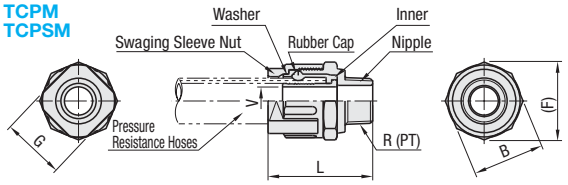
TCBM
TCBSM

- Nipple Points
  No.9 ~ No.15 Hexagon
  No.19 ~ No.25 Octagon



TCPM
TCPSM

- Nipple Points
  No.9 ~ No.12 Hexagon
  No.15 ~ No.25 Octagon



Part Number Type	No.	L	Hexagon · Octagon Diagonal Dims. B	V	(F)	G	R (PT)	Applicable Hose	€ Unit Price 1 ~4 pieces	Volume Discount 5 ~9 pieces
TCBM (Brass)	9	39.5	25	7	27.5	-	R3/8	(TCBM · TCPM) HOTR_ HOTSG_ HOTG_ (TCBSM · TCPSM) HOTRS_		
	12	45	29	9.9	31.9		R1/2			
TCBSM (Brass)	15	47.5	34	12.3	37.4		R1/2			
	19	52.5	40	17	42.4		R3/4			
	25	59.5	49	22.5	52.4		R1			
TCPM (Polyacetal)	9	50	30	7	34.6	24	R3/8			
	12	57	32	9.6	36.9	27	R1/2			
TCPSM (Polyacetal)	15	61.5	41	12.3	45.64	32	R1/2			
	19	68.5	42	17	45.64	37	R3/4			
	25	75.7	52	22.5	56.28	47	R1			

For orders larger than indicated quantity, please request a quotation.

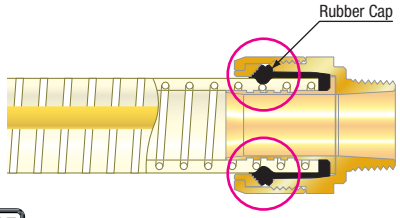
Order Example | Part Number: TCBM25 | Days to Ship: 8 Days | Express A: 5,00 EUR/ piece P. 88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Features

1. Environment-friendly
   Wider effective sectional area compared to male hose nipple results in reduction of pressure loss.
2. Enhanced working efficiency
   No need of cumbersome retightening. Standardizes mounting operation of hoses.
3. Improved maintenability
   Prevents hoses from falling off and fluid from leaking.
4. Safety Operation
   Easy detachment of hose results in enhanced working efficiency. Can prevent twists.

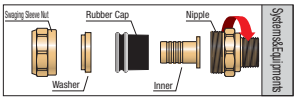
Structure Diagram of Hose Fixing Connector



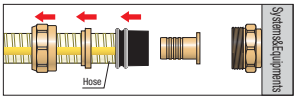
How to Mount Fitting

* Assembling methods are common in every hose.

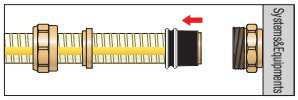
1 Attach a nipple on the machine side.



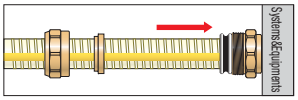
2 Insert a Swaging Sleeve nut and a washer into hose (make sure to insert toward right direction) and put a rubber cap (until it touches the end of rubber cap).



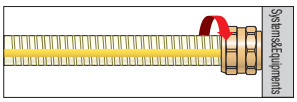
3 Insert inner into hose.



4 Insert the hose including rubber cap into the main body.

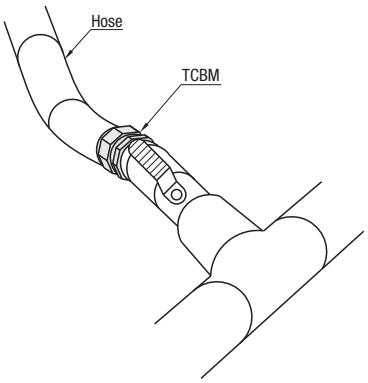


5 Tighten the domed nut until there is no clearance.



⚠ For tightening, use a wrench (adjustable wrench).
Do not use a "pipe wrench". It may cause damage the nut.
For reuse, replacement of rubber cap will be required.

Example



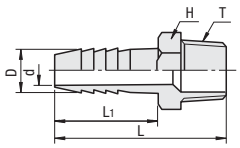
Fittings for Hoses

■Male Nipples



RoHS

Type	Material
HOSN	Brass
HOSNS	1.4301/X5CrNi18-10



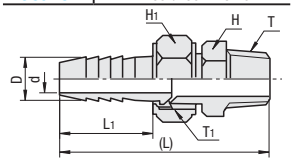
Part Number Type	No.	Applicable Hose Nominal Inner Dia.	T R (PT)	D	HOSN d	HOSN H	HOSN L	HOSN L1	HOSNS d	HOSNS H	HOSNS L	HOSNS L1	HOSN € Unit Price 1~19 pieces	HOSN Volume Discount 20 pieces~	HOSNS € Unit Price Qty. 1~9	HOSNS Volume Discount Qty. 10~
HOSN (Brass) / HOSNS (1.4301/ X5CrNi18-10)	61	6	1/8	7	4	12	34	20	4	12	36	20				
	62		1/4		4	14	41	26	4	14	42	24				
	63		3/8		4	17	46	29	4	17	44	25				
	64		1/2		3.5	22	50	29	4	22	49	27				
	628		1/4	8	4.5	14	41	26	5	14	42	24				
	629		1/4	9	5	14	41	26	5	14	42	24				
	91	9	1/8	10.5	6	12	34	20	6	12	36	20				
	92		1/4		7	14	41	26	6	14	42	24				
	93		3/8		7	17	46	29	6	17	44	25				
	94		1/2		6	22	50	29	7	22	49	27				
	12412	12	1/2	12	7.5	22	50	29	8	22	49	27				
	122		1/4	14	9	14	41	26	8	17	42	24				
	123		3/8		10	17	46	29	9	17	44	25				
	124		1/2		10	22	50	29	11	22	49	27				
	153	15	3/8	16	11.5	17	46	29	11	17	44	25				
	154		1/2		11	22	50	29	12	22	49	27				
	19619	19	3/4	19	13	27	60	36	14	27	59	33				
	194		1/2	20.5	14	22	50	29	15	22	49	27				
	196		3/4		15	27	60	36	15	27	59	33				
	258	25	1	27	20	35	73	41	22	35	70	40				
	3812	38	1 1/2	40	30	51	100	61	31	52	92	53				
	5016	50	2	52	40	63	132	86	43	63	102	59				

■Joint Nipples



RoHS

Type	Material
HOSJN	Brass
HOSJNS	1.4301/X5CrNi18-10



Part Number Type	No.	Applicable Hose Nominal Inner Dia.	T R (PT)	D	T1 G (PF)	d	H	H1	(L)	L1	HOSJN € Unit Price Qty. 1~9	HOSJN Volume Discount Qty. 10~	HOSJNS € Unit Price Qty. 1~9	HOSJNS Volume Discount Qty. 10~29
HOSJN (Brass)	61	6	1/8	7.0	1/8	4.0	12	12	43	19				
	62		1/4		1/4	4.0	14	16	59	26				
	63		3/8		1/4	4.0	17	16	60	26				
	628		1/4	8	1/4	4.5	14	16	59	26				
	629		1/4	9	1/4	5	14	16	59	26				
HOSJNS (1.4301/ X5CrNi18-10)	92	9	1/4	10.5	3/8	7.0	17	19	57	27				
	93		3/8		3/8	7.0(7.2)	17	19	60(64)	27(25)				
	94		1/2		3/8	7.0	22	19	63	27				
	123	12	3/8	14.0	1/2	10.0	22	24	71	31				
	124		1/2		1/2	10.0(10.5)	22	24	73(78)	31(30)				
	126		3/4		1/2	10.0	28	24	77	31				
	153	15	3/8	16	1/2	11.5	22	24	71	31				
	154		1/2		1/2	11.5	22	24	73	31				
	194	19	1/2	20.5	3/4	15.0	28	30	78	35				
	196		3/4		3/4	15.0(15.5)	28(27)	30	82(90)	35(39)				

Values in ( ) are applicable to HOSJNS.

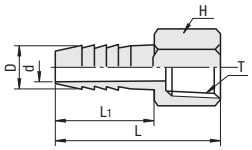
For orders larger than indicated quantity, please request a quotation.

■Female Nipples



RoHS

Type	Material
HOSFNS	1.4301/X5CrNi18-10



Part Number Type	No.	Applicable Hose Nominal Inner Dia.	T RC (PT)	D	d	H	L	L1	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
HOSFNS (1.4301/ X5CrNi18-10)	62	6	1/4	7.0	4.0	17	45	26		
	92	9	1/4	10.5	7.0	17	45	26		
	93		3/8			22	49	28		
	94		1/2			24	54	29		
	123	12	3/8	14	10.0	22	49	28		
	124		1/2			24	54	29		

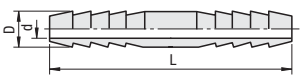
For orders larger than indicated quantity, please request a quotation.

■Bamboo Shoot Joints



RoHS

Type	Material
HOSJJS	1.4301/X5CrNi18-10



Part Number Type	No.	Applicable Hose Nominal Inner Dia.	D	d	L	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
HOSJJS (1.4301/ X5CrNi18-10)	6	6	7.0	4.0	55		
	9	9	10.5	6.5	70		
	12	12	14.0	10.0	75		
	19	19	20.5	15.7	90		

For orders larger than indicated quantity, please request a quotation.

Specifications

Applicable Fluid	Water · Air · Oil
Operation Temperature Range	-50 ~ 150℃ (Not to be frozen)
Normal Operating Pressure	3.5MPa

Order Example — Part Number: HOSN61, HOSJJS12

Days to Ship: 6 Days P.87

Reduced Delivery Time

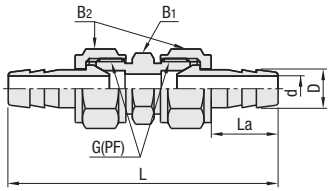
CAD Data

Open-ended Hose Joint



RoHS

Type	Material
HOSSH	Brass



Part Number Type	Part Number No.	Applicable Hose Nominal Inner Dia.	D	d	B1	B2	G (PF)	La	L	€ Unit Price Qty.1-4	Volume Discount 5 ~ 9 pieces
HOSSH	61	6	7	4	14	16	1/4	26	89		
	628		8	4.5	14	16	1/4	26	89		
	629		9	5	14	16	1/4	26	89		
	92	9	10.5	7	17	19	3/8	27	91		
	123	12	14	10	22	24	1/2	31	112		
	153	15	16	11.5	22	24	1/2	31	112		
	196	19	20.5	15	27	30	3/4	35	120		

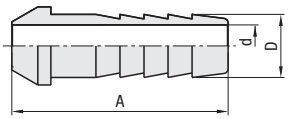
For orders larger than indicated quantity, please request a quotation.

Bamboo Shoot Joints



RoHS

Type	Material
HOSHS	Brass



Part Number Type	Part Number No.	Applicable Hose Nominal Inner Dia.	D	d	A	€ Unit Price Qty.1-4	Volume Discount 5 ~ 9 pieces
HOSHS	628	6	8	4.5	34		
	629		9	5	34		
	92	9	10.5	7	36		
	123	12	14	10	42		
	153	15	16	11.5	42		
	196	19	20.5	15	46		

Joint applicable for HOSJN and HOSSH only.

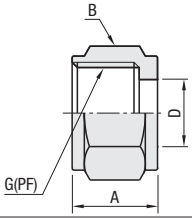
For orders larger than indicated quantity, please request a quotation.

Swaging Sleeve Nut for Hose



RoHS

Type	Material
HOSHN	Brass



Part Number Type	Part Number No.	Body Applicable No.	G (PF)	D	B	A	Unit Price Qty.1-4	Volume Discount 5 ~ 9 pieces
HOSHN	2	62 63 628 629	1/4	9.5	16	13		
	3	92 93 94	3/8	11	19	14		
	4	123 124 126 153 154	1/2	16.5	24	16		
	6	194 196	3/4	21.5	30	17.5		

Joint applicable for HOSJN and HOSSH only.

For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number: HOSSH92

Days to Ship: 8 Days

Express A: 2,00 EUR/piece

P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

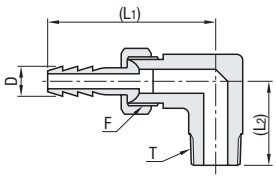
Fittings for Hoses

■Elbow Nipples



RoHS

Type	Material
HOSJE	Brass

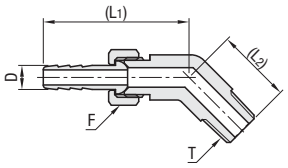


■45° Elbow Nipples



RoHS

Type	Material
HOSJH	Brass

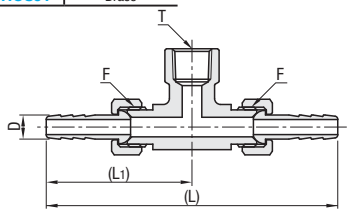


■Blanch Tee



RoHS

Type	Material
HOSJT	Brass



■Elbow Nipples

Part Number		Applicable Hose Nominal Inner Dia.	T R (PT)	F G (PF)	D	(L1)	(L2)	€ Unit Price	Volume Discount
Type	No.							Qty. 1~9	Qty. 10~29
HOSJE (Brass)	61	6	1/8	1/8	6.5	39	20		
	82	8	1/4	1/4	8	48.5	25		
	93	9	3/8	3/8	10.0	56	28		
	124	12	1/2	1/2	14.0	72	34		

For orders larger than indicated quantity, please request a quotation.

■45° Elbow Nipples

Part Number		Applicable Hose Nominal Inner Dia.	T R (PT)	F G (PF)	D	(L1)	(L2)	€ Unit Price	Volume Discount
Type	No.							Qty. 1~9	Qty. 10~29
HOSJH (Brass)	61	6	1/8	1/8	6.5	39	20		
	82	8	1/4	1/4	8	48.5	25		
	93	9	3/8	3/8	10.0	56	28		
	124	12	1/2	1/2	14.0	72	34		

For orders larger than indicated quantity, please request a quotation.

■Blanch Tee

Part Number		Applicable Hose Nominal Inner Dia.	T R (PT)	F G (PF)	D	(L1)	(L)	€ Unit Price	Volume Discount
Type	No.							Qty. 1~9	Qty. 10~29
HOSJT (Brass)	61	6	1/8	1/8	6.5	39	78		
	82	8	1/4	1/4	8	48.5	97		
	93	9	3/8	3/8	10.0	56	112		
	124	12	1/2	1/2	14.0	72	144		

For orders larger than indicated quantity, please request a quotation.

Order Example | Part Number: HOSJE61

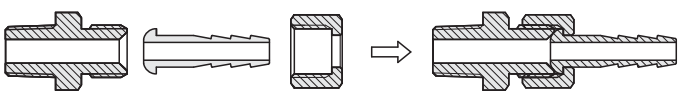
Days to Ship: 8 Days

Express A: 2,00 EUR/piece

P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

■Assembly Procedure (HOSJE · HOSJH · HOSJT)



(1) Insert hose nozzle into hose nut.
(2) Position the R-plane (seat) of hose nozzle to inside the body.
(3) Hand tighten hose nut.
(4) Then secure with a wrench or a spanner.

Coiled Hoses / Air Hoses

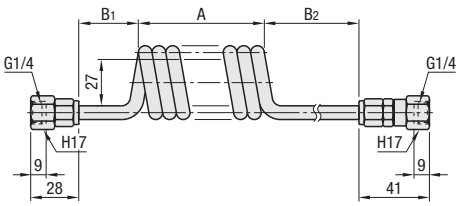
Price Reduction
Up to 6%

Coil Hose



RoHS

HOSPH



Material: Polyurethane

Features
- Excellent in flexibility.
- Excellent in mechanical strength, especially in abrasion resistance.

Specifications
- Operation Temperature Range: -40 ~ 80°C
- Maximum Operating Pressure: 1.1MPa
- Applicable Fluid: Compressed Air

Order Example: Part Number HOSPH8 - Hose Length 3000

Days to Ship: 8 Days

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Part Number Type	Hose Nominal Inner Dia.	Hose Extension Length (mm)	Inner Diameter (mm)	Outer Diameter (mm)	A	B1	B2	Min. Bending Radius	Outer Diameter Precision	Mass (g)	HOSPH € Unit Price 1 pc.	HOSPH Volume Discount 2~5 pieces
HOSPH	8	800	5	8	180	100	500	14	±0.1	200		
		1800	5	8	400	100	500			300		
		3000	5	8	630	100	500			405		
		3700	5	8	800	100	500			490		
	10	800	6.5	10	185	100	500	16		285		
		1800	6.5	10	400	100	500			425		
		3700	6.5	10	800	100	500			690		

For orders larger than indicated quantity, please request a quotation.

Air Hoses -Standard Type-

RoHS



Material: Polyurethane

Part Number Type	Hose Nominal Inner Dia.	Hose Length (m) Selection	Hose Color	Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure MPa	Operation Temperature Range	€ Unit Price 1 ~ 4	Volume Discount 5 ~ 9
EHOS	6	10	Not Specified (Red)	6.5	10	1.75	40	0~1.5	-20~60°C		
		20									
	9	10	BL (Blue)	8.5	12.5	2	55	0~1.5			
		20									

For orders larger than indicated quantity, please request a quotation.

Features
- Hose weight is very light.
- Excellent in cold resistance and oil resistance.

Specifications

Applicable Fluid	Air
Operation Temperature Range	-20~60°C
Normal Operating Pressure	0~1.5MPa

Air Hoses -Sliding Type-

RoHS



Material: Special Polyurethane

Part Number Type	Hose Nominal Inner Dia.	Hose Length (m) Selection	Hose Color	Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure MPa	Operation Temperature Range	€ Unit Price 1 ~ 4	Volume Discount 5 ~ 9
ERHOS	6	10	Not Specified (Red)	6.3	10	1.85	40	0~1.5	-20~60°C		
		20									
	9	10	BL (Blue)	8.3	12.5	2.1	40				
		20									

For orders larger than indicated quantity, please request a quotation.

Features
- Enhances sliding of hose and facilitates movement and operation.
- Soft and flexible hose leads to less burden on wrist and arm.
- Lithe hose causes less leaping and secures safety at foot.

Specifications

Applicable Fluid	Air
Operation Temperature Range	-20~60°C
Normal Operating Pressure	0~1.5MPa

Air Hoses -High-Flex Type-

RoHS



Material: Polyvinyl Chloride

Part Number Type	Hose Nominal Inner Dia.	Hose Length (m) Selection	Inner Diameter (mm)	Outer Diameter (mm)	Thickness (mm)	Min. Bending Radius (mm)	Operating Pressure MPa	Operation Temperature Range	€ Unit Price 1 ~ 4	Volume Discount 5 ~ 9
AHOS	6	10	6.5	13	3.25	30	0~1.0	-5~60°C		
		20								
	9	10	8	15	3.5	35				
		20								

For orders larger than indicated quantity, please request a quotation.

Features
- Soft type easy to insert into metal fittings such as hose nipples.
- Band tightening with high air tightness prevents leakage of air.
- No sticking of oil. No swelling often seen in rubber hoses.

Specifications

Applicable Fluid	Air
Operation Temperature Range	-5~60°C
Normal Operating Pressure	0~1.0MPa

Order Example: Part Number EHOS6 - Hose Length 10 - Hose Color BL

Days to Ship: 8 Days

Hose Bands

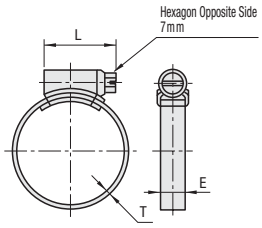
Price Reduction
Up to 70%

CAD Data

■Hose Bands -Standard Type- RoHS

HOSBS





Material: 1.4301/X5CrNi18-10

Part Number Type	No.	Tightening Range (mm)	L	E	T	Tightening Torque (Nm)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
HOSBS	9N	9~ 13	19	9.5	0.7	3.4		
	13N	13~ 19						
	16N	16~ 22	24	12	0.8	4.2		
	19N	19~ 25						
	22N	22~ 29				5.1		
	25N	25~ 35						
	28N	28~ 41						
	31N	31~ 48	33			5.9		
	38N	38~ 54						
	44N	44~ 60						
	50N	50~ 70				6.7		
	60N	60~ 80						
	70N	70~ 90						
	83N	83~102						
	95N	95~115						
	104N	104~127						
	127N	127~146				5.9		
	146N	146~159						
	149N	149~178						
	175N	175~203						
	200N	200~229						

Suitable for connecting Duct Hoses on **P.1195** and **P.1196**

Hose band is the product to prevent the hose from falling off. Structurally, clearance may occur at the smallest tightening torque.

Order Example — Part Number: HOSBS13N

For orders larger than indicated quantity, please request a quotation.

Days to Ship — HOSBS: 6 Days P.87

HOSSB · HOSBH: 8 Days

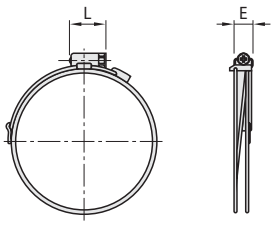
Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

■Hose Bands -Spiral Type- RoHS

HOSSB





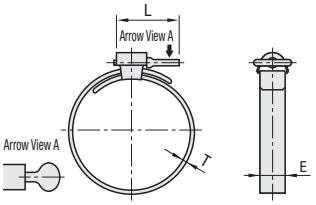
Material: 1.4301/X5CrNi18-10

Part Number Type	No.	Hose Outer Dia. Tightening Range (m,m)	L	E	Tightening Torque (N-m)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
HOSSB	30	30~37	30.5	15	5		
	32	32~42					
	47	47~57					
	58	58~68					
	71	71~81					
	86	86~96					
	90	90~110					

■Hose Bands -Hand Tightening Type- RoHS

HOSBH





Material: 1.0330/DC01
Surface Treatment: Trivalent Chromate

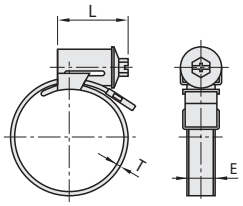
Part Number Type	No.	Hose Outer Dia. Tightening Range (mm)	L	E	T	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
HOSBH	15	15~22	32	12	0.5		
	18	18~28					
	20	20~34					
	25	25~40					
	40	40~55					

■Hose Bands -Safety Lock Type- RoHS

HOABS

(Cap Type)





Material:
Band, Housing: 1.4016/X6(8)Cr17
Bolt: Iron Cap: Polyethylene

Part Number Type	No.	Hose Outer Dia. Tightening Range (mm)	L	T	E	Tightening Torque (Nm)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
HOABS	8	8~12	21	0.6	9	3.5		
	10	10~15						
	11	11~17						
	13	13~20						
	16	16~22						
	18	18~25	30	0.8	12	5		
	22	22~30						
	25	25~35						
	27	27~40						
	30	30~45						
	35	35~50						
	40	40~55				6		
	45	45~60						
	55	55~70						

Order Example — Part Number: HOABS25

For orders larger than indicated quantity, please request a quotation.

Days to Ship — 8 Days

Express A 2,00 EUR/ piece P.88.

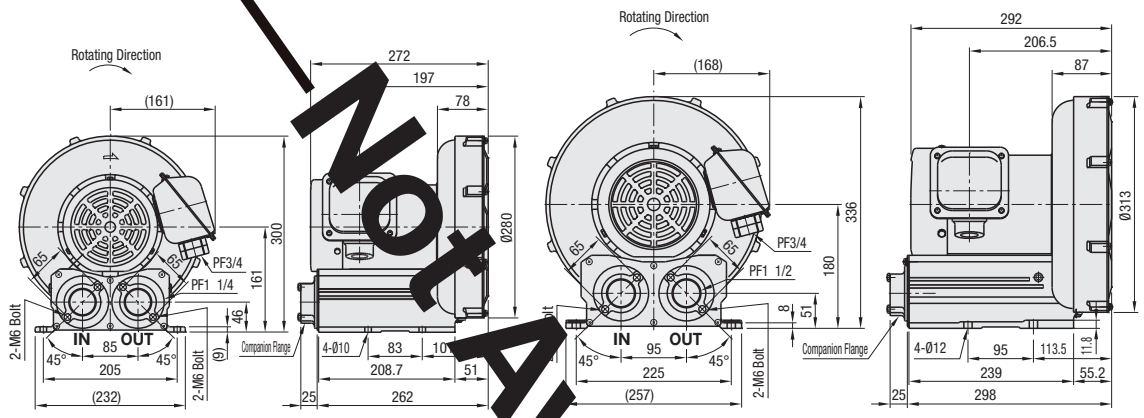
A Express Charge of 5,40 EUR for 3 or more identical pieces.

High Pressure Blower

CAD Data

High Pressure Blower

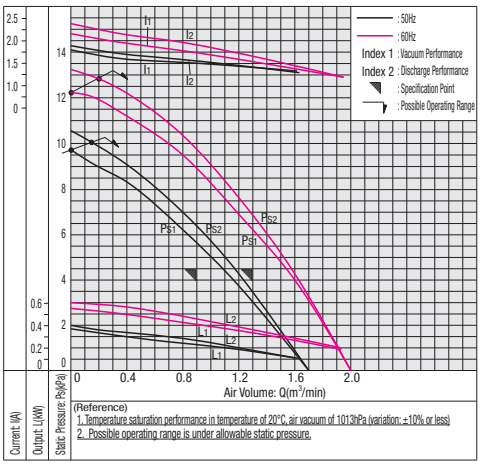


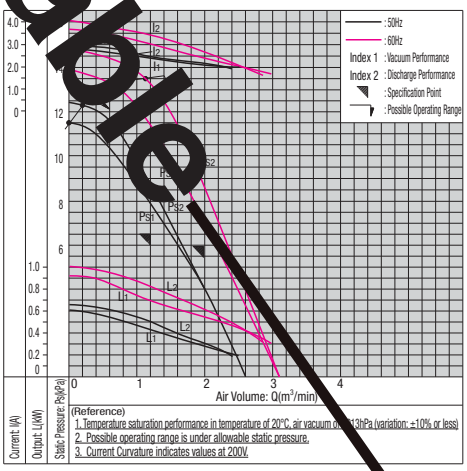


Part Number / Type	Phases	Power supply voltage (V)	Frequency (Hz)	Suction Characteristics: Rating Value Air Volume (m^3/min)	Suction Characteristics: Rating Value Static Pressure (kPa)	Suction Characteristics: Max. Property Static Pressure (kPa)	Suction Characteristics: Max. Property Output (kW)	Suction Characteristics: Max. Property Current (A)	Discharge Characteristics: Max. Property Static Pressure (kPa)	Discharge Characteristics: Max. Property Output (kW)	Discharge Characteristics: Max. Property Current (A)	Max Air Volume (m^3/min)	Noise dB (A)	Starting Current (A)	Mass (Kg)	€ Unit Price
																1
	Three-Phase	200	50	0.9	4.4	9.7	0.35	3.8	10.2	0.38	1.9	1.7	58	17.4(50Hz)	17.5	
			60	1.3	4.4	12.3	0.53	2.8	12.5	0.56	2.3	2	62	16.7(60Hz)		
	Three-Phase	200	50	1.2	6.5	11.5	0.63	3.6	12.3	0.67	3.1	2.6	63	22(50Hz)	21.5	
			60	2	5.9	13.3	0.88	3.6	12.5	0.9	3.7	3.1	66	20(60Hz)		

For orders larger than indicated quantity, please request a quotation.

Possible Operating Range





Order Example Part Number

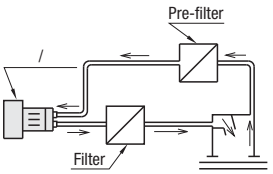
Days to Ship 8 Days

Express A | 2,00 EUR/piece P.88

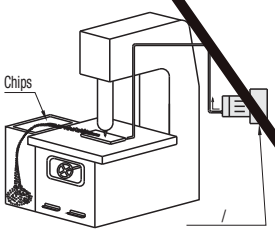
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Example

Dust Separator



Removal of Machining Chips



Specifications

- Environment Temperature and Air Vacuum Temperature: -20~+40°C
- Reference Temperature: 90% or less
- Use only for vacuuming air. Do not use for vacuuming fluid, corrosive and explosive gases

Not Available

Duct Hoses

-Overview-

	HOSEE/HOSEE_	HOSKK	HOSSD/HOSSD_	HOSHD/HOSHD_
	Lightweight Type	**Swivel Type**	**Flexible Type**	**Friction Resistant, Antistatic Duct Hoses**
	P.1194	P.1194	P.1195	P.1195
Type				
Type	Blast and Exhaust	Spot Cooler	Blast and Exhaust	Powder and grains
Fluid · Application	- For blast and exhaust of air, wooden powder, dust, etc.	- For air (spot cooler · supply of air-conditioner)	- Blast and exhaust of warm air - Air Conditioning, Ventilation - Exhaust emission of equipments	- Carriage of particles, iron powder, paper trash, wood particles - Heat-resistant Hot Air Heaters
Material	Flexible or Hard PVC	PP	Polypropylene Reinforcement: Hard Steel Wire	Polypropylene Reinforcement: Synthetic Rubber (EPDM)
Operation Temperature Range	-10 ~ 50°C	-	-20 ~ 80°C	-30 ~ 80°C
Allowable Pressure Range Below ambient temperatur	0~0.06MPa	0~0.001MPa	0~0.002MPa	0~0.03MPa
Allowable Pressure Range Above ambient temperature	0~0.03MPa	0~0.0005MPa	0~0.002MPa	0~0.01MPa
Features	- Being excellent in flexibility and lightweight property, it improves operating efficiency. - Easy to cut and mount.	- Capable of being bent or flexed as desired and keeping its bent state. - Diameter can be varied by twisting the opening. - Can be cut with a utility knife.	- Highly flexible and can be fixed at desired angles and positions. - It can be shortened to 1/3~1/4 of the original length.	- Resistant to cold, heat and abrasion. - Excels in antistatic property. - Reduces generation of ozone crack (deformity).

	HOSDY/HOSDY_	HOSCD/HOSCD_	HOSCE/HOSCER
	Oil-proof Type	**Translucent Type**	**Antistatic Translucent Type**
	P.1196	P.1196	P.1196
Type			
Type	Suction and Exhaust	Blast and Exhaust	Blast and Exhaust
Fluid · Application	- Suction of exhaust emission of oil mist - Collection of oil mist such as lathes and milling machines	- Blast and exhaust of systems & equipments - Blast and exhaust emission of food processing evaporator systems - Blast and exhaust emission in environments where dust must be avoided. - Clean room air supply and exhausts	- Blast and exhaust of systems & equipments - Blast and exhaust emission of food processing evaporator systems - Blast and exhaust emission in environments where dust must be avoided. - Clean room air supply and exhausts
Material	Oil Resistance Hard, Flexible PVC	Polypropylene Olefin Type Elastomer	Polypropylene Olefin Type Elastomer
Operation Temperature Range	-10 ~ 50°C	-20 ~ 50°C	-20 ~ 50°C
Allowable Pressure Range Below ambient temperatur	0~0.04MPa	0~0.04MPa	0~0.04MPa
Allowable Pressure Range Above ambient temperature	0~0.02MPa	0~0.02MPa	0~0.02MPa
Features	- Excellent in oil resistance. - Lightweight and Excellent in heat resistance. - High efficiency due to low interior resistance contributes to energy savings.	- Being very excellent in lightweight property, flexibility and bend performance, it improves operating efficiency. - The hose is semi-translucent so transported materials can be observed. Compliant to Health, Labor and Welfare Ministry Notification No.201 Food Sanitation Laws.	- Not only it is semi-translucent, it features antistatic effect. Compliant to Health, Labor and Welfare Ministry Notification No.201 Food Sanitation Laws.

	HOAD	HOCTD	HOTD
	Aluminum Type	**Low Particulate Generation Type**	**Heat-resistant Free Alignment Type**
	P.1198	P.1198	P.1198
Type			
Type	Air Conditioning, Ventilation	Air Conditioning, Ventilation	Air Conditioning, Ventilation
Fluid · Application	- Exhaust Duct for Ventilation Fan	- For air supply and exhausts such as clean rooms where low particulate generation is required. Pumping and exhausting of hot air. - Intake and exhaust for warm air generators.	- Hot air generator · circulator unit, spark collection ducts for grinders and welders.
Material	Aluminum Foil (Laminated) Reinforcement: Hard Steel Wire	Aluminum Polyester Cloth Reinforcement Core: Zinc Plating Steel Plate	Special Coating Glass Reinforcement Core: 1.4301/X5CrNi18-10
Operation Temperature Range	-20 ~ 80°C	~130°C	~250°C
Allowable Pressure Range Below ambient temperatur	0~0.02MPa	0~0.007MPa	0~0.007MPa
Allowable Pressure Range Above ambient temperature	0~0.02MPa	0~0.007MPa	0~0.007MPa
Features	- Being superior in flexibility and bending property, it can be laid in a narrow space. - It can be shortened to 1/5 of the original length.	- Special laminated film is adopted to reduce generation of dust caused by friction on the surface. - Flexible and easy to store and transport.	- Highly flexible. Highly elastic and flame resistant.

	HOTDH	HOTDK
	Heat-resistant Fixed Alignment Type	**High Heat-resistant Alignment Type**
	P.1199	P.1199
Type		
Type	Air Conditioning, Ventilation	Air Conditioning, Ventilation
Fluid · Application	- Hot air, acid and alkali containing gases (normal temperature)	- Supply and exhaust of hot air, air-conditioning and ventilation
Material	1.4301/X5CrNi18-10 Reinforcement Core: 1.4301/X5CrNi18-10	1.4301/X5CrNi18-10 Reinforcement Core: 1.4301/X5CrNi18-10
Operation Temperature Range	30 ~ 450°C	~600°C
Allowable Pressure Range Below ambient temperatur	0~0.007MPa	0~0.027MPa
Allowable Pressure Range Above ambient temperature	0~0.007MPa	0~0.027MPa
Features	- Excellent in heat resistance. - Corrosion resistive material that endures gases containing acid, alkali and solvents. - Though designed for fixed plumbing, it can form curved portions.	- Excellent in flame and heat resistance.

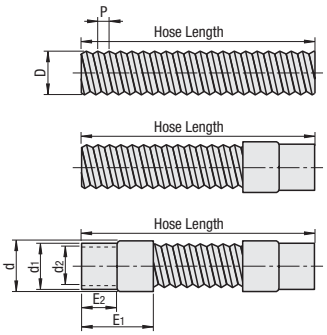
Duct Hoses
-Lightweight Type / Swivel Type-

■Lightweight Type

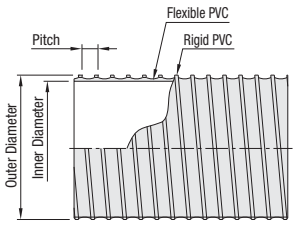


RoHS

HOSEE (Hose Body Only)
HOSEEK (One End Cuff)
HOSEER (Both Ends Cuff)



■Construction Diagram



M Material: Hose Body : Flexible or Hard PVC
Cuff : Flexible PVC

Part Number Type	Nominal	Hose Length 0.1m Increment	D	Hose Inner Dia. (Reference) (mm)	P	d	d1	d2	E1	E2	Allowable Bending Radius (mm)	Reference Mass (kg/m)	€ Unit Price HOSEE € Unit Price of Hose/m	€ Unit Price HOSEEK One End Cuff (+€ Unit Price of Hose)	€ Unit Price HOSEER Both Ends Cuff (+€ Unit Price of Hose)
HOSEE (Hose Body) HOSEEK (One End Cuff) HOSEER (Both Ends Cuff)	38	0.5~50.0	44.5	37.3	7.9	48	43	38	80	35	38	0.365			
	50		59.8	50.8	11	65.5	56.3	50.8	82	35	50	0.555			
	65		73.2	64	11.1	78.5	69	63	86	33	65	0.7			
	75	0.5~30.0	85.9	76.5	11.7	92.5	83.2	76.2	94	37	75	0.83			
	90		100	90	12	106.5	96.9	89.2	99	40	90	0.99			
	100		113	103	12	119.8	109.6	101.6	110	42	100	1.215			
	125	0.5~20.0	137.3	127.3	12.1	146.3	135	128	142	50	125	1.46			
	150		162	151.4	13.5	173.3	160	152	160	70	150	1.85			

Specifications

Usage	For air supply and exhaust (Air)
Operating Temp. Range (°C)	-10~50
Allowable Pressure Range (MPa {kgf/cm²})	Below ambient temperature: 0~0.06 Above ambient temperature: 0~0.03

■Features:

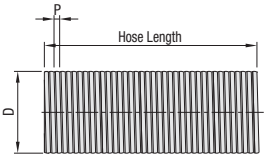
Being excellent in flexibility and lightweight, it improves operating efficiency.
Easy to cut and mount.

■Swivel Type

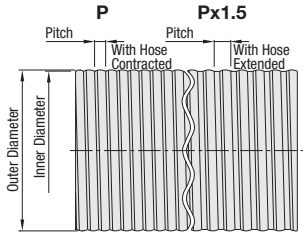


RoHS

HOSKK (Hose Body Only)



■Construction Diagram



M Material: Hose Body: Flexible PVC

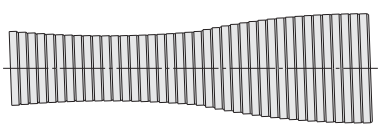
Part Number Type	Nominal	Hose Length 0.1m Increment	D	Hose Inner Dia. (Reference) (mm)	P (contracted state)	Allowable Bending Radius (mm)	Reference Mass (kg/m)	€ Unit Price € Unit Price of Hose/m
HOSKK (Hose Body)	75	0.5~10.0	82.2	75	7.5	175	0.755	
	90		97.2	90	7.5	210	0.918	
	100		107.2	100	7.5	230	1.02	

Specifications

Usage	For blast and exhaust · spot cooler
Allowable Pressure Range (MPa {kgf/cm²})	Below ambient temperature: 0~0.001 Above ambient temperature: 0~0.0005

■Features

Capable of being bent as desired and keeping its bent state.
Diameter can be varied by twisting the opening.



Order Example

Part Number	-	Hose Length
HOSEE50	-	3.2

Days to Ship

8 Days — Express A 3,00 EUR/ piece P.88

(?)A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (?)(Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49
Rate	€ Unit Price	5%	10%

(?)Volume discount rate is applicable to the unit price/m for hose only.

(?)For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example> For HOSEEK50-4.3,
€ Unit Price of Hose/m 22,00 EUR HOSEEK Cuff Charge 4,10
22,00 (Unit price of Hose)x4.3 (Hose Length)+4,10 (HOSEEK Cuff Charge)=98,70 EUR
By rounding it down to the nearest ten Cent, it is 98,70 EUR

Duct Hoses

-Flexible Type / Friction Resistant Antistatic Type-

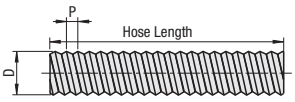
CAD Data

■Flexible Type

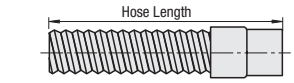


RoHS

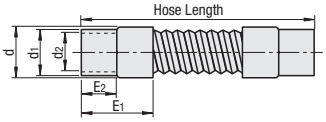
HOSSD (Hose Body Only)



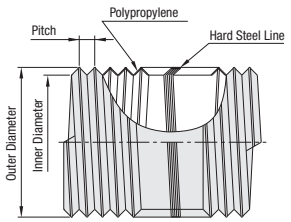
HOSSDK (One End Cuff)



HOSSDR (Both Ends Cuff)



■Construction Diagram



M Material: Hose Body: Polypropylene – Hard Steel Wire
Cuff: EPDM (Light Gray)

Part Number Type	Nominal	Hose Length 0.1m Increment	D	Hose Inner Dia. (Reference) (mm)	P	d	d1	d2	E1	E2	Allowable Bending Radius (mm)	Reference Mass (kg/m)	€ Unit Price HOSSD € Unit Price of Hose/m	€ Unit Price HOSSDK One End Cuff (+€ Unit Price of Hose)	€ Unit Price HOSSDR Both Ends Cuff (+€ Unit Price of Hose)
HOSSD (Hose Body) HOSSDK (One End Cuff) HOSSDR (Both Ends Cuff)	38	0.5~5.0 * Length with hose extended.	42.0	35.0	10.5	47.7	44.0	38.0	70	35	30	0.15			
	50		58.0	50.0	12.3	64.0	56.8	50.8	70	35	40	0.2			
	65		72.0	63.0	14.0	78.0	69.5	63.5	76	35	55	0.255			
	75		81.0	71.0	15.7	88.0	82.5	76.5	85	40	60	0.28			
	90		94.0	83.0	15.7	100.0	95.9	88.9	95	45	70	0.33			
	100		108.0	97.0	17.0	115.5	108.6	101.6	95	45	80	0.4			
	125		135.0	123.0	18.5	140.5	134.0	127.0	95	45	100	0.58			
	150		158.0	145.0	22.5	166.0	160.4	152.4	113	50	120	0.725			

*Hose length refers to the length when the hose is stretched without tensile load.

Usage	For air supply and exhaust (Air)
Operating Temp. Range (°C)	-20~80
Allowable Pressure Range (MPa{kgf/cm2})	0~0.002{0~0.02}

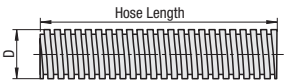
■**Features:** Elastic, and can be fixed at any angle or in any direction.
It can be shortened to 1/3~1/4 of its original length.
*The allowable pressure is the maximum design pressure.
Above range is for Hose Body only. Use data as reference.

■Friction Resistant, Antistatic Duct Hoses

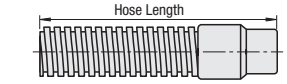


RoHS

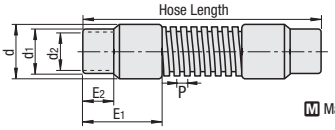
HOSHD (Hose Body Only)



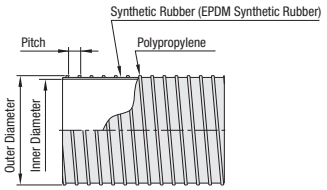
HOSHDK (One End Cuff)



HOSHDR (Both Ends Cuff)



■Construction Diagram



M Material: Hose Body: Polypropylene - Conductive EPDM
Cuff: EPDM (Black)

Part Number Type	Nominal	Hose Length 0.1m Increment	D	Hose Inner Dia. (Reference) (mm)	P	d	d1	d2	E1	E2	Allowable Bending Radius (mm)	Reference Mass (kg/m)	€ Unit Price HOSHD € Unit Price of Hose/m	€ Unit Price HOSHDK One End Cuff (+€ Unit Price of Hose)	€ Unit Price HOSHDR Both Ends Cuff (+€ Unit Price of Hose)
HOSHD (Hose Body) HOSHDK (One End Cuff) HOSHDR (Both Ends Cuff)	38	0.5~30.0	46.8	38.0	9.5	52.0	43.0	38.0	75	30	45	0.34			
	50		61.2	50.6	10.0	66.3	56.0	51.0	81	23	55	0.555			
	65		73.0	62.4	12.0	78.1	69.0	63.0	87	31	65	0.61			
	75		87.2	76.4	13.0	92.5	84.0	77.0	98	38	75	0.73			
	90		100.3	88.9	13.5	105.8	97.0	89.0	107	46	90	0.9			
	100		113.0	101.6	15.0	118.3	110.0	102.0	111	43	100	0.945			
	125	0.5~20.0	139.7	125.9	21.5	144.8	134.0	126.0	146	52	125	1.335			
	150		166.2	152.4	20.0	172.3	161.0	153.0	162	78	150	1.58			

Specifications

Usage	Transfer of powder, grains, iron power, paper scraps, wooden powder, etc. For heat resistant air blowers.
Operating Temp. Range (°C)	-30~80
Allowable Pressure Range (MPa {kgf/cm²})	Below ambient temperature: 0~0.03{0~0.3} Above ambient temperature: 0~0.01{0~0.1}
Allowable Decompression (kPa{mmHg})	-13.0~-40.0 {-98~-300} (Ambient Temperature)

■**Features:** Excels in cold, heat and friction resistance.
Excellent antistatic effect. (Volume Resistivity/105Ω-cm or less)
The allowable pressure is the maximum design pressure. The allowable reduction pressure is the maximum negative pressure that can be applied to the hose under normal temperature.
Above range is for Hose Body only. Use data as reference.

Order Example

Part Number	-	Hose Length
HOSSDR50	-	3.2

Days to Ship

8 Days

Express A 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■**Volume Discount** (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49
Rate	€ Unit Price	5%	10%

Volume discount rate is applicable to the unit price/m for hose only.

For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example> For HOSSDK65-4.3
€ Unit Price of Hose/m 66,50 EUR HOSSDK Cuff Charge 18,00 EUR
66,50 (Unit price of Hose) x4.3 (Hose Length) +18,00 (HOSSDK Cuff Charge) =303,95 EUR
By rounding it down to the nearest ten Cent, it is 303,90 EUR

Duct Hoses /Cuff for Duct Hoses

-Oil Resistance Type / Non-PVC Type-

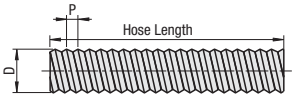
CAD Data

■Oil-resistance type

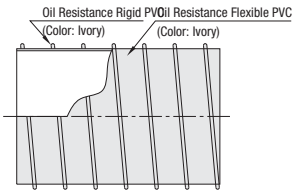


RoHS

HOSDY
(Hose Body Only)



■Construction Diagram



M Material: Hose Body: Oil resistance hard, flexible PVC

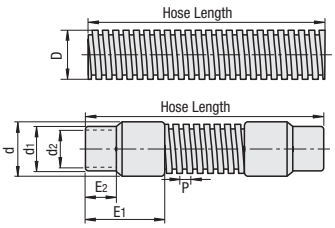
Part Number Type	Part Number Nominal	Hose Length 0.1m Increment	D	Hose Inner Dia. (Reference) (mm)	P	Allowable Bending Radius (mm)	Reference Mass (kg/m)	€ Unit Price € Unit Price of Hose/m
HOSDY (Hose Body)	75	0.5~30.0	86.4	76.4	13	75	0.785	
	100		112.2	101.6	15	100	1.03	
	125	0.5~20.0	138.7	125.9	21	125	1.355	
	150		164.8	152.4	20	150	1.68	

■Oil-resistance Type



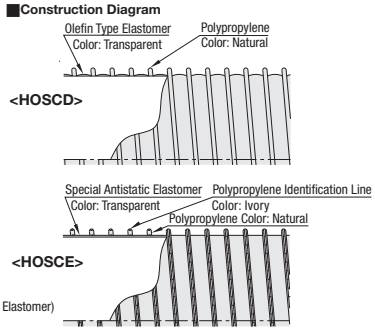
RoHS

Type	Hose Body Only	One End Cuff	Both Ends Cuff
Translucent Type	HOSCD	HOSCDK	HOSCDR
Antistatic Translucent Type	HOSCE	-	HOSCER



M Material: Hose Body: Polypropylene, Olefin Type Elastomer (for HOSCE, Special Anti-electrostatic Elastomer)
Cuff: Olefin Type Elastomer

■Construction Diagram



Part Number Type	Nominal Diameter	Hose Length 0.1m Increment	D	Hose Inner Dia. (Reference) (mm)	P	d	d1	d2	E1	E2	Allowable Bending Radius (mm)	Reference Mass (kg/m)	Allowable Pressure (Ambient Temp.) MPa (kgf/cm²)	Allowable Decompression (Ambient Temp.) kPa(mmHg)	€ Unit Price HOSCD: Hose € Unit Price/m	€ Unit Price HOSCD: One End Cuff (+€ Unit Price of Hose)	€ Unit Price HOSCD: Both Ends Cuff (+€ Unit Price of Hose)	€ Unit Price HOSCE: Hose € Unit Price/m	€ Unit Price HOSCE: Both Ends Cuff (+€ Unit Price of Hose)
Translucent Duct Hoses HOSCD (Hose Body) HOSCDK (One End Cuff) HOSCDR (Both Ends Cuff) / Antistatic Translucent Duct Hoses HOSCE (Hose Body) HOSCER (Both Ends Cuff)	38	0.5~30.0	45.0	38.0	7.8	48.0	43.0	38.0	80	35	50	0.22	0.04(0.4)	-50.7(-380)					
	50		59.0	50.8	10.0	65.5	56.0	50.8	82	35	60	0.33							
	75		85.0	76.2	13.0	92.5	83.2	76.2	94	37	90	0.47	0.03(0.3)	-33.0(-248)					
	100		111.5	101.6	15.0	120.3	108.6	101.6	100	42	110	0.64		-17.5(-131)					
	125	0.5~20.0	138.5	127.0	21.0	143.5	134.0	126.0	119	49	135	0.81	0.02(0.2)	-12.5(-94)					
	150		164.0	152.4	20.0	171.0	160.0	152.0	160	65	160	1.06							

Specifications

Type	HOSDY	HOSCD_ HOSCE_
Usage	Suction and exhaust emission of oil mist	For Blast and exhaust (Air)
Operating Temp. Range (°C)	-10~50	-20~50
Allowable Pressure Range (MPa {kgf/cm²})	Below ambient temperature: 0~0.04 Above ambient temperature: :0~0.02	

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.
Volume discount rate is applicable to the unit price/m for hose only.

<Price Calculation Example> For HOSCDK50-4.3,
€ Unit Price of Hose/m 79,20 EUR HOSEEK Cuff Charge 26,50 EUR
79,20 (Unit price of Hose)x4.3 (Hose Length)+26,50 (HOSCDK Cuff Charge)=367,06 EUR
By rounding it down to the nearest ten Cent, it is 367,00 EUR

Order Example

Part Number	-	Hose Length
HOSDY100	-	5.5
HOSCD50	-	3.2

Days to Ship

8 Days — Express A — 3,00 EUR/piece — P.88

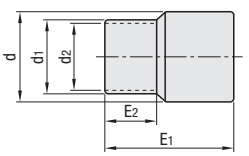
A Express Charge of 8,10 EUR for 3 or more identical pieces.

■Cuff for Duct Hoses



RoHS

Type	Applicable Hoses
DHED	Lightweight Type
DHSD	Flexible Type
DHHD	Friction Resistant, Antistatic Duct Hoses
DHTD	Translucent Type



Part Number Type	Part Number Nominal	€ Unit Price DHED	€ Unit Price DHSD	€ Unit Price DHHD	€ Unit Price DHTD
DHED (For Lightweight Duct Hoses)	38				
	50				
DHSD (For Flexible Duct Hoses)	65				
	75				
DHHD (For Friction Resistant and Antistatic Duct Hoses)	90				
	100				
DHTD (For Translucent Duct Hoses)	125				
	150				

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number
DHSD50

Days to Ship

8 Days — Express A — 3,00 EUR/piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Part Number Type	Nominal	DHED d	DHED d1	DHED d2	DHED E1	DHED E2	DHSD d	DHSD d1	DHSD d2	DHSD E1	DHSD E2	DHHD d	DHHD d1	DHHD d2	DHHD E1	DHHD E2	DHTD d	DHTD d1	DHTD d2	DHTD E1	DHTD E2
DHED (For Lightweight Duct Hoses)	38	48	43	38	80	35	47.7	44	38	70	35	52	43	38	75	30	48	43	38	80	35
	50	65.5	56.3	50.8	82	35	64	56.8	50.8	70	35	66.3	56	51	81	23	65.5	56	50.8	82	35
DHSD (For Flexible Duct Hoses)	65	78.5	69	63	86	33	78	69.5	63.5	76	35	78.1	69	63	87	31	-	-	-	-	-
	75	92.5	83.2	76.2	94	37	88	82.5	76.5	85	40	92.5	84	77	98	38	92.5	83.2	76.2	94	37
DHHD (For Friction Resistant and Antistatic Duct Hoses)	90	106.5	96.9	89.2	99	40	100	95.9	88.9	95	45	105.8	97	89	107	46	-	-	-	-	-
	100	119.8	109.6	101.6	110	42	115.5	108.6	101.6	95	45	118.3	110	102	111	43	120.3	108.6	101.6	100	42
DHTD (For Translucent Duct Hoses)	125	146.3	135	128	142	50	140.5	134	127	95	45	144.8	134	126	146	52	143.5	134	126	119	49
	150	173.3	160	152	160	70	166	160.4	152.4	113	50	172.3	161	153	162	78	171	160	152	160	65

Plumbing Parts for Duct Hoses

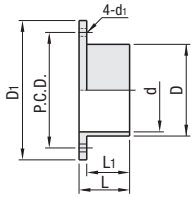
CAD Data

■Duct Hose Mounting Flanges



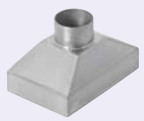
RoHS

Type	Material	Surface Treatment
HOFM	1.0038/S235JR	Acrylic Baking Finish
HOFS	1.4301/X5CrNi18-10	-



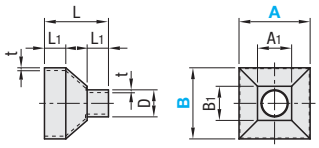
Part Number Type	Nominal Dia.	D	d	L	L1	D1	P.C.D.	d1	€ Unit Price HOFM	€ Unit Price HOFS
HOFM HOFS	38	38	35.6	30	28	66	52	6.6		
	50	50.8	47.8	37	35	79	65	6.6		
	65	63.5	59.5	48	46	91.5	77.5	6.6		
	75	76.3	72.3	55	53	111	94	9		
	90	89.1	85.1	65	63	123	106	9		
	100	101.6	97.6	72	70	136	119	9		
	125	127	123	88	84	162	144	9		
	150	152.4	148.4	105	101	188	170	9		

■Hood Cover with Flange



RoHS

Type	Material
HOSYS	1.4301/X5CrNi18-10



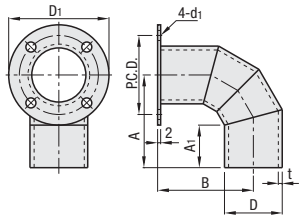
Part Number Type	No.	A	B	D	A1	B1	t	L	L1	€ Unit Price HOSYS
HOSYS	38	50	100	38	50	48	1.2	90	30	
		100	100		48					
	50	75	100	50.8	61	61	1.5			
		100	100							
		100	150							
	65	100	150	63.5	74	74		120	40	
		150	150							
		150	200							
	75	150	200	76.3	86	86				
		200	200							
	100	200	200	101.6	112	112				
		200	300					150		

■Elbows for Duct Hose



RoHS

Type	Material	Surface Treatment
HOEM	1.0038/S235JR	Acrylic Baking Finish
HOES	1.4301/X5CrNi18-10	-



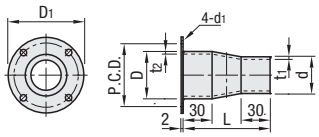
Part Number Type	Nominal Dia.	D	A	A1	B	D1	P.C.D.	d1	t	€ Unit Price HOEM	€ Unit Price HOES
HOEM HOES	38	38	61	28	63	66	52	6.6	1.2		
	50	50.8	78	35	82	79	65		1.5		
	65	63.5	90	35	89	91.5	77.5	9	2		
	75	76.3	100	35	94	111	94				
	100	101.6	130	45	124	136	119				
	125	127	149	55	151	162	144				
	150	152.4	174	60	176	188	170				

■Reducers for Duct Hose



RoHS

Type	Material	Surface Treatment
HORM	1.0038/S235JR	Acrylic Baking Finish
HORS	1.4301/X5CrNi18-10	-



Part Number Type	Nominal Dia.	Hose Nominal Dia.	d	D	L	D1	P.C.D.	d1	t1	t2	€ Unit Price HORM	€ Unit Price HORS
(Flanged) HORM HORS	38	50	38	50.8	90	79	65	6.6	1.2	1.5		
	50	65	50.8	63.5		91.5	77.5		1.5	2		
		75		76.3		111	94	9	2			
		100		101.6		136	119					
	65	75	63.5	76.3		111	94					
		100		101.6		136	119					
	75	100	76.3	101.6	100	136	119					
	125	150	127	152.4		188	170					

■Specifications

- Operation Temperature Range: 0 ~ 160°C

Order Example

Part Number	-	A	-	B
HOFM38				
HOSYS50	-	100	-	100

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

(For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Others: 8 Days
- Hood Cover with Flange: 10 Days

Add. Spec. Duct Hoses

CAD Data

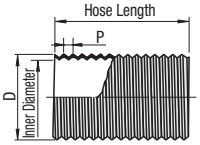
■Aluminum Type

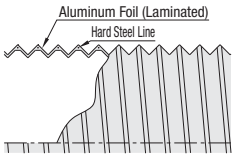


RoHS

Type	Material	Operating Temp. Range (°C)
HOAD	Aluminum Foil (Laminated) Hard Steel Wire	-20 ~ 80°C

■Construction Diagram





Features
- Flexible and elastic, can be stored compactly.
- It can be shortened to 1/5 of its original length. Stored compact for space-saving.

Part Number Type	Nominal Diameter	Hose Length 0.1m Increment	Hose Inner Diameter (Reference) (mm)	D	P	Allowable Pressure Range (MPa {kgf/cm²})	Allowable Decompression (Ambient Temp.) (kPa {mmHg})	Allowable Bending Radius (mm)	Reference Mass g/m	€ Unit Price € Unit Price of Hose/m
HOAD	38	0.5~5	39	45.0	10.8	0~0.02 {0~0.2}	-33{-248}	30	130	
	50		50	55.3	10.8			35	168	
	65		64	70.3	10.8			45	205	
	75		75	80.3	10.8	0~0.01 {0~0.1}	-26.5{-199}	55	244	
	100		98	105.3	10.8		-16.5{-124}	70	312	
	117		113	119.3	10.8		-13.0{-98}	75	375	
	125		125	130.3	10.8		-10.0{-75}	90	390	
	150		150	155.7	10.8			105	606	

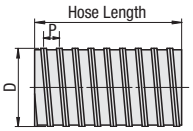
■-Heat Resistance, Low Particulate Generation Type-

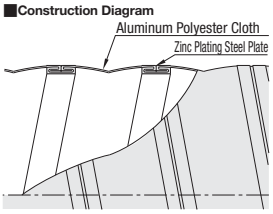


RoHS

Type	Material	Operating Temp. Range (°C)
HOCTD	Hose Body: Aluminum Polyester Cloth Reinforcement Core: Zinc Plating Steel Plate	~130°C
HOTD	Hose Body: Special Coating Glass Cloth Reinforcement Core: 1.4301/X5CrNi18-10	~250°C

■Construction Diagram





Features
<HOCTD>
- Special laminated film is used to reduce generation of particles caused by friction on surfaces (For supply and exhaust in environments such as clean rooms where low particulate generation is required.)
- Flexible and easy to store and transport.

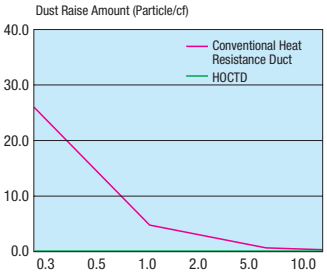
<HOTD>
-Free flexibility. Highly elastic and flame resistant.

Part Number Type	Nominal Dia.	Hose Length 0.1m Increment	Hose Inner Dia. (Reference) (mm)	D	P	Allowable Pressure Range (Mpa)	Allowable Decompression (Ambient Temp.) (kPa)	Allowable Bending Radius (mm)	Reference Mass g/m	€ Unit Price € Unit Price of Hose/m
HOCTD	50	0.5~5	51	54.5	20	0~0.007	-8.5	120	370	
	75		76	80	20		-7	160	530	
	100		102.5	106	23		-6.5	210	640	
	125		127.5	131	23		-6.5	250	770	
	150		152	155	23		-6.0	300	945	
HOTD	50		51	54.5	20	0~0.007	-8.5	110	360	
	65		67	71.5	20		-8	140	480	
	75		76	80	20		-7	160	525	
	90		91	94.5	23		-6.5	190	545	
	100		102.5	106	23			210	635	

*The allowable pressure is the maximum design pressure.
The allowable negative pressure is the maximum negative pressure that can be applied to the hose under normal temperature.
Above range is for Hose Body only. Use data as reference.

■Particulate Generation Comparison Data

Particulate Generation Comparison



*Data above are for reference, not guaranteed.

Order Example Part Number - Hose Length
HOAD50 - 3.2

Days to Ship 8 Days | Express A | 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Duct Hoses / Plumbing Parts for Aluminum Hoses

-Heat Resistant Type-

CAD Data

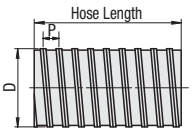
■Heat Resistant Type



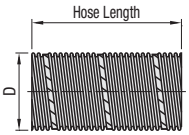
RoHS

Type	Material	Operating Temp. Range (°C)
HOTDH	Hose Body: 1.4301/X5CrNi18-10 Enforcement Core: 1.4301/X5CrNi18-10	30~450
HOTDK	Hose Body: 1.4301/X5CrNi18-10 Enforcement Core: 1.4301/X5CrNi18-10	~600

HOTDH



HOTDK



Features

<HOTDH>
- Corrosion resistive material that endures gases containing acid, alkali and solvents.
- Though designed for fixed plumbing, it can form curved portions.

<HOTDK>
Excellent in fire and heat resistance.

Part Number Type	Part Number Nominal Dia.	Hose Length 0.1m Increment	Hose Inner Dia. (Reference) (mm)	D	P	Allowable Pressure Range (Mpa)	Allowable Decompression (Ambient Temp.) (kPa)	Allowable Bending Radius (mm)	Reference Mass g/m	€ Unit Price € Unit Price of Hose/m
HOTDH	50	0.5~2	52.5	56.6	20	0~0.007	-10.5	170	365	
	65		67	71.5			-10.0	210	460	
	75		76	80				240	525	
	90		91.5	95	23		-9.0	290	570	
	100		102.5	106			-8.0	320	635	
HOTDK	50	0.5~4	51.2	56.8	-	0~0.027	-27.0	75	220	
	65		66.2	71.8				98	280	
	75		76.2	81.8				113	320	
	80		81.2	86.8				120	340	
	100		101.7	107.3				200	420	

*The allowable pressure is the maximum design pressure.
The allowable reduction pressure is the maximum negative pressure that can be applied to the hose under normal temperature.
Above range is for Hose Body only. Use data as reference.

Order Example: Part Number HOTDK50 - Hose Length 3.2

Days to Ship: 8 Days — Express A 3,00 EUR/piece P.88

(?)A Express Charge of 8,10 EUR for 3 or more identical pieces.

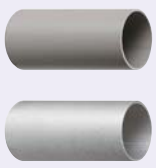
Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~9	10~19
Rate	€ Unit Price	5%

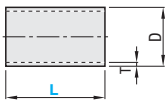
(?)For orders larger than indicated quantity, please request a quotation.

■For Aluminum Duct Hoses - Socket-



RoHS

L Dim. Selectable	L Dim. Configurable	Material	Surface Treatment
HOAM	-	1.0038	Acrylic Baking Finish
HOAS	HOASK	1.4301	-



■L Dimension Configurable

Part Number Type	Part Number Nominal Dia.	L 1mm Increment	D	t	€ Unit Price L50~100	€ Unit Price 101~200
HOASK	38	50~200	38	1.2		
	50		48.6	1.5		
	65		63.5	2		
	75		75			
	100		98			
	113		112			
	125		124			
	150		149			

Order Example: Part Number HOASK 50 / HOAS 50 - Hose Length L 65

Days to Ship: 8 Days

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

(?)For orders larger than indicated quantity, please request a quotation.

■L Dimension Selectable Type

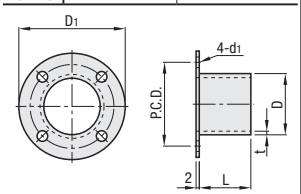
Part Number Type	Part Number Nominal Dia.	D	L	t	€ Unit Price HOAM	€ Unit Price HOAS
HOAM HOAS	38	38	60	1.2		
	50	48.6		1.5		
	65	63.5		2		
	75	75				
	100	98	80			
	113	112				
	125	124				
	150	149				

■For Aluminum Duct Hoses -Mount Flanges-



RoHS

Type	Material	Surface Treatment
HOAFM	1.0038/S235JR	Acrylic Baking Finish
HOAFS	1.4301/X5CrNi18-10	-



Part Number Type	Part Number Nominal Dia.	D	L	D1	P.C.D.	d1	t	€ Unit Price HOAFM	€ Unit Price HOAFS
HOAFM HOAFS	38	38	28	66	52	6.6	1.2		
	50	48.6	35	79	65		1.5		
	65	63.5	46	91.5	77.5	9	2		
	75	75	53	111	94				
	100	98	70	136	119				
	113	112	75	152	134				
	125	124	80	168	148				
	150	149	90	193	173				

■Specifications

- Operation Temperature Range: 0 ~ 160°C

Order Example: Part Number HOAFM 65

Days to Ship: 8 Days

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

(?)For orders larger than indicated quantity, please request a quotation.

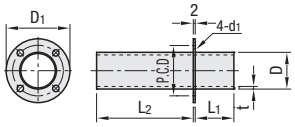
Plumbing Parts for Aluminum Duct Hoses

CAD Data

■For Aluminum Duct Hoses -Panel Mount Type-



Type	M Material	S Surface Treatment
HOBUM	1.0038	Acrylic Baking Finish
HOBU	1.4301	-

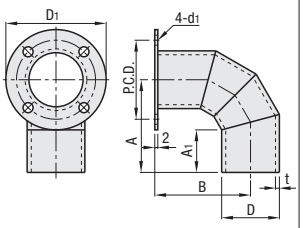


Part Number Type	Nominal Dia.	D	L1	L2	D1	P.C.D.	d1	t	€ Unit Price HOBUM	€ Unit Price HOBU
HOBUM HOBU	38	38	40	100	66	52	6.6	1.2		
	50	48.6	40	100	79	65		1.5		
	65	63.5	40	100	91.5	77.5		2		
	75	75	40	100	111	94	9			
	100	98	50	100	136	119				
	113	112	50	100	152	134				
	125	124	50	100	168	148				
	150	149	50	100	193	173				

■For Aluminum Duct Hoses -Elbow-



Type	M Material	S Surface Treatment
HOAEM	1.0038	Acrylic Baking Finish
HOAE	1.4301	-

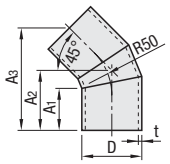


Part Number Type	Nominal Dia.	D	A	A1	B	D1	P.C.D.	d1	t	€ Unit Price HOAEM	€ Unit Price HOAE
HOAEM HOAE	38	38	61	28	63	66	52	6.6	1.2		
	50	48.6	78		82	79	65		1.5		
	65	63.5	90	35	89	91.5	77.5		2		
	75	75	100		94	111	94	9			
	100	98	130	45	124	136	119				
	113	112	138	50	140	152	134				
	125	124	149	55	151	168	148				
	150	149	174	60	176	193	173				

■For Aluminum Duct Hoses -45° Reducers-



Type	M Material	S Surface Treatment
HOAFEM	1.0038	Acrylic Baking Finish
HOAFE	1.4301	-

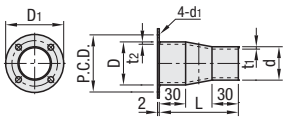


Part Number Type	Nominal Dia.	D	A1	A2	A3	t	€ Unit Price HOAFEM	€ Unit Price HOAFE
HOAFEM HOAFE	38	38	28	41	69	1.2		
	50	48.6	35	50	86.5	1.5		
	65	63.5	35	52.5	91	2		
	75	75	35	56	95			
	100	98	45	73	122			
	113	112	50	81.5	139			
	125	124	55	89	151.5			
	150	149	60	98	170			

■For Aluminum Duct Hoses -Reducer-



Type No Flange	Type Flanged	M Material	S Surface Treatment
HOARM	HOARFM	1.0038	Acrylic Baking Finish
HOAR	HOAFR	1.4301	-

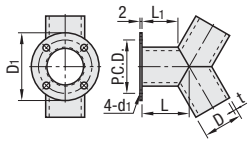


Part Number Type	Nominal Dia.	Hose Nominal Dia.	d	D	L	D1	P.C.D.	d1	t1	t2	€ Unit Price HOARM	€ Unit Price HOAR	€ Unit Price HOARFM	€ Unit Price HOAFR
(No Flange) HOARM HOAR	38	50	38	49	90	79	65	6.6	1.2	1.5				
	50	65	48.6	63.5		91.5	77.5		1.5	2				
		75	49	75		111	94	9	2					
		100	49	98		136	119							
	65	75	63.5	75		111	94							
		100	63.5	98		136	119							
(Flanged) HOARFM HOAFR	75	100	75	98		136	119							
	100	113	98	112	100	152	134							
	113	125	112	124		168	148							
	125	150	124	149		193	173							

■For Aluminum Duct Hoses -Y-Shaped-



Type No Flange	Type Flanged	M Material	S Surface Treatment
HOAYM	HOAYFM	1.0038	Acrylic Baking Finish
HOAY	HOAYF	1.4301	-



Part Number Type	Nominal Dia.	D	L	L1	D1	P.C.D.	d1	t	€ Unit Price HOAYM	€ Unit Price HOAY	€ Unit Price HOAYFM	€ Unit Price HOAYF
(No Flange) HOAYM HOAY	38	38	46	35	66	52	6.6	1.2				
	50	48.6	55	41	79	65		1.5				
	65	63.5	60		91.5	77.5		2				
	75	75	65	43	111	94	9					
(Flanged) HOAYFM HOAYF	100	98	75	46	136	119						
	113	112	80	47.7	152	134		2				
	125	124	85	49.2	168	148						
	150	149	95	52	193	173						

■Specifications

- Operation Temperature Range: 0 ~ 160°C

Order Example

Part Number	-	Hose Nominal Dia.
HOBUM 50 HOAR 50	-	65

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Plumbing Parts for Aluminum Duct Hoses

CAD Data

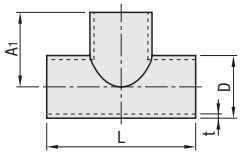
Dedicated plumbing parts for aluminum duct hoses, **P.1198**.

■For Aluminum Duct Hoses -T-Shaped-



RoHS

Type	M Material	S Surface Treatment
HOATM	1.0038	Acrylic Baking Finish
HOAT	1.4301	-



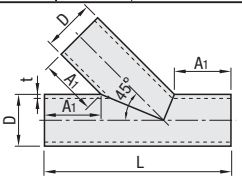
Part Number Type	Nominal Dia.	D	L	A1	t	€ Unit Price HOATM	€ Unit Price HOAT
HOATM HOAT	38	38	100	50	1.2		
	50	48.5	120	60	1.5		
	65	63.5	135	68	2		
	75	75	145	72			
	100	98	180	90			
	113	112	180	100			
	125	124	200	110			
	150	149	240	120			

■For Aluminum Duct Hoses Variant Y-Shaped



RoHS

Type	M Material	S Surface Treatment
HOAHYM	1.0038	Acrylic Baking Finish
HOAHY	1.4301	-



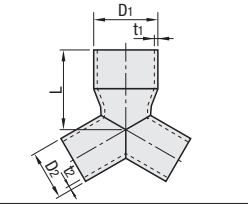
Part Number Type	Nominal Dia.	D	L	A1	t	€ Unit Price HOAHYM	€ Unit Price HOAHY
HOAHYM HOAHY	38	38	114	30	1.2		
	50	48.5	141	36	1.5		
	65	63.5	172	41	2		
	75	75	194	44			
	100	98	243	52			
	113	112	278	60			
	125	124	305	65			
	150	149	350	70			

■For Aluminum Duct Hoses Special Y-Shaped



RoHS

Type	M Material	S Surface Treatment
HOAYEM	1.0038	Acrylic Baking Finish
HOAYE	1.4301	-



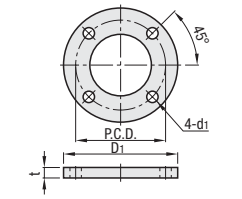
Part Number Type	Nominal Dia.	D1	D2	L	t1	t2	€ Unit Price HOAYEM	€ Unit Price HOAYE
HOAYEM HOAYE	50	48.5	38	80	1.5	1.2		
	65	63.5	48.5	85	2	1.5		
	75	75	63.5	88		2		
	100	98	75	100				
	113	112	98	105				
	125	124	112	110				
	150	149	124	120				

■For Aluminum Duct Hoses -Flange-



RoHS

Type	M Material	S Surface Treatment
HOAJ	1.4301	-



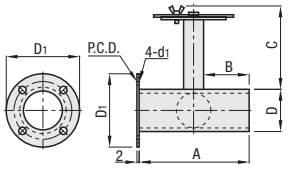
Part Number Type	Nominal Dia.	t	D1	P.C.D.	d1	€ Unit Price HOAJ
HOAJ	38	2	66	52	6.6	
	50		79	65		
	65		91.5	77.5		
	75		111	94	9	
	100		136	119		
	113		152	134		
	125		168	148		
	150		193	173		

■For Aluminum Duct Hoses -Dampers-



RoHS

Type No Flange	Type Flanged	Type Double Flanged	M Material	S Surface Treatment
HOANM	HOANPM	HOANPFM	1.0038	Acrylic Baking Finish
HOAN	HOANP	HOANFP	1.4301	-



Part Number Type	Nominal Dia.	D	A	B	C	D1	P.C.D.	d1
(No Flange) HOANM HOAN	38	38	99	41	75	66	52	6.6
	50	48.5				79	65	
(Flanged)	65	63.5				91.5	77.5	
HOANPM HOANP	75	75	119	51		111	94	9.0
	100	98				136	119	
(Double Flanged) HOANPFM HOANFP	125	124	150	66		168	148	
	150	149				193	173	

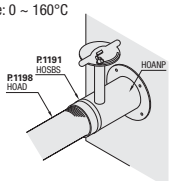
Nominal Dia.	€ Unit Price HOANM	HOAN	HOANPM	HOANP	HOANPFM	HOANFP
38						
50						
65						
75						
100						
125						
150						

Specifications

- Operation Temperature Range: 0 ~ 160°C

Example

Such as exhaust outlet, branch connection, etc.



Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number
HOATM 50
HOAJ 50

Days to Ship 8 Days

Duct Boxes

CAD Data

Duct Boxes

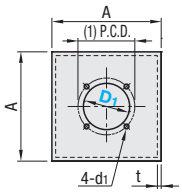


RoHS

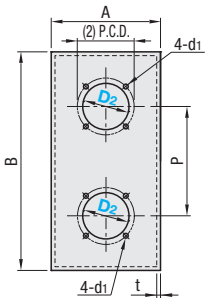
Type		Size	Material
2-story Type	3-story Type		
DBXWS	DBXTS	150x150x300	1.4301/ X5CrNi18-10
DBXWM	DBXTM	200x200x300	

d1 is female hole, and nut is welded to the back side.

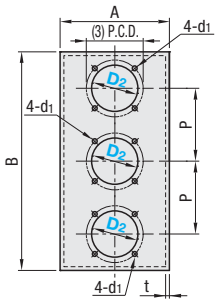
Top View



Side View (2-story)



Side View (3-story)



2-story Type

Part Number Type	D1	D2	A	B	D1	(1) P, C, D	D2	(2) P, C, D	P	d1	t	€ Unit Price Qty.1-4
DBXWS (150x150x300)	38	38	150	300	38	52	38	52	145	M6	2	
	50	50			50	65	50	65				
	65	65			65	77.5	65	77.5				
	75	75			75	94	75	94		M8		
	100	100			100	119	100	119				
DBXWM (200x200x300)	38	38	200	300	38	52	38	52	145	M6		
	50	50			50	65	50	65				
	65	65			65	77.5	65	77.5				
	75	75			75	94	75	94		M8		
	100	100			100	119	100	119				
	113	-			113	134	-	-	-			
	125				125	148						
	150				150	173						

d1 is female hole, and nut is welded to the back side.

For orders larger than indicated quantity, please request a quotation.

3-story Type

Part Number Type	D1	D2	A	B	D1	(1) P, C, D	D2	(2) P, C, D	P	d1	t	€ Unit Price Qty.1-4
DBXTS (150x150x300)	38	38	150	300	38	52	38	52	98	M6	2	
	50	50			50	65	50	65				
	65	65			65	77.5	65	77.5				
	75	-			75	94	-	-	-	M8		
	100				100	119						
DBXTM (200x200x300)	38	38	200	300	38	52	38	52	98	M6		
	50	50			50	65	50	65				
	65	65			65	77.5	65	77.5				
	75	-			75	94	-	-	-	M8		
	100				100	119						
	113				113	134						
	125				125	148						
	150				150	173						

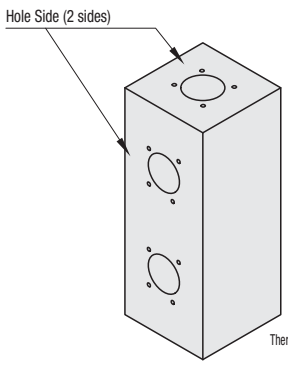
For orders larger than indicated quantity, please request a quotation.

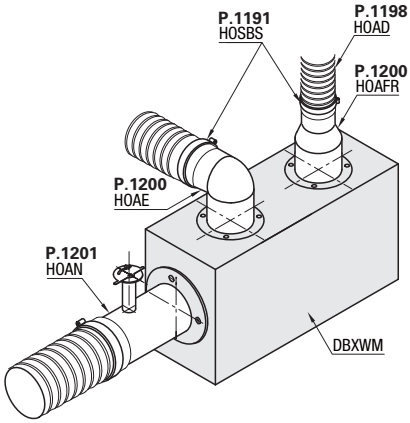
Order Example

Part Number	-	D1	-	D2
DBXWS	-	100	-	50
DBXTM	-	113	-	38

Days to Ship 10 Days

Example





NEW

Ball Valves
-Stainless Steel-

Reduced Delivery Time

CAD Data

■PT Female · PT Female

RoHS

<BSFF>

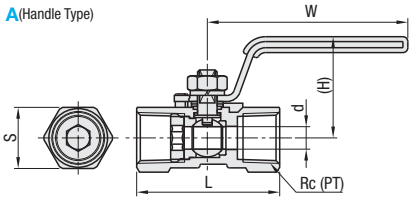


<BSFFS>

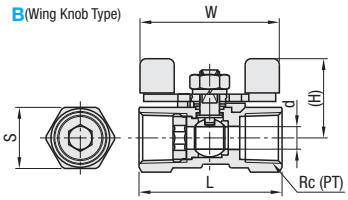


Type	Material	Max. Operating Pressure
BSFF	Body: 1.4308/G-X6CrNi18-9 Ball Sheet: Fluoro Resin	Water · Oil · Air · Gas: 4.12MPa Saturated Steam: 1MPa
BSFFS	Body: 1.4408/GX5CrNiMo19-12-5 Ball Sheet: Fluoro Resin	

A(Handle Type)



B(Wing Knob Type)



Part Number			Rc (PT)	d	S	A Shape			B Shape			BSFF_		BSFFS_	
Type	Handle Shape	No.				L	(H)	W	L	(H)	W	€ Unit Price Qty.1-4	Volume Discount Qty. 5~10	€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
BSFF BSFFS	A (Handle Type) B (Wing Knob Type)	8A	1/4	5	17	39	35	65	39	27	51				
		10A	3/8	7	21	44	39	68	44	29	55				
		15A	1/2	9.2	25	59	42	82	59	33	57				
		20A	3/4	12.5	32	60	45	82	60	38	57				
		25A	1	15	38	72	51	100	-	-	-				

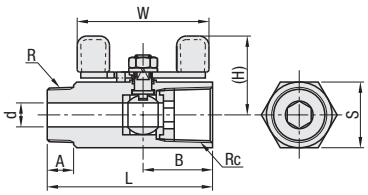
For orders larger than indicated quantity, please request a quotation.

■PT Male · PT Female

RoHS



Type	Material	Max. Operating Pressure
BSRC	Body: 1.4408/ GX5CrNiMo19-12-5 Ball Sheet: Fluoro Resin	Water · Oil · Air · Gas: 4.12MPa Saturated Steam: 1MPa



Part Number		R, Rc (PT)	d	A	B	S	L	(H)	W	€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
Type	No.										
BSRC	8A	1/4	7	11	20	17	57	26	51		
	10A	3/8	7	12	28	21	68	29	55		

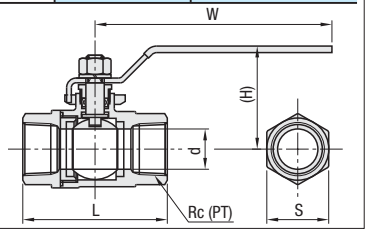
For orders larger than indicated quantity, please request a quotation.

■PT Female · PT Female -High Flow Rate Type-

RoHS



Type	Material	Max. Operating Pressure
BSCSF	Body: 1.4408/ GX5CrNiMo19-12-5 Ball Sheet: Fluoro Resin	Water · Oil · Air · Gas: 4.12MPa Saturated Steam: 1MPa



Part Number		Rc (PT)	d	S	L	(H)	W	€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
Type	No.								
BSCSF	15A	1/2	15	27	68	59	102		
	20A	3/4	20	33	77	62	120		
	25A	1	25	40	90	76	150		
	40A	11/2	38	56	111	88	165		
	50A	2	50	70	126	95	165		

For orders larger than indicated quantity, please request a quotation.

■PT Female · PF Female

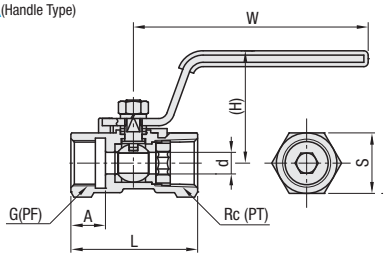
RoHS



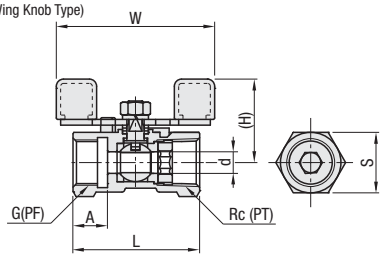
Type	Material	Max. Operating Pressure
BSGF	Body: 1.4408/GX5CrNiMo19-12-5 Ball Sheet: Fluoro Resin	Water · Oil · Air · Gas: 4.12MPa Saturated Steam: 1MPa

■Usage
With Rc (PT) male inlet port and G (PF) male outlet port, it is best suitable for use with a pressure gauge.

A(Handle Type)



B(Wing Knob Type)



Part Number			Rc (PT)	G (PF)	L	A	d	S	A Shape		B Shape		€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
Type		No.							(H)	W	(H)	W		
BSGF	A (Handle Type) B (Wing Knob Type)	8A	1/4	1/4	39	11.5	5	17	27	65	27	51		
		10A	3/8	3/8	44	12	7	21	39	68	29	55		

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number
BSFFA8A
BSRC10A
BSCSF15A
BSGFA8A

Days to Ship

BSFF · BSFFS · BSRC · BSCSF
6 Days P.87

BSGF
8 Days

Ball Valves
-Brass Type-

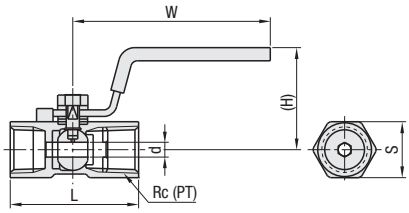
CAD Data

RoHS

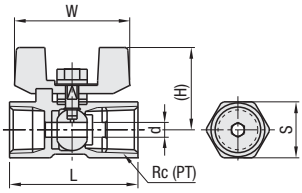


Type	Material	Max. Operating Pressure
BRTK	Body: CW617N/CuZn40Pb2BE Ball Sheet: PTFE (including Glass Fiber)	Water · Oil · Air: 4.12MPa

A(Handle Type)



B(Wing Knob Type)



Part Number			Rc (PT)	d	S	A Shape			B Shape			€ Unit Price	Volume Discount
Type	Handle Shape	No.				L	(H)	W	L	(H)	W	Qty.1-4	Qty. 5~10
BRTK	A (Handle Type) B (Wing Knob Type)	8A	1/4	4.5	17	39	31	60	39	25	35		
		10A	3/8	6.8	21	44	36	70	44	29	40		
		15A	1/2	9.2	25	56.5	41	85	56.5	35	55		
		20A	3/4	12.5	32	59	44	85	59	39	55		
		25A	1	16	38	71	48	100	71	40.8	69		

※BRTKB10A will be put on sale on August, 2010.

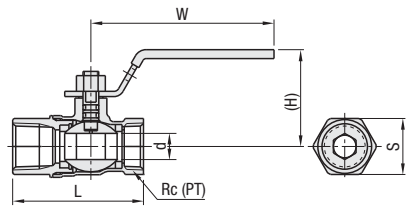
※For orders larger than indicated quantity, please request a quotation.

RoHS

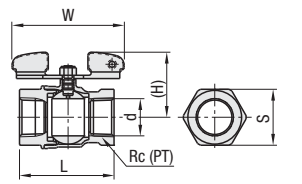


Type	Material	Max. Operating Pressure
BRTW	Body: CW617N/CuZn40Pb2BE Ball Sheet: PTFE (including Glass Fiber)	Water · Oil · Air: 4.12MPa

A(Handle Type)



B(Wing Knob Type)



Part Number			Rc (PT)	d	S	A Shape			B Shape			€ Unit Price	Volume Discount
Type	Handle Shape	No.				L	(H)	W	L	(H)	W	Qty.1-4	Qty. 5~10
BRTW	A (Handle Type) B (Wing Knob Type)	8A	1/4	10	20	50	37	70	50	35	55		
		10A	3/8	10	22	50	37	70	50	35	55		
		15A	1/2	15	26	65	40	80	65	41	70		
		20A	3/4	20	32	68	44	80	68	45	70		
		25A	1	25	39	79	50	110	79	54	100		

※For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number
BRTKA10A
BRTWB15A

Days to Ship

6 Days

P.87

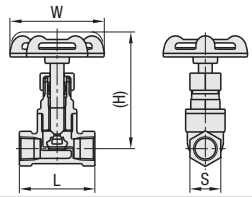
Globe Valve / Check Valves / Strainers / Hydraulic Valves

CAD Data

Globe Valve



Type	Material	Max. Operating Pressure
GBUCL	Body: 1.4308/G-X6CrNi18-9 Seal:8A ~ 15APTFE 20A~25A Expanded graphite+PTFE Braided	Water · Oil · Air: 1.0MPa



Part Number		Rc (PT)	S	L	(H)	W	GBUCL	
Type	No.						€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
GBUCL	8A	1/4	18	44	68	55		
	10A	3/8	22	48	68	55		
	15A	1/2	26	52	68	55		
	20A	3/4	34	60	93	60		
	25A	1	41	72	100	70		

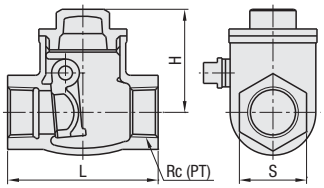
Features

- S-shaped flow valve with bulkhead inside body, positioning the center of inlet and outlet in straight line.

Check Valve



Type	Material	Max. Operating Pressure
THKB	Body: 1.4308/G-X6CrNi18-9 Gasket: Non-asbestos Sheet	Water · Oil · Air: 0.6MPa



This product will be put on sale on August, 2010.

Part Number		Rc (PT)	S	L	H	THKB	
Type	No.					€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
THKB	15A	1/2	29	65	45		
	20A	3/4	35	80	55		
	25A	1	44	90	61		

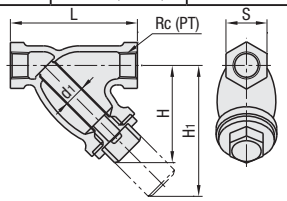
Features

- Flexible structure that can be used by hanging one end of disc in hinge shape. In addition to horizontal piping, it can be used in vertical piping.
- The smooth fluid design reduces pressure losses.

Strainer



Type	Material	Max. Operating Pressure
STRY	Body: 1.4308/G-X6CrNi18-9 Gasket: PTFE (With Filer)	Water · Oil · Air: 0.6MPa



Part Number		Rc (PT)	S	L	H	H1	d1	STRY	
Type	No.							€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
STRY	8A	1/4	21	65	50	67	15		
	10A	3/8	23	70	50	68	15		
	15A	1/2	29	85	60	80	18		
	20A	3/4	35	100	65	90	23		
	25A	1	43	115	77	107	30		

STRY10A will be put on sale on August, 2010.

Features

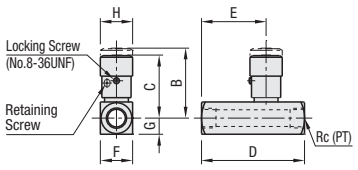
-Separates and removes foreign objects or dust in fluids.

Oil Hydraulic Valve

Inline Flow Control Valve



Type	Material	Applicable Fluid	Operating Temp.	Max. Operating Pressure
BKFS	Body: Steel	Common Mineral Operational Oil	-10~60°C	34.5MPa



Part Number		Rc (PT)	Max. Flow	B	C	D	E	F	G	H	Mass (g)	BKFS	
Type	No.											€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
BKFS	8A	1/4	19ℓ/min	45.5	41	67	42	21	10.5	21	220		
	10A	3/8	30ℓ/min	56.5	49.5	70	44.5	25	12.5	25	365		
	15A	1/2	57ℓ/min	70	61	87.5	57	32	16	30	690		

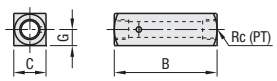
Features

- Fine adjustments at low flow rate possible by 3 initial turns of the knob with step needle.
- Flow rate setup time can be reduced by using the colorings as a guide.

Check Valve



Type	Material	Applicable Fluid	Operating Temp.	Max. Operating Pressure
BCKB	Body: Steel	Common Mineral Operational Oil	-10~60°C	34.5MPa



Part Number		Rc (PT)	Max. Flow	B	C	G	Mass (g)	BCKB	
Type	No.							€ Unit Price Qty.1-4	Volume Discount Qty. 5~10
BCKB	8A	1/4	19ℓ/min	67	21	10.5	170		
	10A	3/8	30ℓ/min	70	25	12.5	260		
	15A	1/2	57ℓ/min	87.5	32	16	510		

Features

-Prevents reflux by integrating this valve into hydraulic circuit.

Order Example — Part Number: GBUCL10A

Days to Ship: 6 Days P.87

For orders larger than indicated quantity, please request a quotation.

Compact Ball Valves
-Straight Type-

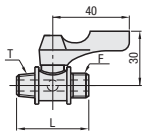
CAD Data

Picture shows "open" condition. Close condition can be obtained by counterclockwise rotation of 90°.

Be sure to use valves in fully open or close conditions.

■PT Male · PF Male RoHS — BBPF

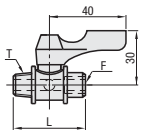




Part Number Type	No.	Handle Color	T R (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPF	11F	Not Specified (Orange)	1/8	1/8	43		
	12F	B (Black)	1/8	1/4			
	21F		1/4	1/8			
	22F		1/4	1/4			
	23F	W (White)	1/4	3/8			
	32F		3/8	1/4			
	33F	Y (Yellow)	3/8	3/8			
	34F		3/8	1/2	55		
	43F	BL (Blue)	1/2	3/8			
	44F		1/2	1/2			

■PT Male · PF Female RoHS — BBPT

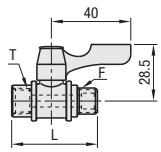




Part Number Type	No.	Handle Color	T R (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPT	11F	Not Specified (Orange)	1/8	1/8	43		
	12F		1/8	1/4			
	21F	B (Black) W (White)	1/4	1/8			
	22F		1/4	1/4			
	32F	Y (Yellow) BL (Blue)	3/8	1/4			
	33F		3/8	3/8	53		
	43F		1/2	3/8			

■Straight Type -PT Female- · PF Male RoHS — BBPW

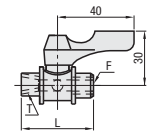




Part Number Type	No.	T RC (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPW	11F	1/8	1/8	43		
	22F	1/4	1/4			
	33F	3/8	3/8			

■PT Female · PF Female RoHS — BBFF

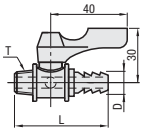




Part Number Type	No.	Handle Color	T RC (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBFF	11F	Not Specified (Orange)	1/8	1/8	43		
	12F	B (Black) W (White)	1/8	1/4			
	21F		1/4	1/8			
	22F	Y (Yellow) BL (Blue)	1/4	1/4			
	33F		3/8	3/8	53		

■PT Male · Hose Connection RoHS — BBPH

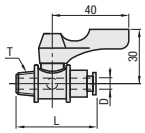




Part Number Type	No.	Handle Color	Applicable Hose Inner Dia. (mm)	T R (PT)	D	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPH	61	Not Specified (Orange) B (Black) W (White) Y (Yellow) BL (Blue)	6	1/8	7	58		
	93		9	3/8	10.5	60		
	124		12	1/2	14	69.5		

■PT Male · Tube Connection RoHS — BBPC





Only Air is applicable.

Part Number Type	No.	Handle Color	D	T R (PT)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPC	61	Not Specified (Orange) B (Black) W (White) Y (Yellow) BL (Blue)	6	1/8	49		
	62			1/4			
	81		8	1/8			
	82			1/4			
	83			3/8			
	102		10	1/4	53		
	103			3/8			

Order Example

Part Number - Color

BBPC62

BBPF11F - B

For orders larger than indicated quantity, please request a quotation.

Days to Ship

-BBPW

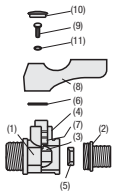
6 Days P.87

- Other Than Those Above

8 Days | Express A | 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

■Name of Parts · Material List



Part No.	Name of Parts	Material	Qty.
(1)	Body	Brass (Chrome Plating)	1
(2)	Sockets	Brass (Chrome Plating)	1
(3)	Ball	Brass (Chrome Plating)	1
(4)	Stem	Brass	1
(5)	Sheets	Fluorine Resin	2
(6)	Ring	Brass	1
(7)	ORing	Synthetic Rubber	2
(8)	Handles	Plastic	1
(9)	Screw	Steel	1
(10)	Cap	Plastic	1
(11)	Spring Washer	Steel	1

■Features: Opening and closing are smooth and reliable.
-Light torque provides easy open-close by turning its handle 90°.(Picture shows open condition.)

Specifications

Applicable Fluid	Water · Air · Oil
Operation Temperature Range	-10 ~ 80℃ (Not to be frozen)
Normal Operating Pressure	0.98MPa

Compact Ball Valves

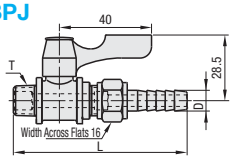
-Straight Type / Elbow Type-

■Straight Type
-PT Male, Hose Connection-

RoHS



BBPJ



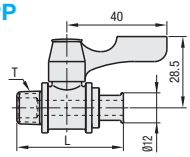
Part Number Type	No.	Applicable Hose Inner Dia. (mm)	T R (PT)	D	L	€ Unit Price Qty.1-4	Volume Discount 5 ~ 9 pieces
BBPJ	628	6	1/4	8	75		
	629		1/4	9			
	93	9	3/8	10.5			

■Straight Type
-PT Male, Peacock Type-

RoHS



BBPP



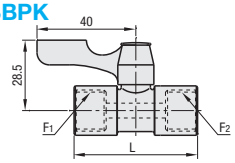
Part Number Type	No.	T R (PT)	L	€ Unit Price Qty.1-4	Volume Discount 5 ~ 9 pieces
BBPP	11F	1/8	43		
	22F	1/4			
	33F	3/8			

■Straight Type
-PF Female · PF Female
Metric Valve Type-

RoHS



BBPK



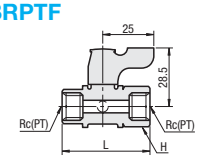
Part Number Type	No.	F1 G (PF)	F2 G (PF)	L	€ Unit Price Qty.1-4	Volume Discount 5 ~ 9 pieces
BBPK	22F	1/4	1/4	50		
	33F	3/8	3/8			

■Straight Type
-PT Female · PT Female-

RoHS



BBRPTF



Part Number Type	No.	RC (PT)	L	Width across flats H	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBRPTF	11	1/8	43	17		
	22	1/4	43	17		
	33	3/8	54.5	22		

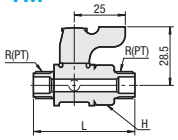
For plumbing to the hexagon side, hold the valve's hexagonal portion, not its body portion.

■Straight Type
-PT Male · PT Male-

RoHS



BBRPTM



Part Number Type	No.	R (PT)	L	Width across flats H	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBRPTM	11	1/8	50	17		
	22	1/4	50			
	33	3/8	50			

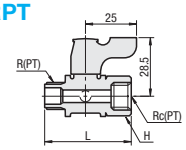
For plumbing to the hexagon side, hold the valve's hexagonal portion, not its body portion.

■Straight Type
-PT Male · PT Female-

RoHS



BBRPT



Part Number Type	No.	R (PT)	RC (PT)	L	Width across flats H	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBRPT	11	1/8	1/8	43	17		
	22	1/4	1/4	43	17		
	33	3/8	3/8	55.5	22		

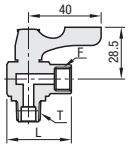
For plumbing to the hexagon side, hold the valve's hexagonal portion, not its body portion.

■Elbow Type
-PT Male · PF Female-

RoHS



BBPTL



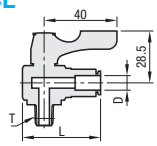
Part Number Type	No.	Handle Color	T R (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPTL	11F	Not Specified (Orange) B (Black) W (White) Y (Yellow) BL (Blue)	1/8	1/8	37		
	22F		1/4	1/4	36		

■Elbow Type
-PT Male · Tube Connection-

RoHS

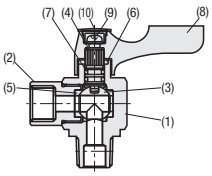


BBPCL



Part Number Type	No.	Handle Color	D	T R (PT)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPCL	61	Not Specified (Orange) B (Black) W (White) Y (Yellow) BL (Blue)	6	1/8	42.3		
	62			1/4			
	81		8	1/8			
	82			1/4			
	102		10	1/4	46.9		

■Elbow Type Parts and Materials



Part No.	Name of Parts	Material	Qty.
(1)	Body	Brass (Chrome Plating)	1
(2)	Sockets	Brass (Chrome Plating)	1
(3)	Ball	Brass (Chrome Plating)	1
(4)	Stem	Brass	1
(5)	Sheet	Fluorine Resin	2
(6)	Ring	Brass	1
(7)	O-Ring	Synthetic Rubber	2
(8)	Handles	Plastic	1
(9)	Screw	Steel	1
(10)	Cap	Plastic	1

Order Example: Part Number - Color (For orders larger than indicated quantity, please request a quotation.)

BBPJ628

BBPTL11F - B

Days to Ship

- BBPJ · BBPP · BBPK
BBRPTF · BBRPT
6 Days P. 87

- Others
8 Days

Express A 5,00 EUR/piece P. 88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

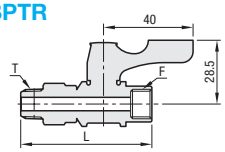
Compact Ball Valves
-Rotary Type / Stainless Steel Type-

CAD Data

For Rotary Type, the valve body and mounting part rotate separately.

Rotary Straight Type RoHS — BBPTR

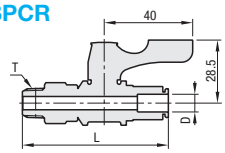




Part Number Type	No.	Handle Color	T R (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPTR	11F	Not Specified (Orange) B (Black) W (White) Y (Yellow) BL (Blue)	1/8	1/8	60		
	22F		1/4	1/4	59		

Rotary Straight Type RoHS — BBPCR

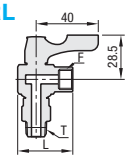




Part Number Type	No.	Handle Color	D	T R (PT)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPCR	61	Not Specified (Orange) B (Black) W (White) Y (Yellow) BL (Blue)	6	1/8	66		
	82		8	1/4			

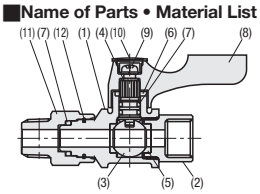
Rotary Elbow Type RoHS — BBPTRL





Part Number Type	No.	Handle Color	T R (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
BBPTRL	11F	Not Specified (Orange) B (Black) W (White) Y (Yellow) BL (Blue)	1/8	1/8	37		
	22F		1/4	1/4	36		

Name of Parts • Material List



Part No.	Name of Parts	Material	Qty.
(1)	Body	Brass (Chrome Plating)	1
(2)	Sockets	Brass (Chrome Plating)	1
(3)	Ball	Brass (Chrome Plating)	1
(4)	Stem	Brass	1
(5)	Sheet	Fluorine Resin	2
(6)	Ring	Brass	1
(7)	O-Ring	Synthetic Rubber	2
(8)	Handles	Plastic	1
(9)	Screw	Steel	1
(10)	Cap	Plastic	1
(11)	RV Type Adapters	Brass (Chrome Plating)	1
(12)	Retaining Ring	Stainless Steel	1

For stainless steel ball valves, picture shows "open" status. Close condition can be obtained by counterclockwise rotation of 90°.

Specifications

Applicable Fluid	Water · Air · Oil
Operation Temperature Range	-10 ~ 80°C (Not to be frozen)
Normal Operating Pressure	0.98MPa

Order Example: Part Number BBPTR11F - Color B

For orders larger than indicated quantity, please request a quotation.

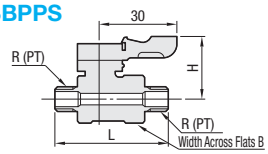
Days to Ship: 8 Days — Express A 5,00 EUR/piece P. 88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Stainless Steel -PT Male · PT Male- RoHS — BBPPS



Material: 1.4308/G-X6CrNi18-9

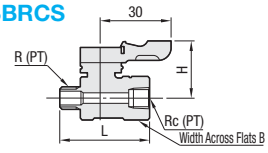


Part Number Type	No.	R (PT)	L	Width across flats B	H	€ Unit Price Qty.1-4	Volume Discount Qty. 5~
BBPPS	11	1/8	44	17	24		
	22	1/4	48				
	33	3/8	57.5	21	26		

Stainless Steel -PT Male · PT Female- RoHS — BBRCS



Material: 1.4308/G-X6CrNi18-9

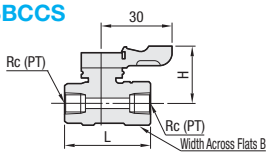


Part Number Type	No.	R (PT)	Rc (PT)	L	Width across flats B	H	€ Unit Price Qty.1-4	Volume Discount Qty. 5~
BBRCS	11	1/8	1/8	38	17	24		
	22	1/4	1/4	43				
	33	3/8	3/8	54	21	26		

Stainless Steel -PT Female · PT Female- RoHS — BBCCS



Material: 1.4308/G-X6CrNi18-9

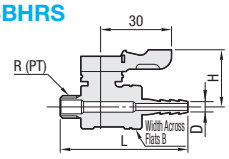


Part Number Type	No.	Rc (PT)	L	Width across flats B	H	€ Unit Price Qty.1-4	Volume Discount Qty. 5~
BBCCS	11	1/8	36	17	24		
	22	1/4	39				
	33	3/8	53	21	26		

Stainless Steel -PT Male · Hose Connection- RoHS — BBHRS



Material: 1.4308/G-X6CrNi18-9

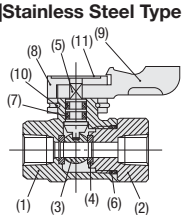


Part Number Type	No.	Applicable Hose Inner Dia. (mm)	R (PT)	D	L	Width across flats B	H	€ Unit Price Qty.1-4	Volume Discount Qty. 5~
BBHRS	61	6	1/8	7	55	17	24		
	62		1/4		57				
	91	9	1/8	10.5	55				
	92		1/4		57				
	93		3/8		64	21	26		

Order Example: Part Number BBPPS11

Days to Ship: 6 Days P. 87

Stainless Steel Type Parts and Materials



Part No.	Name of Parts	Material	Qty.
(1)	Body	1.4308/G-X6CrNi18-9	1
(2)	End Cap	1.4301/X5CrNi18-10	1
(3)	Ball	1.4401/X5CrNiMo17-12-2	1
(4)	Sheets	PTFE (Glass Fiber 15%)	2
(5)	Stem	1.4301/X5CrNi18-10	1
(6)	ORing	FPM (Viton E-60 - F-715-70)	1
(7)	ORing	FPM (Viton E-60 - F-715-70)	2
(8)	Handle Guide	ZC0400/ZnAl4	1
(9)	Lever Handle	EN AC-46100/G-AlSi12Cu	1
(10)	Lock Ring	1.4301/X5CrNi18-10	1
(11)	Name-plate	Polycarbonate	1

Compact Ball Valves / Compact Needle Valves
-Knurled Type-

CAD Data

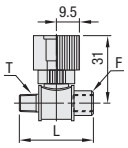
- Compact Ball Valves
Picture shows "open" condition. Close condition can be obtained by counterclockwise rotation of 90°.

■Knurled Type RoHS
-PT Male · PF Female-



M Material: Brass
S Surface Treatment: Chrome Plating

BBPTS



Part Number Type	No.	T R (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~29
BBPTS	11F	1/8	1/8	43		
	12F	1/8	1/4			
	21F	1/4	1/8			
	22F	1/4	1/4			
	32F	3/8	1/4			
	33F	3/8	3/8	53		
	43F	1/2	3/8			

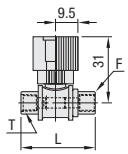
Height of 33F • 43F is 32.

■Knurled Type RoHS
-PT Female · PF Female-



M Material: Brass
S Surface Treatment: Chrome Plating

BBFFS



Part Number Type	No.	T RC (PT)	F G (PF)	L	€ Unit Price Qty.1-4	Volume Discount Qty. 5~29
BBFFS	11F	1/8	1/8	43		
	12F	1/8	1/4			
	21F	1/4	1/8			
	22F	1/4	1/4			
	33F	3/8	3/8	53		

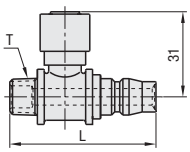
Height of 33F is 32.

■Knurled Type RoHS
-PT Male · Coupler Socket-



M Material: Brass
S Surface Treatment: Chrome Plating

BBKB



Part Number Type	No.	T R (PT)	L	€ Unit Price Qty.1-4	Volume Discount 5 ~ 9 pieces
BBKB	11F	1/8	53		
	22F	1/4			
	33F	3/8			

Specifications

Applicable Fluid	Water · Air · Oil
Operation Temperature Range	-10 ~ 120°C (Not to be frozen)
Normal Operating Pressure	0.98MPa

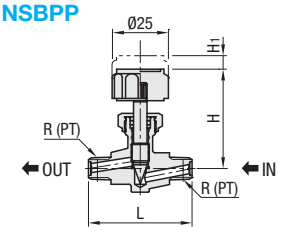
- Compact Needle Valves

■PT Male · PT Male RoHS



M Material: Brass
S Surface Treatment: Chrome Plating

NSBPP



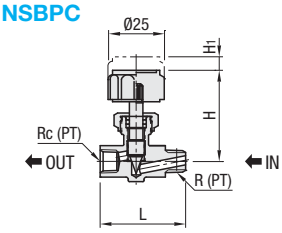
Part Number Type	No.	R (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
NSBPP	11	1/8	46	44	6		
	22	1/4	46				
	33	3/8	50				

■PT Male · PT Female RoHS



M Material: Brass
S Surface Treatment: Chrome Plating

NSBPC



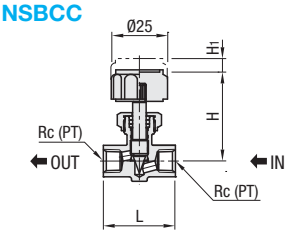
Part Number Type	No.	R (PT)	Rc (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
NSBPC	11	1/8	1/8	38	41	6		
	22	1/4	1/4	42	44			
	33	3/8	3/8	45				

■PT Female · PT Female RoHS



M Material: Brass
S Surface Treatment: Chrome Plating

NSBCC



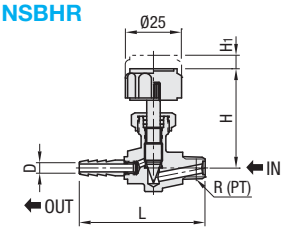
Part Number Type	No.	Rc (PT)	Rc (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
NSBCC	11	1/8	1/8	32	41	5		
	22	1/4	1/4	36	44	6		
	33	3/8	3/8	40				

■PT Male · Hose Connection RoHS



M Material: Brass
S Surface Treatment: Chrome Plating

NSBHR



Part Number Type	No.	Applicable Hose Inner Dia.(mm)	R (PT)	D	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~19
NSBHR	61	6	1/8	7	56	44	6		
	93	9	3/8	10.5	66				

Order Example

Part Number
BBKB11F
NSBCC33

For orders larger than indicated quantity, please request a quotation.

Specifications

Applicable Fluid	Water · Air · Oil
Operation Temperature Range	-10 ~ 80°C (Not to be frozen)
Normal Operating Pressure	0.98MPa

Days to Ship

-BBKB
6 Days P.87

- Other Than Those Above
8 Days Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

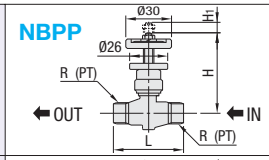
Needle Valve

CAD Data

■Both-Side Male RoHS



M Material: Brass
S Surface Treatment: Chrome Plating

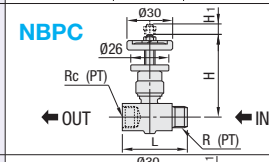


Part Number Type	No.	R (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~
NBPP	11	1/8	46	48	7		
	22	1/4	46				
	33	3/8	50				

■Male / Female RoHS



M Material: Brass
S Surface Treatment: Chrome Plating

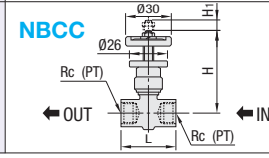


Part Number Type	No.	R (PT)	Rc (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~29
NBPC	11	1/8	1/8	38	46	5		
	22	1/4	1/4	42	48	7		
	33	3/8	3/8	45				

■Both Ends Female RoHS



M Material: Brass
S Surface Treatment: Chrome Plating



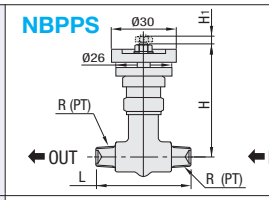
Part Number Type	No.	Rc (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~29
NBCC	11	1/8	32	46	5		
	22	1/4	36	48	7		
	33	3/8	40				

Maximum thickness is 5mm for Mounting Panel of Stainless Steel Needle Valve.

■Stainless Steel-Both Sides Male- RoHS



M Material: 1.4301/X5CrNi18-10

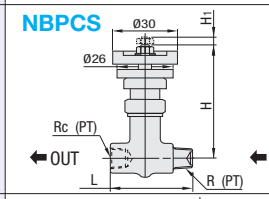


Part Number Type	No.	R (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~29
NBPPS	11	1/8	44	55.5	5.5		
	22	1/4	48	53	5.5		
	33	3/8	54	53	5.5		

■Stainless Steel-Male - Female- RoHS



M Material: 1.4301/X5CrNi18-10

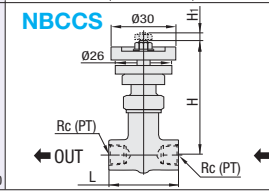


Part Number Type	No.	R (PT)	Rc (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~29
NBPCS	11	1/8	1/8	38	55.5	5.5		
	22	1/4	1/4	42	53	5.5		
	33	3/8	3/8	47	53	5.5		

■Stainless Steel-Both Ends Female- RoHS



M Material: 1.4301/X5CrNi18-10



Part Number Type	No.	Rc (PT)	L	H	H1	€ Unit Price Qty.1-4	Volume Discount Qty. 5~
NBCCS	11	1/8	32	55.5	5.5		
	22	1/4	36	53	5.5		
	33	3/8	40	53	5.5		

Order Example Part Number: NBPP22, NBPPS33

For orders larger than indicated quantity, please request a quotation.

Days to Ship -NBCC / NBCCS: 6 Days P.87

- Others: 8 Days

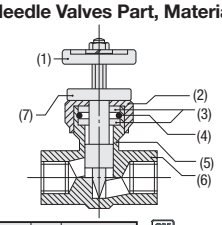
Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

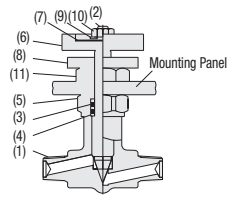
■Features of Needle Valves

- Suited for fine adjustment of flow rate of water, oil or air.
- The body and the needle are chrome plated to improve air tightness, damage-proofing and smooth operation.
- The spindle is provided with a lock nut to prevent loosening due to vibration.

■Needle Valves Part, Material List



■Parts, Material List for Stainless Steel Needle Valves



EX Specifications

Applicable Fluid	Water, Air, Oil
Operation Temperature Range	-10 ~ 80°C (Not to be frozen)
Normal Operating Pressure	0.98MPa
Recommended Panel Hole Diameter	Ø14

Part No.	Name of Parts	M Material	Qty.	Processing
(1)	Handles	CW614N BD Brass (JIS)	1	Chrome Plating
(2)	Gland Nut	CW614N BD Brass (JIS)	1	Chrome Plating
(3)	Ring	CW505L	2	-
(4)	O-Ring	NBR	1	-
(5)	Spindles	CW614N BD Brass (JIS)	1	Chrome Plating
(6)	Body	CW617N/CuZn40Pb2	1	Chrome Plating
(7)	Lock Nut	CW614N BD Brass (JIS)	1	Chrome Plating

EX Specifications

Applicable Fluid	Oil, Air, Water, Chemicals
Operation Temperature Range	-20 ~ 150°C (Not to be frozen)
Normal Operating Pressure	0.98MPa
Recommended Panel Hole Diameter	Ø14

Part No.	Name of Parts	M Material	Qty.	Processing
(1)	Body	1.4301	1	-
(2)	Spindles	1.4301	1	-
(3)	O-Ring	PTFE	2	-
(4)	Ring	1.4301	3	-
(5)	Gland Nut	1.4305	1	-
(6)	Handles	CW614N	1	Chrome Plating
(7)	Plaques	EN AW-1050A	1	-
(8)	Lock Nut	CW614N	1	Chrome Plating
(9)	Washers	1.0038	1	JIS STKM Bright Chromate Plating
(10)	Hexagon Socket Head Cap Screw	CW614N	1	Nickel Plating
(11)	Lock Nut for Panel	CW614N	1	Chrome Plating

Sanitary Pipes · Vacuum Plumbing Parts · Tank

Sanitary Pipes· Vacuum Plumbing Parts· Tank



Product Name	Sanitary Pipes-Standard-	-Welded Low-neck-	Welded Sanitary Pipes-Standard-
Page	1214	1214	1215



Welded Sanitary Pipes -Branching-	Sanitary Pipes-Double Ferrules, Specified Dimension-	-One Side Welded-	-Both Sides Welded-
1216	1217	1217	1217



Sanitary Hollows-Branching Type-	Sanitary Pipe Fittings
1219	1221•1222



Sanitary Pipe Fittings	Sanitary Adapter Fittings	Sanitary Pipe Fittings · Arm Lock Coupling
1223	1224	1225•1226



Sanitary Butterfly Valves	Flange Ball Valve	Sanitary Ball Valves	Sanitary Sight Glasses
1227	1227	1228	1229



Sanitary Tube Strainers	Sanitary Pressure Gauge	Shower-ball	Pressure Tanks-Simplified-
1230	1231	1231	1233



Pressure Tanks - Standard -	Pressure Tanks with Base - Wide Mouth	Pressure Tanks with Base - Narrow Mouth	Pressure Tanks with Safety Function -Standard-	-Wide Mouth-
1234	1235	1236	1237	1238

NEW



Pressure Tanks with Safety Function -Narrow Mouth-
1238



Lid for Pressure Tank · O-Ring
1239



Clamp · Regulator
1239•1240



Low Level Float Switches · Relief Valves
1240

Added
Modified



Price Reduced
up to 15%

Standard Type Open-Top Tank
1242

Added
Modified



Price Reduced
up to 12%

Seal-able Open-Top Tank
1244

Modified



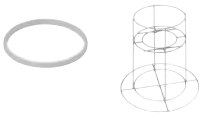
Price Reduced
up to 15%

Outlet Shape
1243•1245

Added
Modified



Cover for Open-Top Tank -Standard · Seal-able
1246



Gasket for Seal-able Lids · Stand for Open-Top Tanks
1246

NEW



Standard Type Open-Top Tank - Hopper Type-
1247

NEW



Seal-able Type Open-Top Tank – Hopper Type-
1248

Added



Price Reduced
up to 55%

Vacuum Plumbing Parts
1249

NEW



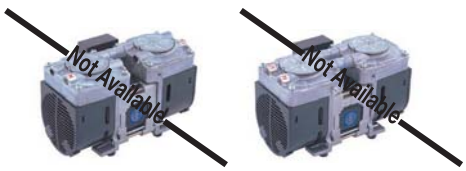
Both Sides Welded Vacuum Pipes
1250



Price Reduced
up to 48%

Fittings for Vacuum Plumbing
1251•1252

NEW



Vacuum Pumps-Diaphragm-
1254

Sanitary Pipes · Joints
-Overview-

■Common Specifications

Material	Standards
1.4301/X5CRNI18-10	(No. 8A~15A) JIS G3459
1.4404/X2CrNiMo17-12-2	(No. 1S~3S) JIS G3447

■Common Specifications (Weld beads inside excluded)

	Surface Finish
Inner Surface	320~400 (Ra≤1.0μm)
Outer Surface	320~400 (Ra≤2.5μm)

■Table of Applicable Standards

Shapes	Page	Standards
Sanitary Pipes (1S~3S)	**P.1214~1220**	JIS G3447
Sanitary Small Diameter Pipes (1.4404/X2CrNiMo17-12-2 8A~15A)	**P.1214 · 1217 · 1219**	JIS G3459
Clamp	**P.1215~1222**	IDF/ISO
Thread	**P.1217 · 1219 · 1223**	IDF
Flange	**P.1224**	JIS B2210

For detailed dimension, refer to stipulated standards.

■Table of Sanitary Pipes Depending on Dimension Standard

JIS G3447 (1994)			JIS G3459			3A (3A Sanitary Standards)			ISO		DIN (DIN1 1850) (DIN)		
Size	Outer Dia. (D)	Thickness (t)	Size	Outer Dia. (D)	Thickness (t)	Size	Outer Dia. (D)	Thickness (t)	Outer Dia. (D)	Thickness (t)	Size	Outer Dia. (D)	Thickness (t)
			8A	13.8	1.65				12	1	DN10	12	1
			10A	17.3	1.65				17.2	1	15	18	1
			15A	21.7	2.1				21.3	1	20	22	1
1S	25.4	1.2	20A	27.2	2.1	1	25.4	1.25 1.65	25	1.2	25	28	1.5
1.25S	31.8	1.2	25A	34	2.8	1 1/4			33.7	1.2	32	34	1.5
1.5S	38.1	1.2	32A	42.7	2.8	1 1/2	38.1	1.25 1.65	38	1.2			
									40	1.2	40	40	1.5
2S	50.8	1.5	40A	48.6	2.8	2	50.8	1.65	51	1.2	50	52	1.5
2.5S	63.5	2	50A	60.5	2.8	2 1/2	63.5	1.65	63.5	1.6			
									70	1.6	65	70	2
3S	76.3	2	65A	76.3	3	3	76.2	1.65	76.1	1.6			

■Information about Sanitary Pipes

Size	Outer Dia. (D)	Thickness (t)	Area of Inner Dia. mm^2	Cross-sectional Area of Pipes mm^2	Weight of Pipes kg/m	Capacity of Liquid in Pipe ℓ/m	Flow at Flow Rate 1m/sec m^3/h
8A	13.8	1.65	87	63	0.499	0.11	0.396
10A	17.3	1.65	154	81.1	0.463	0.154	0.554
15A	21.7	2.1	241	129	1.03	0.241	0.868
1S	25.4	1.2	415	91.2	0.723	0.415	1.49
1.25S	31.8	1.2	679	115	0.915	0.679	2.44
1.5S	38.1	1.2	1001	139	1.1	1	3.6
2S	50.8	1.5	1795	232	1.84	1.8	6.46
2.5S	63.5	2	2781	386	3.06	2.78	10
3S	76.3	2	4106	467	3.7	4.11	14.8

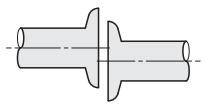
For weight of pipe and liquid (kg/m), add capacity of liquid in pipe to weight of pipe.
Weight of pipe and liquid indicates weight per length (m) when pipe is filled with water (calculated as specific gravity 1.0).
For liquid with different specific gravity, multiply capacity of pipe by specific gravity, and add weight of pipe to it.
Use flow rate 1m/sec for calculating flow rate and velocity in pipe and diameter of pipe.
(Ex.)For flow velocity when using 2S pipe at $10m^3/h$: V(velocity of flowing fluid)=10(m^3/h)/6.46[(m^3/h)/(1m/sec)]=1.55m/sec

■Recommended Tightening Torque and Incompatible Mounting Method

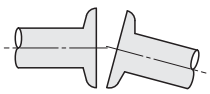
Use 3N·m for 1S~3S; 3N·m or lower for 8A~15A. Further tightening or loading of pipe may deform the gaskets and cause liquid slug, leakages and damages. When fluid leaks during use, retighten pipe with torque above. If this fails to stop leakage, replace gasket.

<Incompatible Mounting Methods>

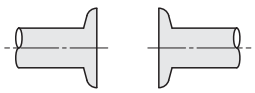
1) When it does not match with the alignment of plumbing



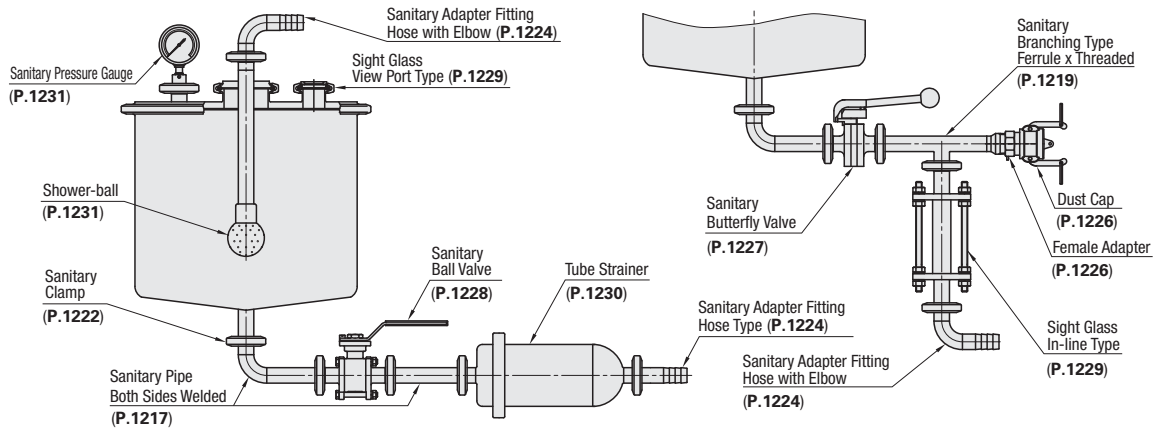
2) When it is not horizontal to the alignment of plumbing



3) When there is much clearance between pipe and joint



■Example of Plumbing Sanitary Pipe and Corresponding Page



NEW

Sanitary Pipes
-Standard / Welded Low-neck-

Reduced Delivery Time

Price Reduction up to 38%

CAD Data

■Sanitary Pipes -Standard-

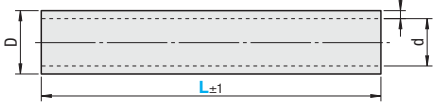


RoHS

Type	Material	Standards
SNPE	1.4301/X5CRNI18-10	(No. 8A~15A) JIS G3459
SNPS	1.4404/X2CrNiMo17-12-2	(No. 1S~3S) JIS G3447

■Common Specifications (Weld beads inside excluded)

	Surface Finish
Inner Surface	#320~400 (Ra≤1.0μm)
Outer Surface	#320~400 (Ra≤2.5μm)



Part Number Type	No.	L 1mm Increment	D	d	t	€ Unit Price / mm SNPE € Unit Price	L Pipe/100mm	€ Unit Price / mm SNPS € Unit Price	L Pipe/100mm
SNPS	8A	50~1500	13.8	10.5	1.65				
	10A		17.3	14					
	15A		21.7	17.5	2.1				
SNPE SNPS	1S		25.4	23	1.2				
	1.5S		38.1	35.7					
	2S		50.8	47.8	1.5				
	2.5S		63.5	59.5	2				
	3S		76.3	72.3					

<Price Calculation Example> Price=€ € Unit Price+L Pipe Price. For L pipe price, charge is added for every 100mm of L dimension. 50 ~ 100 round up to 100; 101 ~ 200 round up to 200.
<Price Calculation Example> For SNPE1S-250: € € Unit Price 19,00 EUR+Pipe Price: 1,50 EURx3(250/100=2.5 Round up to 3)=19,00 EUR+4,50 EUR=23,50 EUR

■Sanitary Pipes -Welded Low-neck-







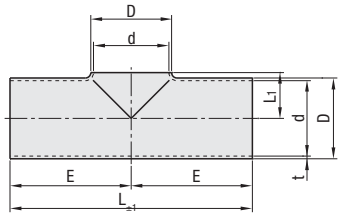
RoHS

Type: L Dimension Fixed	L Dimension Configurable	Multiple	Material	Standards
SNPW	SNPWL	SNPWM	1.4301/ X5CRNI18-10	(No.1S~3S) JIS G3447

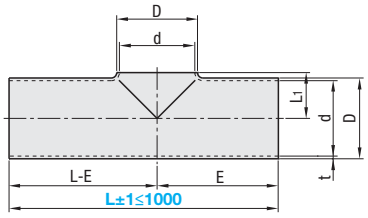
■Common Specifications (Weld beads inside excluded)

	Surface Finish
Inner Surface	320~400 (Ra≤1.0μm)
Outer Surface	320~400 (Ra≤2.5μm)

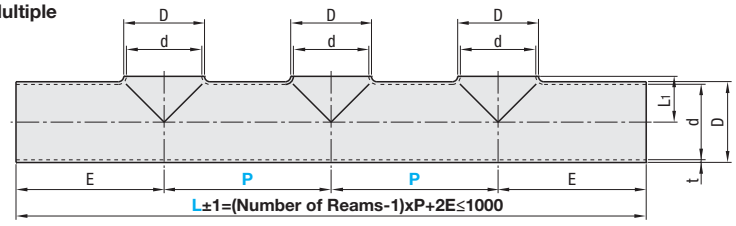
•L Dimension Fixed



•L Dimension Configurable



•Multiple



* Drawing above indicates diagram at sequent number 3. The branching direction is on identical surface.

Part Number Type	No.	L: L Dimension Fixed	L: 1mm Increment	D	d	L1	t	E	SNPW € Unit Price	€ Unit Price/mm SNPWL € Unit Price	L Pipe/100mm
SNPW SNPWL	1S	68	70~1000	25.4	23	14	1.2	34			
	1.5S	98	100~1000	38.1	35.7	21		49			
	2S	122	130~1000	50.8	47.8	28	1.5	61			
	2.5S	168	170~1000	63.5	59.5	34	2	84			
	3S	178	180~1000	76.3	72.3	40.5		89			

<Price Calculation Example> Price=€ Unit Price+L Hollow Price. For L pipe price, charge is added for every 100mm of L dimension. 50 ~ 100 round up to 100; 101 ~ 200 round up to 200.
<Price Calculation Example> For SNPWM1S-250: € Unit Price 40,00 EUR+Hollow Price: 4,00 EURx3(250/100=2.5 Round up to 3)=40,00 EUR+12,00 EUR=52,00 EUR

Part Number Type	No.	Number of Circuits	L 1mm Increment	P 1mm Increment	D	d	L1	t	E	€ Unit Price/mm SNPWM € Unit Price For Sequent Number 2	For Sequent Number 3	For Sequent Number 4	L Pipe/100mm
SNPWM	1S	2	70~1000	68~300	25.4	23	14	1.2	34				
	1.5S		100~1000	98~300	38.1	35.7	21		49				
	2S	3	130~1000	122~300	50.8	47.8	28	1.5	61				
	2.5S	4	170~1000	168~300	63.5	59.5	34	2	84				
	3S		180~1000	178~300	76.3	72.3	40.5		89				

Specify P within range of L=(Number of Circuits-1)xP+2E≤1000.
<Price Calculation Example> Price=€ Unit Price+L Hollow Price. For L pipe price, charge is added for every 100mm of L dimension. 50 ~ 100 round up to 100; 101 ~ 200 round up to 200.
<Price Calculation Example> For SNPWM1S-3-268-P100: € Unit Price 100,00 EUR+Pipe Price: 4,00 EURx3(268/100=2.68 Round up to 3)=69,00 EUR+12,00 EUR=81,00 EUR

Order Example

Part Number	-	L
SNPE2S	-	500
SNPW1.5S SNPWL2S	-	365

Part Number	-	Number of Circuits	-	L	-	P
SNPWM2S	-	2	-	272	-	P150

Price

Days to Ship

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

-SNPE · SNPS · SNPW: 8 Days

-SNPWL · SNPWM: 13 Days

Welded Sanitary Pipes
-Standard-

CAD Data

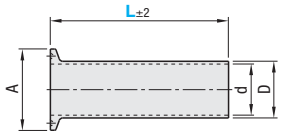
For other similar sanitary pipes with high freedom of combinations, see P.1217

Welded Sanitary Pipes -Ferrule x Pipe-



RoHS

Type	Material	Standards
SNLFP	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



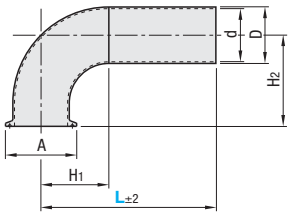
Part Number Type	No.	L 1mm Increment	D	d	A	€ Unit Price The Shortest L ~200	L 201 ~300	L 301 ~400	L 401 ~500
SNLFP	1S	42~500	25.4	23	50.5				
	1.5S	42~500	38.1	35.7	50.5				
	2S	42~500	50.8	47.8	64				
	2.5S	42~500	63.5	59.5	77.5				
	3S	42~500	76.3	72.3	91				

Welded Sanitary Pipes -Elbow x Pipe-



RoHS

Type	Material	Standards
SNLEP	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



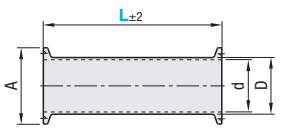
Part Number Type	No.	L 1mm Increment	D	d	A	H1	H2	€ Unit Price The Shortest L ~200	L 201 ~300	L 301 ~400	L 401 ~500
SNLEP	1S	90~500	25.4	23	50.5	34	55				
	1.5S	100~500	38.1	35.7	50.5	49	70				
	2S	110~500	50.8	47.8	64	61	82				
	2.5S	140~500	63.5	59.5	77.5	84	105				
	3S	140~500	76.3	72.3	91	89	110				

Welded Sanitary Pipes -Ferrule x Ferrule-



RoHS

Type	Material	Standards
SNLFF	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



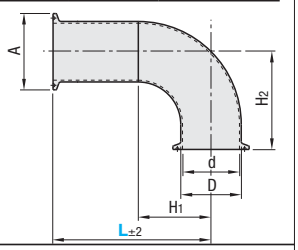
Part Number Type	No.	L 1mm Increment	D	d	A	€ Unit Price The Shortest L ~200	L 201 ~300	L 301 ~400	L 401 ~500
SNLFF	1S	84~500	25.4	23	50.5				
	1.5S	84~500	38.1	35.7	50.5				
	2S	84~500	50.8	47.8	64				
	2.5S	84~500	63.5	59.5	77.5				
	3S	84~500	76.3	72.3	91				

Welded Sanitary Pipes -Ferrule x 90° Elbow-



RoHS

Type	Material	Standards
SNLFE	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



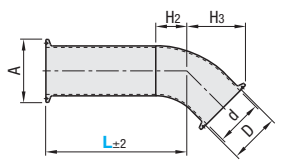
Part Number Type	No.	L 1mm Increment	D	d	A	H1	H2	€ Unit Price The Shortest L ~200	L 201 ~300	L 301 ~400	L 401 ~500
SNLFE	1S	110~500	25.4	23	50.5	34	55				
	1.5S	120~500	38.1	35.7	50.5	49	70				
	2S	130~500	50.8	47.8	64	61	82				
	2.5S	160~500	63.5	59.5	77.5	84	105				
	3S	160~500	76.3	72.3	91	89	110				

Welded Sanitary Pipes -Ferrule x 45° Elbow-



RoHS

Type	Material	Standards
SNLFH	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



Part Number Type	No.	L 1mm Increment	D	d	A	H2	H3	€ Unit Price The Shortest L ~200	L 201 ~300	L 301 ~400	L 401 ~500
SNLFH	1S	90~500	25.4	23	50.5	15.8	43.9				
	1.5S	100~500	38.1	35.7	50.5	23.7	49.5				
	2S	100~500	50.8	47.8	64	31.6	59.8				
	2.5S	110~500	63.5	59.5	77.5	42	71.9				
	3S	120~500	76.3	72.3	91	52.6	84.2				

Order Example

Part Number	-	L
SNLFP2S	-	200
SNLFF1S	-	350

Days to Ship: 10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Welded Sanitary Pipes
-Branching-

CAD Data

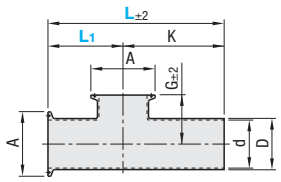
For other similar sanitary pipes with high freedom of combinations, see P.1219

Welded Sanitary Pipes -Ferrule x Pipe-



RoHS

Type	Material	Standards
SNLFFP	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



Part Number Type	No.	L 1mm Increment	L1 1mm Increment	D	d	A	G	K	€ Unit Price The Shortest L ~200	L 201~300	L 301~400	L 401~500
SNLFFP	1S	89~500	55~466	25.4	23	50.5	35	34				
	1.5S	119~500	70~451	38.1	35.7	50.5	42	49				
	2S	143~500	82~439	50.8	47.8	64	49	61				
	2.5S	189~500	105~416	63.5	59.5	77.5	55	84				
	3S	199~500	110~411	76.3	72.3	91	61.5	89				

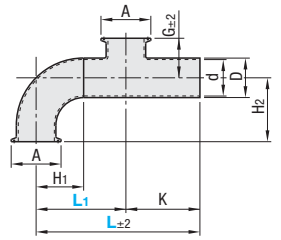
K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L-1 to ensure L-L1≥K.

Welded Sanitary Pipes -Elbow x Pipes-



RoHS

Type	Material	Standards
SNLEFP	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



Part Number Type	No.	L 1mm Increment	L1 1mm Increment	D	d	A	H1	H2	G	K	€ Unit Price The Shortest L ~200	L 201~300	L 301~400	L 401~500
SNLEFP	1S	110~500	70~460	25.4	23	50.5	34	55	35	34				
	1.5S	150~500	100~450	38.1	35.7	50.5	49	70	42	49				
	2S	190~500	130~430	50.8	47.8	64	61	82	49	61				
	2.5S	260~500	170~410	63.5	59.5	77.5	84	105	55	84				
	3S	270~500	180~410	76.3	72.3	91	89	110	61.5	89				

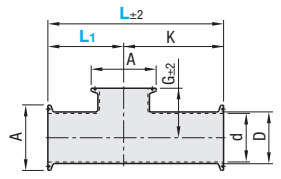
K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L-1 to ensure L-L1≥K.

Welded Sanitary Pipes -Ferrule x Ferrule-



RoHS

Type	Material	Standards
SNLFFF	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



Part Number Type	No.	L 1mm Increment	L1 1mm Increment	D	d	A	G	K	€ Unit Price The Shortest L ~200	L 201~300	L 301~400	L 401~500
SNLFFF	1S	110~500	55~440	25.4	23	50.5	35	55				
	1.5S	140~500	70~430	38.1	35.7	50.5	42	70				
	2S	164~500	82~410	50.8	47.8	64	49	82				
	2.5S	210~500	105~390	63.5	59.5	77.5	55	105				
	3S	220~500	110~390	76.3	72.3	91	61.5	110				

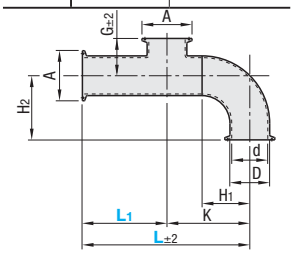
K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L-1 to ensure L-L1≥K.

Welded Sanitary Pipes -Ferrule x 90° Elbow-



RoHS

Type	Material	Standards
SNLFFE	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



Part Number Type	No.	L 1mm Increment	L1 1mm Increment	D	d	A	H1	H2	G	K	€ Unit Price The Shortest L ~200	L 201~300	L 301~400	L 401~500
SNLFFE	1S	130~500	55~430	25.4	23	50.5	34	55	35	68				
	1.5S	170~500	70~400	38.1	35.7	50.5	49	70	42	98				
	2S	210~500	82~370	50.8	47.8	64	61	82	49	122				
	2.5S	280~500	105~330	63.5	59.5	77.5	84	105	55	168				
	3S	290~500	110~320	76.3	72.3	91	89	110	61.5	178				

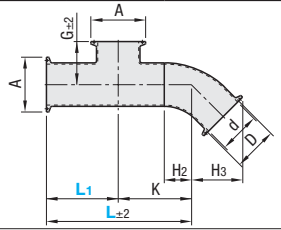
K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L-1 to ensure L-L1≥K.

Welded Sanitary Pipes -Ferrule x 45° Elbow-



RoHS

Type	Material	Standards
SNLFFH	1.4301/ X5CrNi18-10	Pipe :(No. 1S~3S) JIS G3447 Joint : IDF



Part Number Type	No.	L 1mm Increment	L1 1mm Increment	D	d	A	H2	H3	G	K	€ Unit Price The Shortest L ~200	L 201~300	L 301~400	L 401~500
SNLFFH	1S	105~500	55~450	25.4	23	50.5	15.8	43.9	35	50				
	1.5S	145~500	70~420	38.1	35.7	50.5	23.7	49.5	42	80				
	2S	180~500	82~400	50.8	47.8	64	31.6	59.8	49	100				
	2.5S	235~500	105~370	63.5	59.5	77.5	42	71.9	55	130				
	3S	255~500	110~350	76.3	72.3	91	52.6	84.2	61.5	150				

K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L-1 to ensure L-L1≥K.

Order Example

Part Number	-	L	-	L1
SNLFFF2S	-	500	-	300

Days to Ship: 13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Sanitary Pipes

-Double Ferrules, Specified Dimension / One Side Welded / Both Sides Welded-

■Double ferrules for wide range of applications are available (same day shipping is possible).

■Sanitary Pipes
-Double Ferrules, Specified Dimension-

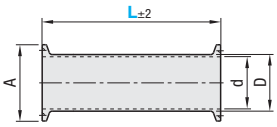


RoHS

Type	Material	Standards
SNPAA	1.4301/ X5CrNi18-10	Pipe :(No. 1S~2S) JIS G3447 Joint : IDF

■Common Specifications (Weld beads inside excluded)

	Surface Finish
Inner Surface	320~400 (Ra≤1.0μm)
Outer Surface	320~400 (Ra≤2.5μm)



Part Number Type	No.	L Selection	D	d	A
SNPAA	1S	100 150 200 250 300	25.4	23	50.5
	1.5S		38.1	35.7	50.5
	2S		50.8	47.8	64

No.	€ Unit Price 1~4pieces			Volume Discount 5~9 PCS.		
	L100•150	L200•250	L300	L100•150	L200•250	L300
1S						
1.5S						
2S						

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number SNPAA2S - L 200

10 Days

■Sanitary Pipes
-One Side Welded-
-Both Sides Welded-



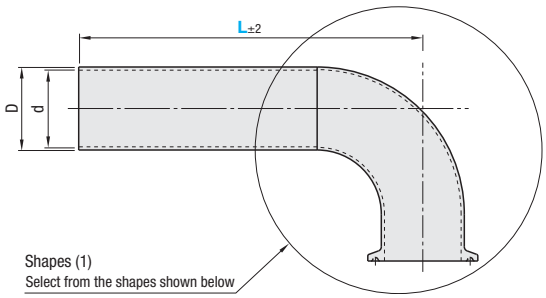
RoHS

Type: One Side Welded	Type: Both Sides Welded	Material	Standards
SNPK	SNPR	1.4301/X5CrNi18-10	Hollow : (No. 8A~15A) JIS G3459 (No. 1S~3S) JIS G3447 Joint : IDF/ISO
SNPSK	SNPSR	1.4404/X2CrNiMo17-12-2	

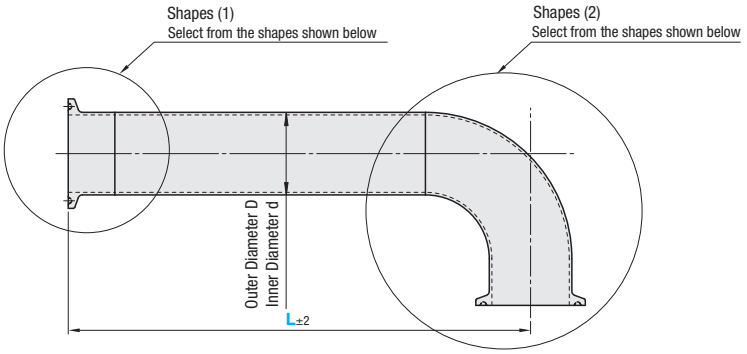
■Common Specifications (Weld beads inside excluded)

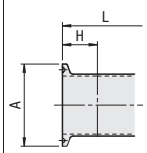
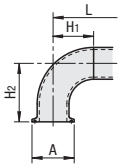
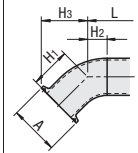
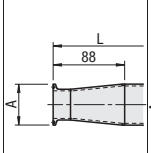
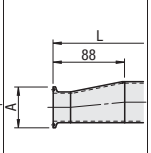
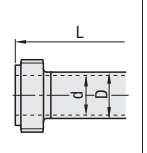
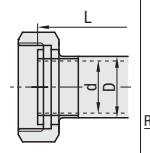
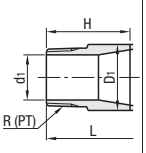
	Surface Finish
Inner Surface	320~400 (Ra≤1.0μm)
Outer Surface	320~400 (Ra≤2.5μm)

■One Side Welded



■Both Sides Welded



Shape A (Ferrule)	Shape B (Elbow)	Shape C (45°Elbow)	Shape D (Reducer)	Shape E (Eccentric Reducer)	Shape F (Thread Sheet)	Shape G (Liner + Hexagon Nut)	Shape H (Male Threads)
							

Reduced Delivery Time

Price Reduction up to 27%

CAD Data

One Side Welded

Part Number Type	No.	L 1mm Increment	Shapes (1)Symbol	D	d	A	Shape A H	Shape B H1	Shape B H2	Shape C H1	Shape C H2	Shape C H3	Shape H R(Pt)	Shape H D1	Shape H d1	Shape H H
SNPSK	8A	90~1000	A B	13.8	10.5	34	17	38	55	-	-	-	-	-	-	-
	10A	90~1000		17.3	14	34	17	38	55	-	-	-	-	-	-	-
	15A	90~1000		21.7	17.5	34	17	38	55	-	-	-	-	-	-	-
SNPK SNPSK	1S	90~1500*	A E B F C G D H	25.4	23	50.5	21	34	55	36.8	15.8	43.9	3/4	27.2	21	39
	1.5S	140~1500*		38.1	35.7	50.5	21	49	70	44.7	23.7	49.5	1 1/4	42.7	35.7	44
	2S	140~1500*		50.8	47.8	64	21	61	82	52.6	31.6	59.8	1 1/2	48.6	40	49
	2.5S	140~1500*		63.5	59.5	77.5	21	84	105	63	42	71.9	-	-	-	-
	3S	140~1500*		76.3	72.3	91	21	89	110	73.6	52.6	84.2	-	-	-	-

For shape D and E (Reducer), the ferrule is one size smaller. Ex: SNPK2S: Welded reducer is 2S (pipe) x1.5S (ferrule part). For shape B, C, D and E, the weld bead on the inner diameter is not removed.
Shape F and G are available for SNPK only. The shapes D and E are not available for 1S. * For 1.4404/X2CrNiMo17-12-2, pipes up to L=1000 are available.

No.	SNPK € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+Additional Charge Depending on Shape)		Additional Charge Depending on Shape							
	€ Unit Price	L Pipe/100mm	Shape A	Shape B	Shape C	Shape D	Shape E	Shape F	Shape G	Shape H
1S										
1.5S										
2S										
2.5S										
3S										

No.	SNPSK € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+Additional Charge Depending on Shape)		Additional Charge Depending on Shape					
	€ Unit Price	L Pipe/100mm	Shape A	Shape B	Shape C	Shape D	Shape E	Shape H
8A								
10A								
15A								
1S								
1.5S								
2S								
2.5S								
3S								

‹Price Calculation Example›
Price=(1) € Unit Price (€ Unit Price+L Pipe Price)+(2) Additional Charge Depending on Shape
For L pipe price, charge is added for every 100mm of L dimension.
50 ~100 round up to 100; 101 ~ 200 round up to 200.

‹Price Calculation Example 1›
For SNPK1S-250-A:
€ Unit Price : 46,00 EUR
Pipe Price : 4,00 EURx3(250/100=2.5 →Round up to 3)
Additional Charge Depending on Shape: 46,00 EUR
Sum : 46,00 EUR

‹Price Calculation Example 2›
For SNPR1.5S-250-LA-RB
€ Unit Price : 86,00 EUR
Pipe Price : 4,00 EURx3(250/100=2.5 →Round up to 3)
Additional Charge Depending on Shape: 86,00 EUR+4,00 EUR
Sum : 86,00 EUR

Both Sides Welded

Part Number Type	No.	L 1mm Increment	L Shapes (1)	R Shapes (2)	D	d	A	Shape A H	Shape B H1	Shape B H2	Shape C H1	Shape C H2	Shape C H3	Shape H R(Pt)	Shape H D1	Shape H d1	Shape H H
SNPSR	8A	130~1000	LA LB	RA RB	13.8	10.5	34	17	38	55	-	-	-	-	-	-	-
	10A	130~1000			17.3	14	34	17	38	55	-	-	-	-	-	-	-
	15A	130~1000			21.7	17.5	34	17	38	55	-	-	-	-	-	-	-
SNPR SNPSR	1S	130~1500*	LA LE LB LF LC LG LD LH	RA RE RB RF RC RG RD RH	25.4	23	50.5	21	34	55	36.8	15.8	43.9	3/4	27.2	21	39
	1.5S	230~1500*			38.1	35.7	50.5	21	49	70	44.7	23.7	49.5	1 1/4	42.7	35.7	44
	2S	230~1500*			50.8	47.8	64	21	61	82	52.6	31.6	59.8	1 1/2	48.6	40	49
	2.5S	230~1500*			63.5	59.5	77.5	21	84	105	63	42	71.9	-	-	-	-
	3S	230~1500*			76.3	72.3	91	21	89	110	73.6	52.6	84.2	-	-	-	-

For shape D and E (Reducer), the ferrule is one size smaller. Ex: SNPR2S: Welded reducer is 2S (pipe) x1.5S (ferrule part). For shape B, C, D and E, the weld bead on the inner diameter is not removed. F and G Shapes are for SNPR only. The shapes D and E are not available for 1S. * For 1.4404/X2CrNiMo17-12-2, pipes up to L=1000 are available.

No.	SNPR € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+Additional Charge Depending on Shape)		Additional Charge Depending on Shape							
	€ Unit Price	L Pipe/100mm	Shape A	Shape B	Shape C	Shape D	Shape E	Shape F	Shape G	Shape H
1S										
1.5S										
2S										
2.5S										
3S										

No.	SNPSR € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+Additional Charge Depending on Shape)		Additional Charge Depending on Shape					
	€ Unit Price	L Pipe/100mm	Shape A	Shape B	Shape C	Shape D	Shape E	Shape H
8A								
10A								
15A								
1S								
1.5S								
2S								
2.5S								
3S								

Order Example

Part Number	L	Shapes (1)	Shapes (2)
SNPK1.5S	300	A	
SNPR2S	500	LA	RB

Price

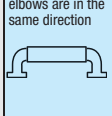
Days to Ship: 10 Days

Volume Discount (Round down to one Cent.) P87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

Not applicable to additional charge for Shape A ~ H.
For orders larger than indicated quantity, please request a quotation.

Part Number - L - Shapes (1) - Shapes (2) - (EAS)
SNPR2S - 500 - LB - RC - EAS180

Alteration	Elbow Angle
Code	EAS
Spec.	When elbow shapes (Shape B or C) are selected for both ends of the pipe, those angle can be specified. Specifies the angle of the right elbow based on the left one. (Not Specified) Both left and right elbows are in the same direction (Angle Specified) Ordering Code Select from EAS90 EAS180 EAS270  Left elbow angle as basis
Price Adder	Free of Charge

Sanitary Pipes
-Branching-

■ **Sanitary Hollows**
-Branching Tees-
-Branching One Side Welded-
-Branching Both Sides Welded-

Type			Material	Standards
Tees	One Side Welded	Both Sides Welded		
SNPFE	SNPFK	SNPFR	1.4301/ X5CrNi18-10	Pipe :(No. 8A~15A) JIS G3459 (No. 1S~3S) JIS G3447 Joint : IDF/ISO
SNPFS	SNPFSK	SNPFSR	1.4404/ X2CrNiMo17-12-2	

■ **Common Specifications (Weld beads inside excluded)**

	Surface Finish
Inner Surface	320~400 (Ra≤1.0μm)
Outer Surface	320~400 (Ra≤2.5μm)





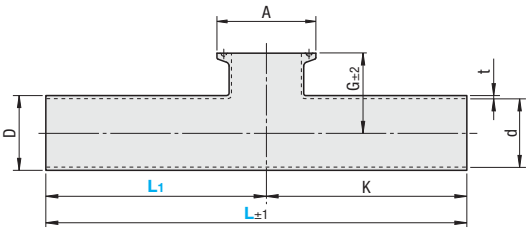




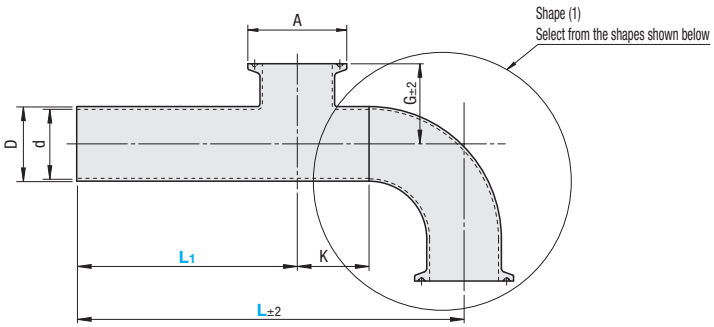


RoHS

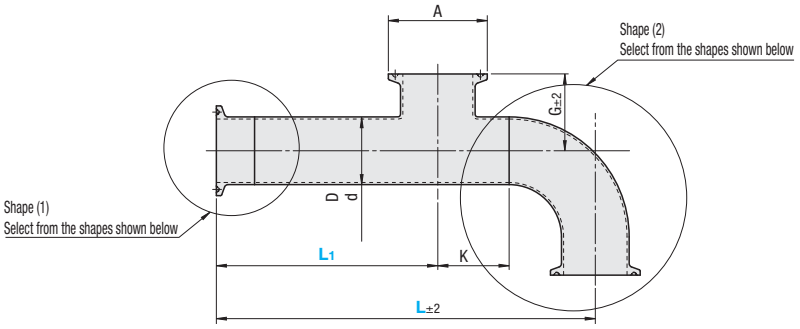
■ **Tees**

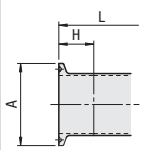
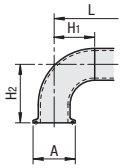
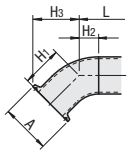
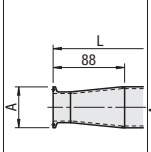
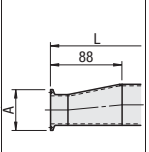
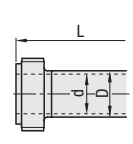
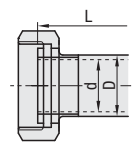
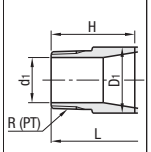


■ **One Side Welded**



■ **Both Sides Welded**



Shape A (Ferrule)	Shape B (Elbow)	Shape C (45°Elbow)	Shape D (Reducer)	Shape E (Eccentric Reducer)	Shape F (Thread Sheet)	Shape G (Liner + Hexagon Nut)	Shape H (Male Threads)
							

Tees

Part Number Type	No.	L 1mm Increment	L1 1mm Increment	D	d	t	A	G	K	SNPFE € Unit Price/mm € Unit Price	SNPFE € Unit Price/mm € Unit Price of L Pipe/100mm	SNPFS € Unit Price/mm € Unit Price	SNPFS € Unit Price/mm L Pipe/100mm
SNPFS	8A	95~1000	55~960	13.8	10.5	1.65	34	26	40				
	10A	95~1000	55~960	17.3	14		34	28	40				
	15A	95~1000	55~960	21.7	17.5	2.1	34	30	40				
SNPFE SNPFS	1S	70~1000	35~965	25.4	23	1.2	50.5	35	35				
	1.5S	100~1000	50~950	38.1	35.7		50.5	42	50				
	2S	130~1000	65~935	50.8	47.8	1.5	64	49	65				
	2.5S	170~1000	85~915	63.5	59.5	2	77.5	55	85				
	3S	180~1000	90~910	76.3	72.3		91	61.5	90				

(K) K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L-1 to ensure L-L1≥K.
<Price Calculation Example> Price=€ Unit Price+L Pipe Price. For L pipe price, charge is added for every 100mm of L dimension. 50 ~ 100 round up to 100; 101 ~ 200 round up to 200.
<Price Calculation Example> For SNPFE1S-250-150: 100,00 EUR+Hollow Price: 6,00 EURx3(250/100=2.5 Round up to 3)=100,00 EUR+18,00 EUR=118,00 EUR

One Side Welded

Part Number Type	No.	L 1mm Increment	L1 1mm Increment	Shapes(1)Symbol	D	d	A	G	K	Shape A H	Shape B H1	Shape B H2	Shape C H1	Shape C H2	Shape C H3	Shape H R (PT)	Shape H D1	Shape H d1	Shape H H
SNPFSK	8A	120~1000	80~910	A B	13.8	10.5	34	26	40	17	38	55	-	-	-	-	-	-	-
	10A	120~1000	80~910		17.3	14	34	28	40	17	38	55	-	-	-	-	-	-	-
	15A	120~1000	80~910		21.7	17.5	34	30	40	17	38	55	-	-	-	-	-	-	-
SNPFK SNPFSK	1S	110~1000	80~920	A E B F C G D H	25.4	23	50.5	35	30	21	34	55	36.8	15.8	43.9	3/4	27.2	21	39
	1.5S	190~1000	140~860		38.1	35.7	50.5	42	50	21	49	70	44.7	23.7	49.5	1 1/4	42.7	35.7	44
	2S	210~1000	150~850		50.8	47.8	64	49	60	21	61	82	52.6	31.6	59.8	1 1/2	48.6	40	49
	2.5S	260~1000	180~820		63.5	59.5	77.5	55	80	21	84	105	63	42	71.9	-	-	-	-
	3S	270~1000	180~820		76.3	72.3	91	61.5	90	21	89	110	73.6	52.6	84.2	-	-	-	-

(K) For shape D and E (Reducer), the ferrule is one size smaller. Ex: SNPFK2S: Welded reducer is 2S (pipe) x1.5S (ferrule part).
(K) For shape B, C, D and E, the weld bead on the inner diameter is not removed. (K) F and G Shapes are for SNPFK only. (K) The shapes D and E are not available for 1S.
(K) K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L1 to ensure L-L1≥K.

No.	SNPFK € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+ Additional Charge Depending on Shape) € Unit Price	L Pipe/100mm	Additional Charge Depending on Shape: Shape A	Shape B	Shape C	Shape D	Shape E	Shape F	Shape G	Shape H
1S										
1.5S										
2S										
2.5S										
3S										

No.	SNPFSK € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+Additional Charge Depending on Shape) € Unit Price	L Pipe/100mm	Additional Charge Depending on Shape: Shape A	Shape B	Shape C	Shape D	Shape E	Shape H
8A								
10A								
15A								
1S								
1.5S								
2S								
2.5S								
3S								

‹Price Calculation Example›
Price=(1) € € Unit Price (€ € Unit Price+L Hollow Price)+(2) Additional Charge Depending on Shape
For L pipe price, charge is added for every 100mm of L dimension.
50 ~100 round up to 100; 101 ~ 200 round up to 200.

‹Price Calculation Example 1›
For SNPK1S-250-150-A
€ Unit Price : 130,00 EUR
Hollow Price : 9,00 EURx3(250/100=2.5 →Round up to 3)
Additional Charge Depending on Shape: 130,00 EUR
Sum : 130,00 EUR

‹Price Calculation Example 2›
For SNPR1.5S-250-150-LA-RB
€ Unit Price : 175,00 EUR
Hollow Price : 12,50 EURx3(250/100=2.5 →Round up to 3)
Additional Charge Depending on Shape: 175,00 EUR+12,50 EUR
Sum : 175,00 EUR

Both Sides Welded

Part Number Type	No.	L 1mm Increment	L1 1mm Increment	L Shapes(1)	R Shapes(2)	D	d	A	G	K	Shape A H	Shape B H1	Shape B H2	Shape C H1	Shape C H2	Shape C H3	Shape H R (PT)	Shape H D1	Shape H d1	Shape H H
SNPFSR	8A	160~1000	90~910	LA	RA	13.8	10.5	34	26	80	17	38	55	-	-	-	-	-	-	-
	10A	160~1000	90~910	LB	RB	17.3	14	34	28	80	17	38	55	-	-	-	-	-	-	-
	15A	160~1000	90~910			21.7	17.5	34	30	80	17	38	55	-	-	-	-	-	-	-
SNPFR SNPFSR	1S	150~1000	80~920			25.4	23	50.5	35	70	21	34	55	36.8	15.8	43.9	3/4	27.2	21	39
	1.5S	280~1000	140~860	LA LE LB LF LC LG LD LH	RA RE RB RF RC RG RD RH	38.1	35.7	50.5	42	140	21	49	70	44.7	23.7	49.5	1 1/4	42.7	35.7	44
	2S	300~1000	150~850			50.8	47.8	64	49	150	21	61	82	52.6	31.6	59.8	1 1/2	48.6	40	49
	2.5S	350~1000	180~820			63.5	59.5	77.5	55	170	21	84	105	63	42	71.9	-	-	-	-
	3S	360~1000	180~820			76.3	72.3	91	61.5	180	21	89	110	73.6	52.6	84.2	-	-	-	-

(K) For shape D and E (Reducer), the ferrule is one size smaller. Ex: SNPFR2S: Welded reducer is 2S (pipe) x1.5S (ferrule part).
(K) For shape B, C, D and E, the weld bead on the inner diameter is not removed. (K) Shapes F and G are for SNPFR only. (K) The shapes D and E are not available for 1S.
(K) K indicates the machining limits. The position of branching ferrule is at L1. Specify L-L-1 to ensure L-L1≥K.

No.	SNPFR € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+Additional Charge Depending on Shape) € Unit Price	L Pipe/100mm	Additional Charge Depending on Shape: Shape A	Shape B	Shape C	Shape D	Shape E	Shape F	Shape G	Shape H
1S										
1.5S										
2S										
2.5S										
3S										

No.	SNPFSR € Unit Price: € Unit Price/mm (Pipe € Unit Price Body+Additional Charge Depending on Shape) € Unit Price	L Pipe/100mm	Additional Charge Depending on Shape: Shape A	Shape B	Shape C	Shape D	Shape E	Shape H
8A								
10A								
15A								
1S								
1.5S								
2S								
2.5S								
3S								

Order Example
Part Number - L - L1 - Shapes (1) - Shapes (2)
SNPFS2S - 300 - 150
SNPFR1.5S - 1000 - 300 - LA - RB

Days to Ship: 13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

⊗ Not applicable to additional charge for shape A ~ H.

(K) For orders larger than indicated quantity, please request a quotation.

Part Number - L - L1 - Shapes (1) - Shapes (2) - (EAS)
SNPFR2S - 500 - 300 - LB - RC - EAS180

Alteration Code	Elbow Angle: EAS
Spec.	When elbow shapes (shape B or C) are selected for both ends of the pipe, those angle can be specified. When shape B or C is selected, those angle can be specified. Specifies the angle of the right elbow based on the left one. (Not Specified) Both left and right elbows are in the same direction. (Angle Specified) Ordering Code: Select from EAS90, EAS180, EAS270. Left elbow angle as basis.
Price Adder	Free of Charge

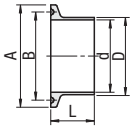
Sanitary Pipe Fittings
-Ferrule x Welded-

Price Reduction up to 41%

CAD Data

■Ferrule

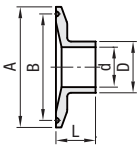
Type	Material
SNFR	1.4301/X5CrNi18-10
SNFRS	1.4404/X2CrNiMo17-12-2



Part Number Type	No.	D	d	A	B	L	SNFR € Unit Price Qty. 1~9	SNFR Volume Discount Qty. 10~	SNFRS € Unit Price Qty. 1~9	SNFRS Volume Discount Qty. 10~
SNFRS	8A	13.8	10.5	34.0	27.5	17.0				
	10A	17.3	14.0							
	15A	21.7	17.5							
SNFR SNFRS	1S	25.4	23.0	50.5	43.5	21.0				
	1.5S	38.1	35.7	50.5	43.5					
	2S	50.8	47.8	64.0	56.5					
	2.5S	63.5	59.5	77.5	70.5					
	3S	76.3	72.3	91.0	83.5					

■Unequal Dia. Ferrule

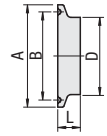
Type	Material
SNFRE	1.4301/X5CrNi18-10



Part Number Type	No.	Nominal	D	d	A	B	L	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SNFRE	1S	8A	13.8	10.5	50.5	43.5	21.0		
		10A	17.3	11.3					
		15A	21.7	15.7					
	1.5S	10A	17.3	11.3	50.5	43.5			
		15A	21.7	15.7					
		20A	27.2	21.2					
	2S	15A	21.7	15.7	64.0	56.5			
		20A	27.2	21.2					
		25A	34.0	28.4					
	2.5S	20A	27.2	21.2	77.5	70.5			
		25A	34.0	28.4					
		32A	42.7	37.1					
	3S	25A	34.0	28.4	91.0	83.5			
		32A	42.7	37.1					
		40A	48.6	43.0					

■Ferrule Cap

Type	Material
SNFK	1.4301/X5CrNi18-10

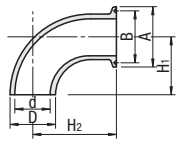


Part Number Type	No.	D	A	B	L	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SNFK	1S	38.1	50.5	43.5	11.0		
	1.5S						
	2S	50.8	64.0	56.5			
	2.5S	63.5	77.5	70.5			
	3S	76.3	91.0	83.5			

SNFK1S and 1.5S are same shape.

■Ferrule x Welded Elbow

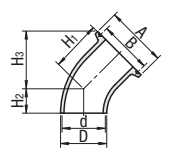
Type	Material
SNFE	1.4301/X5CrNi18-10
SNFES	1.4404/X2CrNiMo17-12-2



Part Number Type	No.	D	d	A	B	H1	H2	SNFE € Unit Price Qty. 1~9	SNFE Volume Discount Qty. 10~19	SNFES € Unit Price Qty. 1~9	SNFES Volume Discount Qty. 10~19
SNFE SNFES	1S	25.4	23	50.5	43.5	34	55				
	1.5S	38.1	35.7	50.5	43.5	49	70				
	2S	50.8	47.8	64.0	56.5	61	82				
	2.5S	63.5	59.5	77.5	70.5	84	105				
	3S	76.3	72.3	91.0	83.5	89	110				

■Ferrule x Welded 45° Elbow

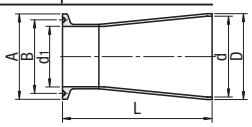
Type	Material
SNFHE	1.4301/X5CrNi18-10
SNFHES	1.4404/X2CrNiMo17-12-2



Part Number Type	No.	D	d	A	B	H1	H2	H3	SNFHE € Unit Price Qty. 1~9	SNFHE Volume Discount Qty. 10~19	SNFHES € Unit Price Qty. 1~9	SNFHES Volume Discount Qty. 10~19
SNFHE SNFHES	1S	25.4	23	50.5	43.4	36.8	15.8	43.9				
	1.5S	38.1	35.7	50.5	43.4	44.7	23.7	49.5				
	2S	50.8	47.8	64.0	56.4	52.6	31.6	59.8				
	2.5S	63.5	59.5	77.5	70.4	63.0	42.0	71.9				
	3S	76.3	72.3	91.0	83.4	73.6	52.6	84.2				

■Ferrule x Welded Reducer

Type	Material
SNFRD	1.4301/X5CrNi18-10
SNFRDS	1.4404/X2CrNiMo17-12-2

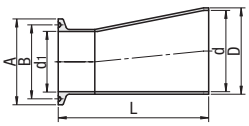


Part Number Type	No.	D	d	d1	A	B	L	SNFRD € Unit Price Qty. 1~9	SNFRD Volume Discount Qty. 10~19	SNFRDS € Unit Price Qty. 1~9	SNFRDS Volume Discount Qty. 10~19
SNFRD SNFRDS	1.5S	38.1	35.7	23	50.5	43.4	88				
	2S	50.8	47.8	35.7	50.5	43.4					
	2.5S	63.5	59.5	47.8	64.0	56.4					
	3S	76.3	72.3	59.5	77.5	70.4					

The ferrule is one size smaller. Ex.: For No.2S, 2S (pipe)x1.5S(ferrule part)

■Ferrule x Welded Eccentric Reducer

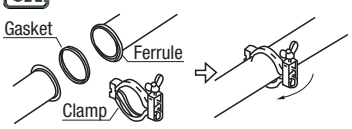
Type	Material
SNFRY	1.4301/X5CrNi18-10
SNFRYS	1.4404/X2CrNiMo17-12-2



Part Number Type	No.	D	d	d1	A	B	L	SNFRY € Unit Price Qty. 1~9	SNFRY Volume Discount Qty. 10~19	SNFRYS € Unit Price Qty. 1~9	SNFRYS Volume Discount Qty. 10~19
SNFRY SNFRYS	1.5S	38.1	35.7	23	50.5	43.4	88				
	2S	50.8	47.8	35.7	50.5	43.4					
	2.5S	63.5	59.5	47.8	64.0	56.4					
	3S	76.3	72.3	59.5	77.5	70.4					

The ferrule is one size smaller.
Ex.: For No.2S, 2S (pipe)x1.5S(ferrule part)

Example



Order Example: Part Number [SNFR2S / SNFRE3S] - Nominal [32A]

Days to Ship: -SNFR · SNFRS · SNFK 6 Days P87 - Others 8 Days

For orders larger than indicated quantity, please request a quotation.

Sanitary Pipe Fittings
-Double Ferrules / Clamp / Gasket-

Price Reduction up to 60%

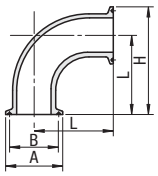
CAD Data

■Double Ferrules Elbow



RoHS

Type	Material
SNBE	1.4301/X5CrNi18-10
SNBES	1.4404/X2CrNiMo17-12-2



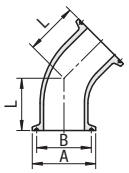
Part Number Type	No.	A	B	L	H	SNBE € Unit Price Qty. 1~9	SNBE Volume Discount Qty. 10~19	SNBES € Unit Price Qty. 1~9	SNBES Volume Discount Qty. 10~19
SNBES	8A	34.0	27.5	55	72				
	10A								
	15A								
SNBE SNBES	1S	50.5	43.5	55	80.3				
	1.5S	50.5	43.5	70	95.3				
	2S	64.0	56.5	82	114				
	2.5S	77.5	70.5	105	143.8				
	3S	91.0	83.5	110	155.5				

■Double Ferrules 45° Elbow



RoHS

Type	Material
SNBHE	1.4301/X5CrNi18-10
SNBHES	1.4404/X2CrNiMo17-12-2



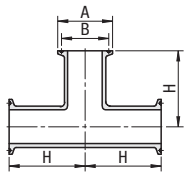
Part Number Type	No.	A	B	L	SNBHE € Unit Price Qty. 1~9	SNBHE Volume Discount Qty. 10~19	SNBHES € Unit Price Qty. 1~9	SNBHES Volume Discount Qty. 10~19
SNBHE SNBHES	1S	50.5	43.4	36.8				
	1.5S	50.5	43.4	44.7				
	2S	64.0	56.4	52.6				
	2.5S	77.5	70.4	63.0				
	3S	91.0	83.4	73.6				

■Double Ferrules Tees



RoHS

Type	Material
SNBT	1.4301/X5CrNi18-10
SNBTS	1.4404/X2CrNiMo17-12-2



Part Number Type	No.	A	B	H	SNBT € Unit Price Qty. 1~9	SNBT Volume Discount Qty. 10~19	SNBTS € Unit Price Qty. 1~9	SNBTS Volume Discount Qty. 10~19
SNBTS	8A	34.0	27.5	55				
	10A							
	15A							
SNBT	1S	50.5	43.5	55				
	1.5S	50.5	43.5	70				
	2S	64.0	56.5	82				
	2.5S	77.5	70.5	105				
	3S	91.0	83.5	110				

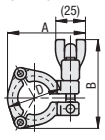
■Clamp -Low Pressure Use-



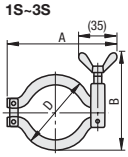
RoHS

Type	Material	Recommended Operating Pressure
SNCP	8A~15A 1.4308 1S~3S 1.4301	8A~2S:0~0.3MPa 2.5S or 3S:0~0.2MPa

8A~15A



1S~3S



Part Number Type	No.	D	A	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SNCP	8A	45	65	74		
	10A					
	15A					
	1S	60	94	90		
	1.5S	60	94	90		
	2S	75	110	103		
	2.5S	90	130	108		
	3S	104	144	114		

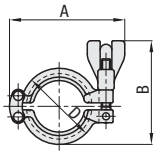
※As the ferrule shape for No.8A~15A and 1S and 1.5S are identical, the shapes for SNCP8A~15A and SNCP1S are identical.

■Clamp -Medium, High Voltage Use-



RoHS

Type	Material	Recommended Operating Pressure
SNCPH	1.4308/ G-X6CrNi18-9	1S~2S:0~1MPa 2.5S~3S: 0~0.8MPa



Part Number Type	No.	D	A	B	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SNCPH	1S	65	97	88		
	1.5S					
	2S	79	109	96		
	2.5S	94	128	104		
	3S	107	143	110		

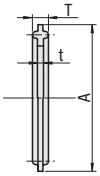
※The shapes for SNCPH1S and 1.5S are identical.

■Gasket



RoHS

Type	Material
SNGS	Silicon
SNGSF	PTFE



Part Number Type	No.	A	t	t	SNGS € Unit Price Qty.1-19	SNGS Volume Discount Qty. 20 ~	SNGSF € Unit Price Qty.1-19	SNGSF Volume Discount Qty. 20 ~
SNGSF	8A	34.0	4.9	1.7				
	10A							
	15A							
SNGS SNGSF	1S	50.5	5.5 (5.0)	2 (1.8)				
	1.5S							
	2S	64.0						
	2.5S	77.5						
	3S	91.0						

※Dimensions in ( ) are for SNGSF.

Order Example — Part Number: SNCP2S

Days to Ship — -SNCP · SNCPH · SNGS · SNGSF: 6 Days P.87 — - Others: 8 Days

※For orders larger than indicated quantity, please request a quotation.

NEW

Sanitary Pipe Fittings

-Double Weld / Welded Thread / L-shaped Gasket-

Price Reduction up to 41%

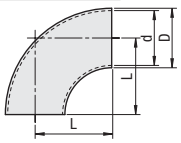
CAD Data

■Double Weld Elbow



RoHS

Type	Material
SNWE	1.4301/C5CrNi18-10
SNWES	1.4404/X2CrNiMo17-12-2



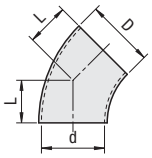
Part Number Type	No.	D	d	L	SNWE € Unit Price Qty. 1~9	SNWE Volume Discount Qty. 10~19	SNWES € Unit Price Qty. 1~9	SNWES Volume Discount Qty. 10~19
SNWES	8A	13.8	10.5	38				
SNWES	10A	17.3	14.0					
SNWES	15A	21.7	17.5					
SNWE SNWES	1S	25.4	23	34				
SNWE SNWES	1.5S	38.1	35.7	49				
SNWE SNWES	2S	50.8	47.8	61				
SNWE SNWES	2.5S	63.5	59.5	84				
SNWE SNWES	3S	76.3	72.3	89				

■Double Weld 45° Elbow



RoHS

Type	Material
SNWHE	1.4301/C5CrNi18-10
SNWHES	1.4404/X2CrNiMo17-12-2



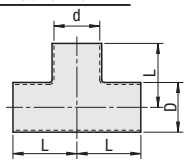
Part Number Type	No.	D	d	L	SNWHE € Unit Price Qty. 1~9	SNWHE Vol. Qty. 10~19	SNWHES € Unit Price Qty. 1~9	SNWHES Vol. Qty. 10~19
SNWHE SNWHES	1S	25.4	23	15.8				
SNWHE SNWHES	1.5S	38.1	35.7	23.7				
SNWHE SNWHES	2S	50.8	47.8	31.6				
SNWHE SNWHES	2.5S	63.5	59.5	42				
SNWHE SNWHES	3S	76.3	72.3	52.6				

■Double Weld Tees



RoHS

Type	Material
SNWT	1.4301/C5CrNi18-10
SNWTS	1.4404/X2CrNiMo17-12-2



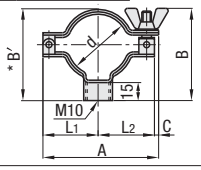
Part Number Type	No.	D	d	L	SNWT € Unit Price Qty. 1~9	SNWT Volume Discount Qty. 10~19	SNWTS € Unit Price Qty. 1~9	SNWTS Volume Discount Qty. 10~19
SNWT SNWTS	1S	25.4	23.0	34.0				
SNWT SNWTS	1.5S	38.1	35.7	49.0				
SNWT SNWTS	2S	50.8	47.8	61.0				
SNWT SNWTS	2.5S	63.5	59.5	84.0				
SNWT SNWTS	3S	76.3	72.3	89.0				

■Hollow Hangers



RoHS

Type	Material
SNZP	1.4301/C5CrNi18-10



Part Number Type	No.	d	A	B	L_1	L_2	C	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SNZP	1S	25.5	60	56	28	30	2		
SNZP	1.5S	38.0	81.5	63	39	37.5	5		
SNZP	2S	50.8	96.5	76	46	47	3.5		
SNZP	2.5S	63.5	111.5	*86	53.5	54.5	3.5		
SNZP	3S	76.2	122	*98	58	61	3		

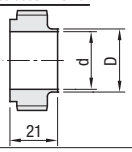
Dimensions marked with * are B' Dimension. All widths marked with * are 28.

■Welding Male Thread Seat



RoHS

Type	Material
SNYNS	1.4301/C5CrNi18-10



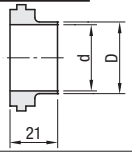
Part Number Type	No.	D	d	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SNYNS	1S	25.4	23.0		
SNYNS	1.5S	38.1	35.7		
SNYNS	2S	50.8	47.8		
SNYNS	2.5S	63.5	59.5		
SNYNS	3S	76.3	72.3		

■Welding Liner



RoHS

Type	Material
SNYRN	1.4301/C5CrNi18-10



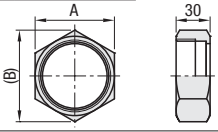
Part Number Type	No.	D	d	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SNYRN	1S	25.4	23.0		
SNYRN	1.5S	38.1	35.7		
SNYRN	2S	50.8	47.8		
SNYRN	2.5S	63.5	59.5		
SNYRN	3S	76.3	72.3		

■Hexagon Socket Head Cap Screw



RoHS

Type	Material
SNRN	1.4301/C5CrNi18-10



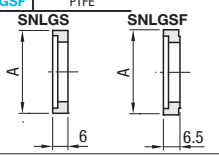
Part Number Type	No.	A	(B)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SNRN	1S	46	53.1		
SNRN	1.5S	56	64.6		
SNRN	2S	71	81.9		
SNRN	2.5S	85	98.1		
SNRN	3S	100	115.4		

■L-shaped Gasket



RoHS

Type	Material
SNLGS	Silicon
SNLGSF	PTFE



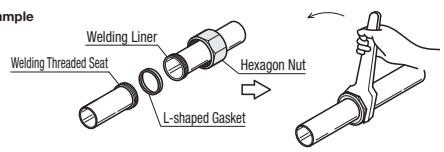
Part Number Type	No.	A SNLGS	A SNLGSF	SNLGS € Unit Price Qty.1-19	SNLGS Volume Discount Qty 20~49	SNLGSF € Unit Price Qty.1-19	SNLGSF Volume Discount Qty 20~49
SNLGS SNLGSF	1S	32.5	33.4				
SNLGS SNLGSF	1.5S	46	46.8				
SNLGS SNLGSF	2S	59.5	60.5				
SNLGS SNLGSF	2.5S	73.2	74.0				
SNLGS SNLGSF	3S	86.5	87.0				

Order Example: Part Number SNZP1.5S SNYNS1S

Days to Ship: -SNZP 6 Days P.87 - Others 8 Days

For orders larger than indicated quantity, please request a quotation.

Example



Sanitary Adapter Fittings

NEW

Reduced Delivery Time

Price Reduction up to 35%

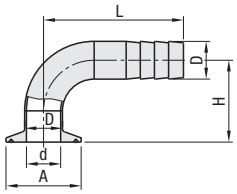
CAD Data

■Sanitary Adapter Fittings -Elbow Hose-



RoHS

Type	Material
SNZEH	1.4301/C5CrNi18-10



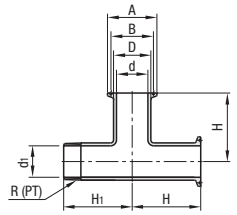
Part Number Type	No.	D	d	A	L	H	€ Unit Price 1~4pieces	Volume Discount 5~9pieces
SNZEH	1S	25.4	23	50.5	94	55		
	1.5S	38.1	35.7	50.5	129	70		
	2S	50.8	47.8	64	141	82		
	2.5S	63.5	59.5	77.5	164	105		
	3S	76.3	72.3	91	169	110		

■Sanitary Adapter Fittings -T-shaped Branching-



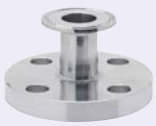
RoHS

Type	Material
SNZt	1.4301/C5CrNi18-10



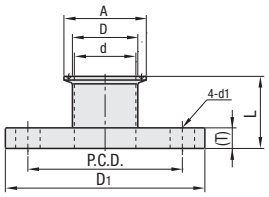
Part Number Type	No.	Nominal	R (PT)	A	B	D	d	d1	H	H1	€ Unit Price 1~4pieces	Volume Discount 5~9pieces
SNZt	1S	4	1/2	50.5	43.5	25.4	23	15.7	55	73		
		6	3/4					21				
		8	1					26				
	1.5S	8	1			38.1	35.7	26	70	88		
		10	11/4					35.7		93		
	2S	12	11/2	64	56.5	50.8	47.8	40	82	110		
		16	2					51				

■Sanitary Adapter Fittings -Flanged-



RoHS

Type	Material
SNZFR	1.4301/C5CrNi18-10 * Flange: 10K



Part Number Type	No.	Nominal	D	D1	d	d1	A	L	(t)	P.C.D.	€ Unit Price 1~4pieces	Volume Discount 5~9pieces
SNZFR	1S	20A	25.4	100	23	15	50.5	54	14	75		
		25A		125						90		
	1.5S	32A	38.1	135	35.7	19	50.5	56	16	100		
		40A		140						105		
	2S	40A	50.8	140	47.8		64			105		
		50A		155						120		
	2.5S	50A	63.5	155	59.5		77.5			120		
		65A		175				58	18	140		

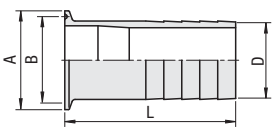
Weld beads are removed and polished on inner surface only.

■Sanitary Adapter Fittings -Hose-



RoHS

Type	Material
SNHAD	1.4301/C5CrNi18-10
SNHADS	1.4404/X2CrNiMo17-12-2



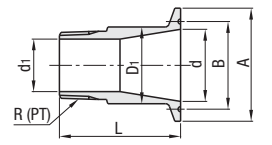
Part Number Type	No.	A	B	L	D	SNHAD € Unit Price Qty. 1~9	SNHAD Volume Discount Qty. 10~19	SNHADS € Unit Price Qty. 1~9	SNHADS Volume Discount Qty. 10~19
SNHAD SNHADS	1S	50.5	43.5	80	25.4				
	1.5S	50.5	43.5	100	38.1				
	2S	64.0	56.5	100	50.8				
	2.5S	77.5	70.5	100	63.5				
	3S	91.0	83.5	100	76.3				

■Sanitary Adapter Fittings -Male Thread-



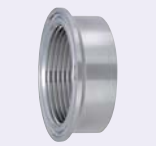
RoHS

Type	Material
SNZFA	1.4301/C5CrNi18-10



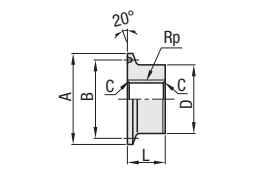
Part Number Type	No.	Nominal	R (PT)	A	B	d	d1	L	D1	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
SNZFA	1S	4	1/2	50.5	43.5	23.0	15.7	60	21.7		
		6	3/4				21.0	60	27.2		
		8	1				26.0	60	34.0		
	1.5S	8	1			35.7	26.0	60	34.0		
		10	11/4				35.7	65	42.7		
		12	11/2				40.0	65	48.6		
	2S	12	11/2	64.0	56.5	47.8	40.0	70	50.8		
		16	2				51.0	70	60.5		

■Sanitary Adapter Fittings -Female Thread-



RoHS

Type	Material
SNZFS	1.4301/C5CrNi18-10



Part Number Type	No.	Nominal	Rp	A	B	D	L	C	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~19
SNZFS	1.5S	2	1/4	50.5	43.5	38.1	21	0.9		
		3	3/8					1.2		
		4	1/2					1.2		
	2S	3	3/8	64.0	56.5	50.8	21	1.2		
		4	1/2					1.2		
		6	3/4					1.2		
	2.5S	4	1/2	77.5	70.5	63.5	21	1.2		
		6	3/4					1.2		
		8	1					1.5		
	3S	6	3/4	91.0	83.5	76.3	21	1.2		
		8	1					1.5		
		10	11/4					1.5		

Order Example

Part Number	-	Nominal
SNZT2S	-	12
SNZFA1S	-	4

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- SNHAD(1S ~ 2S) · SNZFA(1 · 1.5S): 6 Days P87
- SNZEH · SNZT · SNZFR: 10 Days
- SNHAD(2.5S, 3S) · SNHADS · SNZFA(2S) · SNZFS: 8 Days

Sanitary Pipe Fittings

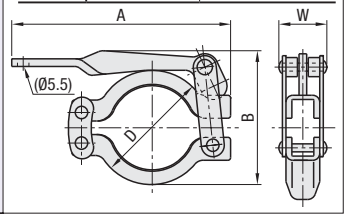
-One-touch Clamp / Gasket for Mounting Accessories-

CAD Data

■One-touch Clamp

Type	Material	Recommended Operating Pressure
SNCPW	1.4301/C5CrNi18-10	0~1MPa





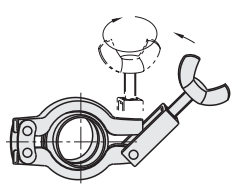
RoHS

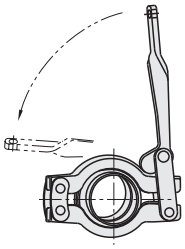
Part Number		D	A	B	W	€ Unit Price	Volume Discount
Type	No.					Qty. 1~9	10 ~ 20 PCS.
SNCPW	1S	60	114	70	25		
	1.5S						
	2S	75	124	88	25		

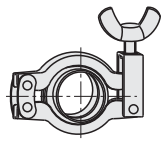
※SNCPW1S and 1.5S are same shape.

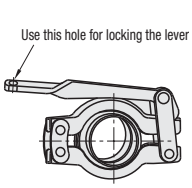
※For orders larger than indicated quantity, please request a quotation.

-Conventional Product (SNCP) -New Product (SNCPW)









■Features

-Reduces time for attaching or detaching the clamps, and improves operating efficiency.
-Suitable for test equipment which requires many attachment and detachment. Lever provides fixed tightening torque to enable secure tightening without damaging the gaskets.
-Lack of cross-threading results in more durability compared to screw fastening type.
-Lack of friction at the thread has results in less metal power and excellent hygiene.

■Allowable Pressure Range: 1MPa or lower

■Results of Pressure Test (Conditions of Pressure Resistance: Water Pressure, Ambient Temperature)

-1.5MPax30 minutes: No Leakage
-After 300 times of open/shut cycles, 1.5MPax30 minutes: No Leakage

Caution

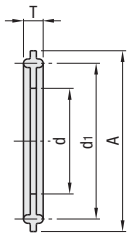
Excessive pressure at lever may cause band to come off, as there is no locking mechanism.
To prevent the malfunction of the band, locking of lever using a hole at lever is recommended.

■Gasket for Mounting Accessories

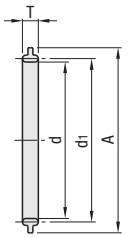
Type	Material
SNGGS	Silicon
SNGGF	PTFE



1S



1.5S, 2S

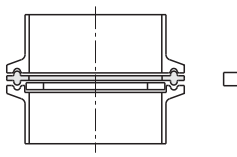


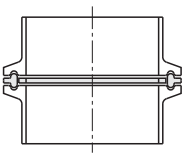
RoHS

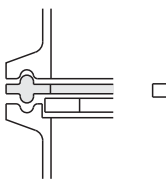
Part Number		A	T	d	d1	SNGGS		SNGGF	
Type	No.					€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
						1 ~ 10 PCS.	11 ~ 19 PCS.	1 ~ 10 PCS.	11 ~ 19 PCS.
SNGGS SNGGF	1S	50.5	5.5 (5)	30 (29.5)	43.5				
	1.5S			41 (40.5)					
	2S	64		54 (53.5)	56.5				

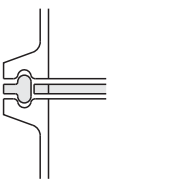
※Dimensions in ( ) are for SNGGF.

-Conventional Product -New Product









Need to treat ferrule No need to treat ferrule

■Features

-Plumbing without adding the ferrule is possible.
-Attachable to existing plumbing.

Caution

Fluid may come as it is sealed with metal.
Be sure not to use at large flow area as it may cause damage on gasket.

Order Example

Part Number
SNCPW2S
SNGGF1.5S

Days to Ship 6 Days

P.87

Sanitary Pipe Fittings · Arm Lock Coupling
-Cover Cap-

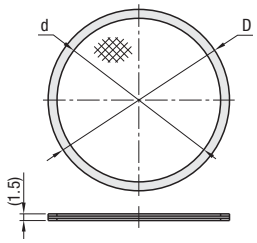
CAD Data

■Cover Cap



RoHS

Type	Material
SNGCN	1.4404/X2CrNiMo17-12-2



Part Number Type	Part Number No.	Mesh Roughness	D	d	€ Unit Price 1 ~ 5 PCS.	Volume Discount 6 ~ 10 PCS.
SNGCN	1S	40•100•200	29	23		
	1.5S		40	35.7		
	2S		53	47.8		

※As the mesh number is larger, mesh becomes finer.

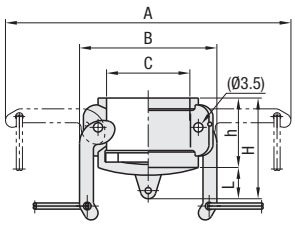
※For orders larger than indicated quantity, please request a quotation.

■Arm Lock Coupling -Dust Cap-



RoHS

Type	Material		
	Body	Cam	Ring
SNADC	1.4408/ GX5CrNiMo19-12-5	Austenitic Stainless Steel Sintered	1.4301/ C5CrNi18-10



Part Number Type	Part Number No.	A	B	C	H	h	L	€ Unit Price Qty.1-19	Volume Discount 20 ~ 30 PCS.
SNADC	20A	110	52	32	45	33	12		
	25A	125	60	37	52	40	12		
	40A	188	87	54	63	48	15		
	50A	197	97	63	66	54	12		

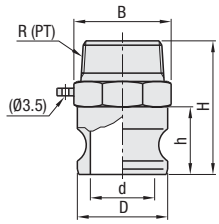
※For orders larger than indicated quantity, please request a quotation.

■Arm Lock Coupling -Male Thread Adapter-



RoHS

Type	Material
SNAMA	1.4408/GX5CrNiMo19-12-5



Part Number Type	Part Number No.	R (PT)	D	d	H	h	B	€ Unit Price Qty.1-19	Volume Discount 20 ~ 30 PCS.
SNAMA	20A	3/4	32	19	58	26	33		
	25A	1	37	24	69	32	41		
	40A	11/2	53	36	79	40	57		
	50A	2	63	46	86	42	68		

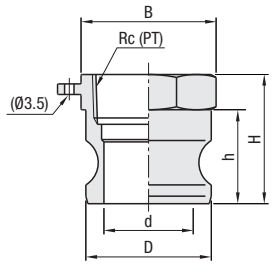
※For orders larger than indicated quantity, please request a quotation.

■Arm Lock Coupling -Female Thread Adapter-



RoHS

Type	Material
SNAFA	1.4408/GX5CrNiMo19-12-5



Part Number Type	Part Number No.	Rc (PT)	D	d	H	h	B	€ Unit Price Qty.1-19	Volume Discount 20 ~ 30 PCS.
SNAFA	20A	3/4	32	19	40	26	33		
	25A	1	37	24	47	32	41		
	40A	11/2	53	36	55	40	57		
	50A	2	63	46	62	48	68		

※For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	Mesh Roughness
SNGCN1S	-	100
SNADC20A		

Days to Ship

-SNGCN: 6 Days P.87

-SNADC · SNAMA · SNAFA: 8 Days

Sanitary Butterfly Valves / Flange Ball Valves

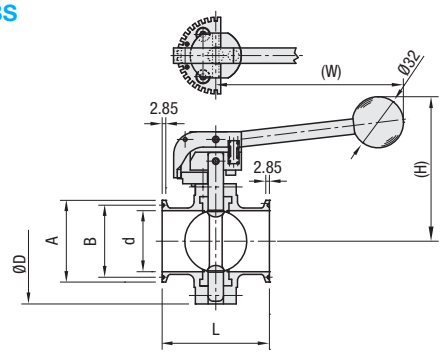
CAD Data

Butterfly Valve

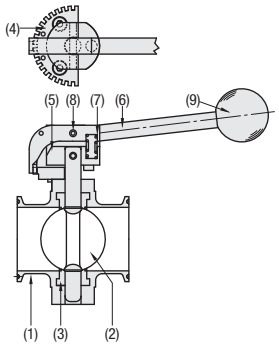
RoHS



BFBS



Parts View



Part Number		d	A	B	D	L	(H)	(W)	€ Unit Price	Vol. Discount
Type	No.								1 pc.	Qty.1-5
BFBS	1S	23.0	50.5	43.5	74	84	92	142		
	1.5S	35.7	50.5	43.5	87	84	99	142		
	2S	47.8	64.0	56.5	98	84	105	142		
	2.5S	59.5	77.5	70.5	112	100	112	142		
	3S	72.3	91.0	83.5	128	100	126	189		

For orders larger than indicated quantity, please request a quotation.

Parts and Materials

Part No.	Name of Parts	Material
(1)	Body	Stainless Steel 316L
(2)	Valve Body	Stainless Steel 316L
(3)	Seat Ring	Silicon Rubber
(4)	Notch Plate	1.4308/G-X6CrNi18-9
(5)	Handle Bracket	1.4308/G-X6CrNi18-9
(6)	Handles	1.4308/G-X6CrNi18-9
(7)	Spring	1.4301/X5CrNi18-10
(8)	Spring Pins	1.4301/X5CrNi18-10
(9)	Handle Grip	Plastic

Specifications

Applicable Fluid	Water, Air, Oil, Gas
Max. Operating Temp.	120°C
Max. Operating Pressure	1S~2S 0.98MPa 2.5, 3S 0.78MPa

Features

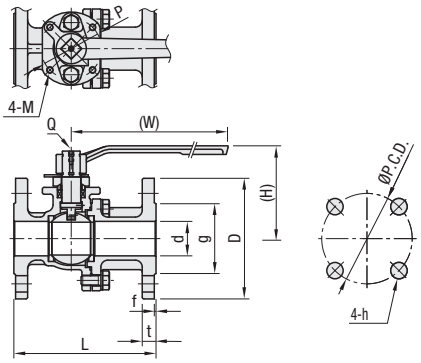
- The full-port design minimizes liquid slug.
- The degree of opening can be fixed at a position specifiable in 10° increment.
- The surface pressure being constant maintains air tightness and enables small torque operation.

Flange Ball Valve

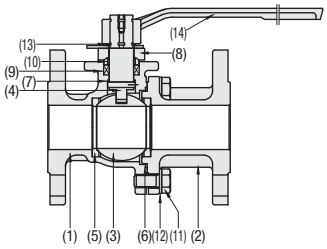
RoHS



BFRBG



Parts View



Part Number		d	D	P.C.D.	g	t	f	h	L	(W)	(H)	Q	P	M	€ Unit Price	Vol. Disc.
Type	No.														1 pc.	Qty.1-5
BFRBG	15A	15	95	70	51	12	1	15	108	145	85	M4	42	M5		
	20A	20	100	75	56	14	1	15	117	145	92	M4	42	M5		
	25A	25	125	90	67	14	1	19	127	165	90	M5	50	M6		
	32A	32	135	100	76	16	2	19	140	165	97	M5	50	M6		
	40A	38	140	105	81	16	2	19	165	230	108	M5	70	M8		
	50A	50	155	120	96	16	2	19	178	230	116	M5	70	M8		

For orders larger than indicated quantity, please request a quotation.

Parts and Materials

Part No.	Name of Parts	Material
(1)	Body	1.4308/G-X6CrNi18-9
(2)	Cap	1.4308/G-X6CrNi18-9
(3)	Ball	1.4308/G-X6CrNi18-9
(4)	Stem	1.4301/X5CrNi18-10
(5)	Ball Sheet	Fluorine Resin
(6)	Gasket	Fluorine Resin
(7)	Thrust Washer	Fluorine Resin
(8)	Gland Nut	1.4308/G-X6CrNi18-9
(9)	Gland Nut Gasket	Fluorine Resin
(10)	Stem Sleeve	Fluorine Resin
(11)	Hexagon Bolt	1.4301/X5CrNi18-10
(12)	Spring Washer	1.4301/X5CrNi18-10
(13)	Retaining Ring	1.4301/X5CrNi18-10
(14)	Handles	EN-JS 1030/EN-GJS 400-15

Specifications

Applicable Fluid	Water, Air, Oil, Gas
Max. Operating Temp.	200°C
Max. Operating Pressure	1.4MPa

Features

- The full-port design reduces pressure loss.
- Lost wax precision casting product.
- Key position can be locket at "Full-Open" and "Full-Close" positions.
- Equipped with anti-static function.
- Tap on upper stem and fix by flat washer and bolts prevent fallout of grip.

Order Example

Part Number
BFBS1S
BFRBG15A

Days to Ship **8 Days**

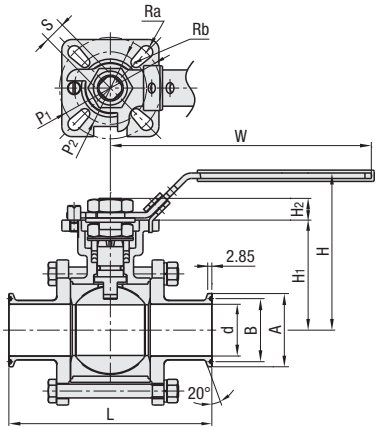
Sanitary Ball Valves
-Standard · Small Diameter-

CAD Data

Ball Valves -Standard- RoHS

SNBS

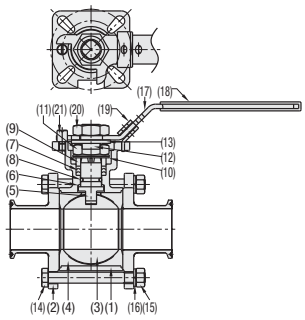




Part No. Type	No.	d	A	B	L	H	H_1	H_2	W	S	P_1	P_2	Ra	Rb	€ Unit Price 1piece	Vol. Discount 2~5 PCS.
SNBS	1S	23	50.5	43.5	114	87.5	56	11	150	11	50	42	R3.5	R3		
	1.5S	35.7	50.5	43.5	140	108.5	76	15	180	14	70	50	R4.5	R3.5		
	2S	47.8	64	56.5	156	115.5	83	15	180	14	70	50	R4.5	R3.5		

For orders larger than indicated quantity, please request a quotation.

Parts View



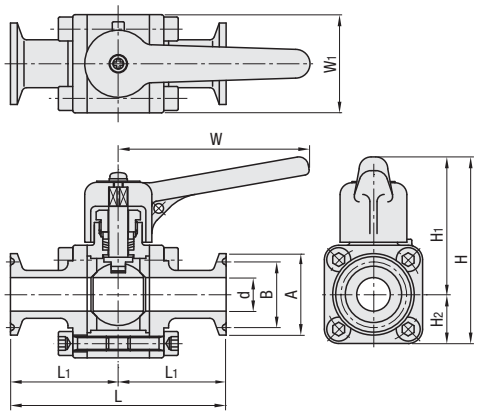
Parts and Materials

P. No.	Name of Parts	Material
(1)	Body	1.4408/GX5CrNiMo19-12-5
(2)	End Cap	1.4408/GX5CrNiMo19-12-5
(3)	Ball	1.4408/GX5CrNiMo19-12-5
(4)	Ball Sheet	Fluorine Resin
(5)	Stem	1.4401/X5CrNiMo17-12-2
(6)	Thrust Washer	Fluorine Resin
(7)	Gland Nut Gasket	Fluorine Resin
(8)	O-Ring	EPDM
(9)	Gland Nut	1.4301/X5CrNi18-10
(10)	Conical Spring Washer	1.4301/X5CrNi18-10
(11)	Gland Nut	1.4301/X5CrNi18-10
(12)	Detent	1.4301/X5CrNi18-10
(13)	Washer	1.4301/X5CrNi18-10
(14)	Hexagon Bolt	1.4301/X5CrNi18-10
(15)	Nuts	1.4301/X5CrNi18-10
(16)	Spring Washer	1.4301/X5CrNi18-10
(17)	Handles	1.4301/X5CrNi18-10
(18)	Handle Cover	Plastic
(19)	Locking Plate	1.4301/X5CrNi18-10
(20)	Stem Nut	1.4301/X5CrNi18-10
(21)	Stop Pin	1.4301/X5CrNi18-10

Ball Valves -Small Diameter- RoHS

SNBSS

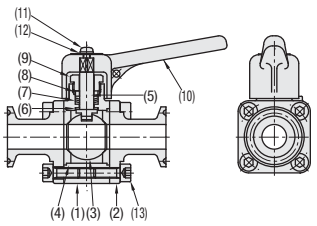




Part Number Type	No.	d	A	B	L	L_1	H	H_1	H_2	W	W_1	€ Unit Price 1piece	Volume Discount 2~5 PCS.
SNBSS	8A	10.5	34	27.5	90	45	78	57	21	80	41		
	10A	14	34	27.5	90	45	78	57	21	80	41		
	15A	17.5	34	27.5	90	45	83	60	23	80	46		

For orders larger than indicated quantity, please request a quotation.

Parts View



Parts and Materials

Part No.	Name of Parts	Material
(1)	Body	1.4435/G-X2CrNiMo18
(2)	Cap	1.4435/G-X2CrNiMo18
(3)	Ball	1.4404/X2CrNiMo 17-12-2 or US316L
(4)	Ball Seat	Fluorine Resin
(5)	Stem	1.4404/ X2CrNiMo17-12-2
(6)	Thrust Washer	Fluorine Resin
(7)	Gland Nut Gasket	Fluorine Resin
(8)	Gland Ring	1.4404/ X2CrNiMo17-12-2
(9)	Gland Nut	1.4301/X5CrNi18-10
(10)	Handles	1.4308/G-X6CrNi18-9
(11)	Cross-recessed Head Machine Screw	1.4301/X5CrNi18-10
(12)	Spring Washer	1.4301/X5CrNi18-10
(13)	20.6MPa≈210kgf/cm2 or less	1.4301/X5CrNi18-10

Specifications

Applicable Fluid	Water, Air, Oil, Gas
Max. Operating Temp.	120°C
Max. Operating Pressure	1S~2S 0.98MPa 8A~15A

Order Example

Part Number
SNBS1S
SNBSS10A

Days to Ship

8 Days

Sanitary Sight Glasses
-In-line · View Port-

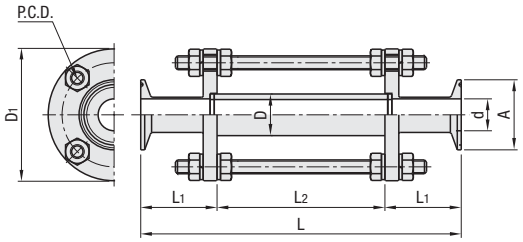
CAD Data

Sight Glass -In-line-

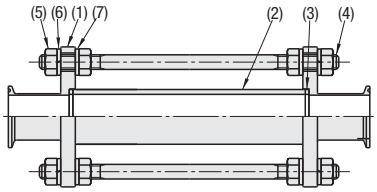


RoHS

SNSGR



Parts View



Part Number		A	d	D	D1	P.C.D.	L	L1	L2	€ Unit Price	Volume Discount
Type	No.									1 pc.	2 ~ 3 PCS.
SNSGR	1S	50.5	23	30	95	75	231	55	121		
	1.5S		35.7	45	115	90	306		196		
	2S	64	47.8	60	120	95					

For orders larger than indicated quantity, please request a quotation.

Parts and Materials

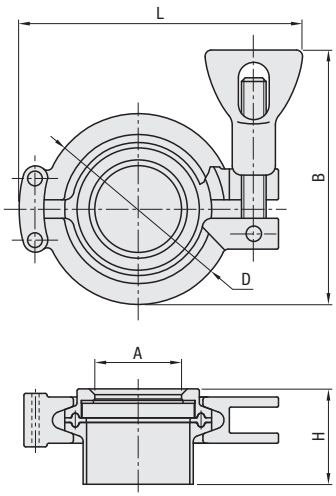
Part No.	Name of Parts	Material
(1)	Flanged Joint	1.4301/X5CrNi18-10
(2)	Glass Hollow	Pyrex
(3)	Gasket	EPDM
(4)	Stud Bolt	1.4301/X5CrNi18-10
(5)	Nuts	1.4301/X5CrNi18-10
(6)	Spring Washer	1.4301/X5CrNi18-10
(7)	Plain Washer	1.4301/X5CrNi18-10

Sight Glass -View Port-

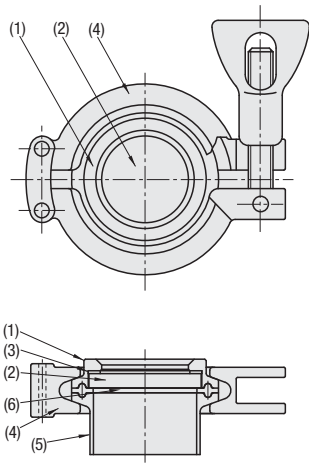


RoHS

SNSGT



Parts View



Part Number		A	B	D	L	H	€ Unit Price	Volume Discount
Type	No.						1 pc.	Qty.1-5
SNSGt	1.5S	30	88	66	98	36		
	2S	40	93	80	113	36		

For orders larger than indicated quantity, please request a quotation.

Parts and Materials

Part No.	Name of Parts	Material
(1)	Ferrule (Window Frame)	1.4301/X5CrNi18-10
(2)	Window	Tempax
(3)	Gasket	EPDM
(4)	Clamp	1.4308/G-X6CrNi18-9
(5)	Ferrule (Welded)	1.4301/X5CrNi18-10
(6)	Seal	EPDM

Order Example

Part Number
SNSGR1S
SNSGT2S

Features

-In-line: Useful to see fluid state inside glass pipe.
-View Port: Useful to see contents such as tank..

Days to Ship: 13 Days

Sanitary Tube Strainers
-Standard · L-shaped-

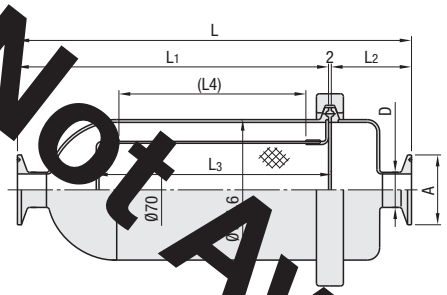
CAD Data

Not Available

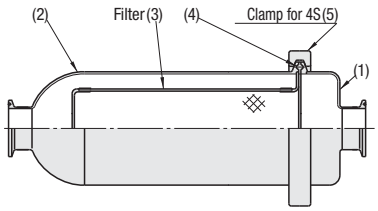
■Tube Strainer -Standard-



(Set)
((Filter Only)



■Parts View



Part Number		Mesh Roughness	A	D	L	L1	L2	L3	(L4)	€ Unit Price	Volume Discount
Type	No.									1 pc.	2 ~ 3 PCS.
		40·60·80 100·200	50.5	25.4	285	225	58	170	138.5		
			50.5	38.1	320	260	58	205	173.5		
			64	50.8	350	290	58	235	203.5		

As the mesh number is larger, mesh becomes finer.

For orders larger than indicated quantity, please request a quotation.

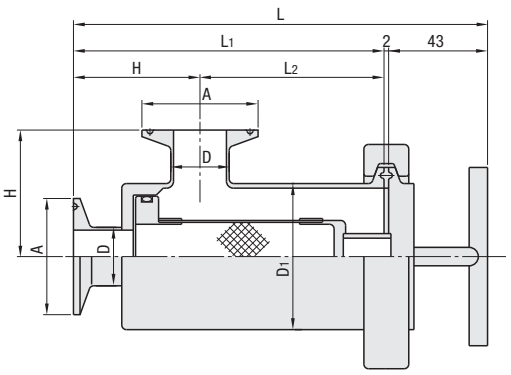
■Parts and Materials

Part No.	Name of Parts	Material
(1)	Upper Lid	1.4301/X5CrNi18-10
(2)	Body Case	1.4301/X5CrNi18-10
(3)	Filter	1.4301/X5CrNi18-10
(4)	Gasket	EPDM
(5)	Clamp	1.4301/X5CrNi18-10

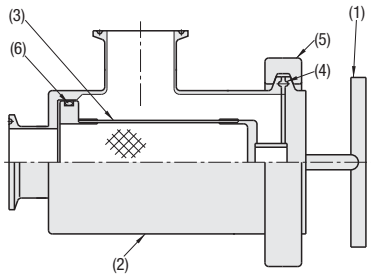
■Tube Strainer -L-shaped-

SNTSL





■Parts View



Part Number		Mesh Roughness	A	D	D1	L	L1	L2	H	€ Unit Price	Volume Discount
Type	No.									1 pc.	2 ~ 3 PCS.
SNTSL	1S	40/60/80 100/200	50.5	25.4	63.5	180	135	80	55		
	1.5S		50.5	38.1	76.3	190	145	75	70		
	2S		64	50.8	101.6	205	160	78	82		

As the mesh number is larger, mesh becomes finer.

For orders larger than indicated quantity, please request a quotation.

■Parts and Materials

Part No.	Name of Parts	Material
(1)	Upper Lid	1.4301/X5CrNi18-10
(2)	Body Case	1.4301/X5CrNi18-10
(3)	Filter	1.4301/X5CrNi18-10
(4)	Gasket	EPDM
(5)	Clamp	1.4301/X5CrNi18-10
(6)	O-Ring	EPDM

Order Example

Part Number	-	Mesh Roughness
	-	40
SNTSL2S	-	100

Days to Ship 13 Days

■Features

-Standard: connects in-line with plumbing to filter foreign objects.
-L-shaped Easy to swap into existing elbow plumbing as its connection diameter is same as that of double ferrules elbow. (**P.1222 SNBE**).

Sanitary Pressure Gauge / Shower-ball

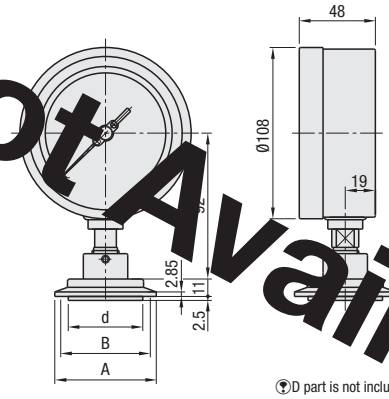
NEW

CAD Data

Not Available

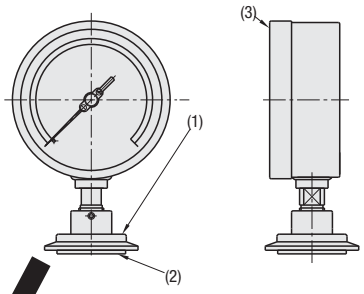
Sanitary Pressure Gauge





D part is not included in 1

Parts View



Part Number		Pressure Range (MPa)	A	B	d	€ Unit Price	Volume Discount
Type	No.					1 ~ 2 PCS.	3 ~ 5 PCS.
		0.25	50.5	43.5	-		
		0.4			34		
		0.6					
		1.0	64	56.5	47		

Parts and Materials

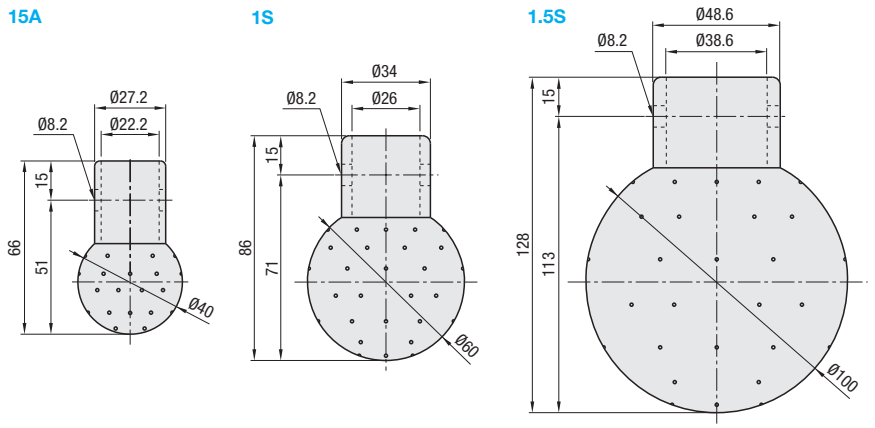
Part No.	Name of Parts	M Material
(1)	Diaphragm - Rule	1.4401/X5CrNiMo17-12-2
(2)	Diaphragm - Film	1.4401/X5CrNiMo17-12-2
(3)	Indicating Part Body	1.4301/X5CrNi18-10
-	Diaphragm - Fluid	Silicon Oil for Food
-	Precision	±1.6%

For orders larger than indicated quantity, please request a quotation.

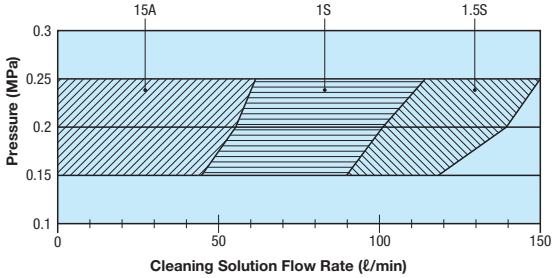
Shower-ball



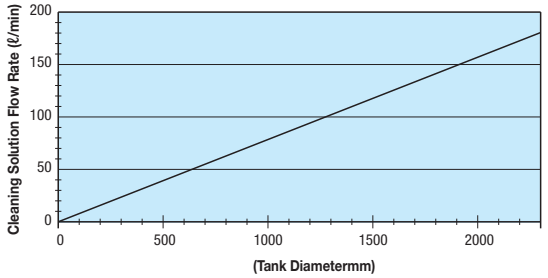
Type	M Material	Surface Finish	A Accessory	Recommended Operating Pressure
SNSHB	1.4404/X2CrNiMo17-12-2	Outer Surface: #320 Polish	Drawing Pin	0.2MPa



Selection of Showerball



Selection of Flow Rate Depending on Tank Diameter



Part Number		Hole Dia.	No. of Holes	Max. Flow at 0.2MPa	Tank Ø Applicable for Cleansing	€ Unit Price	Volume Discount
Type	No.					1 pc.	2 ~ 3 PCS.
SNSHB	15A	1.2	22	56ℓ/min	Ø700		
	1S	1.5	50	102ℓ/min	Ø1300		
	1.5S	2	60	139ℓ/min	Ø1800		

For tank diameter applicable for cleansing at 0.2MPa: Tank Diameter xπx25ℓ/min

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number - Pressure Range

SNSHB1S

Days to Ship

13 Days

-SNSHB

8 Days

Pressure Tanks
-Overview-

■Features

- Pressure tank suitable for liquid pumping and vacuum defoaming. Capacity and tank shape (3 options) are selectable.
- Number of holes on rid (0, 3 ~ 5) and hole size (Rc (PT) 1/8 ~ 3/8) are selectable.
- Level gauge and float switch can be mounted as alteration.

■Product Overview

- (1) Capacity: 1~22.5ℓ
- (2) Material: 304 Stainless Steel
- (3) Finish: Buffing on inner and outer surface Polishing grade 400 (* Note)

(* Note) Buff Polish Grade: (a)240--- Coarse Buff Polish. High level of brightness or luster is not provided.
(b)320--- Standard Buff Polish
(c)400--- Fine Buff Polish Our product is provided with this type of polish.

■Condition of Use

- (1) Operating Pressure Range: 0.5Mpa or lower
- (2) Chemical Resistance: See <Table> 1 to the right for details.
- (3) O-Ring: Physical Characteristics, Chemical Resistance **P.1309**
  Oil Resistance - Solvent Resistance: See Table <2> below.

<Table 1> Stainless Steel Chemical Resistance Chart

O: Excellent Δ: Slight Corrosion X: Severe Corrosion

Chemical Solution	1.4301/ X5CrNi18-10	Chemical Solution	1.4301/ X5CrNi18-10
Alcohol	○	Bicarbonate Soda	○
Ether	○	Lactic Acid (5%, boiled)	Δ
Ammonia Water	○	Lactic Acid (10%, boiled)	X
Butyric Acid	○	Sulfuric Acid (5%)	Δ
Salt (Dry)	○	Sulfuric Acid (50%)	X
Vinegar	○	Chlorine Gas (Humid)	X
Dilute Nitric Acid	○	Chlorine water	X
Concentrated Nitric Acid	X	Hydrochloric Acid	X
Acetic Anhydride	○	Ferric Chloride	X
Acetic Anhydride (Boiled)	X	Bromine	X

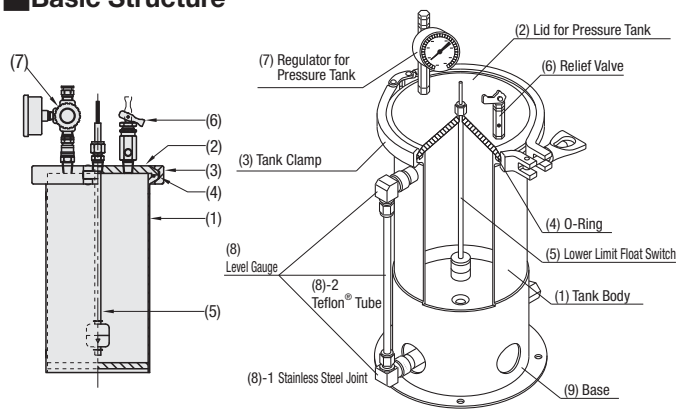
<Table 2> O-Ring Oil Resistance and Solvent Resistance

◎: Excellent O: Good _: Acceptable Δ: Inferior X: Not Acceptable

Chemical Solution	Nitrile	Fluorine	Chemical Solution	Nitrile	Fluorine
Gasoline, Light Oil	◎	◎	Trichloroethylene	Δ	◎
Benzene, Toluene	Δ	◎	Methyl Alcohol	_	Δ
Animal and Vegetable Oil	◎	◎	Methylethylketone	X	X
Diester Lubricating Oil	X	○	Ethyl Acetate	X	X
Phosphate-chlorinated Hydraulic Oil	X	Δ	Ether	_	X

The information in <Table 1> and <Table 2> above is reference data and to be used only as a guide. Values may differ depending on operational conditions or operating environment.

■Basic Structure



Part No.	Name of Parts	Purpose
(1)	Tank Body	Container for liquid
(2)	Lid for Pressure Tank	Applies pressure and prevents contamination
(3)	Tank Clamp	Fix body and lid
(4)	O-Ring	Seal for body and lid
(5)	Lower Limit Float Switch	Activates an alarm when the liquid level drops to low limit
(6)	Relief Valve	Releases pressure
(7)	Regulator for Pressure Tank	Controls pressure within tank
(8)	Level Gauge ((8)-1 Stainless Steel Joint)	Provides visual view of the liquid level
	Level Gauge ((8)-2 Teflon® Tube)	
(9)	Base	Secures tank body

Caution CAUTION

Precautions for Use

- Pressure tanks featured in this catalog are not classified as first-class or second-class pressure vessels.
- Please use in the operational conditions above. When applying pressure, use pressure gauge, relief valve and safety regulator for your safety.
- When the internal pressure is high, never loosen clamps etc., that tighten rid and nozzle.
- Never use as a container to generate vapor by steaming, heating or as a result of chemical reaction.

Caution CAUTION

Handling Instruction

1.)O-ring is used in the rid of this product.
When closing the lid, please make sure the O-ring is securely fit into the groove on tank body.
2.)Tighten the clamp by hand, then secure with a wrench the extra half revolution or so.
3.)Maximum operating pressure of the tank is 0.5Mpa or less. Do not operate beyond the maximum pressure.
Pressure relief valves are recommended when using tanks in compression mode.
4.)When loosening clamps, be sure to release the internal pressure by a relief valve etc. into the ambient condition.
Also, confirm that the pressure gauge (regulator) indicates ambient pressure.

NEW

Pressure Tanks

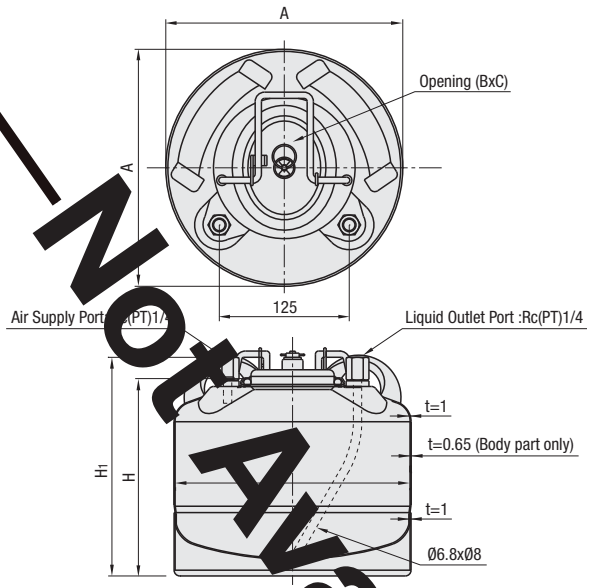
-Simplified Type-

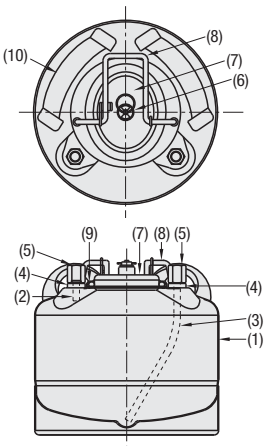
CAD Data

RoHS



Type	Material	Surface Finish	Normal Operating Pressure
	Refer to "Component List" Surface Finish	Inner SurfaceDeoxidizing Outer SurfaceXXX	0.49MPa or lower





■Component List

Part No.	Name of Parts	Material
(1)	Pressure Tank Body	1.4301/X5CrNi18-10
(2)	Pressure Air Pipe	1.4301/X5CrNi18-10
(3)	Suction Pipe	1.4301/X5CrNi18-10
(4)	O-Ring	Nitrile Rubber
(5)	Hexagon Reducing Sockets	1.4301/X5CrNi18-10
(6)	Relief Valve	1.4301/X5CrNi18-10
(7)	Lid for Pressure Tank	1.4301/X5CrNi18-10
(8)	Handle for Locking Lid	1.4301/X5CrNi18-10
(9)	O-Ring	Nitrile Rubber
(10)	Carrying Handle	1.4301/X5CrNi18-10

Features of Nitril Rubber **P.358**
Features of O-Ring **P.1232** and **1239**

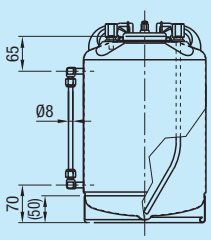
Part Number Type	Effective Capacity (ℓ)	At Full Capacity (ℓ)	Inner Diameter D	Effective Capacity Depth H	H1	A	B	C	Weight kg	€ Unit Price 1 ~ 3 pcs.
	5	5.2	226.7	192	210		81	97	2	
	10	10.3		347	365				2.5	
	20	20.5		580	598				3.8	

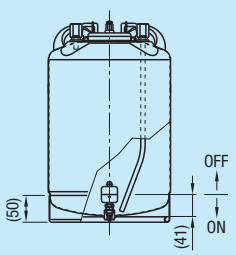
For orders larger than indicated quantity, please request a quotation.

Order Example **Part Number**

Days to Ship **8 Days**

Alterations **Part Number** - (LG, FS)
- LG-FS
10 Days

Alterations	Code	Spec.	Price Adder
Installation of Level Gauge 	LG	Install level gauge to provide visual view of the liquid level. Install level gauge at a position of 65mm from upper surface and 70mm from the bottom outside of the tank. ⊗TNKD5 is not applicable.	220,00

Alterations	Code	Spec.	Price Adder
Low Level Float Switch Installation 	FS	Install a switch to operate as alarm or signal of level of liquids such as water and oil. Switch will be turned on at a position of 41mm or lower from bottom of the tank. For details of Float Switch, refer to **P.1240**	200,00

Not Available

NEW

Pressure Tanks -Standard-

- Number of Holes Fixed Type · Selectable Type-

Price Reduction
Up to 9%

CAD Data

Features: Standard pressure tank (1.6 ~ 11ℓ) to compress liquid and force feed. Can be used for vacuum de-foaming (decompression). Float switch is available as an alteration.

RoHS

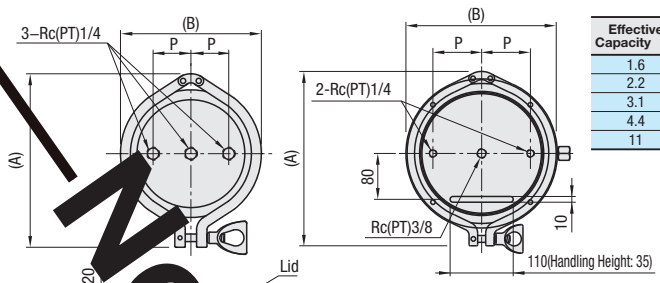


Type		Material				Surface Finish	Normal Operating Pressure
Fixed	Selectable	Body	Clamp	Lid	O-Ring		
		1.4301/X5CrNi18-10			Nitrile Rubber	Buffed (body only) Inner & Outer Surface: 400 Except weld bead portion on inner diameter	0.5Mpa or lower
					Fluoro Rubber		

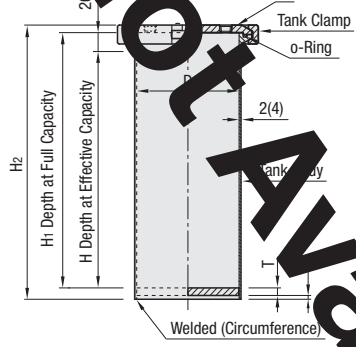
Features of Nitril Rubber / Fluorine Rubber **P.358**
Features of O-Ring **P.1232** and **1239**

Effective Capacity (ℓ)	Weight (kg)		
	Body	Lid	Clamp for Tank
1.6	1.96	0.62	0.42
2.2	2.45	0.8	0.75
3.1	3.13	1.42	0.95
4.4	3.77	2.18	1.05
11	11.35	3.45	2.2

Number of Holes Fixed: 3 Holes (4.4ℓ or less) **For 3 Hole (11ℓ)**

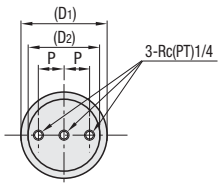


Effective Capacity (ℓ)	Lid & Clamp					
	T1	(D1)	(D2)	P	(A)	(B)
1.6	10	120	103	30	166	133
2.2		135	118		184	149
3.1	12	160	143	40	213	174
4.4		190	166		246	204
11		244	216	85	302	258



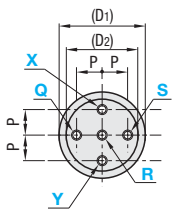
Values in ( ) are for effective capacity 11ℓ.
For detailed clamp dimension, refer to **P.1239**
Please read "Precautions for Use" and "Handling Instruction" on P. [illegible] before

Lid (Number of Holes Fixed) For 3 Hole



For no hole type, there is no PT hole.
Lid with capacity 11ℓ comes with carrying handle.

Lid (Number of Holes Selectable) For 3 ~ 5 Holes



Select up to Q, R, S for 3 hole type; up to Q, R, S, X for 4 hole type; up to Q, R, S, X, Y for 5 hole type.

Part Number		Number of Hole Selection for Fixed Type	For "Selectable Hole Type" only		At Full Capacity (ℓ)	Inner Diameter D	Effective Capacity	Full Capacity	H2	t	h	€ Unit Price 1 ~ 3 pcs.				
Type	Effective Capacity (ℓ)		No. of Holes Selection	* Rc (PT) Selection Q, R, S, X, Y								Fixed		Selectable		
												0	3	3	4	5
Number of Holes Fixed Number of Holes Selectable	1.6	0	3	1(1/8)	1.7	95.6	230	25[illegible]	270		4					
	2.2				2.4	108.3	250	[illegible]	290	8						
(0-Ring: Nitrile Rubber)	3.1	3	4	2(1/4)	3.4	133	230	29[illegible]	[illegible]							
(0-Ring: Fluoro Rubber)	4.4		5	3(3/8)	4.8	158.4	230	[illegible]	[illegible]	10	5					
	11				11.8	208.3	330	3[illegible]	[illegible]	12						

To specify * marked Q, R, S, X and Y use the numbers in front of (): 1, 2, 3.
Full capacity level is a theoretical value that is obtained by calculation (base area x depth). Use within the effective depth (up to -20mm from upper surface).
<Reference> Effective Capacity (ℓ)≈ Radius cm (D/2/10)xRadius cm (D/2/10)x3.14xDepth at Effective Capacity cm (H/10)/ 1000 (At full capacity, H1 is used as H)
For orders greater than indicated quantity, please request a quotation.

Order Example

Part Number	-	No. of Holes Selection	-	Q	-	R	-	S	-	X	-	Y
Number of Holes Fixed Type: 3 Holes	-	3										
Number of Holes Selectable Type: 3 Holes	-	3	-	Q2	-	R3	-	S3				
Number of Holes Selectable Type: 5 Holes	-	5	-	Q1	-	R2	-	S3	-	X2	-	Y2

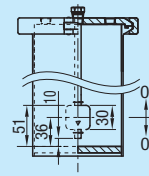
For number of holes selectable type, choose between Q ~ Y according to the number of holes. Specify up to S for 3 hole type, up to Y for 5 hole type.

Days to Ship
- Number of Holes Fixed Type: **8 Days**
- Number of Holes Selectable Type: **10 Days**

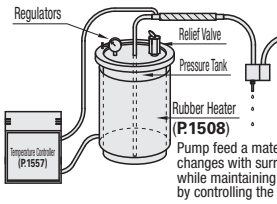
Alterations

Part Number	-	No. of Holes Selection	-	Q	-	R	-	S	-	X	-	Y	-	(FS)
	-	4	-	Q2	-	R2	-	S3	-	X3			-	FS

10 Days

Alterations	Code	Spec.	Price Adder
Low Level Float Switch Installation 	FS	Install a switch to operate as alarm or signal of level of liquids such as water and oil. Shaft tip will be suspended at 10mm from bottom of the tank. For details of Float Switch, refer to **P.1240**	200,00

Example



Pump feed a material whose viscosity changes with surrounding temperature, while maintaining the viscosity constant by controlling the temperature.

Not Available

NEW

Pressure Tanks with Base -Wide Mouth-

- Number of Holes Fixed Type / Selectable Type-

Price Reduction Up to 9%

CAD Data

Features: Wide opening design for easy cleaning. Excels in liquid discharging and there is little liquid when the tank is emptied (Capacity: 1 ~ 10ℓ). Can be used for vacuum de-foaming (decompression).



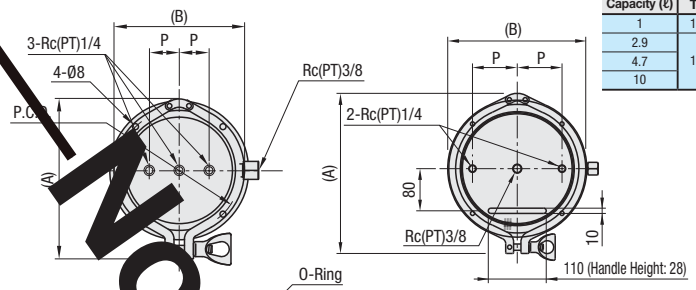
RoHS

Type		Material				Surface Finish	Normal Operating Pressure
Fixed	Selectable	Body	Clamp	Lid	O-Ring		
		1.4301/X5CrNi18-10			Nitrile Rubber / Fluoro Rubber	Buffed (body only) Inner & Outer Surface: #400 Except weld bead portion on inner diameter	0.5Mpa or lower

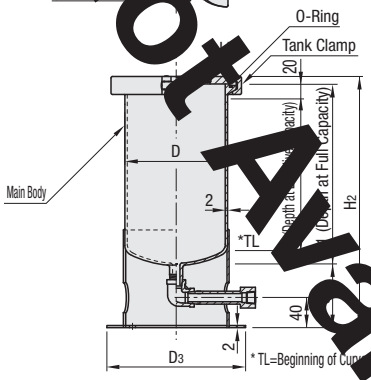
Features of Nitril Rubber / Fluorine Rubber **P.358**
Features of O-Ring **P.1232** and **1239**

Effective Capacity (ℓ)	Weight (kg)		
	Body	Lid	Clamp for Tank Clamp
1	1.46	0.62	0.42
2.9	2.63	1.42	0.95
4.7	3.27	2.18	1.05
10	5.35	3.45	2.2

Number of Holes Fixed Type: 3 Holes (4.7ℓ or less) **For 3 Holes (10ℓ)**

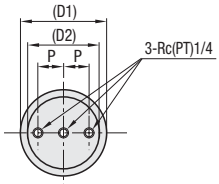


Effective Capacity (ℓ)	Lid & Clamp					
	T1	(D1)	(D2)	P	(A)	(B)
1	10	120	103	30	166	133
2.9	12	160	143	40	213	174
4.7		190	166		246	204
10		244	216	85	302	258

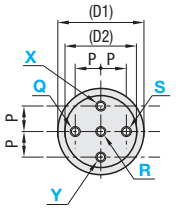


*TL=Beginning of Curv… no hole type there is no PT hole.
Tank with capacity 10ℓ comes with carrying handle.

Lid (Number of Holes Fixed Type) For 3 Holes



Lid (Number of Holes Selectable Type) For 3 ~ 5 Holes



Select up to Q R S for 3 hole type;
up to Q R S X for 4 hole type;
up to Q R S X Y for 5 hole type.
Select up to Q R S X Y for 5 hole type.

For detailed clamp dimension refer to **P.1239**
Please read "Precautions for Use" and "Handling Instruction" on P.123… before use.

Part Number		No. of Hole Selection for Fixed Type	For "Selectable Hole Type" only Select from below shapes. Select from below shapes.		At Full Capacity Water (ℓ)	Surface Inner Diameter D	Effective Capacity Depth H	At Full Capacity Water Depth H1	H2	P.C.D.	D3	€ Unit Price 1~3 pcs.				
Type	Effective Capacity Depth (ℓ)		No. of Hole Selection	* Rc(PT)(Select from below shapes. Q · R · S · X · Y								For "Selectable Hole Type" only L Dimension Fixed Type		For "Selectable Hole Type" only Select from below shapes.		
												0 pcs.	3 pcs.	3 pcs.	4 pcs.	5 pcs.
For "Selectable Hole Type" only L Dimension Fixed Type For "Selectable Hole Type" only Select from below shapes.	1				1.1	95.6		16…	260	127	140					
	2.9	0	3	1(1/8)	3.2	133	194	…	335	165	185					
(OO-Ring:Nitrile RubberO-Ring)	4.7		4	2(1/4)	5.1	158.4	220	…	…	190	210					
		3	5	3(3/8)												
(OO-Ring:Fluoro Rubber)	10				10.6	208.3	265	…	…12	240	260					

To specify * marked Q R S X and Y use the numbers in front of ( ): 1 2 3.
Full capacity level is a theoretical value that is obtained by calculation (base area x depth). Use within the effective depth (up to -20mm from upper surface).
<Reference> Effective Capacity (ℓ)≈ Radius cm (D/2/10)xRadius cm (D/2/10)x3.14xDepth at Effective Capacity cm (H/10)/ 1000 (At full capacity H1 is used as H)

For orders larger than indicated quantity please request a quotation.

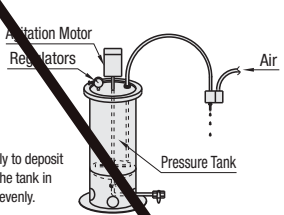
Order Example

Part Number - No. of Holes Selection - Q - R - S - X - Y

Number of Holes Fixed Type: 3 Holes - 3
Number of Holes Configurable Type: 3 Holes - 3 - Q2 - R3 - S3
Number of Holes Configurable Type: 5 Holes - 5 - Q1 - R2 - S3 - X2 - Y2

For number of holes selectable type choose between Q ~ Y according to the number of holes.
Specify up to S for 3 hole type up to Y for 5 hole type.

Example



Pump a material that is likely to deposit through an agitator within the tank in order to apply the material evenly.

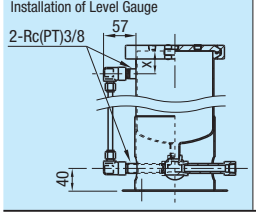
Days to Ship

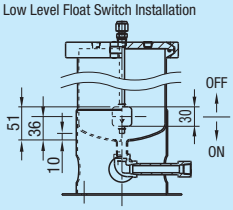
- Number of Holes Fixed Type: 8 Days
- Number of Holes Configurable Type: 10 Days

Alterations

Part Number - No. of Holes Selection - Q - R - S - X - Y - (LG FS)
TNKBH4.7 - 4 - Q2 - R2 - S2 - X3 - FS

10 Days

Alterations	Code	Spec.	Price Adder
Installation of Level Gauge 	LG	Install level gauge to provide visual view of the liquid level. Suspended at a position of 40mm from upper surface (X) and 40mm from the bottom.	2,20

Alterations	Code	Spec.	Price Adder
Low Level Float Switch Installation 	FS	Install a switch to operate as alarm or signal of level of liquids such as water and oil. Shaft tip will be suspended at 10 mm from bottom of the tank. For details of Float Switch refer to **P.1240**	2,00

Not Available

NEW

Pressure Tanks with Base -Narrow Mouth-

- Number of Holes Fixed Type · Selectable Type-

Price Reduction up to 10%

CAD Data

■Feature: Reasonably priced type with a narrow opening. Excels in liquid discharging and there is little liquid when the tank is emptied (Capacity: 4 ~ 22.5ℓ). Can be used for vacuum de-foaming (decompression).

RoHS

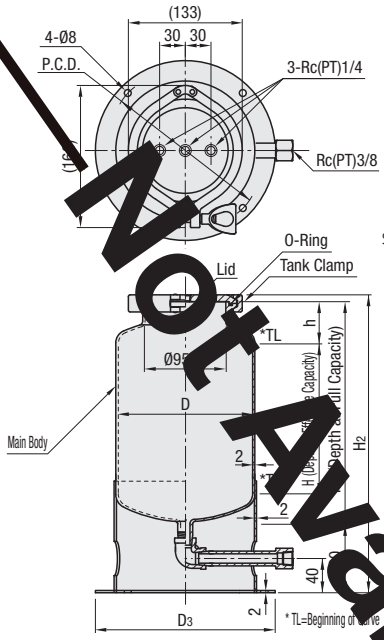


Type		Material				Surface Finish	Normal Operating Pressure
Fixed	Selectable	Body	Clamp	Lid	O-Ring		
		1.4301/X5CrNi18-10			Nitrile Rubber Fluoro Rubber	Buffed (body only) Inner & Outer Surface: #400 Except weld bead portion on inner diameter	0.5Mpa or lower

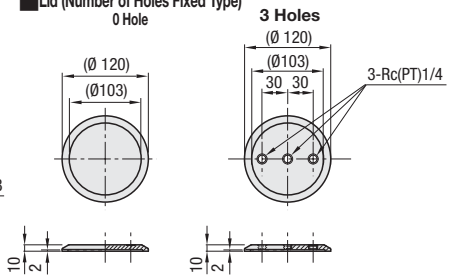
Effective Capacity (ℓ)	Weight (kg)		
	Body	Lid	Clamp for Tank
4	3.06	0.62	0.42
5.9	3.96		
12.7	6.46		
22.5	7.96		

Features of Nitril Rubber / Fluorine Rubber **P.358**
Features of O-Ring **P.1232** and **1239**

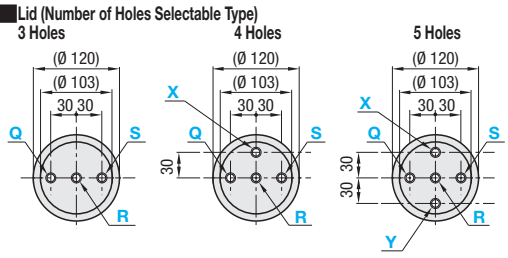
■Number of Holes Fixed Type: 3 Holes



■Lid (Number of Holes Fixed Type)



■Lid (Number of Holes Selectable Type)



For detailed clamp dimension refer to **P.1239**
Please read "Precautions for Use" and "Handling Instruction" on P.1[illegible] before use.

Part Number		No. of Hole Selection for Fixed Type	For "Selectable Hole Type" only Select from below shapes.		At Full Capacity Water(ℓ)	Inner Surface Inner Diameter D	Effective Capacity Depth H	At Full Capacity Water H1	H2	P.C.D.	D3	€ Unit Price1~3 pcs.				
Type	Provided Effective Capacity Depth(ℓ)		No. of Hole Selection	*Rc(PT)Select from below shapes. Q·R·S·X·Y								For "Selectable Hole Type" only L Dimension Fixed Type		For "Selectable Hole Type" only Select from below shapes.		
												0 pcs.	3 pcs.	3 pcs.	4 pcs.	5 pcs.
For "Selectable Hole Type" only L Dimension Fixed Type / For "Selectable Hole Type" only Select from below shapes.					4.2	158.4	175	260	348		190	210				
(OO-Ring:Nitrile Rubber0-Ring)		0	3	1(1/8)	6	180	194	287	375	54.8		230				
	12.7		4	2(1/4)	13.2	250	208	325	418	73.5		250				
(OO-Ring:Fluoro Rubber)	22.5	3	5	3(3/8)	23.2	250	408	530	623	73.5		310				

To specify * marked Q R S X and Y use the numbers in front of ( ): 1 2 3.
Full capacity level is a theoretical value that is obtained by calculation (base area x depth). Use within the effective depth (up to -20mm from upper surface).
<Reference> Effective Capacity (ℓ)≈ Radius cm (D/2/10)xRadius cm (D/2/10)x3.14xDepth at Effective Capacity cm (H/10)/ 1000 (At full capacity H1 is used for H)
For orders larger than indicated quantity please request a quotation.

Order Example

Part Number - No. of Holes Selection - Q - R - S - X - Y

Number of Holes Fixed Type: 3 Holes: TNKC12.7 - 3
Number of Holes Configurable Type: 5 Holes: - 5 - Q1 - R2 - S3 - X2 - Y2

For number of holes selectable type choose between Q ~ Y according to the number of holes. Specify up to S for 3 hole type up to Y for 5 hole type.

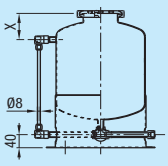
Days to Ship

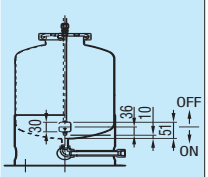
- Number of Holes Fixed Type: 8 Days
- Number of Holes Configurable Type: 10 Days

Alterations

Part Number - No. of Holes Selection - Q - R - S - X - Y - (LG FS)
- 4 - Q2 - R2 - S2 - X3 - FS

[illegible] Days

Alterations	Code	Spec.	Price Adder
Installation of Level Gauge 	LG	Install level gauge to provide visual view of the liquid level. Suspended at a position of 595mm from upper surface (X) when effective capacity is 4ℓ at a position of 65mm from upper surface (X) when effective capacity is 59ℓ at a position of 80mm from upper surface when effective capacity is 12.7ℓ and at a position of 80mm from upper surface and 40mm from the bottom when effective capacity is 225ℓ.	220

Alterations	Code	Spec.	Price Adder
Low Level Float Switch Installation 	FS	Install a switch to operate as alarm [illegible] signal of level of liquids such as water and oil. Shaft tip will be suspended at 10 mm from bottom of the tank. For details of Float Switch refer to **P.1240**	20[illegible]

Not Available

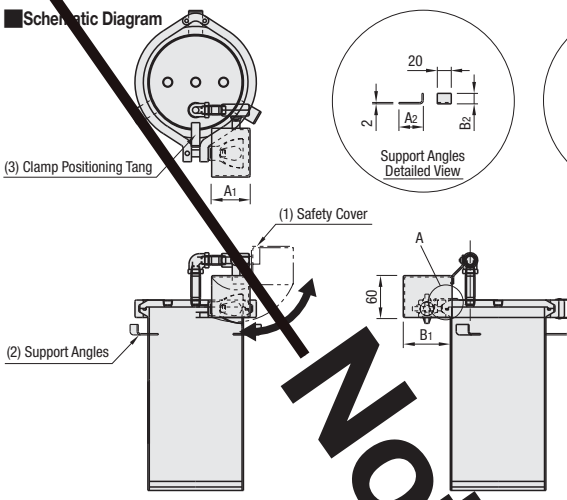
NEW

Pressure Tanks with Safety Function

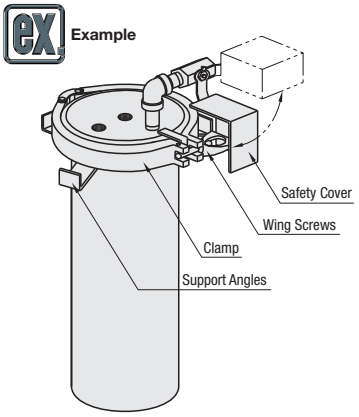
-Overview / Standard-

CAD Data

Schematic Diagram



Example



Features

(1) Safety Cover: Lifting the cover discharges the pressure, preventing inadvertent operation.
(2) Support Angles: Support angles prevents the tank from falling after detachment, improving safety.
(3) Clamp Locating Tang: Use the tang to position the clamp to improve repeatability.

Type	Provided Effective Capacity Depth	(1)Safety Cover A1		(2)Support Angles A2	B2	(3)Clamp Locating Tang A3	B3	H	W
	1.6	40		35	15	30	10	10	8
	2.2					35	13		10
	3.1	55	70		20	37		14	12
	4.4						16		
	11					40			16
	1	40	55	35	15	30	10	10	8
	2.9	55	70		20	37	13	14	12
	4.7						16		
	10					40			16
TNKCS	4~22.5	40	55		-	30	10	10	8

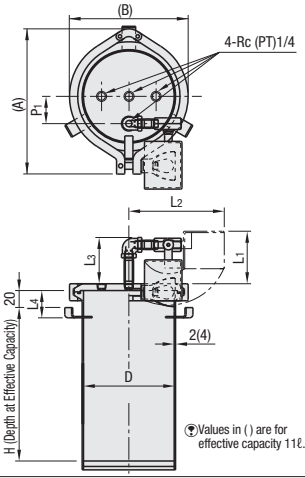
Standard Type



RoHS

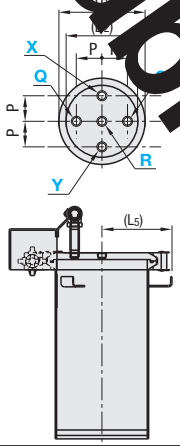
Type		Material			Surface Finish	Normal Operating Pressure
Fixed	Selectable	Body	Clamp	Lid		
		1.4301/X5CrNi18-10			Outer Surface: 400 (Except [illegible] Inner diameter)	0.5Mpa or lower

Number of Holes Fixed Type 4 Holes



Values in ( ) are for effective capacity 11ℓ.

Number of Holes Selectable Type 4 or 5 Holes



Effective Capacity (ℓ)	Weight (kg) Body	Lid	Clamp for Tank Clamp
1.6	1.96	0.62	0.42
2.2	2.45	0.8	0.75
3.1	3.13	1.42	0.95
4.4	3.77	2.18	1.05
11	11.35	3.45	2.2

Effective Capacity (ℓ)	Lid & Clamp (D1)	(D2)	P	(A)	(B)
1.6	120	103	30	166	133
2.2	135	118	40	184	149
3.1	160	143		213	174
4.4	190	166		246	204
11	244	216	85	302	258

Select up to Q, R, S, X for 4 holes, up to Q, R, S, X, Y for 5 holes in number of holes selectable type.
Select up to Q, R, S, X, Y for 5 hole type.
For tank body (H1, H2, ...), refer to **P.1234**
Please read "Precautions for Use" and "Handling Instruction" on **P.1232** before use.

Part Number Type	Effective Capacity (ℓ)	No. of Hole Selection for Fixed Type	For "Selectable Hole Type" only: No. of Holes Selection	* Rc (PT) Selection Q / R / S / X / Y	Material of O-Ring	At Full Capacity (ℓ)	Inner Diameter D	Effective Capacity Depth H	L1	L2	L3	L4	(L5)	P1	€ Unit Price 1 ~ 3 pcs. Fixed 4	Selectable 4	Selectable 5
Number of Holes Fixed Type		4	4	1(1/8)	N (Nitrile)	1.7	95.6	230	68.5	133.9	57.8	30	84	25			
For "Selectable Hole Type" only				2(1/4)		2.4	108.3	250					90	30			
			5	3(3/8)	F (Fluorine)	3.4	133	230	77	140	67.8	40	103	40			
						4.8	158.4			145			131	60			
						11.8	208.3	330		150		50	158	85			

To specify * marked Q, R, S, X and Y use the numbers in front of (): 1, 2, 3.
For orders larger than indicated quantity, please request a quotation.
Full capacity level is a theoretical value that is obtained by calculation (base area x depth). Use within the effective depth (up to -20mm from upper surface).
<Reference> Effective Capacity (ℓ)≈ Radius cm (D/2/10)xRadius cm (D/2/10)x3.14xDepth at Effective Capacity cm (H/10)/ 1000 (At full capacity, H1 is used as H)

Order Example

Part Number	-	No. of Holes Selection	-	Q	-	R	-	S	-	X	-	Y	-	O-Ring
	-	4											-	F
	-	5	-	Q1	-	R2	-	S3	-	X2	-	Y2	-	N

Number of Holes Configurable Type: 5 Holes
For number of holes selectable type, choose between Q ~ Y according to the number of holes. Specify up to x for 4 hole type, up to Y for 5 hole type.

Days to Ship **10 Days**

Not Available

Pressure Tanks with Safety Function

-Wide Mouth / Narrow Mouth-

CAD Data

■Wide Mouth



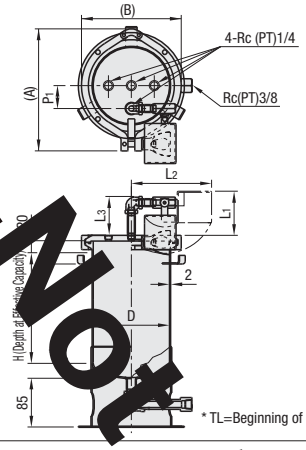


RoHS

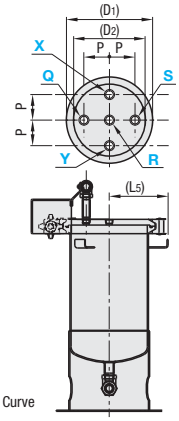
Type		Material				Surface Finish	Normal Operating Pressure
Fixed	Number of Holes Selectable	Body	Clamp	Lid	(1)~(3)		
		1.4301/X5CrNi18-10				Buffed (body only) Inner & Outer Surface: #400 (Except weld bead portion on inner diameter)	0.5Mpa or lower

Effective Capacity (ℓ)	Weight (kg)		
	Body	Lid	Clamp for Tank
1	1.46	0.62	0.42
2.9	2.63	1.42	0.95
4.7	3.27	2.18	1.05
10	5.35	3.45	2.2

■Number of Holes Fixed Type 4 Holes



■Number of Holes Selectable Type 4 or 5 Holes



Effective Capacity (ℓ)	Lid & Clamp				
	(D1)	(D2)	P	(A)	(B)
1	120	103	30	166	133
2.9	160	143	40	213	174
4.7	190	166		246	204
10	244	216	85	302	258

Select up to Q, R, S, X for 4 holes, up to Q, R, S, X, Y for 5 holes in number of holes selectable type.
Select up to Q, R, S, X, Y for 5 hole type.
For tank body (H1, H2, P.C.D, D3), refer to **P.1235**
Please read "Precautions for Use" and "Handling Instruction" on **P.1232** before use.

Part Number		No. of Hole Selection for Fixed Type	For "Selectable Hole Type" only Select from below shapes. Select from below shapes.		Material of O-Ring	At Full Capacity Water (ℓ)	Inner Surface Inner Diameter D	Effective Capacity Depth H	L1	L2	L3	L4	(L5)	P1	€ Unit Price 1~3 pcs.		
Type	Provided Effective Capacity Depth (ℓ)		No. of Hole Selection	* Rc(Pt)Select from below shapes. Q•R•S•X•Y											Fixed	Selectable	
															4pieces	4pieces	5pieces
Number of Holes Fixed Type		4	4	1(1/8)	N (Nitrile)	1.1	95.6	130	68.5	133.9	57.8	30	84	25			
For "Selectable Hole Type" only				2(1/4)		3.2	133	194		140		40	103	40			
			5	3(3/8)	F (Fluorine)	5.1	158.4	220	77	145	67.8		131	60			
						10.6	208.3	265		150		50	156	85			

To specify * marked Q, R, S, X and Y use the numbers in front of (): 1, 2, 3.
For orders larger than indicated quantity, please request a quotation.
Full capacity level is a theoretical value that is obtained by calculation (base area x depth). Use within the effective depth (up to -20mm from upper surface).
<Reference> Effective Capacity (ℓ)≈ Radius cm (D/2/10)xRadius cm (D/2/10)x3.14xDepth at Effective Capacity cm (H/10)/ 1000 (At full capacity, H1 is used as H)

■Narrow Mouth



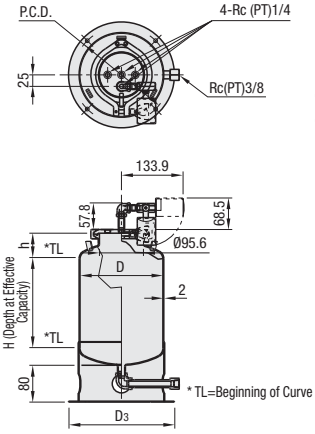


RoHS

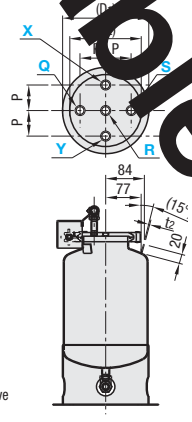
Type		Material				Surface Finish	Normal Operating Pressure
Fixed	Number of Holes Selectable	Body	Clamp	Lid	(1)~(3)		
		1.4301/X5CrNi18-10				Buffed (body only) Inner & Outer Surface: 400 (Except weld bead portion on inner diameter)	0.5Mpa or lower

Effective Capacity (ℓ)	Weight (kg)		
	Body	Lid	Clamp for Tank
4	3.06	0.62	0.42
5.9	3.96	0.62	0.42
12.7	6.46	0.62	0.42
22.5	7.96	0.62	0.42

■Number of Holes Fixed Type 4 Holes



■Number of Holes Selectable Type 4 or 5 Holes



Select up to Q, R, S, X for 4 holes, up to Q, R, S, X, Y for 5 holes in number of holes selectable type.
Select up to Q, R, S, X, Y for 5 hole type.
For tank body (H1,H2), refer to **P.1236**
Please read "Precautions for Use" and "Handling Instruction" on **P.1232** before use.

Part Number		No. of Hole Selection for Fixed Type	For "Selectable Hole Type" only Select from below shapes. Select from below shapes.		Material of O-Ring	At Full Capacity Water (ℓ)	Inner Surface Inner Diameter D	Effective Capacity Depth H	h	P.C.D.	D3	€ Unit Price 1~3 pcs.		
Type	Provided Effective Capacity Depth (ℓ)		No. of Hole Selection	* Rc(Pt)Select from below shapes. Q・R・S・X・Y								Fixed	Selectable	
For "Selectable Hole Type" only Dimension Fixed Type	4	4	4	1(1/8)	N (Nitrile)	4.2	158.4	175	49.3	190	210			
For "Selectable Hole Type" only Select from below shapes.	5.9			2(1/4)		6	180	194	54.8	210	230			
	12.7		5	3(3/8)	F (Fluorine)	13.2	250	208	73.5	285	310			
	22.5					23.2		408						

To specify * marked Q, R, S, X and Y use the numbers in front of (): 1, 2, 3.
For orders larger than indicated quantity, please request a quotation.
Full capacity level is a theoretical value that is obtained by calculation (base area x depth). Use within the effective depth (up to -20mm from upper surface).
<Reference> Effective Capacity (ℓ)≈ Radius cm (D/2/10)xRadius cm (D/2/10)x3.14xDepth at Effective Capacity cm (H/10)/ 1000 (At full capacity, H1 is used as H)

Order Example

Part Number	-	No. of Holes Selection	-	Q	-	R	-	S	-	X	-	Y	-	O-Ring
	-	4											-	F
Number of Holes Configurable Type: 5 Holes	-	5	-	Q1	-	R2	-	S3	-	X2	-	Y2	-	N

Days to Ship **10 Days**

For number of holes selectable type, choose between Q ~ Y according to the number of holes. Specify up to x for 4 hole type, up to Y for 5 hole type.

Not Available

Lid for Pressure Tank / O-Ring / Tank Clamps

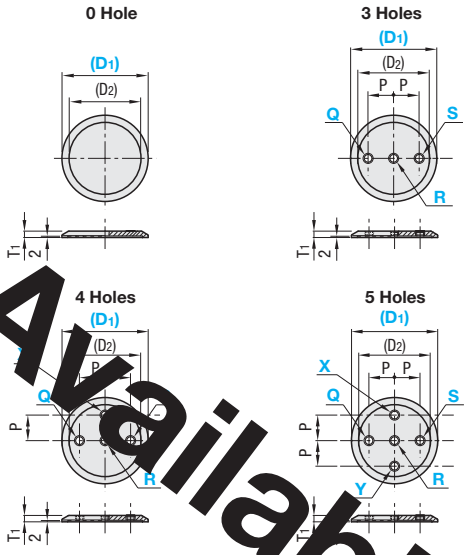
NEW

CAD Data

Lid for Pressure Tank RoHS



Type	M Material	Surface Finish	Normal Operating Pressure
	1.4301/ X5CrNi18-10	Buffing Outer Surface: 400	0.5Mpa or lower



Select a lid with D1 that fits D1 of the tank.

Part Number Type	(D1)	No. of Holes Sel.	For 3 ~ 5 Holes * Rc (PT) Selection Q, R, S, X, Y	(D2)	T1	P	Weight (kg)	€ Unit Price 1~3 pcs. No. of Holes Selection 0 Hole	3 Holes	4 Holes	5 Holes
	120	0	1(1/8)	103	10	30	0.62				
	135	3	2(1/4)	118		40	0.8				
	160	4	3(3/8)	143	12		1.42				
	190	5		166			2.18				

To specify * marked Q, R, S, X and Y use the numbers in front of (): 1, 2, 3. For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	No. of Holes Sel.	- Q	- R	- S	- X	- Y
For no hole type	- 0					
For 3 hole type	- 3	- Q2	- R3	- S3		
For 5 hole type	- 5	- Q1	- R2	- S3	- X2	- Y2

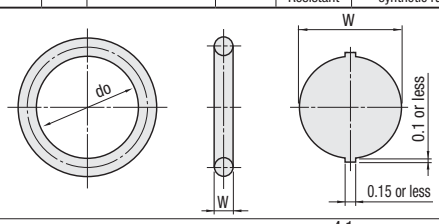
For 3 ~ 5 hole types, choose between Q ~ Y according to the number of holes. Specify up to S for 3 hole type, up to Y for 5 hole type.

Days to Ship - No Hole: 8 Days - 3 ~ 5 Holes: 10 Days

O-Ring RoHS

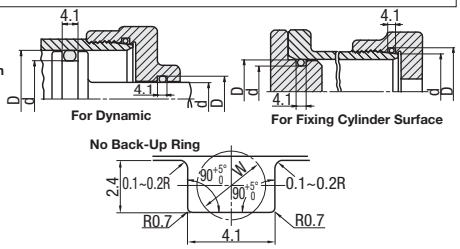


Type	M Material	H Hardness (JIS Hs)	Color	Possible Operating Temp. Range	JIS Symbol	Usage	Features
NGA	Nitrile Rubber	70±5	Black	-30~100°C	Class 1 A	Mineral Oil Resistance	Most representative material with superior oil / abrasion resistance and heat stability.
NGF	Fluoro Rubber	70±5	Black	-15~200°C	Class 4 D	Heat Resistant	Best in oil / chemical resistance and heat stability as heat-resistant synthetic rubber. Suitable for a wide range of applications.



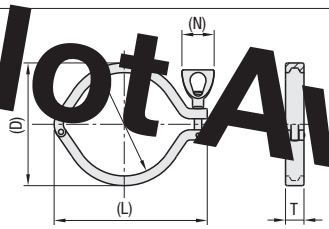
Part Number Type	No.	JIS Nominal Number	W	Inner Ø do	Tol.	Matching Material d	Tol.	D	Tol.	NGA € Unit Price Qty. 1~49	NGA Vol. Discount Qty. 50~	NGF € Unit Price Qty. 1~49	NGF Vol. Discount Qty. 50~
NGA	105	G105	3.1	104.4	±0.87	105	0 -0.1	110	+0.1 0				
	120	G120		119.4	±0.98	120		125					
NGF	145	G145		144.4	±1.16	145		150					
	170	G170	5.7	169.3	±1.33	170		180					

Information about Grooves



Clamp for Tank RoHS





Part Number Type	No.	(D)	(d)	(L)	t	(N)	€ Unit Price 1 ~ 3 pcs.
	90A	133	112	166	20	35	
	100A	149	128	184	20.7		
	125A	174	150	212	25	42	
	150A	204	180	246			

For orders larger than indicated quantity, please request a quotation.

Order Example Part Number: GM-5 **Days to Ship** 5 Days

Not Available

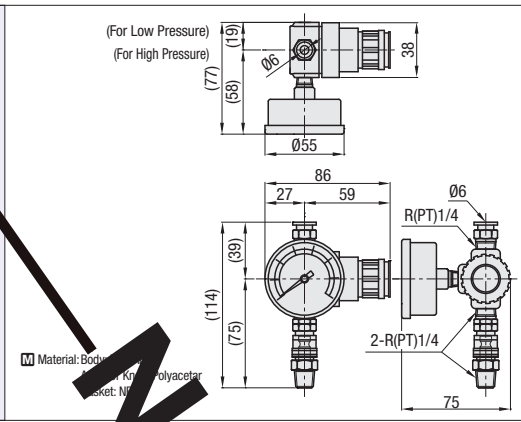
Regulator for Pressure Tanks / Low Level Float Switches / Relief Valves
- For Low Pressure · High Pressure-

CAD Data

■Regulator for Pressure Tank

RoHS





Material: Body [illegible] Knob: Polyacetar
[illegible] Gasket: NB

Part Number	Specifications	Adjustable Range:	€ Unit Price 1 ~ 3 pcs.
	For Low Pressure	0~0.2MPa	
	For High Pressure	0~0.7MPa	

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number

Days to Ship: 8 Days

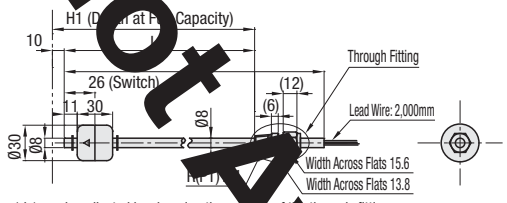
■Cautions on Installation and Handling
- Install in a place which is not subject to vibration.
- Use within surrounding temperature range of 5 ~ 60℃.
- Do not squeeze the pipe to the connecting port in the halfway.

■Features
Controls pressure within pressure tank. By securing in the "lock" position after setting the pressure, set value is fixed and does not change during operation.

■Low Level Float Switch

RoHS

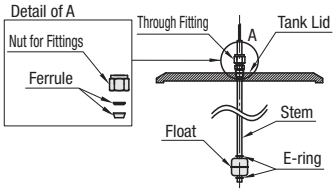




* L1 can be adjusted by changing the p[illegible] of [illegible] through-fitting.

■Feature: Switch to operate as alarm or signa[illegible] level [illegible]quids such as water and oil.

■Installation Manual
1 Apply adhesive tape to through fitting (R1/4 portion) and screw the fitting into tank lid.
2 Thread lead wire through the through fitting from inside of the lid, and insert the stem.
3 Insert the ferrule of through fitting and nut for fitting, into the stem pushed outward the lid (see below drawing)
* Do not tighten the nut for fitting at this stage.
4 Confirm the distance from the tip of the stem and switch portion to the bottom of the tank, define the location where the stem will be fixed, and hand tighten the nut.
5 Turn until hand-tight and then secure with a wrench



■Float Switch (Optional) Spec List

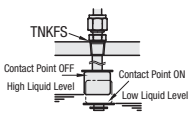
Part Number		€
Type	L	1 ~ 3 pcs.
	220	
	300	
	325	

For orders larger than indicated quantity, please request a quotation.

■Tank & Float Switch Compatibility Chart for Alteration

Compatible Tank		L1	L
Part Number	H1		
TNKA1.6	250	240	300
TNKA2.2	270	260	325
TNKA3.1	250	240	300
TNKA4.4	250	240	300
	167	157	220
TNKB2.9	240	230	300
TNKB4.7	270	260	325
	260	250	325
TNKC5.9	287	277	325

■Cautions on Installation
Float may not function properly if mounted with excessive tilt. .



■[illegible]tion

Usage	For liquids
Operat[illegible] Range (Gravity)	0.7 or more
Pressu[illegible] Resistance	0.75MPa
Heat R[illegible] Temperature	100°C
Material: Lead[illegible]	FEP Coating 0.3sq
Material: S[illegible]at	1.4301
Material: Stem	1.4301
Material: Fi[illegible]	Epoxy Type
Switch	[illegible]229
Maximum Operating [illegible]oltage	[illegible]0V, DC[illegible]00V
Maximum Operating C[illegible]	[illegible] 0.5A [illegible]0A
Maximum Contact Capa[illegible]	AC[illegible] DC 50W
Contact Resistance	[illegible]mΩ or [illegible]
Precision	[illegible]3mm

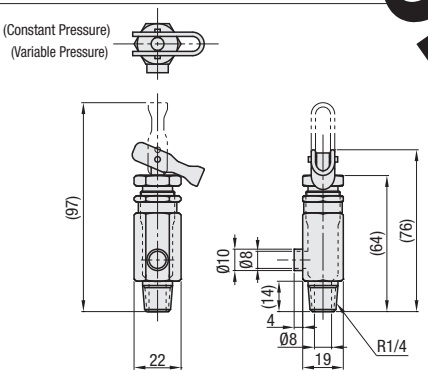
Order Example: Part Number

Days to Ship: 10 Days

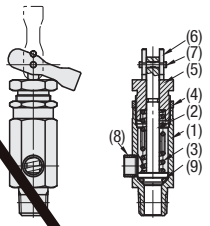
■Relief Valve

RoHS





■Structure Diagram



■Parts and Materials

No.	Name of Parts	Material
(1)	Body	1.4401/X5CrNiMo17-12-2
(2)	Stem	1.4401/X5CrNiMo17-12-2
(3)	Spring	1.4401/X5CrNiMo17-12-2-WPA
(4)	Lock Nut	1.4401/X5CrNiMo17-12-2
(5)	Lock Cap	1.4401/X5CrNiMo17-12-2
(6)	Stopper	1.4401/X5CrNiMo17-12-2
(7)	Pin	1.4401/X5CrNiMo17-12-2
(8)	Hose End	1.4401/X5CrNiMo17-12-2
(9)	O-Ring	Fluoro Rubber

Part Number			Usage	Upper Pressure Limit (MPa)	€ Unit Price 1 ~ 3 pcs.	
Type	Relief Valve Pressure (MPa) only	Relief Valve Pressure (MPa) only 0.05MPa increment				
Constant Pressure	0.2	0.05~0.25	For Low Pressure	0.3		
Variable Pressure	0.6	0.3~0.6	For High Pressure	0.65		

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number

Days to Ship: - Constant Pressure 8 Days - Variable Pressure 10 Days

■Specification
Applicable Fluid: Compressed Air Compressed Nitrogen Other Gases
Set Pressure: For Low Pressure 0.05 ~ 0.25Mpa
For High Pressure 0.3 ~ 0.6MPa

■Cautions on Installation and Handling
- Install in a place which is not subject to vibration.
- Do not squeeze the pipe to the connecting port in the halfway.

Not Available

Open Tanks
-Overview-

■Features

- Open-top tank suitable for storage or mixing of liquids (powders). Selectable from a wide capacity range from 2.0 to 45.8ℓ.
- By specifying inner diameter and desired depth, depth is automatically determined (refer to "How to Specify Tank Capacity" below).
- Selectable between 4 outlet shapes (see "Shapes of Liquid Outlets" below for details) and 2 types of covers, according to the application.
- Position of the tank can be adjustable by specifying the weld height of feet in 10mm increment.

■Product Overview

- (1) Effective Capacity: 2.0~45.8ℓ
- (2) Material: 304 Stainless Steel
- (3) Finish: Buffing on inner and outer surface Polishing grade 320 (* Note)

(* Note) Buff Polishing Grade: (a) 240--- Rough Buffing High level of brightness or luster is not provided.
(b) 320--- Standard Buff Polish Our product is provided with this type of polish.

■Condition of Use

- (1) Operating Pressure (Atmospheric Pressure)
- (2) 304 Stainless Steel Chemical Resistance (See Table 1 to the right for details)
- (3) Gasket for Sealing Cover (For physical properties and chemical resistance, see **P.358**)
  (See Table 2 below for oil and solvent resistance)
  Confirm (1) ~ (3) above before use.

Gasket for Sealing Cover Oil Resistance and Solvent Resistance

O: Good _: Acceptable Δ: Inferior X: Not Acceptable

Chemical Solution	Silicon	Chemical Solution	Silicon
Gasoline, Light Oil	Δ	Trichloroethylene	X
Benzene, Toluene	X	Methyl Alcohol	◯
Animal and Vegetable Oil	_	Methylethylketone	X
Diester Lubricating Oil	_	Ethyl Acetate	X
Phosphate-chlorinated Hydraulic Oil	Δ	Ether	X

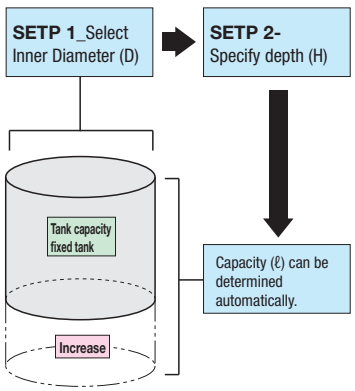
<Table 1> Stainless Steel Chemical Resistance Chart

◯: Excellent Δ: Slight Corrosion X: Severe Corrosion

Chemical Solution	1.4301/ X5CrNi18-10	Chemical Solution	1.4301/ X5CrNi18-10
Alcohol	◯	Bicarbonate Soda	◯
Ether	◯	Lactic Acid (5%, boiled)	Δ
Ammonia Water	◯	Lactic Acid (10%, boiled)	X
Butyric Acid	◯	Sulfuric Acid (5%)	Δ
Salt (Dry)	◯	Sulfuric Acid (50%)	X
Vinegar	◯	Chlorine Gas (Humid)	X
Dilute Nitric Acid	◯	Chlorine water	X
Concentrated Nitric Acid	X	Hydrochloric Acid	X
Acetic Anhydride	◯	Ferric Chloride	X
Acetic Anhydride (Boiled)	X	Bromine	X

The information in <Table 1> and <Table 2> above is reference data and to be used only as a guide. Values may differ depending on operational conditions or operating environment.

How to Specify Tank Depth



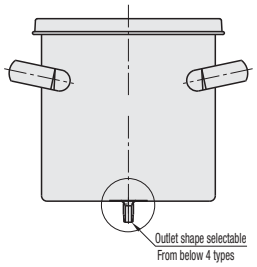
■Point

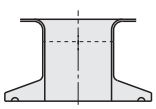
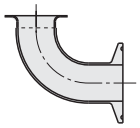
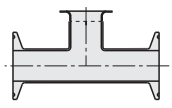
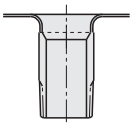
(1) Outer Diameter: Selectable from 6 sizes
(2) Capacity Configurable: Selectable from a depth range from 90 to 450mm
A variety of tank shapes is possible by the combination of (1)&(2).

Ex.) Tanks with full capacity of 5ℓ, with 3 different inner diameters

Inner Diameter (D)	Depth (H)	Features
180	200	Slim and deep tanks
210	150	Medium-sized tanks
240	115	Thick and shallow tanks

Liquid Outlet Variation

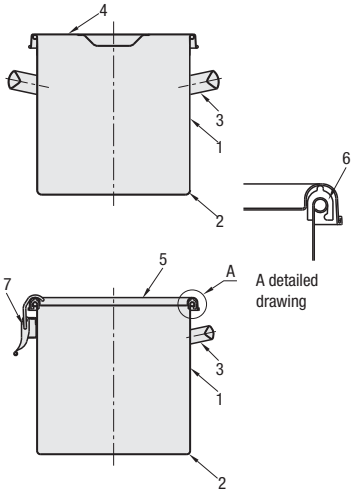


Sanitary Type (Straight)	Sanitary Type (L-Shaped)
	
Sanitary Type (T-Shaped)	**External Threads Type**
	

Point
(1) Sanitary type is selectable between 3 shapes; Straight, L-shape and T-shape.
(2) Male Thread type is selectable from R(PT) 1/8, 1 and 3/8.

Structure Diagram

No.	Part Name	Material	Qty.
(1)	Shell Plate	1.4301/X5CrNi18-10	1
(2)	Base Plate	1.4301/X5CrNi18-10	1
(3)	Carrying Handle	1.4301/X5CrNi18-10	2
(4)	Standard Cover	1.4301/X5CrNi18-10	1
(5)	Sealing Cover	1.4301/X5CrNi18-10	1
(6)	Gasket for Sealing Cover	Silicon Rubber	1
(7)	Clip	1.4301/X5CrNi18-10	3



Caution
CAUTION

- Use under atmospheric pressure. Never use for compressing.
- Never use as a container to generate vapor by steaming, heating or chemical reaction.

Standard Open-Top Tank
-Depth Fixed Type · Selectable Type-

NEW

Spec.Change Printed in Purple

Price Reduction up to 15%

CAD Data

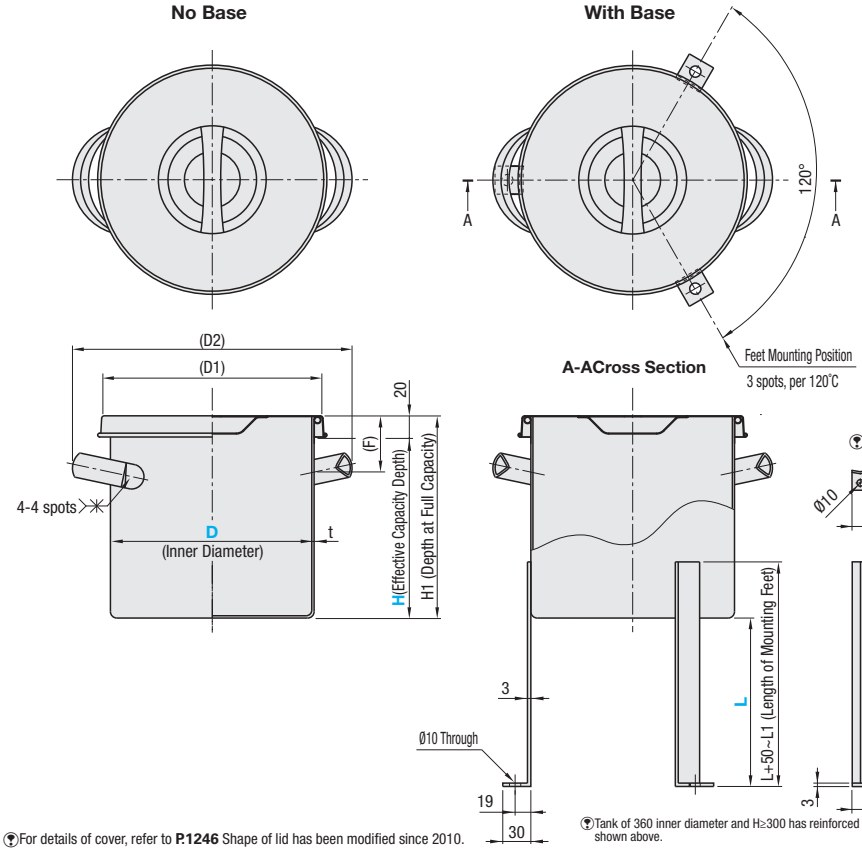
Features: Standard type tank whose depth is configurable in 10mm increment, within the effective capacity range of 2.0 ~ 45.8ℓ. Tank bottom position is also configurable in 10mm increment.

RoHS





Type	Type		Material					Surface Finish	Normal Operating Pressure
	Depth Fixed	Depth Selelctable	Body	Carrying Handle	Lid	Base	Clip		
No Base	TANK	TANKF	1.4301/X5CrNi18/10					Buffed (body only) Inner & Outer Surface: 320 Except bead portion on liquid outlet (joint portion)	Atmospheric Pressure
With Base	TANA	TANAF							



For details of cover, refer to **P.1246** Shape of lid has been modified since 2010.

Tank of 360 inner diameter and H≥300 has reinforced legs shown above.

Part Number Type			Inner Diameter (D)	Provided Effective Capacity Depth(H) Fixed	Provided Effective Capacity Depth(H) Specify in 10mm Increment For "Depth Selectable Type" only	Clamp Tank Bottom Height (L) 10mm Increment For "With Base" only	Effective Capacity DepthL Dimension Fixed Type(ℓ) Effective Capacity Depth	Effective Capacity DepthL Dimension Fixed Type(ℓ) At Full Capacity Water	t	H1	(D1)	(D2)	(F)	Weight(kg) Depth Fixed Type
	Depth Fixed	Depth Selectable	180	160	100~300	100~300	4.1	4.6	0.7	H+20	207	249	55	0.9
No Base	TANK	TANKF	210	190	100~300		6.6	7.3	0.7		236	282		1
With Base	TANA	TANAF	240	220	100~350		9.9	10.9	0.7		267	315		1.2
			270	250	100~350		14.3	15.5	0.8		296	350	70	1.8
			300	280	100~400		19.8	21.2	0.8		330	380		2.2
			360	340	100~450		34.6	36.6	0.9		390	469		3.6

Method of ordering depth configurable type has been changed.2009: Outer DiameterxEffective Capacity (0.5ℓ increment)→2010: Outer DiameterxDepth at Effective Capacity (10mm increment)
Effective Capacity (ℓ)=Radius (D/2)x3.14xDepth at Effective Capacity (H)/100000 (converted to capacity)
Full capacity level is a theoretical value that is obtained by calculation (base area x H1 depth). Use within the effective H depth (up to -20mm from upper surface).

Inner Diameter (D)	€ Unit Price 1~3 pcs. TANK Body Price	TANKF Body Price Depth at Effective Capacity (H) € Unit Price (H=100~140)	TANKF Body Price Depth at Effective Capacity (H) Added Capacity Price Factor(H) /50mm	Clamp Tank Bottom Height (L)	Leg Length (L1)	Base Price Added Capacity Price Factor tANA · tANAF
180				100~150	L+50	
210				160~200		
240				210~250		
270				260~300		
300				Reinforced Leg	(D=360&H≥300)	
360						

The price of With Base Type is the unit price shown above plus the price of base indicated to the right.

For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>	1	2
	TANKF240-270	TANAF180-130-L220
€ Unit Price of Tank Body (H=100~140)		
Added Capacity Price Factor(H)		
Added Capacity Price Factor		
Base Price Added Capacity Price Factor		
Total PricePrice Calculation Example		

*Coefficient of Depth Price: Round up to the nearest number:
Ex. 150~190→1, 200~240→2, 450→7

Order Example

Part Number		Effective Depth		Tank Bottom Height
TANK210 TANA180 TANAF240	-	300	-	L200 L250

Days to Ship

Depth Fixed, No Base Type: 8 Days

Depth Fixed, With Base Type · Capacity Configurable Type: 13 Days

Standard Open-Top Tank
-Outlet Shape Selectable Type-

NEW

Spec.Change Printed in Purple

Price Reduction up to 15%

CAD Data

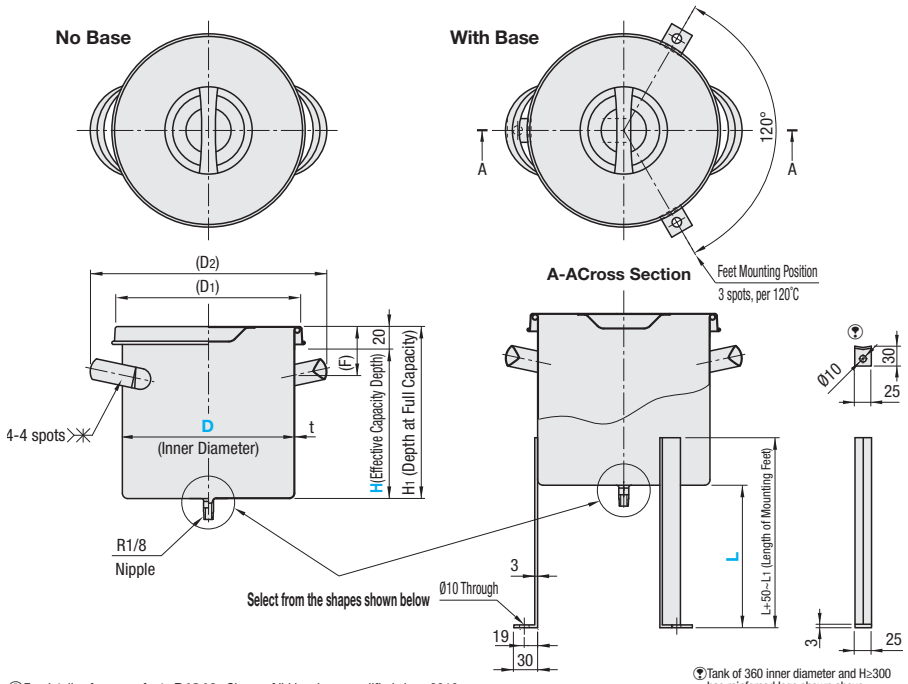
Features: Liquid outlet shape is selectable from 4 types (straight, L-shaped, T-shaped, threaded). Tank bottom position is also configurable in 10mm increment.

RoHS



Straight	L-Shaped
	
T-Shaped	**Male Thread**
	

Type	Type		Material					Surface Finish	Normal Operating Pressure
	Depth Fixed	Depth Selectable	Body	Carrying Handle	Lid	Base	Clip		
No Base	TANS	TANSF	1.4301/X5CrNi18-10					Buffed (body only) Inner & Outer Surface: 320 Except bead portion on liquid outlet (joint portion)	Atmospheric Pressure
With Base	TANSA	TANSAF							

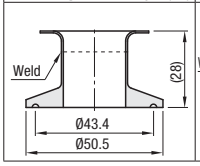


For details of cover, refer to **P.1246** Shape of lid has been modified since 2010.

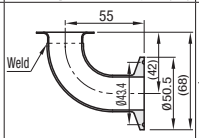
Tank of 360 inner diameter and H≥300 has reinforced legs shown above.

Sanitary Outlet Shapes

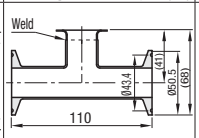
Shape A: Straight (1S)



Shape B: L-shaped (1S)

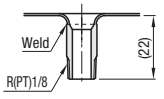


Shape C: T-shaped (1S)

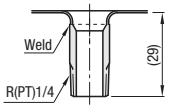


Male Thread Outlet Shapes

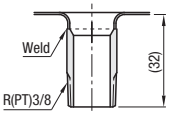
Shape D: R (PT) 1/8



Shape E: R (PT) 1/4



Shape F: R (PT) 3/8



Part Number			Effective Capacity Depth(H)		Clamp Tank Bottom Height(L) 10mm Increment For "With Base" only	Outlet Shape Selectable Type	Effective Capacity Depth L Dimension Fixed Type(ℓ)		t	H1	(D1)	(D2)	(F)	Weight(kg)
Type		Inner Diameter (D)	Fixed	Specify in 10mm Increment For "Depth Selectable Type" only			Effective Capacity Depth	At Full Capacity Water						Depth Fixed Type
No Base	Depth Fixed Type TANS	Depth Selectable TANSF	180	160	100~300	100~300	A B	4.1	4.6	0.7	H+20	207	249	55	0.9
			210	190	100~300			6.6	7.3			236	282		1
			240	220	100~350		C D	9.9	10.9			267	315		1.2
With Base	TANSA	TANSAF	270	250	100~350			14.3	15.5	0.8		296	350		1.8
			300	280	100~400		E F	19.8	21.2			330	380	70	2.2
			360	340	100~450			34.6	36.6	0.9		390	469		3.6

Method of ordering depth configurable type has been changed.2009: Outer DiameterxEffective Capacity (0.5ℓ increment)→2010: Outer DiameterxDepth at Effective Capacity (10mm increment)

Effective Capacity (ℓ)=Radius (D/2)x3.14xDepth at Effective Capacity (H)/100000 (converted to capacity)

Full capacity level is a theoretical value that is obtained by calculation (base area x H1 depth). Use within the effective H depth (up to -20mm from upper surface).

Inner Diameter (D)	€ Unit Price 1~3 pcs. TANS Body Price	TANSF Body Price Depth at Effective Capacity (H) € Unit Price (H=100~140)	Added Capacity Price Factor(H) /50mm	Shapes	Added Capacity Price Factor	Clamp Tank Bottom Height (L)	Leg Length (L1)	Base Price Added Capacity Price Factor TANSA TANSAF
180				A	+9,000	100~150	L+50	
210				B	+10,500	160~200		
240				C	+16,400	210~250		
270				D~F	+7,400	260~300		
300						Reinforced Leg	(D=360&H≥300)	
360								

For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>	1 TANS300-A	2 TANSAF240-270-L220-F
€ Unit Price of Tank Body (H=100~140)		
Added Capacity Price Factor(H)		
Added Capacity Price Factor		
Shapes Added Capacity Price Factor		
Base Price Added Capacity Price Factor		
Total PricePrice Calculation Example		

* Coefficient of Depth Price: Round up to the nearest number: Ex. 150~190→1, 200~240→2, 450→7

The price of With Base Type is the unit price+price of outlet shown above plus the price of base indicated to the right.

Order Example

Part Number	-	Effective Depth	-	Tank Bottom Height	-	Outlet Shape
TANS210					-	A
TANSA240			-	L250	-	E
TANSAF180	-	300	-	L200	-	C

Days to Ship **13 Days**

Seal-able Open-Top Tank

-Depth Fixed Type · Depth Selectable Type

Add. Spec.

Spec.Change Printed in Purple

Price Reduction up to 12%

CAD Data

Features: Seal-able type tank whose depth is configurable in 10mm increment, within the effective capacity range of 2.0 ~ 45.8ℓ. Tank bottom position is also configurable in 10mm increment.

RoHS

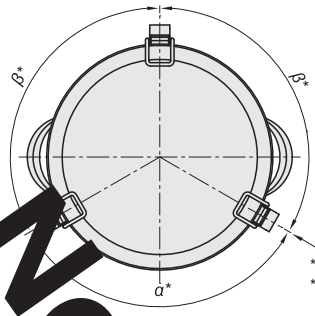




Type		Material						Surface Finish	Normal Operating Pressure
Type	Depth Fixed / Depth Selectable	Body	Carrying Handle	Lid	Base	Clip			
No Base		1.4301/X5CrNi18-10						Buffed (body only) Inner & Outer Surface: 320 Except bead portion on liquid outlet (joint portion)	Atmospheric Pressure
With Base									

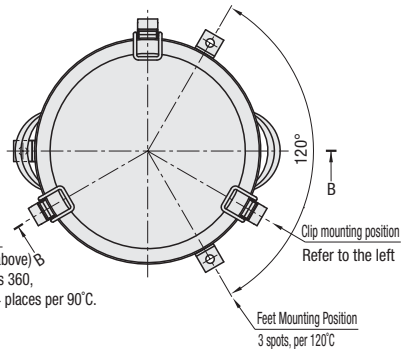
Features of Silicon Rubber **P.358** Features of Gasket for Sealing Cover **P.1241**

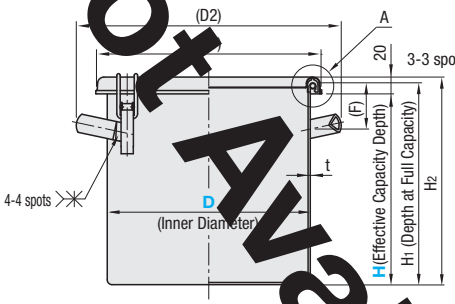
No Base



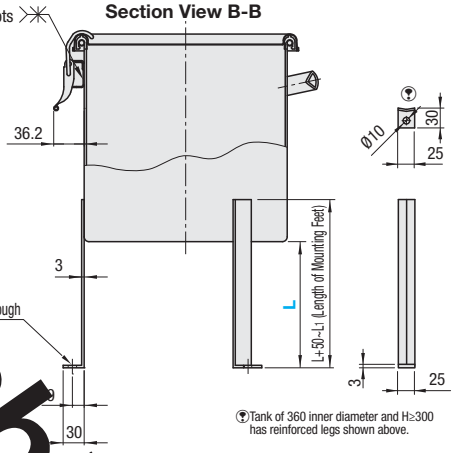
Inner Diameter	α	β
180	104°	128°
210	108°	126°
240	120°	120°
270	120°	120°
300	120°	120°
360	90°	90°

With Base





Section View B-B



Detail of A



Tank of 360 inner diameter and H≥300 has reinforced legs shown above.

For details of cover and gasket for sealing cover, refer to **P.1246**

Part Number Type	Inner Diameter (D)	Effective Capacity Depth(H) Fixed	Effective Capacity Depth(H) Specify in 10mm Increment For "Depth Selectable Type" only	Clamp Tank Bottom Height(L) 10mm Increment For "With Base" only	Effective Capacity Depth	Effective Capacity Conversion Fixed Type(ℓ) Capacity Water	t	H1	H2	(D1)	(D2)	(F)	Weight(kg) Depth Fixed Type
Depth Fixed Depth Selectable / No Base / With Base	180	160	100~300	100~300	4.1	4.6	0.7	H+20	H1+4	206	249	55	1.3
	210	190	100~300		6.6	7.3			H1+6	234	282		1.6
	240	220	100~350		9.9	10.9			H1+7	269	315		2
	270	250	100~350		14.3	15.5	0.8			297	350		2.7
	300	280	100~400		19.8	21.2			H1+6	330	380	70	3.2
	360	340	100~450		34.6	36.6	0.9			390	469		5

Method of ordering depth configurable type has been changed.2009: Outer DiameterxEffective Capacity (0.5ℓ increment)→2010: Outer DiameterxDepth at Effective Capacity (10mm increment)
Effective Capacity (ℓ)=Radius (D/2)x3.14xDepth at Effective Capacity (H)/100000 (converted to capacity) It is not possible to pressurize a seal-able open-top tank. Use under atmospheric pressure.
Full capacity level is a theoretical value that is obtained by calculation (base area x H1 depth). Use within the effective H depth (up to -20mm from upper surface).

Inner Diameter (D)	€ Unit Price 1~3 pcs. Body Price	Body Price Depth at Effective Capacity (H) € Unit Price (H=100~140)	Body Price Depth at Effective Capacity (H) Added Capacity Price Factor(H) /50mm	Clamp Tank Bottom Height (L)	Leg Length (L1)	Base Price Added Capacity Price Factor
180				100~150	L+50	
210				160~200		
240				210~250		
270				260~300		
300				Reinforced Leg (D=360&H≥300)		
360						

For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>	1 TANKMF240-270	2 TANAMF180-130-L220
€ Unit Price of Tank Body (H=100~140)		
Added Capacity Price Factor(H)		
Added Capacity Price Factor		
Base Price Added Capacity Price Factor		
Total PricePrice Calculation Example		

*Coefficient of Depth Price: Round up to the nearest number
Ex. 150~190→1, 200~240→2, 450→7

The price of With Base Type is the unit price shown above plus the price of base indicated to the right.

Order Example

Part Number	-	Effective Depth	-	Tank Bottom Height
	-	300	-	L250

Days to Ship

-Depth Fixed, No Base Type: 8 Days

-Depth Fixed, With Base Type Capacity Selectable Type: 13 Days

Not Available

Add. Spec.

Seal-able Open-Top Tank
-Outlet Shape Selectable Type-

Spec.Change Printed in Purple

Price Reduction up to 12%

CAD Data

Features: Seal-able type tank whose liquid outlet shape is selectable from 4 types (straight, L-shaped, T-shaped, threaded). Tank bottom position is also configurable in 10mm increment

RoHS





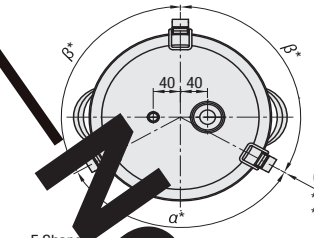
Straight	L-Shaped
	
T-Shaped	**Male Thread**
	

Type	Type		Material					Surface Finish	Normal Operating Pressure
	Depth Fixed	Depth Selectable	Body	Carrying Handle	Lid	Base	Clip		
No Base			1.4301/X5CrNi18-10					Buffed (body only) Inner & Outer Surface: 320 Except bead portion on liquid outlet (joint portion)	Atmospheric Pressure
With Base									

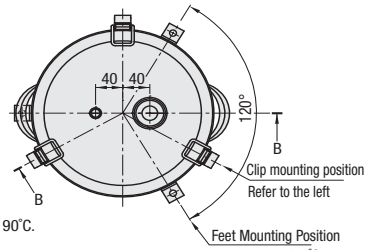
Features of Silicon Rubber **P.358** Features of Gasket for Sealing Cover **P.1241**

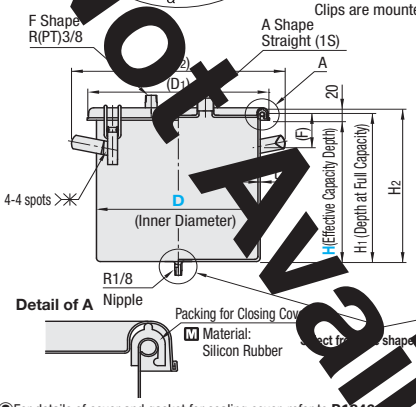
No Base

Inner Diameter	α	β
180	104°	128°
210	108°	126°
240	120°	120°
270	120°	120°
300	120°	120°
360	90°	90°

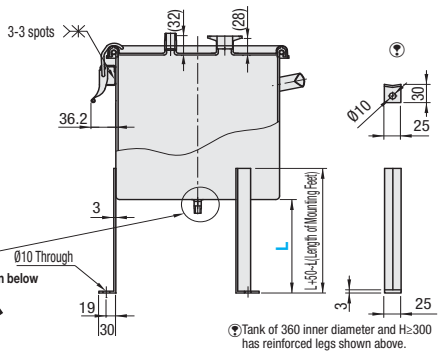


With Base





Section View B-B

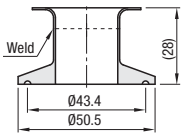


Tank of 360 inner diameter and H≥300 has reinforced legs shown above.

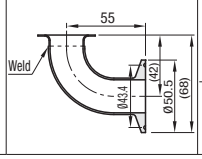
For details of cover and gasket for sealing cover, refer to **P.1240**

Sanitary Outlet Shapes

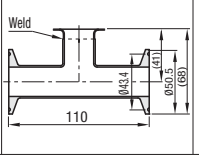
Shape A: Straight (1S)



Shape B: L-shaped (1S)

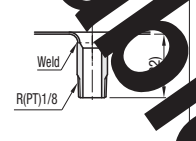


Shape C: T-shaped (1S)

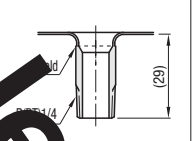


Male Thread Outlet Shapes

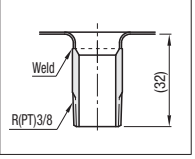
Shape D: (PT) 1/8



Shape E: R (PT) 1/4



Shape F: R (PT) 3/8



Part Number Type	Inter Diameter (D)	Effective Capacity Depth(H) Fixed Type	Specify in 10mm Increment For "Depth Selectable Type" only	Clamp Tank Bottom Height(L) 10mm Increment For "With Base" only	Outlet Shape Selectable Type	Effective Capacity Depth L Dimension Fixed Type(ℓ) Effective Capacity Depth	At Full Capacity(Water)	t	H1	H2	(D1)	(D2)	(F)	Weight(kg) Depth Fixed Type
Depth Fixed / Depth Selectable; No Base / With Bose	180	160	100~300	100~300	A B	4.1	4.6	0.7	20	H1+4	206	249	55	1.3
	210	190	100~300			6.6	7.3	0.7		H1+6	234	282		1.6
	240	220	100~350		C D	9.9	10.9	0.7		H1+7	269	315		2
	270	250	100~350			14.3	15.5	0.8		H1+6	297	350		2.7
	300	280	100~400		E F	19.8	21.2	0.8		H1+6	330	380	70	3.2
	360	340	100~450			34.6	36.6	0.9		H1+6	390	469		5

DepthMethod of ordering depth configurable type has been changed.2009: Outer DiameterxEffective Capacity (0.5ℓ increment)→2010: Outer DiameterxDepth at Effective Capacity (10mm increment)
Effective Capacity (ℓ)=Radius (D/2)x3.14xDepth at Effective Capacity (H)/100000 (converted to capacity) It is not possible to pressurize a seal-able open-top tank. Use under atmospheric pressure.
Full capacity level is a theoretical value that is obtained by calculation (base area x H1 depth). Use within the effective H depth (up to -20mm from upper surface).

€ Unit Price1~3pieces

Inner Diameter (D)	Body Price	Body Price Depth at Effective Capacity (H) € Unit Price (H=100~140)	Body Price Depth at Effective Capacity (H) Added Capacity Price Factor(H)/50mm	Shapes Added Capacity Price Factor		Clamp Tank Bottom Height (L)	Leg Length (L1)	Base Price Added Capacity Price Factor
180				A		100~150	L+50	
210				B		160~200		
240				C		210~250		
270				D~F		260~300		
300						Reinforced Leg (D=360&H≥300)		
360								

For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>	1	2
€ Unit Price of Tank Body (H=100~140)		
Added Capacity Price Factor(H)		
Added Capacity Price Factor		
ShapesAdded Capacity Price Factor		
Base Price Added Capacity Price Factor		
Total PricePrice Calculation Example		

The price of With Base Type is the unit price+price of outlet shown above plus the price of base indicated to the right.
Body price will be inclusive of the price of liquid inlet (Shape A + Shape F), which is welded to the lid.

* Coefficient of Depth Price: Round up to the nearest number:
Ex. 150~190→1, 200~240→2, 450→7

Order Example

Part Number	-	Effective Depth	-	Tank Bottom Height	-	Outlet Shape
					-	A
			-	L250	-	E
	-	300			-	C

Days to Ship **13 Days**

Not Available

Add. Spec.

Covers / Gasket for Seal-able Lids / Stands for Open-Top Tanks
-Outlet Shape Selectable Type-

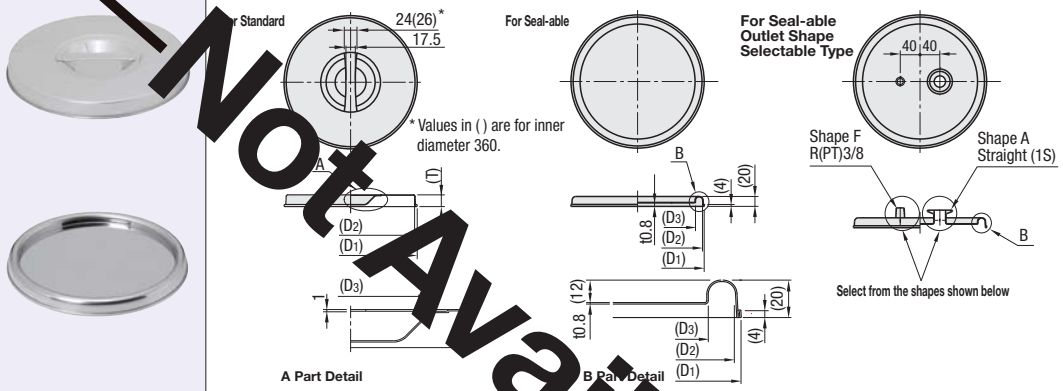
Spec.Change Printed in Purple

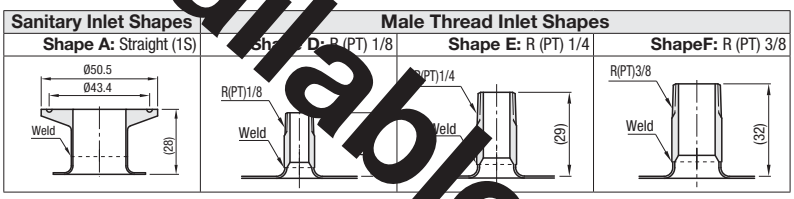
CAD Data

Features: Upper column mid column: Tank components can be ordered from one unit. Shape of the inlet on cover for seal-able type tank is selectable. Lower column: Detachable tank holder.

Cover for Open-Top Tanks RoHS

Type			Material	Normal Operating Pressure
For Standard	For Seal-able			
	For Standard	For Outlet Shape Selectable		
			1.4301/ X5CrNi18-10	Atmospheric Pressure





Cover for Standard Open-Top Tank

Part Number Type	Tank Inner Dia (D)	(D1)	(D2)	(D3)	(T)	€ Unit Price
	180	207	197	92	22	
	210	236	226			
	240	267	257			
	270	296	286			
	300	330	320		25	
	360	390	380	109		

As for TANCV, shape of lid has been modified.

Cover for Seal-able Open-Top Tank

Part Number Type	Tank Inner Dia (D)	Inlet Shape TANCVS Only	(D1)	(D2)	(D3)	€ Unit Price Body € Unit Price	€ Unit Price Price of Outlet
For Standard Type	180	A D E F	206	198	175		A: + 90,00 EUR/unit
	210		234	227	202		D ~ F: + 74,00 EUR/unit
	240		269	262	234		
For Outlet Shape Selectable Type	270		297	290	260		
	300		330	323	291		
	360		390	382	352		

For orders larger than indicated quantity, please request a quotation.

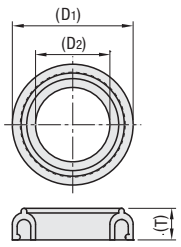
When ordering an Outlet Shape Selectable Type Cover for Seal-able Open-top Tank, choose TANCVS, which is for liquid discharging under airtight condition.
The price of TANCVS is the € Unit Price plus the price of two outlets.

Order Example: Part Number - For Inlet Shape Selectable Type
- A - A

Days to Ship: -TANCV · TANCVM 8 Days; -TANCVS 13 Days

Seal RoHS TANSEL



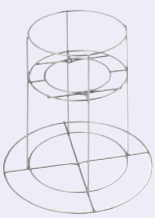


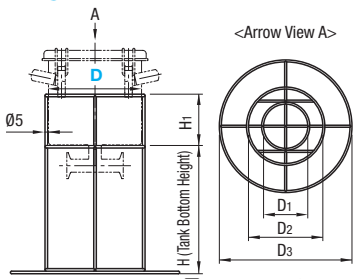
Material: Silicon Rubber

Part Number Type	Tank Inner Dia (D)	(D1)	(D2)	(T)	€ Unit Price 1 ~ 3 pcs.
Seal TANSEL	180	195	177	13	
	210	226	205	16	
	240	260	235	17	

Features of Silicon Rubber P.358 Features of Gasketfor Sealing Cover P.1241
For orders larger than indicated quantity, please request a quotation.

Stand RoHS TANSTD





Material: 1.4301/X5CrNi18-10

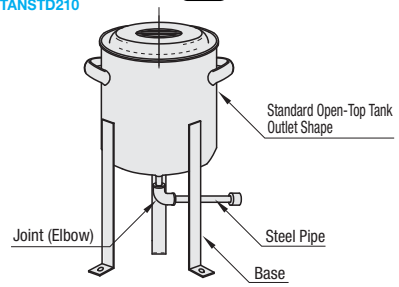
Part Number Type	Tank Inner Dia (D)	H	D1	D2	D3	H1	€ Unit Price 1 ~ 3 pcs.
Stand TANSTD	180	250	120	195	330	100	
	210		150	225	350	120	
	240		180	255	370	140	

D1 fits any of the outlet shapes of the Selectable Type.
For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number TANSEL180 TANSTD210

Days to Ship: 8 Days

Example



Not Available

Standard Type Open-Top Tank
-Hopper Type-

CAD Data

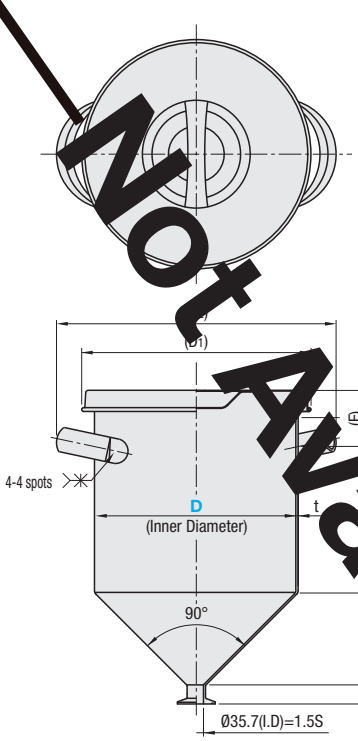
RoHS

Type		Material					Surface Finish	Normal Operating Pressure
No Base	With Base	Body	Leg Length	Lid	Base	Clip		
		1.4301/X5CrNi18-10					Buffed (body only) Inner & Outer Surface: 320 Except bead portion on liquid outlet (joint portion)	Atmospheric Pressure

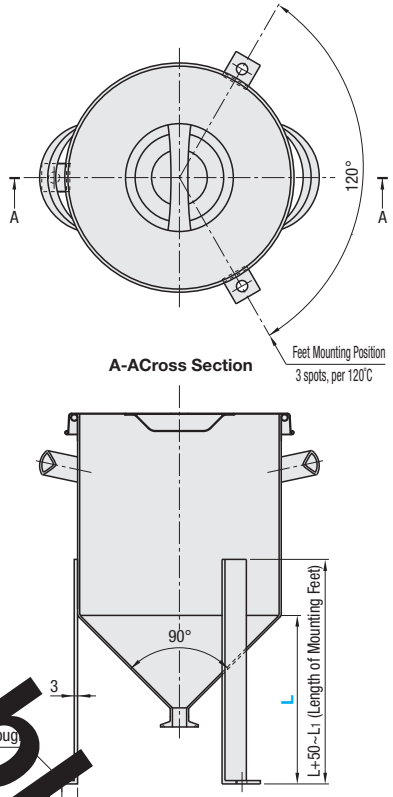




No Base



With Base



Not Available

Part Number		Effective Capacity Depth(H)	Clamp Tank Bottom Height(L) 10mm Increment ⓨFor "With Base" only	t	H1	(H2)	(D1)	(D2)	(F)	G	Capacity of Hopper Part (DxG)
Type	Inner Diameter (D)	10mm Increment									
No Base With Base	240	100~350	180~300	0.8	H+20	H+G+26	267	315	55	103	1.8ℓ
	270	100~350		1			296	350	70	118	2.5ℓ
	300	100~400		1			330	380	70	133	3.5ℓ

ⓨEffective Capacity of Body (ℓ) =Radius (D/2)xRadius(D/2)x3.14xDepth at Effective Capacity (H)/1000000 (converted to capacity) Total Effective Capacity=Effective Capacity of Body + Capacity of Hopper Parts
ⓨFull capacity level is a theoretical value that is obtained by calculation (base area x H1 depth). Use within the effective H depth (up to -20mm from upper surface).

Inner Diameter (D)	€ Unit Price 1~3 pcs.				
	Body Price Depth at Effective Capacity (H)		Clamp Tank Bottom Height (L)	Leg Length (L1)	Base Price Added Capacity Price Factor TANHAF
	€ Unit Price (H=100~140)	Added Capacity Price Factor(H)/50mm			
240			180~200	L+50	
270			210~250		
300			260~300		

ⓨThe price of With Base Type is the unit price shown above plus the price of base indicated to the right.
ⓨFor orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>	1	2
	240-190	300-300-L220
€ Unit Price of Tank Body (H=100~140)		
Added Capacity Price Factor(H)		
Added Capacity Price Factor		
Base Price Added Capacity Price Factor		
Total PricePrice Calculation Example		

Added Depth Price Factor: Round up to the nearest number: Ex. 150~190→1, 200~240→2, 400→6

Order Example

Part Number - Effective Capacity - Tank Bottom Height

- 300
- 400 - L200

Days to Ship: 13 Days

Seal-able Open-Top Tank
-Hopper Type-

CAD Data

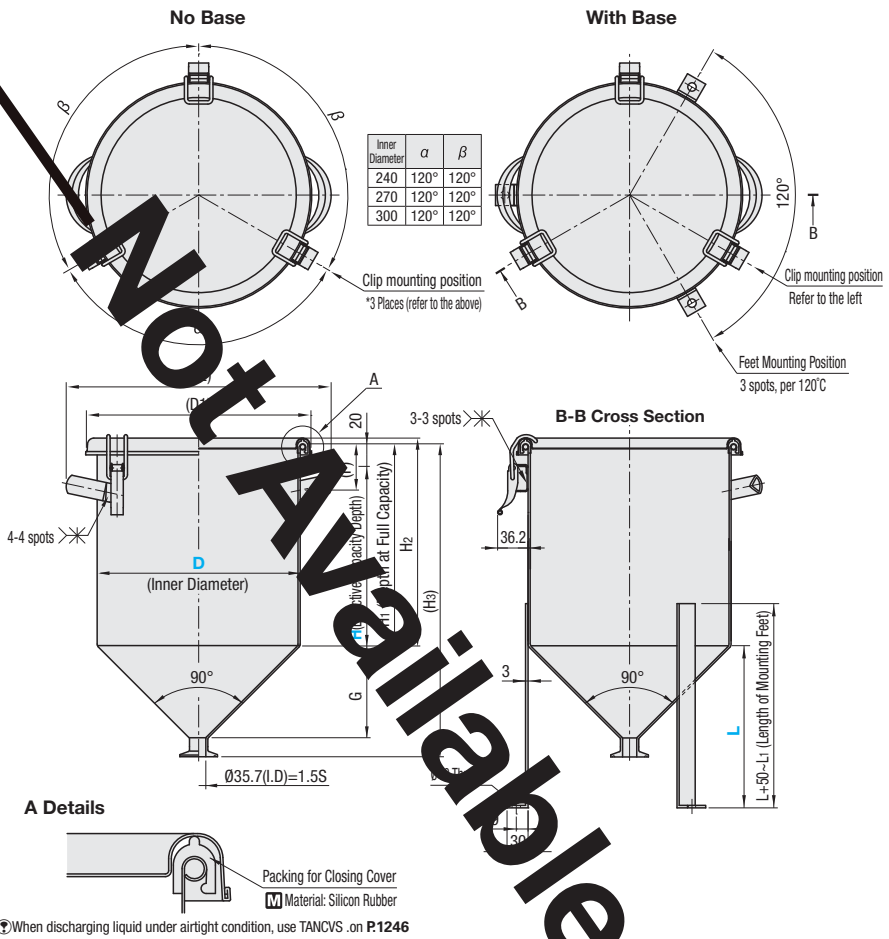
RoHS

Type		Material					Surface Finish	Normal Operating Pressure
Base Price No Base	Base Price O-Ring	€ Unit Price Body	Leg Length	Lid	Base Price	Clamp TangO-Ring		
		1.4301/X5CrNi18-10					Buffed (body only) Inner & Outer Surface: 320 Except bead portion on liquid outlet (joint portion)	Atmospheric Pressure

Features of Silicon Rubber **P.358** Features of Gasket for Sealing Cover **P.1241**







A Details

When discharging liquid under airtight condition, use TANCVS .on **P.1246**

Not Available

Part Number Type	Inner Diameter (D)	Effective Capacity Depth(H) 10mm Increment	Clamp Tank Bottom Height(L) 10mm Increment For "With Base" only	t	H1	H2	(H3)	(D1)	(D2)	(F)	G	Capacity of Hopper Part (DxG)
No Base With Base	240	100~350	180~300	0.8	H+20	H1+7	H+G+26	269	315	55	103	1.8ℓ
	270	100~350		1		H1+6		297	339	70	118	2.5ℓ
	300	100~400		1		H1+6		330	380	70	133	3.5ℓ

Effective Capacity of Body (ℓ) =Radius (D/2)xRadius(D/2)x3.14xDepth at Effective Capacity (H)/1000000 (converted to capacity) Total Effective Capacity=Effective Capacity of Body+Capacity of Hopper Parts
Full capacity level is a theoretical value that is obtained by calculation (base area x H1 depth). Use within the effective H depth (up to -20mm from upper surface).
It is not possible to pressurize a seal-able open-top tank. Use under atmospheric pressure.

Inner Diameter (D)	€ Unit Price 1~3 pcs. Body Price Depth at Effective Capacity (H) € Unit Price (H=100~140)	Added Capacity Price Factor(H)/50mm	Clamp Tank Bottom Height (L)	Leg Length (L1)	Base Price Added Capacity Price Factor TANHAMF
240			180~200	L+50	
270			210~250		
300			260~300		

The price of With Base Type is the unit price shown above plus the price of base indicated to the right.
For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>	1 240-190	2 300-300-L220
€ Unit Price of Tank Body (H=100~140)		
Added Capacity Price Factor(H)		
Added Capacity Price Factor		
Base Price Added Capacity Price Factor		
Total PricePrice Calculation Example		

Added Depth Price Factor: Round up to the nearest number: Ex. 150~190→1, 200~240→2, 400→6

Order Example

Part Number - Effective Capacity - Tank Bottom Height

- 300
- 400 - L200

Days to Ship: **13 Days**

Vacuum Plumbing Parts
-NW (KF) Flexible Tubes-

Add. Spec.

Reduced Delivery Time

Price Reduction up to 55%

Related Products: For O-Ring of large diameter, refer to **P.1314**

CAD Data

Standard



JIS Flanged



Compact

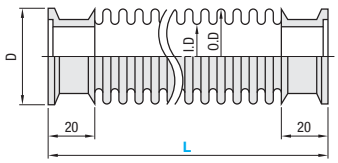


Connected with Stainless Pipe Hollow



RoHS

FRNW (Standard)



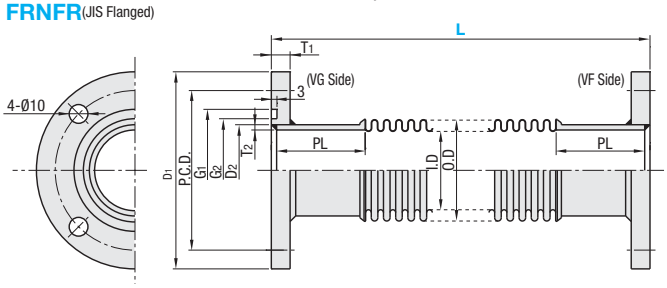
Features

These vacuum pipes are for auxiliary exhaust system of High Vacuum System or rough vacuum fitting of an Ultrahigh Vacuum System.
The flexibility of the pipe enables it to absorb the vibration from vacuum pumps · vacuum system to weaken the swing of vacuum fittings.
Distance adjustment is available due to its flexibility of length.

type	Material	Standards	Operating Pressure	Allowable Leak Amount O-Ring-Clamp Tang	Max. Operating Temp.
FRNW	1.4301/ X5CrNi18-10	ISO2861/1-1974 JISB8365:1988 Nitrile Rubber	0.1MPa~-0.1MPa	$1x10^{-9}$Torr-ℓ/sec or lower	200°C
FRNFR					
FRNFC					
FRNFS	*				

* Body of Flexible Tube: 1.4404/X2CrNiMo17-12-2 Joint: 304 Stainless Steel

FRNFR (JIS Flanged)



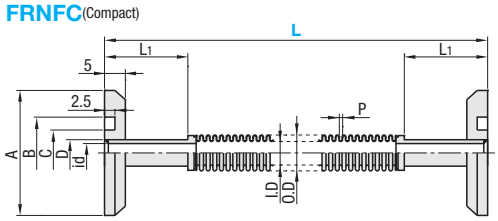
How to Connect

- Flanged connection at one side VG and the other side VF Both sides fixed flange.

Applicable O-Ring Specification

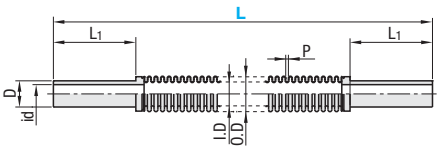
No.	O-Ring Size	Material
20	V38	NBR/Viton
25	V40	NBR/Viton
40	V55	NBR/Viton
50	V70	NBR/Viton

FRNFC (Compact)



FRNFS (Connected Stainless Steel Pipe)

For details of stainless steel pipe fittings, refer to **P.1161~1164**



Part Number Type	No.	L 50mm Increment	I.D	O.D	D	Min. Bending Radius (mm)	€ Unit Price 1~4 pcs. L100 · 150	L200 · 250	L300~1000 € Unit Price	L300~1000 Tube Price-/50mm
FRNW	10	100~1000	12	16.5	30	40				
	16		21.5	28.5	30	50				
	25		26.5	36.5	40	70				
	40		41.5	54	55	100				
	50		50.5	65	75	160				

For L≥300, Total Price is € Unit Price plus (specified L dimension-300xTube Price/50mm. 310~340 round up to 350, 360~390 round up to 400.
<Price Calculation Example>For FRNW25-380: € Unit Price 95,00 EUR+[(4,00-3,00)/50]x3,00=101,00 EUR

For orders larger than indicated quantity, please request a quotation.

Part Number Type	No.	L 50mm Increment	I.D	O.D	D_1	D_2	T_1	T_2	G_1	G_2	P.C.D.	PL	€ Unit Price 1~4 pcs. L100 · 150	L200 · 250	L300~1000 € Unit Price	L300~1000 Tube Price-/50mm
FRNFR	20	100~1000	26.5	36	80	27.2	8	2.1	44	34	60	30				
	25	150~1000	33	44	90	34	8	2.8	50	40	70	50				
	40	150~1000	50.5	65	105	48.6	10	2.8	65	55	85	50				
	50	150~1000	66	86	120	60.5	10	2.8	80	70	100	50				

For L≥300, Total Price is € Unit Price plus (specified L dimension-300xTube Price/50mm. 310~340 round up to 350, 360~390 round up to 400.
<Price Calculation Example>For FRNFR25-380: € Unit Price 120,00 EUR+[(4,00-3,00)/50]x3,00=126,00 EUR

For orders larger than indicated quantity, please request a quotation.

Part Number Type	No.	L 50mm Increment	A	B	C	D	I.D	O.D	P	id	L_1	Min. Bending Radius (mm)	€ Unit Price 1~4 pcs. L100 · 150	L200 · 250	L300~1000 € Unit Price	L300~1000 Tube Price-/50mm
FRNFC	16	100~1000	30	17.2	11	6.35	5.5	8.5	1.6	4.5	20	30				
	25		40	26.2	20	9.52	10	13.5	2.5	7	25	25				
	40		55	41.2	35	12.7	12.5	16.5	2.8	10	30	40				

For L≥300, Total Price is € Unit Price plus (specified L dimension-300xTube Price/50mm. 310~340 round up to 350, 360~390 round up to 400.
<Price Calculation Example>For FRNFC25-380: € Unit Price 95,00 EUR+[(4,00-3,00)/50]x2,50=100,00 EUR

For orders larger than indicated quantity, please request a quotation.

Part Number Type	No.	L 50mm Increment	D	I.D	O.D	P	id	L_1	Min. Bending Radius (mm)	€ Unit Price 1~4 pcs. L100 · 150	L200 · 250	L300~1000 € Unit Price	L300~1000 Tube Price-/50mm
FRNFS	16	100~1000	6.35	5.5	8.5	1.6	4.5	20	30				
	25		9.52	10	13.5	2.5	7	25	25				
	40		12.7	12.5	16.5	2.8	10	30	40				

For L≥300, Total Price is € Unit Price plus (specified L dimension-300xTube Price/50mm. 310~340 round up to 350, 360~390 round up to 400.
<Price Calculation Example>For FRNFS25-380: € Unit Price 96,00 EUR+[(4,00-3,00)/50]x4,00=68,00 EUR

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	L
FRNW10	-	200

Days to Ship **10 Days**

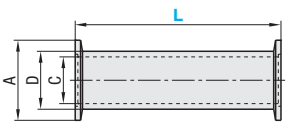
Both Sides Welded Vacuum Hollows

CAD Data

■Both NW Flanged



Type	Material
FRNRF	1.4301/X5CRNI18-10



RoHS

Part Number		L				€ Unit Price 1~4 pcs.	
Type	No.	10mm Increment	A	C	D	€ Unit Price	L Pipe Price /100mm
FRNRF	10	100~1000	30	10	13.8		
	16		30	17.5	21.7		
	25		40	23	27.2		
	40		55	37.1	42.7		

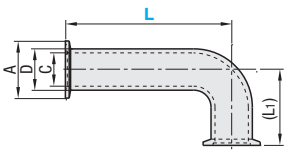
For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>: Price=€ Unit Price+L Pipe Price
For L pipe price, charge is added for every 100mm of L dimension. 100 ~ 200 round up to 200.
‹Price Calculation Example› : For FRNRF25-250€ Unit Pricece 110,00 EUR+L Hollow Price: 12,00 EURx3(250/100=2.5 Round up to 3)=110,00 EUR+36,00 EUR=146,00 EUR

■NW FlangedxElbow



Type	Material
FRNRE	1.4301/X5CRNI18-10



RoHS

Part Number		L					€ Unit Price 1~4 pcs.	
Type	No.	10mm Increment	A	C	D	(L1)	€ Unit Price	L Pipe Price /100mm
FRNRE	16	100~1000	30	17.5	21.7	58.1		
	25		40	23	27.2	58.1		
	40		55	37.1	42.7	67.6		

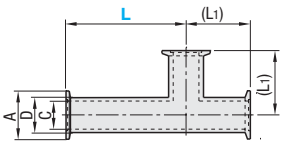
For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>: Price=€ Unit Price+L Pipe Price
For L pipe price, charge is added for every 100mm of L dimension. 100 ~ 200 round up to 200.
‹Price Calculation Example› : For FRNRE25-250€ Unit Pricece 150,00 EUR+L Hollow Price: 12,00 EURx3(250/100=2.5 Round up to 3)=150,00 EUR+36,00 EUR=186,00 EUR

■NW FlangedxTees



Type	Material
FRNRT	1.4301/X5CRNI18-10



RoHS

Part Number		L					€ Unit Price 1~4 pcs.	
Type	No.	10mm Increment	A	C	D	(L1)	€ Unit Price	LPipe Price /100mm
FRNRt	16	100~1000	30	17.5	21.7	45.4		
	25		40	23	27.2	48.6		
	40		55	37.1	42.7	67.6		

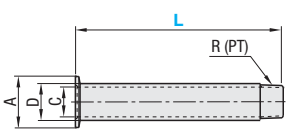
For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>: Price=€ Unit Price+L Pipe Price
For L pipe price, charge is added for every 100mm of L dimension. 100 ~ 200 round up to 200.
‹Price Calculation Example› : For FRNRT25-250€ Unit Pricece 180,00 EUR+L Hollow Price: 12,00 EURx3(250/100=2.5 Round up to 3)=180,00 EUR+36,00 EUR=216,00 EUR

■NW FlangedxMale Thread



Type	Material
FRNRFA	1.4301/X5CRNI18-10



RoHS

Part Number		L					€ Unit Price 1~4 pcs.	
Type	No.	10mm Increment	A	C	D	R(PT)	€ Unit Price	L Pipe Price /100mm
FRNRFA	16	100~1000	30	7.1	10.5	1/8		
	25		40	9.4	13.8	1/4		
	40		55	12.7	17.3	3/8		

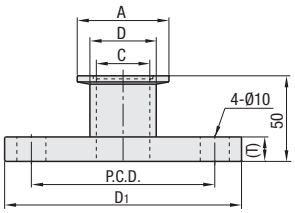
For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example>: Price=€ Unit Price+L Pipe Price
For L pipe price, charge is added for every 100mm of L dimension. 100 ~ 200 round up to 200.
‹Price Calculation Example› : For FRNRFA25-250€ Unit Pricece 120,00 EUR+L Hollow Price: 12,00 EURx3(250/100=2.5 Round up to 3)=120,00 EUR+36,00 EUR=156,00 EUR

■NW FlangedxFlanged



Type	Material
FRNRFR	1.4301/X5CRNI18-10



RoHS

Part Number								€ Unit Price
Type	No.	A	C	D	D1	(T)	P.C.D.	1~4 pcs.
FRNRFR	10	30	10	13.8	70	8	50	
	16	30	17.5	21.7	70	8	50	
	25	40	23	27.2	80	8	60	
	40	55	37.1	42.7	105	10	85	

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	L
FRNRF25	-	300

Days to Ship **10 Days**

Fittings for Vacuum Plumbing
-NW (KF) Flanged-

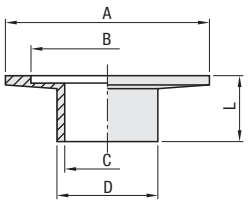
Price Reduction up to 48%

CAD Data

■NW Flanged RoHS



FRNWF



Max Operation Temperature: 200°C Material: 1.4301/X5CRNI18-10

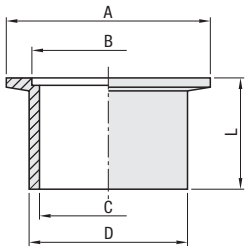
Part Number Type	No.	A	B	C	D	L	€ Unit Price Qty.1-4
FRNWF	10	30	12.2	10.0	13.8	20	
	16	30	17.2	17.5	21.7		
	25	40	26.2	23.0	27.2		
	40	55	41.2	37.1	42.7		
	50	75	52.2	54.9	60.5		

For orders larger than indicated quantity, please request a quotation.

■NW Long Flanged RoHS



FRNWLF



Max Operation Temperature: 200°C Material: 1.4301/X5CRNI18-10

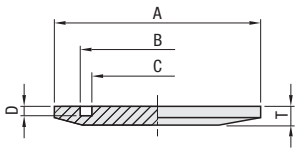
Part Number Type	No.	A	B	C	D	L	€ Unit Price Qty.1-4
FRNWLF	10	30	12.2	10.0	13.8	50	
	16	30	17.2	17.5	21.7		
	25	40	26.2	23.0	27.2		
	40	55	41.2	37.1	42.7		
	50	75	52.2	54.9	60.5		

For orders larger than indicated quantity, please request a quotation.

■NW Blind Flanged RoHS



FRNWBF



Max Operation Temperature: 200°C Material: 1.4301/X5CRNI18-10

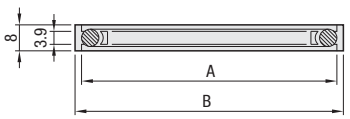
Part Number Type	No.	A	B	C	D	T	€ Unit Price Qty.1-4
FRNWBF	10	30	12.2	6.0	2.5	5	
	16	30	17.2	11.0			
	25	40	26.2	20.0			
	40	55	41.2	35.0			
	50	75	52.2	46.0			

For orders larger than indicated quantity, please request a quotation.

■Center Rings -With Outer- RoHS



FRNWR



Material: Ring: 1.4401/X5CrNiMo17-12-2
Max Operation Temperature: 150°C O-Ring: Flourine-Rubber

Part Number Type	No.	A	B	€ Unit Price Qty.1-4
FRNWR	16	30	32	
	25	40	42	
	40	55	57	
	50	75	77	

Commonly used for No.10 and 16.
For orders larger than indicated quantity, please request a quotation.

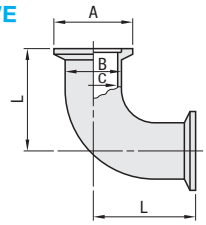
■Features

Center rings prevent O-Rings falling off and suppress deformation.

■Elbow RoHS



FRNWE



Max Operation Temperature: 200°C Material: 1.4301/X5CRNI18-10

Part Number Type	No.	A	B	C	L	€ Unit Price Qty.1-4
FRNWE	10	30	13.8	10	40	
	16	30	21.7	16	40	
	25	40	27.2	23	50	
	40	55	42.7	37.1	65	
	50	75	60.5	54.9	80	

For orders larger than indicated quantity, please request a quotation.

Order Example Part Number: FRNWF16

Days to Ship -FRNWR: 6 Days P.87 - Others: 10 Days

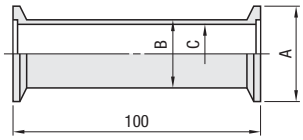
Fittings for Vacuum Plumbing
-NW (KF) Flanged-

CAD Data

■Nipple RoHS



FRNWN



Max Operation Temperature: 200°C Material: 1.4301/X5CrNi18-10

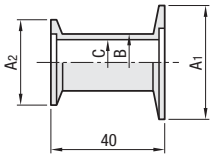
Part Number Type	No.	A	B	C	€ Unit Price Qty.1-4
FRNWN	10	30	13.8	10	
	16	30	21.7	16	
	25	40	27.2	24	
	40	55	42.7	39	
	50	75	60.5	55	

For orders larger than indicated quantity, please request a quotation.

■Reducer RoHS



FRNWJ



Max Operation Temperature: 200°C Material: 1.4301/X5CrNi18-10

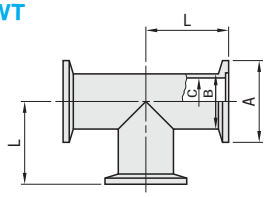
Part Number Type	No.	A1	A2	B	C	€ Unit Price Qty.1-4
FRNWJ	25-10	40	30	13.8	10	
	25-16	40	30	21.7	16	
	40-16	55	30	21.7	16	
	40-25	55	40	27.2	24	
	50-25	75	40	27.2	24	

For orders larger than indicated quantity, please request a quotation.

■Tees RoHS



FRNWT



Max Operation Temperature: 200°C Material: 1.4301/X5CrNi18-10

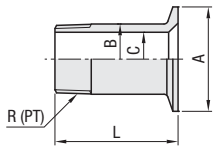
Part Number Type	No.	A	B	C	L	€ Unit Price Qty.1-4
FRNWT	10	30	13.8	10	40	
	16	30	21.7	16	40	
	25	40	27.2	23	50	
	40	55	42.7	37.1	65	
	50	75	60.5	54.9	80	

For orders larger than indicated quantity, please request a quotation.

■Male Thread Adapter RoHS



FRNFA



Max Operation Temperature: 200°C Material: 1.4301/X5CrNi18-10

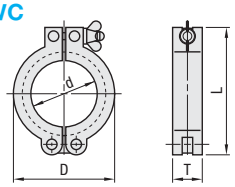
Part No. Type	No.	Nominal	R (PT)	A	B	C	L	€ Unit Price Qty. 1~9
FRNFA	16	1	1/8	30	10.5	7.1	50	
	25	1	1/8	40	10.5	7.1		
		2	1/4		13.8	9.4		
		3	3/8		17.3	12.7		
	40	2	1/4	55	13.8	9.4		
		3	3/8		17.3	12.7		
		4	1/2		21.7	16.1		
		6	3/4		27.2	21.4		

For orders larger than indicated quantity, please request a quotation.

■Clamp RoHS



FRNWC



Max Operation Temperature: 200°C Material: Body: Aliminium Thread: 1.4301/X5CrNi18-10

Part Number Type	No.	d	D	L	T	€ Unit Price Qty.1-4
FRNWC	16	20	42	61	17	
	25	30	52	72	17	
	40	44	70	90	17	
	50	62	94	123	25	

Commonly used for No.10 and 16.
For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	Nominal
FRNFA25	-	2

Days to Ship

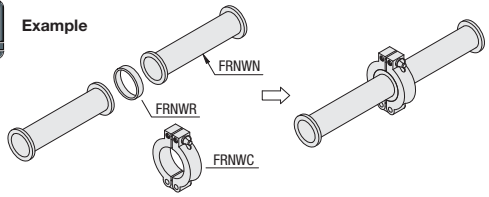
-FRNWC

6 Days P.88

- Other Than Those Above

10 Days

Example



■Features

These vacuum pipes are for auxiliary exhaust system of High Vacuum System or rough vacuum fitting of an Ultrahigh Vacuum System. The plumbing parts of NW (KF) Flanged Type enables frequent detachment without tools compliant with ISO or KF.

■Specifications

Dimensions and shapes are compliant with ISO2861/1-1974 - JISB8365: 1988.

Vacuum Pumps
-Overview-

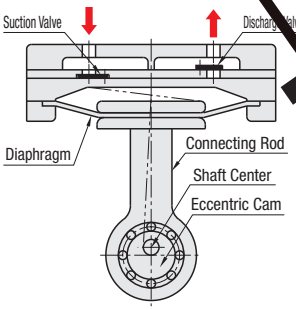
Features: Vacuum pumps exhaust emission utilizing reciprocating motion of thin film (diaphragm) of rubber with no use of oil or water. Thermal protector is built in all products to ensure safety. Simple structure easy for maintenance.

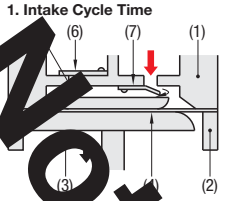
Unit Conversion Table

From \ to	Pa(N/m²)	Torr(mmHg)	atm	mbar	psi(bf/in²)	kgf/cm²	mH₂O(15°)
1 Pa(N/m²)	1	$7.5X10^{-3}$	$9.87X10^{-6}$	10^{-2}	$1.45X10^{-4}$	$1.02X10^{-5}$	$1.02X10^{-4}$
1 Torr(mmHg)	133.32	1	$1.316X10^{-3}$	1.33	$1.93X10^{-2}$	$1.359X10^{-3}$	$1.36X10^{-2}$
1 atm	$1.013X10^{5}$	760	1	$1.013X10^{3}$	14.696	1.033	10.34
1 mbar	100	0.75	$9.87X10^{-4}$	1	$1.45X10^{-2}$	$1.02X10^{-3}$	$10.206X10^{-3}$
1 psi(bf/in²)	$6.89X10^{3}$	51.71	$6.8X10^{-2}$	68.9	1	$7.031X10^{-2}$	0.703
1 kgf/cm²	$9.8X10^{4}$	735.56	0.968	$9.81X10^{2}$	14.223	1	10
1 mH₂O	$9.8X10^{3}$	73.49	$9.68X10^{-2}$	98	1.421	0.1	1

Working Principle

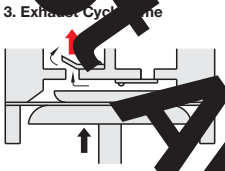
Diaphragm Type Dry Vacuum Pump





(1)Pump Head
(2) Casing
(3) Connecting Rod
(4) Diaphragm
(5) Diaphragm Washer
(6) Exhaust Valve
(7) Air Suction Valve

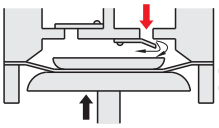
(7) opens by being suctioned down.
(6) will close by being pulled.



(7) will close by being pushed.
(6) will open by being pushed.

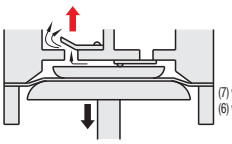
➡ indicates flow of air.
➡ indicates the motion of connecting rod into next process.
Procedure of process: 1→2→3→4→1

2. Intake Cycle Final State (bottom dead center)



(7) will open fully.
(6) will remain closed.

4. Exhaust Cycle Final State (top dead center)



(7) will remain closed by being pushed.
(6) will open fully by being pushed.

How to Select Pump

1. Calculation of Time and Velocity of Exhaust

$$t=\frac{V}{S}\times 2.303\log\frac{P1}{P2}$$

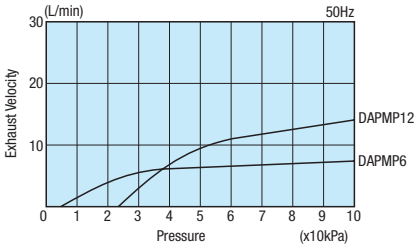
t; Time of Exhaust (min)

t0; Total Time of Exhaust (min)

$t0=t1+t2+t3+\ldots$

V: Tank Capacity (ℓ)
S: Velocity of Exhaust (L/min)
P1: Initial Pressure
P2: Final Pressure

-Curvature of Exhaust Velocity



-Actual Calculation Example

(Ex1) When decompressing a container of 25ℓ capacity from atmospheric pressure (101,324Pa) to 10,000Pa in 10 minutes,

$$S=\frac{V(25)}{t(10)}\times 2.303\log\frac{P1(101,324)}{P2(100,000)}\approx 5.79\text{L/min (at 1Pa)}$$

DAPMP6 will be required as 5 L/min or faster exhaust velocity is needed for 10,000Pa.
However, be sure to select pump considering conductance of plumbing and leakage.

(Ex2) Time for decompressing a container of 25ℓ capacity from atmospheric pressure (101,324Pa) to 40,000Pa

In use of DAPMP12

1:101,324Pa→80,000Pa	S1=12 L/min	t1=10/12x2.303log(101,324/80,000)≈0.2
2:80,000Pa→60,000Pa	S2=11 L/min	t2=10/11x2.303log(80,000/60,000)≈0.26
3:60,000Pa→40,000Pa	S3=6L/min	t3=10/6x2.303log(60,000/40,000)≈0.68
		Total t=1.14min

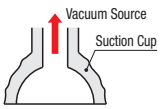
2. Calculation for Suction by Vacuum

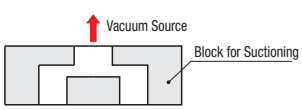
-Vacuum Suction

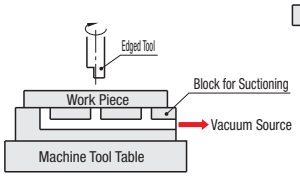
Vacuum suction means sucking an object to vacuum side utilizing differential pressure between vacuum and atmospheric pressure. Atmospheric pressure indicates 1kg/cm2. Accordingly, differential pressure is 1kg/cm2 under absolute vacuum; 0.5kg/cm2 under 50662Pa (1/2 pressure).

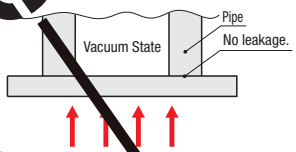
-Actual Suction

When suctioning, suction cup or suction block is generally used.



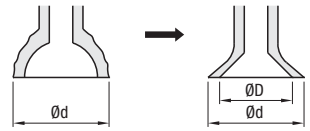






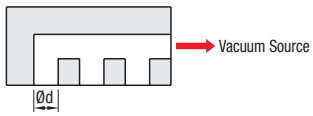
Strength of vacuum suction depends on performance of vacuum pump or the area of suction cup or suction block.

Suction area A when using suction cup



Before Suction A=πd2/4 After actual suction A=πD2/4

Suction area A when using perforated block



A=πd²/4x(n: No. of holes)

-Actual Calculation Example

$$W=\frac{(101,324-P)}{101,324}\times AxT$$

W: Theoretical Suction Power (kg) A: Area of Suction Pad (cm²)
P: Pressure of Suction Pad (Pa) T: Power by Atmospheric Pressure (1kg/cm²)

-Actual Calculation Example

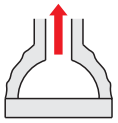
(Ex.) Area of suction pad when suspending load of 0.5kg perpendicularly. Assume that pressure of suction pad is 40,000Pa.

$$A=\frac{(101,324xW)}{(101,324-P)xT}=\frac{(101,324x0.5)}{(101,324-40,000)x1}=0.83(cm^2)$$

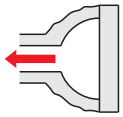
Considering that work is suspended vertically: 0.83x3=2.69cm²

-Safety Factor

When load is suspended perpendicularly
Theoretical Value x 3



When load is suspended horizontally
Theoretical Value x 6



Not Available

Vacuum Pumps
-Diaphragm Type-

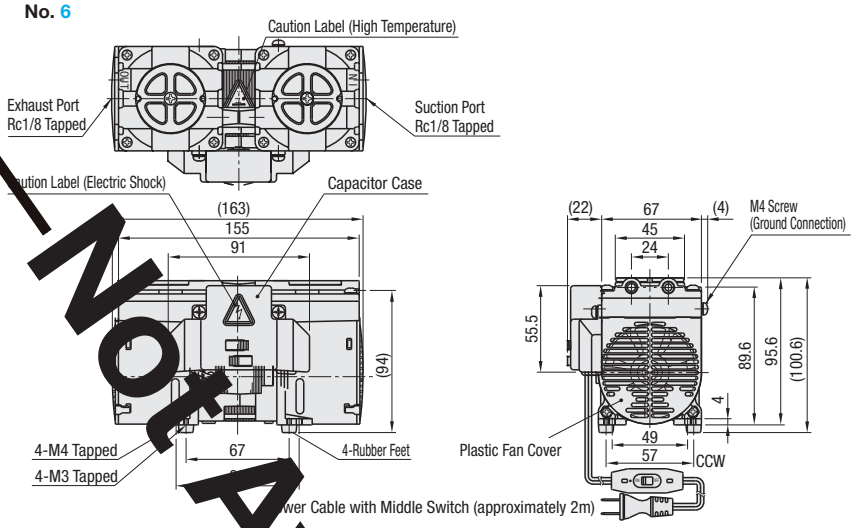
CAD Data

RoHS

Type	Material					
	Body	Pump Head	Diaphragm	Valve	Head Gasket	Suction and Exhaust Valve
	1.4301/ X5CrNi18-10	ADC	Ethylene Rubber (EPDM)			Fluoro Rubber (FPM)

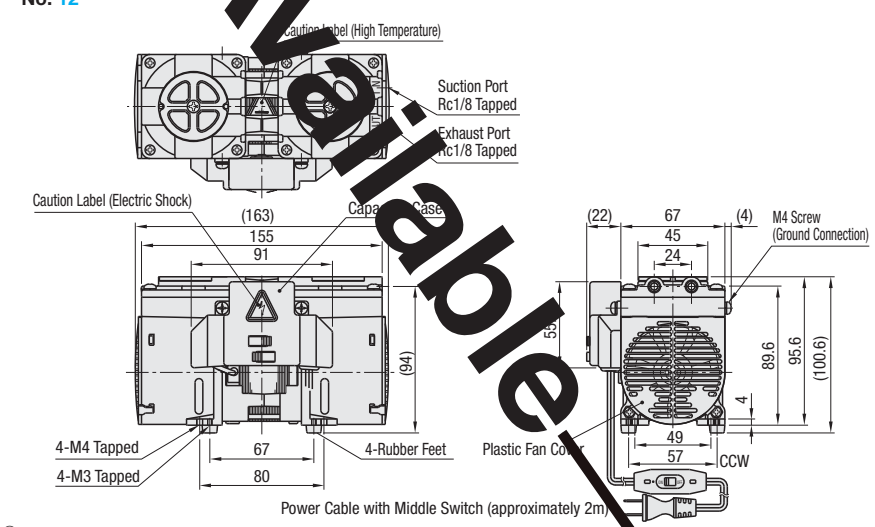
No. 6





No. 12





※Intake/Exhaust pipe (hose nipple) is not included.

■**Information about Tolerance and Mounting Hole**
Some combination of base components may have variations on positions of M3 and M4 within the range of tolerances.
For installation of this pipe, use of elongated hole is recommended. For example of elongated hole drilling, refer to WL M3 or M4 P.115

Part Number Type	No.	Effective Exhaust Velocity L/min	Pressure Obtained Pa	Applicable Motor	Full Load Current A	Mass kg	Diameter of Inlet and Outlet (mm)	Operation Temperature Range °C	€ Unit Price 1~2 pcs.	Volume Discount 3~4 pcs.
	6	6/7(50/60Hz)	6.65x103	1Ø,100V,10W 4P,condenser run	0.5(50/60Hz)	1.9	Rc1/8	0~40		
	12	12/14(50/60Hz)	24x103							

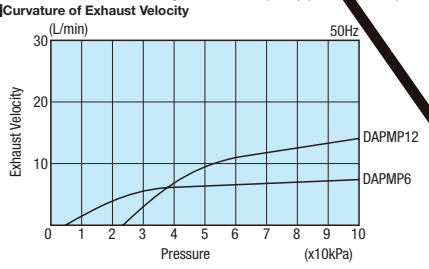
※For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number

Days to Ship — 6 Days P.87

■**Cautions**
-Pump may not restart in internally vacuum condition after stopping. Return the pump into atmospheric pressure condition, and pump will restart.
-Be sure to remove moisture, dust and corrosive gas in absorbed gas.

■**Curvature of Exhaust Velocity**



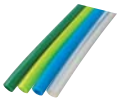
Not Available

Tubes · Fittings · Vacuum Components · Nozzles

Tubes · Fittings · Vacuum Components · Nozzles



Price Reduced
Up to 39%







Modified







Product Name	Tubes -Polyurethane · Nylon-	-Flat-	-Spiral-	-Sputtering Resistant--For Vacuum-	-Antistatic-	-Polyolefin-
Page	1258	1259	1259	1259	1260	1260







Modified







Price Reduced
Up to 21%



-Fluororesin · Silicon · Fluororubber-	Spiral Tubes	Soft Tube Inserts	Flexible Tube	Tube Cutter	Tube Clips
1260 · 1261	1261	1261	1262	1262	1262



Price Reduced
Up to 42%

Modified



NEW





Compact Air Fittings	One-Touch Couplings	Free Angle Fittings
1263	1264~1269	1269



Price Reduced
Up to 51%





Price Reduced
Up to 37%



Price Reduced
Up to 35%

Miniature One-Touch Coupling Connectors	All Stainless Steel One -Touch Couplings	One -Touch Couplings - Heat Resistant / High Heat Resistant	One -Touch Couplings For Clean Applications
1270	1271	1272	1273 · 1274



Price Reduced
Up to 21%





Price Reduced
Up to 19%

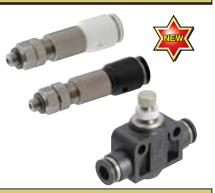


Price Reduced
Up to 31%

Modified



NEW



Rotary Joints	High Rotary Joints	Ball Valves - One -Touch Coupling Type	Hand Valves / Change Valves / Check Valves	Flow Rate Controllers
1275	1275	1276	1277 · 1278	1279 · 1280

NEW





Price Reduced
Up to 28%



Price Reduced
Up to 26%



Price Reduced
Up to 19%

NEW



Valves with Adjusting Dial	Flow Rate Controllers · Stainless Steel · Clean Type	Throttle Valves	Miniature Couplings	Couplings with Tube Insert
1280	1281	1282	1283	1284



NEW



Price Reduced
Up to 29%





Price Reduced
Up to 23%



Price Reduced
Up to 16%



Price Reduced
Up to 12%

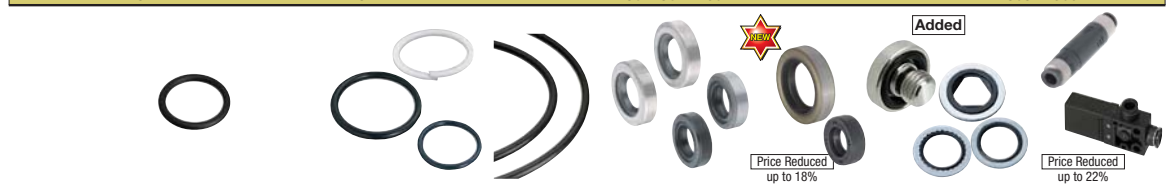
Couplings for Tubes	Fluororesin Couplings	Quick Exhaust Valves	Pressure Gauge	Regulators
1285 · 1286	1287 · 1288	1289	1289	1290 · 1291



Digital Pressure Sensors	Pressure Switches	Drain Traps	Service Units	Air Regulators with Filters	Lubricators	Air Filters	Air Regulators
1292	1293	1293	1294	1295	1295	1296	1296



One-Touch Articulated Connectors	Resin Connectors	Air Couplers	Quick Couplings
1297	1297	1298~1304 · 1307	1305 · 1306



High Chemical Resistant Products / High Heat Resistant Seals	O-Rings	Large Diameter O-Rings	Oil · Oil Free Seals	Seal Plugs / Seal Washers	Vacuum Generators
1308	1309~1313	1314	1315 · 1316	1317	1319



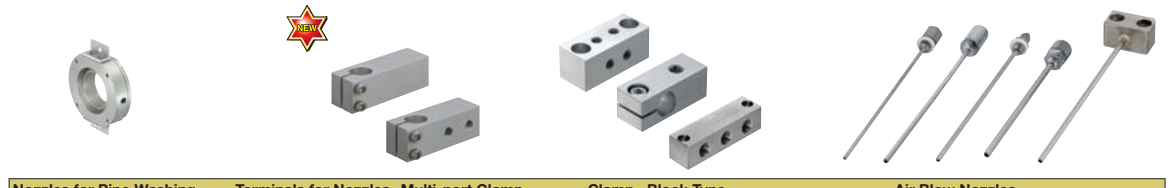
Vacuum Pressure Sensors	Vacuum Filters · Elements for Replacement	Vacuum Ejectors · Elements for Replacement	Vacuum Components	Holders for Mini Suction Cups
1319	1320	1321 · 1322	1323 · 1324	1325



Mini Suction Cups	Vacuum Fittings / Suction Cups	Air Nozzles -Flat Type-
1325	1326~1334	1335



Air Nozzles -90° Type-	- Economy Type-	-Round Type-	Nozzle Joints	Point Nozzles	Steel Pipes for Air Nozzles	Steel Pipe Nozzles with Slit	Steel Pipe Nozzles
1336	1337	1337	1338	1338	1339	1339	1340



Nozzles for Pipe Washing	Terminals for Nozzles -Multi-port Clamp	-Clamp · Block Type-	Air Blow Nozzles
1341	1341	1342	1343 · 1344



Air Blow Nozzles	Two-Fluid Nozzles	Spray Nozzles	Adjusting Hoses	Tools · Connectors · Valves · Hoses
1345	1346	1347 · 1348	1349	1349 · 1350

Tube -Guide-

■Specifications

Type	PUT·PUTL·PUTSP·MPUT			PUTY·PUTYL		PUTN·PUTNL				PUTHP·PUTHPL
Material	Polyurethane			Soft Polyurethane		Nylon (Polyamide)				Nylon (Polyamide)
Applicable Fluid	Air	Water	Vacuum	Air	Vacuum	Oil	Air	Water	Vacuum	* Refer to Operation Temperature Range
Operation Temperature Range	-5~60°C	0~40°C	-5~60°C	-5~60°C	-5~60°C	-5~40°C	-40~100°C	0~80°C	-5~100°C	-40~120°C (Air - Oil) 0~80°C (Water)
Burst Pressure	3.0MPa		-	1.7MPa	-	Depends on size.			-	Depends on size. Refer to specification table
Max. Operating Pressure	0.8MPa	0.3MPa	-	0.4MPa	-	Depends on size.			-	Depends on size. Refer to specification table
Operating Vacuum Level	-		-100kPa	-	-100kPa	-			-100kPa	-
Features	· Highly water resistant. · More flexible than Nylon tubes with smaller bend radius. · Excellent mechanical (especially wear resistance) strengths.			· Flexibility similar to the Silicon Tubes and easier to handle than the Polyurethane Tubes. · Excellent mechanical (especially wear resistance) strengths.		· Highly oil resistant, and best for oil tubing. · Excellent mechanical (especially wear resistance) strengths.				· Available for Oil Supplying or Oil Hydraulic plumbing. · It can take the place of copper pipes.

Type	PUTNS·PUTNSL			PUTMF·PUTMFL·PUTMSP		PUTS·PUTSL			PUVF·PUVFL	
Material	Nylon			Polyurethane (Multi-core Type)		Incombustible Polyurethane			Soft Polyurethan	
Applicable Fluid	Air	Water	Vacuum	Air	Vacuum	Air	Water	Vacuum	Air	Vacuum
Operation Temperature Range	-15~60°C (Antifreeze)			-5~60°C		-5~60°C	0~50°C	-5~60°C	-15~60°C	
Burst Pressure	3.0MPa		-	3.0MPa	-	3.0MPa		-	0.8MPa	-
Max. Operating Pressure	1.0MPa	0.3MPa	-	0.8MPa	-	0.8MPa	0.3MPa	-	0.2MPa	-
Operating Vacuum Level	-		-100kPa	-	-100kPa	-		-100kPa	-	-100kPa
Features	· Excellent in pressure, abrasion, whether and low temperature resistance, as well as softness. · It is suitable for high pressure pipeline in narrow pitch.			· Suitable for multiple tubing to double acting cylinders, etc. · It is easy to peel and connectable to joint without any pre-processing.		· Connectable to joints without being covered or peeled. · Quickly carbonize upon contact with hot sputter to prevent fusion pitting. · More flexible and easier to handle than the Flame Retardant Tubes.			· The tube excels in softness and bending stress. · Non-creasing when bent. Best suited for end effectors connections.	

Type	PUAS·PUASL		PORF·PORFL			PUTF·PUTFL·PUFN			PUJTF·PUJTFL
Material	Conductive Polyurethane		Polyolefinic Resin			Fluorine Resin			Fluoro Resin (ETFE)
Applicable Fluid	Air	Vacuum	Air	Water	Vacuum	Air	Water	Vacuum	Air, Water
Operation Temperature Range	-5~60°C		-20~60°C	0~40°C	-20~60°C	-65~260°C			-20~80°C
Burst Pressure	3.0MPa	-	2.0MPa		-	Depends on size. Refer to specification table			Refer to specification table
Max. Operating Pressure	0.8MPa	-	0.5MPa		-	Depends on size. Refer to specification table			Refer to specification table
Operating Vacuum Level	-	-100kPa	-		-100kPa	-		-100kPa	-
Features	· Electrically conductive tube is suitable for applications where static electricity is undesirable. · Surface resistivity is 10^{10} (Ω) or less.		· Clean and conforms to the Food Sanitation Laws (except oil-processed foods). (Health, Labor and Welfare Ministry Notification No.370) · Highly water resistant and non-hydrolysable. · Low specific gravity, and light weight. · Disposable by combustion without emitting harmful gases. · Suitable for uses in food, beverage, physicochemical and other industries.			· Excels in heat and low temperature resisting. · Inactive to most of corrosive gases, chemicals and solvents. · Highly weather resistant, and does not deteriorate with time. · Incombustible. · No toxic substances released.			· Excels in chemical resistance. · Good clarity allows visual checks of contents. · Compliant to Health, Labor and Welfare Ministry Notification No. 20 under Food Sanitation Laws of Japan

Type	PUTFB·PUTFBL·PUTFG·PUTFGL			PUTC·PUTCL
Material	Fluoro Rubber			Silicon Rubber
Applicable Fluid	Oil	Air	Water	Water, Pure Water, Beverage, etc.
Operation Temperature Range	-20~180°C			-30~150°C
Burst Pressure	Depends on size. Refer to specification table			-(Elastic body. Not available under pressure.)
Max. Operating Pressure	Depends on size. Refer to specification table			-(Elastic body. Not available under pressure.)
Operating Vacuum Level	-			-(Elastic body. Not available under pressure.)
Features	· Excellent in heat resistance, oil resistance, weather resistance and chemical resistance. · Excellent resistance in the environment of ozone and light.			· Compliant to Food Sanitary Act (MHLW Notification No. 201) · Excels in heat and low temperature resisting. · Retains the characteristics as an elastic body within the above temp. range.

Various fittings are prepared.
- One-Touch Couplings ☞ P.1264~1268
- All Stainless Steel, 1-Touch Couplings ☞ P.1271
- Miniature 1-Touch Couplings ☞ P.1270
- Fluororesin Couplings ☞ P.1287
- Couplings for Tubes ☞ P.1285, 1286
- 1-Touch Couplings For Clean Applications ☞ P.1273, 1274
- Rotary Joints ☞ P.1275
- High Rotary Joints ☞ P.1275
- Hand Valves ☞ P.1277
- Flow Rate Controllers ☞ P.1279~1281

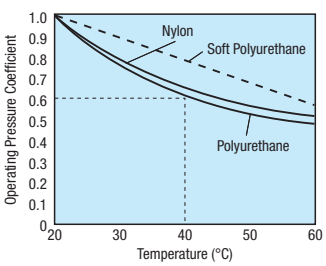
■Correction Coefficient for Temperature-Dependent Tube Burst Pressure (Reference)

Temperature-Dependent Maximum Operating Pressure (Mpa)=Max. Operating Pressure x Correction Coefficient

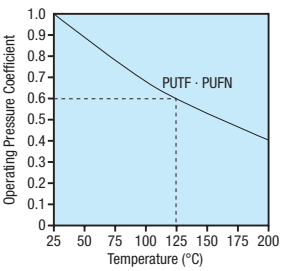
(Calc. Ex.) PUT6-20 (Polyurethane Tube) used at 40°C

→0.8 (Mpa)x0.6=0.48MPa

■Polyurethane - Nylon



■Fluorine Resin



■Polyolefin

Ambient Temperature	20°C or less	30°C	40°C	50°C	60°C
Correction Factor	1	0.9	0.7	0.6	0.5

■Chemical Resistance of Tubes (Reference)

The list below is for reference only and not guaranteed.

	Mineral Oil	Water	Hydrochloric Acid (10%, RT)	Ammonia Water	Gasoline	Organic Solvent
Polyurethane Tubes	○	○	△	△	◎	△
Soft Urethane	○	○	△	△	◎	△
Nylon Tubes	◎	◎	△~×	◎~○	◎	△
Soft Nylon Tubes	○	◎	×	◎	○	△
Sputtering Resistant Tubes	○	○	△	△	◎	△
Vacuum Tubes	○	◎	×	◎	△	△
Antistatic Tubes	○	○	△	△	◎	△
Polyolefin	×	◎	◎	◎	×	×~○
Fluororesin Tubes	○	◎	◎	◎	◎	○
Silicon Tubes	×	◎	○	◎	○~△	△

◎ = Excellent. Little affected.
○ = Good. Affected or swollen to some extent but usable depending on conditions.
△ = Unsuitable. Evidently Affected.
× = Not Usable. Dissolve.
(RT is for ambient temperature=20°C, % is concentration of solution.)

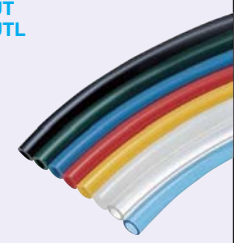
Tubes

Price Reduction
Up to 39%

See P.1257 for tube characteristic details.

Water Resistant Polyurethane Tubes

PUT
PUTL



Material: Polyurethane RoHS

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (Specify in 0.5m increment)	Tube Color	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Precision (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUT (Standard Length) PUTL (Configurable Length)	3.2	10	0.5~20	B(Black) C(Transparent)	1.8	7	±0.1	0.0064				
		20										
	4	10		B(Black) C(Transparent) W(White) R(Red) Y(Yellow) BL(Blue) G(Green) CB(Transparent Blue)	2.5	5		0.009				
		20										
		100										
	6	10			4	12		0.019				
		20										
		100										
	8	10			5	15		0.037				
		20										
		100										
	10	10			6.5	25	+0.1 -0.15	0.055				
		20										
		100										
	12	10			8	28		0.076				
		20										
		100										
	16	10		B(Black)	11	40		0.127				
		20										

Soft Polyurethane Tubes

PUTY
PUTYL



Material: Soft Polyurethane RoHS

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (Specify in 0.5m increment)	Tube Color	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Precision (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUTY (Standard Length)	4	10	0.5~20	B (Black)	2.5	17	+0.05 -0.2	0.009				
		20										
	6	10			4	28		0.019				
		20										
PUTYL (Configurable Length)	8	10		C (Transparent)	5	36		0.037				
		20										
	10	10			6.5	45		0.055				
		20										

Use Inserts for Soft Tubes on (P.1261) when connecting these tubes to One Touch Couplings.

Nylon Tubes

PUTN
PUTNL



Material: Nylon (Polyamide) RoHS

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (Specify in 0.5m increment)	Tube Color	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Precision (mm)	Burst Pressure (MPa)	Normal Pressure (MPa)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Vol. D. Qty. 5~9	Confi. Length € Unit P./m Qty. 1~4	Confi. Length Vol. D./m Qty. 5~9
PUTN (Standard Length) PUTNL (Configurable Length)	3.2	10	0.5~20	B (Black) W (White)	2	7	+0.05 -0.10	5.4	1.8	0.0052				
		20												
	4	10			2.5	10	±0.05	6.0	2.0	0.008				
		20												
	6	10			4	20		5.1	1.7	0.017				
		20												
	8	10			6.0	30		3.9	1.3	0.026				
		20												
	10	10			7.5	40		3.6	1.2	0.040				
		20												
	12	10			9.0	55		3.6	1.2	0.053				
		20												

Pressure Resistant Nylon Tubes

PUTHP
PUTHPL



Material: Nylon (Polyamide) RoHS

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (Specify in 0.5m increment)	Tube Color	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Precision (mm)	Burst Pressure (MPa)	Normal Pressure (MPa)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Vol. D. Qty. 5~9	Confi. Length € Unit P./m Qty. 1~4	Confi. Length Vol. D./m Qty. 5~9
PUTHP (Standard Length) PUTHPL (Configurable Length)	4	10	0.5~20	B (Black) W (White)	2.5	15	±0.05	8.8	2.9	0.008				
		20												
	6	10			4	25		7.7	2.6	0.017				
		20												
	8	10			6	35	+0.05 -0.1	5.5	1.8	0.023				
		20												
	10	10			8	50		5.1	1.7	0.029				
		20												
	12	10			9	55		5.5	1.8	0.052				
		20												
	16	10			12.8	100	+0.05 -0.15	4.0	1.3	0.076				
		20												

Soft Nylon Tubes

PUTNS
PUTNSL



Material: Nylon RoHS

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (Specify in 0.5m increment)	Color Specified	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Precision (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUTNS (Standard Length) PUTNSL (Configurable Length)	4	20	0.5~20	W (White)	2.5	9	±0.1	0.009				
	6				4	14		0.017				
	8				6	22		0.023				
	10			B (Black)	7.5	28		0.036				
	12				9	34		0.052				

Order Example

Part Number	-	Length	-	Color
PUT4	-	10	-	B
PUTNL8	-	2.5	-	W

<Price Calculation Example of Dimension Configurable>
For PUTL12-1.5, € Unit Price/m = 16,80 EUR
→16,80x1.5=16,80 EUR

For orders larger than indicated quantity, please request a quotation.

Days to Ship

8 Days | Express A | 3,00 EUR/ piece | P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

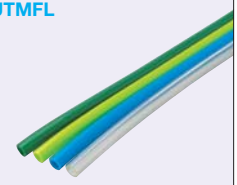
Tubes

Part Number & Spec.Change Printed in Purple

See P.1257 for characteristics.

■Flat Tubes RoHS

PUTMF
PUTMFL



Material: Polyurethane

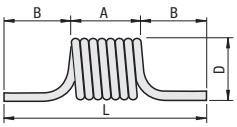
Part Number Type	Outer Dia. (mm)	No. of Bores	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Mass (kg/m)	Standard € Unit Price 1 pc.	Standard Volume Discount Qty.2~4	Configurable Length € Unit Price/m 1 pc.	Configurable Length Volume Discount/m Qty.2~4
PUTMF (Standard Length) PUTMFL (Configurable Length)	4	2	20	0.5~20	2	0.022				
		3			2.5	0.033				
		4				0.044				
	6	2			4	0.038				
		3				0.057				
		4				0.076				
	8	2			5	0.074				
		3				0.111				
		4				0.148				
	10	2			6.5	0.110				
		3				0.165				
		4				0.220				
	12	2			8	0.152				
		3				0.220				
		4				0.304				

Color Matching: 2-Bore=Clear, Blue; 3-Bore=Clear, Blue, Light Green; 4-Bore=Clear, Blue, Light Green, Green

■Water Resistant Polyurethane Spiral Tubes

PUTSP





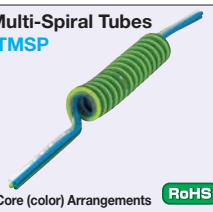
Material: Polyurethane

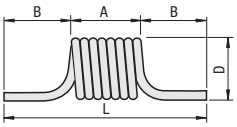
Part Number Type	Outer Dia. (mm)	Operating Limit Length (mm)	Tube Color	Inner Diameter (mm)	D	L	A	B	Min. Bending Radius (mm)	Outer Dia. Accuracy (mm)	Mass (kg/m)	€ Unit Price/m Qty. 1~4	Volume Discount/m Qty. 5~9
PUTSP	4	700	B (Black)	2.5	21	460	60	200	5	±0.1	0.009		
		1000				520	120						
		1300				580	180						
	6	850		4	38	490	90		12		0.019		
		1300				580	180						
		1750				670	270						
	8	1000		5	42	520	120		15		0.037		
		1600				640	240						
		2200				760	360						
	10	1150		6.5	52	550	150		25	+0.1 -0.15	0.055		
		1900				700	300						
		2650				850	450						
	12	1300		8	67	580	180		28		0.076		
		2200				760	360						
		3100				940	540						

Operating Limit Length is the full length (L) of the tube when extended to a serviceable maximum.

■Multi-Spiral Tubes

PUTMSP





■Core (color) Arrangements

2 Bores	3 Bores	4 Bores
①②	①②③	③④ ①②

Color / No. of Bores	Trans-parent	Blue	Light Green	Green
2	(1)	(2)	-	-
3	(1)	(2)	(3)	-
4	(1)	(2)	(3)	(4)

Material: Polyurethane

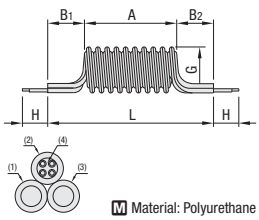
Part Number Type	Outer Dia. (mm)	No. of Bores	Nominal Length	Operating Limit Length (mm)	Inner Diameter (mm)	D	L	A	B	€ Unit Price/m 1 pc.	Volume Discount/m Qty.2~4
PUTMSP	4	2	700	787	2.5	21	529	129	200		
		3	800	885		27	594	194	200		
		4	700	787		35	529	129	200		
	6	2	900	985	4	38	595	195	200		
		3	1100	1133		44	693	293	200		
		4	900	985		56	595	195	200		
	8	2	1200	1210	5	42	670	270	200		
		3	1400	1413		50	805	405	200		
		4	1200	1210		66	670	270	200		
	10	2	1400	1417	6.5	52	739	339	200		
		3	1600	1673		63	909	509	200		
		4	1400	1417		83	739	339	200		
	12	2	1700	1715	8	67	805	405	200		
		3	1900	1920		84	1008	608	200		
		4	1600	1615		108	805	405	200		

Operating Limit Length is the full length (L) of the tube when extended to a serviceable maximum.

■Slit Spiral Tubes -With Fluororesin Insulated Wire-

PUTHSP





Material: Polyurethane

Part Number Type	Outer Dia. (mm)	Nominal Length	Wire (mm²)	L	Operating Limit Length (mm)	Inner Diameter (mm)	A	B1	B2	G	H	€ Unit Price/m 1 pc.	Volume Discount/m Qty.2~4
PUTHSP	4	500	0.15	445	535	2.5	45	150	250	35	300		
		800		535	805		135						
		900		580	940		180						
	6	500	0.3	465	560	4	65						
		700		530	725		130						
		800		595	890		195						
	8	600	0.3	490	670	5	90						
		900		580	940		180						
		1200		670	1210		270						

Operating Limit Length is the full length (L) of the tube when extended to a serviceable maximum.

(1) Black (2) Transparent Blue (3) Blue
(4) Wire Colors: White / Black / Red / Green (4 conductors)

■Features: The tube can flex and follow the movements of liner slides, etc. Electrical wire can easily be inserted and removed from the slit on the side.

■Sputtering Resistant Tubes RoHS

PUTS
PUTSL

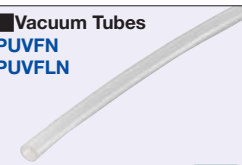


Material: Incombustible Polyurethane

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Tube Color	Inner Dia-meter (mm)	Min. Bending Radius (mm)	Outer Dia. Accu-racy (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUTS (Standard Length) PUTSL (Configurable Length)	6	10	0.5~20	B(Black) R(Red) G(Green)	4	15	±0.1	0.019				
		20										
	8	10			5	20		0.037				
		20										
	10	10			6.5	25	+0.1 -0.15	0.055				
		20										
	12	10			8	30		0.076				
		20										

■Vacuum Tubes

PUVFN
PUVFLN



Material: Soft Polyurethan

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configu-rable Length (0.5m Increment)	Inner Dia-meter (mm)	Min. Bending Radius (mm)	Outer Dia. Accu-racy (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUVFN (Standard Length)	4	10	0.5~20	2.5	8	±0.1	0.009				
		20									
PUVFLN (Configurable Length)	6	10		4	12		0.017				
		20									

Use Inserts for Soft Tubes on (P.1261) when connecting these tubes to One Touch Couplings.

Order Example

Part Number	-	No. of Bores	-	Length
PUTMF4	-	3	-	20
PUTMSP6	-	4	-	900

Part Number	-	Length	-	Color
PUTSL8	-	1.5	-	R

<Price Calculation Example of Dimension Configurable>
For PUTSL6-1.5,
€ Unit Price/m=11,70 EUR
→11,70x1.5=17,55 EUR

For orders larger than indicated quantity, please request a quotation.

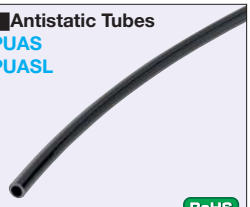
Days to Ship 8 Days

Express A 3,00 EUR/piece P. 88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Tubes

■Antistatic Tubes
PUAS
PUASL



RoHS

Ⓜ Material: Conductive Polyurethane

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Accuracy (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUAS (Standard Length)	4	10	0.5~20	2.5	10	±0.1	0.009				
		20									
	6	10		4	15		0.019				
		20									
	8	10		5	20		0.037				
		20									
PUASL (Configurable Length)	10	10		6.5	25	+0.1 -0.15	0.055				
		20									
	12	10		8	30		0.076				
		20									

■Polyolefin Tubes
PORF
PORFL



RoHS

Ⓜ Material: Polyolefin Resin

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Accuracy (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PORF (Standard Length) PORFL (Configurable Length)	4	10	0.5~20	2.5	8	±0.1	0.0069				
		20									
		100									
	6	10		4	14		0.0141				
		20									
		100									
	8	10		5	20		0.0276				
		20									
		100									
	10	10		6.5	25		0.0408				
		20									
		100									
	12	10		8.0	30		0.0565				
		20									
		100									

■Fluororesin Tubes
PUTF
PUTFL



Ⓜ Material: Fluororesin (PFA) RoHS

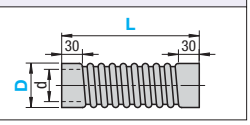
Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Accuracy (mm)	Max. Operating Pressure (MPa)	Burst Pressure (MPa)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUTF (Standard Length) PUTFL (Configurable Length)	3.2	10	0.5~20	1.6	32	±0.1	1.1	4.5	0.013				
		20											
	4	10		2	30		2.5	10	0.020				
		20											
	6	10		4	50		1.7	7	0.034				
		20											
	8	10		6	80		1.1	4	0.047				
		20											
	10	10		8	120	+0.1 -0.15	0.8	3	0.061				
		20											
	12	10		10	200		0.7	3	0.074				
		20											

Ⓟ Maximum operating pressure and Break pressure shown are values at ambient temperature.

■Flexible Fluororesin Tube
PUFN



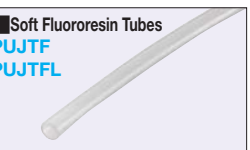
Ⓜ Material: Fluororesin (PFA) RoHS



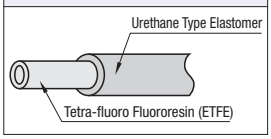
Part Number Type	Outer Dia. D (mm)	L (mm)	Inner Diameter d (mm)	Min. Bending Radius (mm)Ⓟ	Outer Dia. Accuracy (mm)	Max. Operating Pressure (MPa)	Burst Pressure (MPa)	Mass (kg/m)	€ Unit Price/m Qty. 1~4	Volume Discount/m Qty.5~9
PUFN	6	300	4	10	±0.1	1.7	7	0.034		
		500								
		1000								
	8	300	6	10		1.1	4.5	0.047		
		500								
		1000								
	10	300	8	15		0.8	3.5	0.061		
		500								
		1000								
	12	300	10	15		0.7	3	0.074		
		500								
		1000								

Ⓟ Minimum bending radius shown is based on static state. When tubing in the dynamic state rough standard is the value of 3 times higher than that of static.
Ⓟ Outer diameter precision is the value of straight parts at both ends.
Ⓟ Maximum operating pressure and Break pressure shown are values at ambient temperature.

■Soft Fluororesin Tubes
PUJTF
PUJTFL



Ⓜ Material: Fluororesin (ETFE) RoHS



Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Accuracy (mm)	Operating Pressure Mpa at 20°C	Operating Pressure Mpa at 80°C	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUJTF (Standard Length) PUJTFL (Configurable Length)	4	10	0.5~20	2	12	±0.1	0~0.6	0~0.2				
		20										
	6	10		4	24							
		20										
	9	10		6	36							
		20										
	12	10		8	48							
		20										

■**Features**: The laminated structure realizes better flexibility than conventional fluororesin tubes (PUTF, PUTFL) and increases workability.

<Price Calculation Example of Dimension Configurable>
For PUTFL6-2.5, € Unit Price/m = 29,70 EUR
→29,70x2.5=74,25 EUR

Ⓟ For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	Length
PUTF4	-	10
PUFN6	-	1000

Days to Ship: 8 Days
Express A 3,00 EUR/piece P. 88
Ⓟ A Express Charge of 8,10 EUR for 3 or more identical pieces.

Tubes

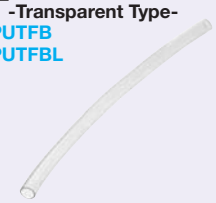
Part Number & Spec.Change Printed in Purple

CAD Data

See P.1257 for tube characteristic details.

■Fluoro Rubber Tube -Transparent Type-

PUTFB
PUTFBL



M Material: luoro Rubber

RoHS

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Outer Dia. Accuracy (mm)	Max. Operating Pressure (MPa)	Burst Pressure (MPa)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUTFB (Standard Length) PUTFBL (Configurable Length)	4	10	0.5~20	2	±0.15	0.248	0.993	0.018				
		20										
	6	10		4		0.149	0.594	0.030				
		20										
	8	10		6		0.09	0.360	0.042				
		20										
	10	10		8		0.049	0.195	0.053				
		20										

■Features: Excellent in transparency and chemical resistance.

■Fluoro Rubber Tube -Heat Resistant Type-

PUTFG
PUTFGL



MFluoro Rubber

RoHS

Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Accuracy (mm)	Max. Operating Pressure (MPa)	Burst Pressure (MPa)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUTFG (Standard Length) PUTFGL (Configurable Length)	4	10	0.5~20	2	-	±0.15	-	-	0.019				
		20											
	6	10		4	20		-	-	0.031				
		20											
	8	10		6	25		0.088	0.35	0.044				
		20											
	10	10		8	35	±0.2	-	-	0.080				
		20											

■Excellent in heat resistance (~200°C), oil resistance, ozone resistance, and chemical resistance.

■Silicon Tube

PUTC
PUTCL



M Silicon Rubber

RoHS

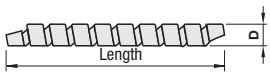
Part Number Type	Outer Dia. (mm)	Standard Length (m)	Configurable Length (0.5m Increment)	Inner Diameter (mm)	Mass (kg/m)	Standard € Unit Price Qty. 1~4	Standard Volume Discount Qty.5~9	Configurable Length € Unit Price/m Qty. 1~4	Configurable Length Volume Discount/m Qty.5~9
PUTC (Standard Length) PUTCL (Configurable Length)	4	10	0.5~20	2	0.011				
		20							
	6	10		4	0.018				
		20							
	8	10		6	0.025				
		20							
	10	10		8	0.033				
		20							
	12	10		9	0.058				
		20							

■Spiral Tube

RoHS

PUSP





M Material: Soft Polyethylene (White)

Part Number Type	No.	Operating Binding Dia. D	* Length (m)	€ Unit Price Qty. 1~4	Volume Discount Qty.5~9
PUSP	4	4~8	100		72,40
	9	9~18	50		67,90
	20	20~40	25		72,40

* The length is with nothing inserted inside the spiral tube.

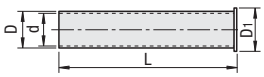
■Soft Tube Insert

PUIT
PACK-PUSIT



RoHS

Type	M Material	S Surface Treatment
PUIT	CW508L/CuZn37	Electroless Nickel Plating
PACK-PUSIT	1.4301/X5CrNi18-10	-



Part Number Type	App. Tube Outer Dia. (mm)	Applicable Tube Inner Diameter (mm)	D	d	D1	L	PUIT € Unit Price Qty. 1~9	PUIT Volume Discount Qty. 10~	PACK-PUSIT € Unit Price 1~2 packs	PACK-PUSIT Volume Discount 3 pack or more
PUIT PACK-PUSIT	4	2.5	2.4	2.0	3.0	18				
	6	4	3.9	3.5	4.5	19				
	8	5	4.9	4.5	5.5	20				
	10	6.5	6.4	6.0	7.0	22				

10pcs. per pack for PACK-PUSIT

■Features
- Prevents shrinkage of tube from inside.
- Insert from the connecting part of soft tubes.

Order Example

Part Number - Length

PUTCL12 - 1.5
PUSP4
PUIT6

Days to Ship

- Inserts for Soft Tubes: 6 Days P.87

- Fluoro-rubber Tube · Silicon Tube: 8 Days

- Spiral Tube: 8 Days

Express A 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

For orders larger than indicated quantity, please request a quotation.

<Price Calculation Example of Dimension Configurable>
For PUTCL12-1.5, € Unit Price/m = 22,50 EUR
→22,50x1.5=33,75 EUR

Flexible Tube / Tube Cutter / Tube Clips

Price Reduction
Up to 21%

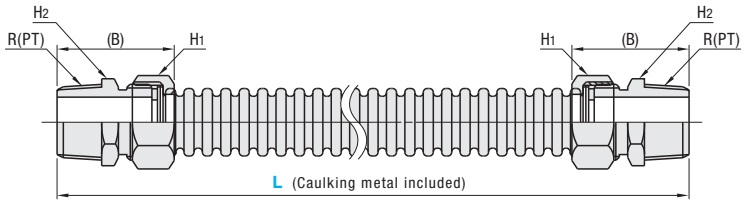
CAD Data

Flexible Tube



RoHS

HOFBL



Applicable Fluids: Water - Warm Water Maximum operating temperature: 80°C

M Material: 1.4301/X5CrNi18-10
A Accessory: Included Gasket NBR

Part Number Type	Part Number Nominal Diameter	L 5mm Increment	Opposite Side H_1	Opposite Side H_2	(B)	R (PT)	Tube Inner Diameter	Min. Bending Radius (mm)	Max. Pressure (MPa)	€ Unit Price L105~200	€ Unit Price L205~300	€ Unit Price L305~400	€ Unit Price L405~500
HOFBL	4	105~500	24	22	35	1/2	1/2	40	1.75				
	6	115~500	30	27	42	3/4	3/4	60					

Order Example: Part Number HOFBL4 - L 150

Days to Ship: 10 Days

Price: euros

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

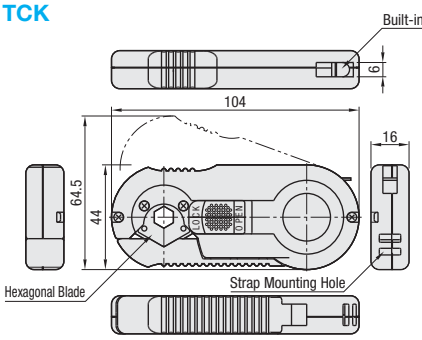
For orders larger than indicated quantity, please request a quotation.

Tube Cutter



RoHS

TCK



Order Example: Part Number TCK / TCKE

Days to Ship: 6 Days P.87

Features

- New edges can be used by turning the hexagonal blade.
- The tube can be cut at a desired length using the built-in measure.
- The tube cutter can be safely stored using the lock mechanism.

Tube Cutter Replacement Blades

TCKE



RoHS

Tube Cutter

Part Number Type	€ Unit Price Qty.1-19
TCK	

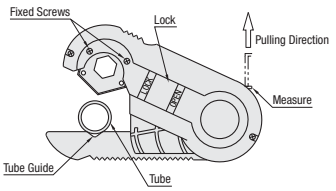
For orders larger than indicated quantity, please request a quotation.

Replacement blades for Tube Cutters

Part Number Type	Quantity	€ Unit Price Qty. 1~9
TCKE	10 pcs./set	

For orders larger than indicated quantity, please request a quotation.

Name of Parts

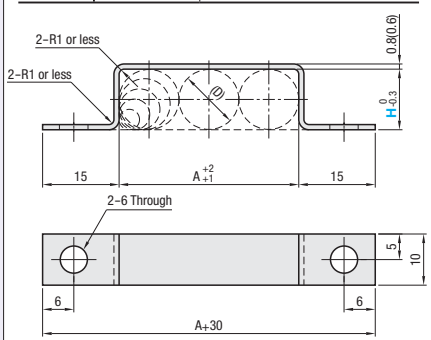


Tube Clips



RoHS

Type	M Material	S Surface Treatment
CUCLP	1.0330/DC01	JIS STKM Bright Chromate Plating
CUCLPS	1.4301-D	-



Dimensions in ( ) are for CUCLPS.

Part Number Type	H	Tube Qty.	A	Applicable Tube Outer Dia. (D)	€ Unit Price CUCLP	€ Unit Price CUCLPS
CUCLP CUCLPS	4	2~10	4xpcs.	4		
	6		6xpcs.	6		
	8		8xpcs.	8		
	10		10xpcs.	10		
	12		12xpcs.	12		

Order Example: Part Number CUCLP10 - No. of Tubes 4

Days to Ship: 8 Days

Express A: 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price: euros

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

NEW

Compact Air Fittings

-Tubes - One-Touch Couplings - Speed Controller-

Price Reduction
Up to 42%

CAD Data

■Tube



Material: Polyurethane RoHS

Part Number		Length (m)	Tube Color	Inner Diameter (mm)	Min. Bending Radius (mm)	Outer Dia. Accuracy (mm)	Mass (kg/m)	€ Unit Price	Volume Discount
Type	Outer Dia. (mm)							Qty. 1~4	Qty.5~9
MPUT	1.8	5 10	B (Black) C (Transparent) W (White)	1.2	4	±0.1	0.0017		

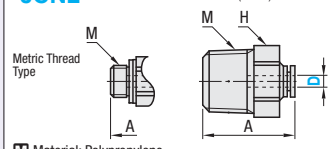
For orders larger than indicated quantity, please request a quotation.

■Compressed Air - Miniature Connector Fitting



RoHS

JCNL Thread: CW614N/CuZn39Pb3 (Brass)



Material: Polypropylene

Part Number		Nominal	A	Width across flats H	Thread Size M x Pitch	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price	Volume Discount
Type	D							Qty. 1-4	Qty. 5~9
JCNL	1.8	M3	10.7	5.5	M3x0.5	0.92	3.9		
		M5	10.4	7	M5x0.8	0.92	4.6		
		1	14.4	10	R1/8	0.97	5.9		

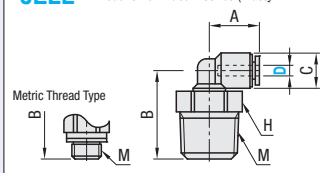
For orders larger than indicated quantity, please request a quotation.

■Compressed Air - Miniature Connector Fitting - 90 Deg. Elbow



RoHS

JELL Thread: CW614N/CuZn39Pb3 (Brass)



Material: Polypropylene

Part Number		Nominal	A	B	C	Width across flats H	Thread Size M x Pitch	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price	Volume Discount
Type	D									Qty. 1-4	Qty. 5~9
JELL	1.8	M3	8.5	11	6	5.5	M3x0.5	0.83	4.0		
		M5	8.5	11.5	6	7	M5x0.8	0.83	4.8		
		1	8.5	15	6	10	R1/8	0.70	8.6		

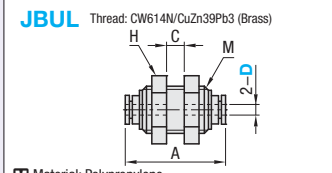
For orders larger than indicated quantity, please request a quotation.

■Bulkhead Union



RoHS

JBUL Thread: CW614N/CuZn39Pb3 (Brass)



Material: Polypropylene

Part Number		A	Width across flats H	Thread Size M x Pitch	C (max)	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price	Volume Discount
Type	D							Qty. 1-4	Qty. 5~9
JBUL	1.8	17	10	M8x1	4	0.85	5.3		

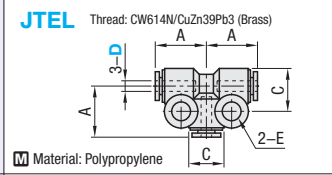
For orders larger than indicated quantity, please request a quotation.

■Union Tee



RoHS

JTEL Thread: CW614N/CuZn39Pb3 (Brass)



Material: Polypropylene

Part Number		A	C	E	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price	Volume Discount
Type	D						Qty.1-4	Qty.5~9
JTEL	1.8	8.7	7.3	3.2	0.9	3.9		

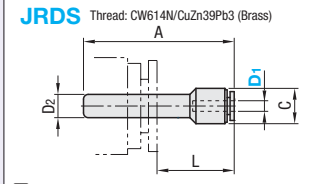
For orders larger than indicated quantity, please request a quotation.

■Reducer



RoHS

JRDS Thread: CW614N/CuZn39Pb3 (Brass)



Material: Polypropylene

Part Number		D_2	A	C	L	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price	Volume Discount
Type	D_1							Qty.1-4	Qty.5~9
JRDS	1.8	4	25.6	6	9.6	0.97	0.5		

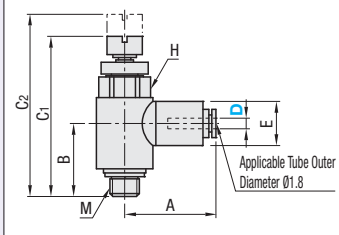
For orders larger than indicated quantity, please request a quotation.

■Flow Rate Controller Meter-Out



RoHS

JNL Thread: CW614N/CuZn39Pb3 (Brass)



Material: PBT (Polybutylene Terephthalate)

Part Number		Nominal	A	B	C_1	C_2	E	Width across flats H	Thread Size M x Pitch	Mass (g)	€ Unit Price	Volume Discount
Type	D										Qty.1-4	Qty.5~9
JNL	1.8	M3	15.3	11.4	25.1	27.6	7.5	7	M3x0.5	6.1		
		M5	15.5	12.4	27.2	30.2	7.5	8	M5x0.8	9.4		

For orders larger than indicated quantity, please request a quotation.

Specifications

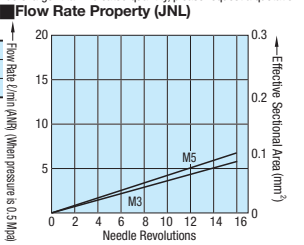
One-Touch Couplings

Applicable Fluid	Compressed Air
Operation Temperature Range	-10~60°C
Operating Pressure Range	-100kPa~0.8MPa

Flow Rate Controller

Applicable Fluid	Compressed Air
Operation Temperature Range	5 ~ 60°C (Not to be frozen)
Max. Operating Pressure	1.0 MPa
Min. Operating Pressure	0.05 MPa

■Flow Rate Property (JNL)



Order Example

Part Number	-	Length	-	Color
MPUT1.8	-	10	-	B

Part Number	-	Nominal
JCNL1.8	-	M5

Days to Ship: 8 Days

Express A 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

One-Touch Couplings

Part Number & Spec.Change Printed in Purple

CAD Data

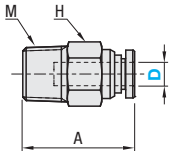
Previous One Touch Coupling products have been moved to Web Listed Products category.

Compressed Air - Miniature Connector Fittings



RoHS

MSCNL Thread: CW614N/CuZn39Pb3
MJCNLS Thread: 1.4301/X5CrNi18-10



M Material: Ring: PBT (Polybutylene Terephthalate)

The photo and drawing are for MSCNL. See the CAD data for MJCNLS.

Part Number Type	D	Nominal	A	Width across flats H	Thread Size M	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	MSCNL € Unit Price Qty. 1~9	MSCNL Volume Discount Qty. 10~	MJCNLS € Unit Price Qty. 1~9	MJCNLS Volume Discount Qty. 10~
MSCNL / MJCNLS	4	M5	20.1(21.5)	8(10)	M5x0.8	3.2(4)	4.5(6)				
		1	20.1(20.5)	10	R1/8		8.6(8)				
		2	20.1(19.5)	14	R1/4		17.3(15)				
	6	M5	21.8(23)	11(12)	M5x0.8	3.2(4.4)	8.3(9)				
		1	22.6(23)		R1/8	11.5(10.3)	9.2(11)				
		2	22.8(23.5)	14	R1/4		18.2(18)				
		3	22.8(21.5)	17	R3/8		28.4(26)				
	8	1	27.7(28)	13(14)	R1/8	18.7(17.5)	13.7(18)				
		2	25.7(27)	14	R1/4	26.9(22.4)	17.1(17)				
		3	23.7(22.5)	17	R3/8		27.3(24)				
	10	1	29.4(31)		R1/8	18.5(17.5)	22.2(26)				
		2	32.4(32.5)		R1/4	26.9(30.5)	27.6(22)				
		3	28.4(28.5)		R3/8	38.9(30.5)	29.3(26)				
		4	27.3(26.5)	21(22)	R1/2		48.5(49)				
	12	2	35.4(35.5)	19	R1/4	26.9(30.5)	34.2(37)				
		3	31.8(30.5)		R3/8	47.9(40)	33.5(32)				
		4	33.8(29.5)	21(22)	R1/2		54.8(51)				
	16	3	39.7(42)	24	R3/8	48.8(90)	58.7(60)				
		4	42.2(37.5)		R1/2		58.2(66)				

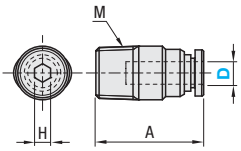
( ) values apply to MJCNLS.

Compressed Air - Miniature Connector Fittings -Hexagon Socket Head Type-



RoHS

MSCNC Thread: CW614N/CuZn39Pb3



M Material: Ring: PBT (Polybutylene Terephthalate)

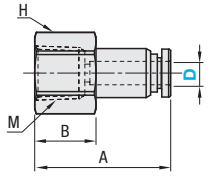
Part Number Type	D	Nominal	A	Width across flats H	Thread Size M	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MSCNC	4	M5	20.1	2	M5x0.8	3.2	4.2		
		1	20.1	3	R1/8		8		
	6	M5	21.8	2	M5x0.8	11.5	7.2		
		1	22.0	4	R1/8		8.6		
		2	22.8	4	R1/4		16.8		
	8	1	27.7	5	R1/8	18.7	13.1		
		2	25.7	6	R1/4	26.9	15.5		
		3	23.7	6	R3/8		25.9		
	10	1	29.4	5	R1/8	18.5	18		
		2	32.4	6	R1/4	26.9	23.3		
		3	28.4	8	R3/8	38.9	25.7		
		4	27.3	8	R1/2		46.7		
	12	2	35.4	6	R1/4	26.9	29.7		
		3	31.8	8	R3/8	47.9	30.2		
		4	33.8	8	R1/2		50.6		

Female Thread Connectors



RoHS

MSCNF Thread: CW614N/CuZn39Pb3 (Brass)



M Material: Ring: PBT (Polybutylene Terephthalate)

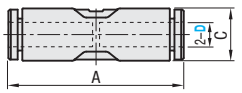
Part Number Type	D	Nominal	A	B	Width across flats H	Thread Size M	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MSCNF	4	1	24.4	11	13	Rc1/8	3.2	13.5		
		2	27.4	14	17	Rc1/4		24.9		
	6	1	25.4	11	13	Rc1/8	11.0	14.8		
		2	28.4	14	17	Rc1/4		26.1		
		3	29.4	15	19	Rc3/8		27.6		
	8	1	27.7	10	13	Rc1/8	25.2	16.4		
		2	30.7	14	17	Rc1/4		27.7		
		3	31.7	15	19	Rc3/8		29.2		
	10	2	32.4	13	17	Rc1/4	38.7	30.3		
		3	33.4	15	19	Rc3/8		32.5		
		4	36.4	18	24	Rc1/2		53.6		
	12	2	35.4	12	19	Rc1/4	44.6	45.3		
		3	36.4	15	19	Rc3/8		39.4		
		4	39.4	18	24	Rc1/2		60.6		

Union Straight



RoHS

USSTL



M Material: PBT (Polybutylene Terephthalate)

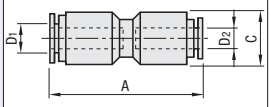
Part Number Type	D	A	C	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
USSTL	4	30.2	9	3.2	3.1		
	6	32	11.2	11.0	4.8		
	8	40.2	13.6	25.2	8.8		
	10	40	16.3	38.7	10.6		
	12	54.8	19.7	44.6	20.9		
	16	52	25.6	85.0	32.8		

Stepped Diameter Union Straight



RoHS

UJDST



M Material: PBT (Polybutylene Terephthalate)

Part Number Type	No.	Body Color	D1	D2	A	C	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
UJDST	4	B (Black)	4	6	36.5	12.5	3.5	6		
	4-8		4	8	39.5	14.5	4	8		
	6		6	8	39.5	14.5	10	8		
	6-10	W (White)	6	10	45	17.5	10	12		
	8		8	10	45	17.5	22	12		
	10		10	12	47.5	20	30	17		

Specifications

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	0.9MPa
Operating Vacuum Level	-100kPa

Purple printed items in the specification table have been changed.

Old Type	New Type
MJCNL	MSCNL
MJCNC	MSCNC
MJCNF	MSCNF
UJSTL	USSTL

Order Example: Part Number - Nominal - Body Color
MSCNL6 - 1
UJDST8 - B

Days to Ship: 6 Days P.87

One-Touch Couplings

Part Number & Spec.Change Printed in Purple

Previous One Touch Coupling products have been moved to Web Listed Products category.

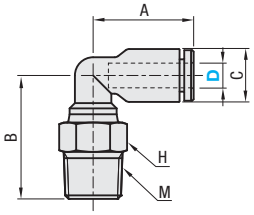
Compressed Air - Miniature Connector Fittings - 90 Deg. Elbow



RoHS

MSELL **MJELLS**

Thread: CW614N/CuZn39Pb3 (Brass)
Thread: 1.4301/X5CrNi18-10



M Material: Body: PBT (Polybutylene Terephthalate)

The photo and drawing are for MSELL. See the CAD data for MJELLS.

Part Number Type	D	Nominal	A	B	C	Width across flats H	Thread Size M	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	MSELL € Unit Price Qty. 1~9	MSELL Volume Discount Qty. 10~	MJELLS € Unit Price Qty. 1~9	MJELLS Volume Discount Qty. 10~
MSELL MJELLS	4	M5	17.1(18)	14.6(15)	9(10)	9(8)	M5x0.8	3.2	4.6(5)				
		1	17.1(18.5)	17.8(20.5)		10	R1/8	4.4(3.5)	7.9(8)				
		2	17.1(18.5)	20.8(24)		14	R1/4		17(15)				
	6	M5	18(20)	15.7(15)	11.2(12.5)	9(10)	M5x0.8	3.2(4.2)	5.4(7)				
		1	18(21)	18.9(24)		10(12)	R1/8	8.5(8)	8.7(13)				
		2	18(21)	21.9(28)		14	R1/4		17.8(18)				
		3	18(21)	22.9(30)		17	R3/8		27.2(26)				
	8	1	23.6	20.3(25.5)	13.6(14.5)	10(14)	R1/8	15(18)	10.4(17)				
		2	23.6	22.8(28.5)		14	R1/4		19.1(20)				
		3	23.6	23.8(30)		17	R3/8		28.4(28)				
	10	1	25(27)	23.6(28)	16.3(17.5)	17	R1/8	22.1(24.3)	20.8(26)				
		2	25(27)	26.6(31)		17	R1/4	31.5(27)	25.5(28)				
		3	25(27)	26.1(32.5)		17	R3/8		27.5(33)				
		4	25(27)	29.1(35.5)		21(22)	R1/2		47.2(49)				
	12	2	32.2(29.5)	28.5(33)	19.7	17(19)	R1/4	41.7(33)	31.1(37)				
		3	32.2(29.5)	28(34.5)		17(19)	R3/8	42.6(35)	33.1(43)				
		4	32.2(29.5)	31(39.5)		21(22)	R1/2		52.8(56)				
	16	3	34(35.5)	36(41)	25.6(26.5)	20(22)	R3/8	77.8(80)	52.9(63)				
		4	34(35.5)	38.5(44)		21(22)	R1/2		67.2(76)				

( ) values apply to MJELLS.

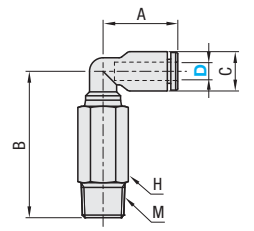
Long Elbows



RoHS

MSELG

Thread: CW614N/CuZn39Pb3 (Brass)



M Material: Body: PBT (Polybutylene Terephthalate)

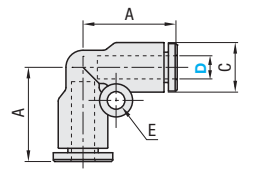
Part Number Type	D	Nominal	A	B	C	Width across flats H	Thread Size M	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MSELG	4	1	17.1	30.3	9	10	R1/8	4.4	14.7		
	6	1	18.0	31.4	11.2	10	R1/8	8.5	15.5		
		2	18.0	34.4	11.2	14	R1/4		31.8		
	8	1	23.6	35.3	13.6	10	R1/8	15.0	18.6		
		2	23.6	37.8	13.6	14	R1/4		35.8		
		3	23.6	38.8	13.6	17	R3/8		50		
	10	2	25	47.8	16.3	17	R1/4	31.5	59.4		
		3	25	47.3	16.3	17	R3/8		58.2		
		4	25	50.3	16.3	21	R1/2		94.4		
	12	2	32.2	49.7	19.7	17	R1/4	41.7	65		
		3	32.2	49.2	19.7	17	R3/8	42.6	63.8		

Union Elbows



RoHS

USEBL



M Material: PBT (Polybutylene Terephthalate)

Part Number Type	D	A	C	E	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
USEBL	4	17.1	9	3.2	3.2	3.2		
	6	19.0	11.2	3.2	9.3	4.9		
	8	23.6	13.6	3.2	20.3	9.4		
	10	25	16.3	4.2	27.0	11.8		
	12	32.2	19.7	4.2	40.6	22.5		
	16	34	25.6	4.2	78.7	36.5		

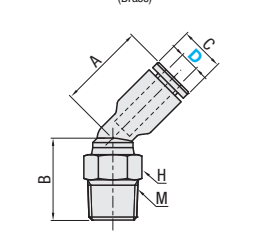
45° Elbow



RoHS

MSEFE

Thread: CW614N/CuZn39Pb3 (Brass)



M Material: PBT (Polybutylene Terephthalate)

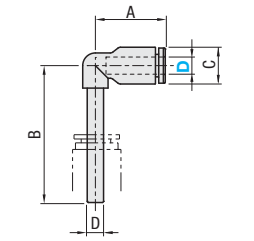
Part Number Type	D	Nominal	A	B	C	Width across flats H	Thread Size M	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
MSEFE	4	1	17.1	16.3	9	10	R1/8	4.4	6.5		
		2	17.1	19.3		14	R1/4		14.5		
	6	M5	18.0	13.7	11.2	9	M5x0.8	3.2	5		
		1	18.0	16.9		10	R1/8	8.5	7.5		
		2	18.0	19.9		14	R1/4		15		
		3	18.0	20.9		17	R3/8		24		
	8	1	23.6	17.5	13.6	10	R1/8	15.0	8		
		2	23.6	20		14	R1/4		15		
		3	23.6	21		17	R3/8		23		
	10	1	25	19.6	16.3	17	R1/8	22.1	18		
		2	25	22.6		17	R1/4	31.5	22		
		3	25	22.1		17	R3/8		23		
		4	25	25.1		21	R1/2		39.5		
	12	2	32.2	24.1	19.7	17	R1/4	41.7	27		
		3	32.2	23.6		17	R3/8	42.6	28		
		4	32.2	26.6		21	R1/2		44.5		

L-Connectors



RoHS

USLCN



M Material: PBT (Polybutylene Terephthalate)

Part Number Type	D	A	B	C	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
USLCN	4	17.1	33.5	9	3.2	1.5		
	6	18.0	42.1	11.2	6.3	3		
	8	23.6	47.8	13.6	20.3	5		
	10	25	53.7	16.3	27.0	7		
	12	32.2	60.9	19.7	40.6	13.5		

Purple printed items in the specification table have been changed.

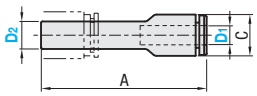
Old Type	New Type
MJELL	MSELL
MJELG	MSELG
UJEBL	USEBL
MJEFE	MSEFE
UJLCN	USLCN

■Reducer



RoHS

USRDS



Material: PBT (Polybutylene Terephthalate)

Part Number Type	D1	D2	A	C	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
USRDS	4	6	36.1	9	3.2	2		
		8	36.9	9		2		
	6	8	39.5	11.2	11.0	3		
		10	40.3	11.2		3.5		
	8	10	45.6	13.6	25.2	4.5		
		12	46.6	13.6		5.5		
	10	12	46.6	16.3	38.7	6.5		

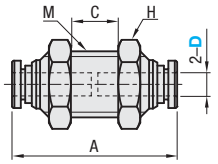
■Bulkhead Unions



RoHS

MSBUL MJBULS

Thread: CW614N/CuZn39Pb3 (Brass)
Thread: 1.4301/X5CrNi18-10



Material: Ring: PBT (Polybutylene Terephthalate)

The photo and drawing are for MSBUL. See the CAD data for MJBULS.

Part Number Type	D	A	Width across flats H	Thread Size M x Pitch	C (max)	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	MSBUL € Unit Price Qty. 1~9	MSBUL Volume Discount Qty. 10~	MJBULS € Unit Price Qty. 1~9	MJBULS Volume Discount Qty. 10~
MSBUL MJBULS	4	30(33)	14	M12x1	8.6(7.5)	3.2(4)	16(20)				
	6	31.9(36)	17	M14x1	9.4(9.5)	11.0(10)	22(33)				
	8	37(39)	19	M16x1	10.6(12.5)	25.2(22)	31.5(42)				
	10	40.1(44.5)	24	M20x1	12.9(18)	38.7(30)	54.5(75)				
	12	45.8(47)	26	M22x1	15.4(21)	44.6(35)	70.5(92)				

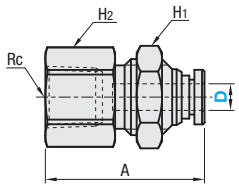
( ) values apply to MJBULS.

■Female for Bulkhead



RoHS

MSSB



Material: Ring: PBT (Polybutylene Terephthalate)

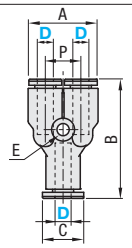
Part Number Type	D	Nominal	A	Width across flats H1	Width across flats H2	Thread Size Rc	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
MSSB	4	1	25.1	14	14	Rc1/8	3.2	18		
	6	1	26.3	17	17	Rc1/8	11.0	26		
		2	31.3			Rc1/4		30		
	8	1	28.9	19	19	Rc1/8	25.2	34.5		
		2	34.9			Rc1/4		42.5		
		3	35.9			Rc3/8		36		
	10	2	32.3	24	22	Rc1/4	38.7	58.5		
		3	34.3			Rc3/8		55		
	12	3	37.4	26	24	Rc3/8	44.6	71.5		
		4	41.4			Rc1/2		70.5		

■Y Type



RoHS

USYL



Material: PBT (Polybutylene Terephthalate)

Part Number Type	D	A	B	C	E	P	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
USYL	4	18.3	31.2	9	2.2	9.3	2.5	4.9		
	6	22.6	34.7	11.2	3.2	11.4	9.9	7.3		
	8	27.8	44.2	13.6		14.2	22.8	13.9		
	10	33.3	46	16.3	4.2	17	36.6	17.7		
	12	39.7	56.8	19.7		20	43.2	32.5		

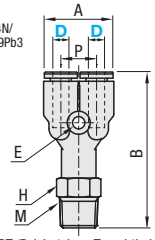
■Y Type



RoHS

MSYL

Threads:CW614N/CuZn39Pb3 (Brass)



Material: PBT (Polybutylene Terephthalate)

Part Number Type	D	Nominal	A	B	E	Width across flats H	P	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MSYL	4	M5	18.3	37.4	3.2	9	9.3	M5x0.8	3.2	8.9		
		1		40.6		10		R1/8	5.3	11.6		
		2		43.6		14		R1/4		20.5		
	6	M5	22.6	40.5		11	11.4	M5x0.8	3.2	12.9		
		1		43.7		11		R1/8	12.6	15.2		
		2		46.7		14		R1/4		23.1		
		3		47.7		17		R3/8		35.2		
	8	1	27.3	52.6		13	14.2	R1/8	20.7	23.3		
		2		55.1		14		R1/4		27.9		
		3		56.1		17		R3/8		36.2		
	10	2	33.3	56		17	17	R1/4	42.1	35.2		
		3		58		17		R3/8	46.9	40.8		
	12	2	39.7	65.9	4.2	19	20	R1/4	42.3	53.7		
		3		67.9		19		R3/8		59.5		
		4		70.9		21		R1/2	58.7	74.9		

Specifications

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	0.9MPa
Operating Vacuum Level	-100kPa

Order Example

Part Number - Nominal - D2

MSELL4 - 1
USRDS6 - 10
USYL4

For orders larger than indicated quantity, please request a quotation.

Days to Ship

6 Days P.87

Purple printed items in the specification table have been changed.

Old Type	New Type
UJRDS	USRDS
MJBUL	MSBUL
UJYL	USYL
MJYL	MSYL

One-Touch Couplings

Part Number & Spec.Change Printed in Purple

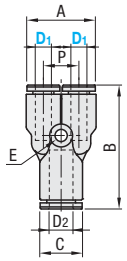
Previous One Touch Coupling products have been moved to Web Listed Products category.

Stepped Diameter Union-Y



RoHS

USDY



M Material: PBT (Polybutylene Terephthalate)

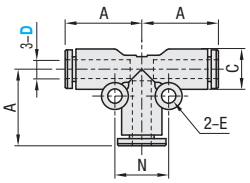
Part Number Type	D1	A	D2	B	C	E	P	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
USDY	4	18.3	6	32.5	11.2	3.2	9.3	7.1	5		
	6	22.6	8	38.1	13.6		11.4	18.9	8		
	8	27.8	10	43.2	16.3		14.2	32.9	12.5		
	10	33.3	12	50.9	19.7	4.2	17	43.4	20		

Union Tees



RoHS

USTEL



M Material: PBT (Polybutylene Terephthalate)

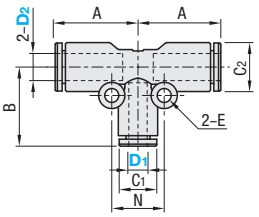
Part Number Type	D	A	C	E	N	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
USTEL	4	17.1	9	3.2	12	3.2	5		
	6	19	11.2		13	10.9	7.3		
	8	23.6	13.6		18	24.8	14.1		
	10	25	16.3	4.2	24	39.5	17.7		
	12	32.2	19.7		28	44.2	33.5		
	16	34	25.6		30	83.5	53.8		

Stepped Unions Tees



RoHS

USDTE



M Material: PBT (Polybutylene Terephthalate)

Part Number Type	D1	D2	A	C1	E	C2	N	B	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Q. 10~49
USDTE	4	6	19	9	3.2	11.2	12	18.1	3.2	6.5		
	6	8	23.6	11.2		13.6	16	20	10.9	10		
	8	10	25	13.6	4.2	16.3	19	24.1	24.8	14.5		
	10	12	32.2	16.3		19.7	20	25.5	39.5	25		

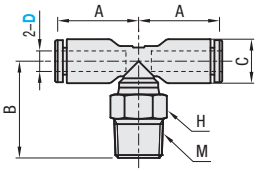
Union Tees



RoHS

MSTEL

Thread: CW614N/CuZn39Pb3 (Brass)



M Material: PBT (Polybutylene Terephthalate)

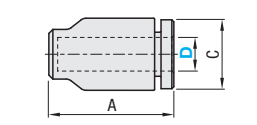
Part Number Type	D	Nom.	A	B	C	Width across flats H	Thread Size M	Effective Sectional Area (mm²) Urethane Tube	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MSTEL	4	M5	17.1	16.6	9	9	M5x0.8	3.2	6.2		
		1		19.8		10	R1/8	4.4	9.5		
		2		22.8		14	R1/4		18.7		
	6	M5	18	17.7	11.2	9	M5x0.8	3.2	7.7		
		1		20.9		10	R1/8	8.5	11		
		2		23.9		14	R1/4		20.2		
		3		24.9		17	R3/8		29.5		
	8	1	23.6	23.5	13.6	10	R1/8	15	14.9		
		2		26		14	R1/4		23.6		
	10	1	25	25.8	16.3	17	R1/8	31.5	22.1	26.3	
		2		28.8			R1/4		31		
		3		28.3			R3/8		33		
	12	2	32.2	30.5	19.7	17	R1/4	42.6	41.7	41.7	
		3		30			R3/8		43.7		
		4		33		21	R1/2		63.4		

Cap



RoHS

MSCAP



M Material: PBT (Polybutylene Terephthalate)

Part Number Type	D	A	C	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
MSCAP	4	15.6	9	1.5		
	6	17	11.2	2		
	8	19.8	13.6	3.5		
	10	21	16.3	5		
	12	25.4	19.7	9.5		

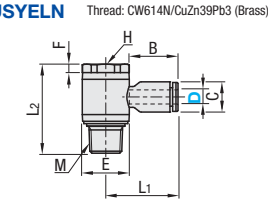
Turn Elbow Unions



RoHS

USYELN

Thread: CW614N/CuZn39Pb3 (Brass)



M Material: PBT (Polybutylene Terephthalate)

Part Number Type	D	Nom.	L1	B	F	E	L2	C	Width across flats H	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Q. 10~49
USYELN	4	1	21.5	14.5	2.5	14	26.5	9	13	R1/8	15.5		
	6	M5	20.5	15.5	2.5	10	17.8	11.2	8	M5x0.8	8.2		
		1	22.5		2.5	14	26.5		13	R1/8	16.5		
		2	25		3	19	34		17	R1/4	30.5		
		3	26.7		4	22.4	39.8		21	R3/8	50.5		
	8	1	25.6	17.8	2.5	14	26.5	13.6	13	R1/8	17.5		
		2	28.1		3	19	34		17	R1/4	31.5		
		3	29.8		4	22.4	39.8		21	R3/8	51		
	10	2	28.9	19.4	3	19	34	16.3	17	R1/4	33		
		3	30.6		4	22.4	39.8		21	R3/8	52.5		
		4	32.9		5	27	44.8		24	R1/2	84.5		
	12	2	36.5	24.5	4.5	18.4	28.9	21.2	14	R1/4	64		
		3	35.9	22.4	4	22.4	39.8	19.7	21	R3/8	57		

Old Type	New Type
UJDY	USDY
UJTEL	USTEL
UJDTE	USDTE
MJTEL	MSTEL
UJYELN	USYELN

Purple printed items in the specification table have been changed.

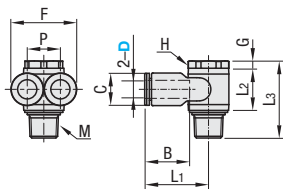
2 Turn Elbow



RoHS

USTE

Thread: CW614N/CuZn39Pb3 (Brass)



M Material: PBT (Polybutylene Terephthalate)

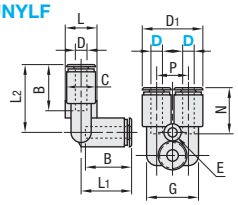
Part No. Type	D	L1	L2	L3	B	C	G	P	Width across flats H	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
USTE	4	18.6	11.8	17.8	14.5	9	2.5	9.3	8	M5x0.8	7.4		
	6	22	14.5	26.5	15.5	11.2	2.5	13	13	R1/8	18.5		
	8	28.1	18	34	17.8	13.6	3	17	17	R1/4	35		
	10	27.5	18	34	19.4	16.3	3	17	17	R1/4	57.5		
	12	34.9	22	44.8	22.4	19.7	5	24	20	R1/2	98		

FY Type Elbow Unions



RoHS

UNYLF



M Material: PBT (Polybutylene Terephthalate)

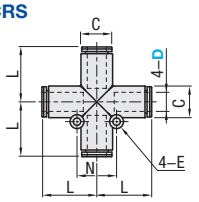
Part No. Type	D	L1	L2	B	C	D1	E	L	G	N	P	Mass (g)	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~49
UNYLF	4	17.5	23.5	16	10	21	3.2	11	18	15.5	11	8		
	6	19.5	27	17.5	12.5	26	4.2	13.5	22.5	17	13.5	12		
	8	22	29	19	14.5	30	4.2	15.5	26.5	18	15.5	16		
	10	25.5	33	21.5	17.5	36	4.2	18.5	31.5	20	18.5	25		
	12	28	35.5	23	20	41	4.2	21	37	21.5	21	34		

Cross Unions



RoHS

USCRS



M Material: PBT (Polybutylene Terephthalate)

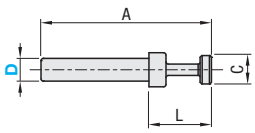
Part No. Type	D	L	C	E	N	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
USCRS	8	23.6	13.6	3.2	17	14.5		
	10	25	16.3	4.2	20	20.5		
	12	32.2	19.7	4.2	24	38		

Blind Plugs



RoHS

BSLG



M Material: PBT (Polybutylene Terephthalate)

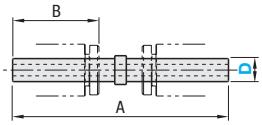
Part No. Type	D	A	L	C	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
BSLG	4	30	11	6	0.5		
	6	34	14	8	1		
	8	38	16	10	2		
	10	41	16	12	3		
	12	43	16	14	4		

Nipple



RoHS

MSPJ



M Material: PBT (Polybutylene Terephthalate)

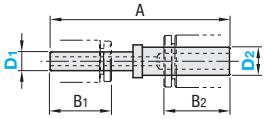
Part No. Type	D	A	B	Effective Sectional Area (mm²) (Urethane Tube)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
MSPJ	4	37.5	16	3.2	2		
	6	39.5	17	12.6	3		
	8	43.2	18.5	19.6	4		
	10	47	21	31.2	6		
	12	52.8	22.5	50.2	8		

Irregular Connection Plugs



RoHS

BSLDS



M Material: PBT (Polybutylene Terephthalate)

Part No. Type	D1	D2	A	B1	B2	Effective Sectional Area (mm²) Urethane Tube	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~49
BSLDS	4	6	38.3	16	17	3.2	3		
	6	8	41.2	17	18.5	12.6	3		
	8	10	45	18.5	21	18.8	5		
	10	12	49.8	21	22.5	31.2	8		

Specifications

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	0.9MPa
Operating Vacuum Level	-100kPa

Purple printed items in the specification table have been changed.

Old Type	New Type
UMTE	USTE
UNCRS	USCRS
BJLG	BSLG
BJLDS	BSLDS

Order Example

Part Number	-	D2	-	Nominal
USDTE8	-	10		
MSTEL6			-	M5

Days to Ship

-Except shown on right. **6 Days** P. 87

-UNYLF **8 Days** Express A 2,00 EUR/piece P. 88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

One-Touch Couplings / Free Angle Fittings

Part Number & Spec.Change Printed in Purple

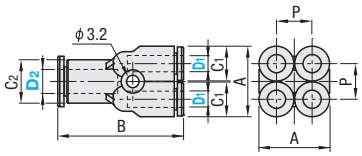
CAD Data

Previous One Touch Coupling products have been moved to Web Listed Products category.

Double Y-Shaped

DSNYL





Purple printed items in the specification table have been changed from the old DUNYL.

M Material: Polybutylene Terephthalate

RoHS

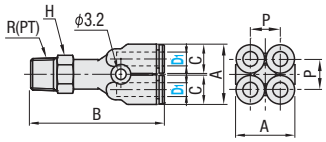
Part Number Type	D1	D2	A	B	C1	C2	P	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
DSNYL	4	6	18.2	32.5	9	11.2	9.2		
	6	8	22.6	36.6	11.2	13.6	11.5		

For orders larger than indicated quantity, please request a quotation.

R (PT) Double Y-Shaped

DSLYL





Purple printed items in the specification table have been changed from the old DMLYL.

M Material: Polybutylene Terephthalate
Thread Part: CW614N/CuZn39Pb3

RoHS

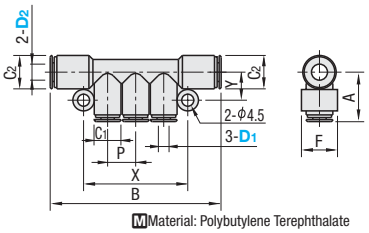
Part Number Type	D1	Nominal Diameter	A	B	C	Width across flats H	P	Thread Size R (PT)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
DSLYL	4	1	18.2	41.5	9	11	9.2	R1/8		
		2	18.2	44.5	9	14	9.2	R1/4		
	6	1	22.6	45	11.2	13	11.5	R1/8		

For orders larger than indicated quantity, please request a quotation.

Triple Single

DUNL





M Material: Polybutylene Terephthalate

RoHS

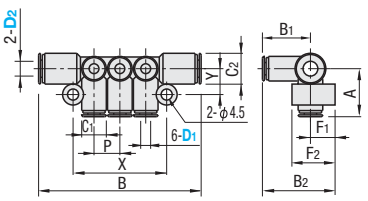
Part Number Type	D1	D2	A	B	C1	C2	P	F	X	Y	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
DUNL	4	6	18.5	64	10	12.5	10.5	13.5	39	10.5		
		8	19.5	66	10	14.5	10.5	15.5	39	11.5		
	6	8	21	73	12.5	14.5	13	15.5	46.5	11.5		
		10	22	78.5	12.5	17.5	13	18.5	46.5	13		
	8	10	23.5	84.5	14.5	17.5	15	18.5	52.5	13		

For orders larger than indicated quantity, please request a quotation.

Triple Double

DUNLW





M Material: Polybutylene Terephthalate

RoHS

Part Number Type	D1	D2	A	B	B1	B2	C1	C2	P	F1	F2	X	Y	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
DUNLW	4	8	19.5	66	19.5	29.5	10	14.5	10.5	10	17.5	38	10.5		
	6	10	22	78.5	22	32	12.5	17.5	13	10	19.5	45	12		
	8	12	24.5	87	24.5	36	14.5	20	15	11.5	22	51	13		

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number		D2, Nominal Diameter
DSNYL4	-	6
DUNL6	-	8
DSLYL4	-	2

Days to Ship: Except shown on right. **6 Days** P.87

- DUNL · DUNLW: **8 Days**

Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

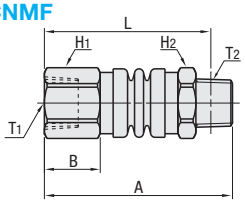
Specifications

Applicable Fluid	Compressed Air
Operation Temperature Range	-15~60°C
Max. Operating Pressure	1MPa
Operating Vacuum Level	-100kPa

Free Angle Fittings -Female Thread, Male Thread End-

KPCNMF





RoHS

Part Number Type	No.	A	B	Width across flats H1	Width across flats H2	L	Thread Size T1	Thread Size T2	Effective Sectional Area (mm²)	Weight (g)	€ Unit Price
KPCNMF	2	52.2	15.5	17.0	17.0	46.2	G1/4	R1/4	10	48	
	3	59.3	19.5	21.0	19.0	52.9	Rc3/8	R3/8	25	76	

For materials, see below.

Order Example

Part Number
KPCNMF2

Type (Free Angle Fitting)

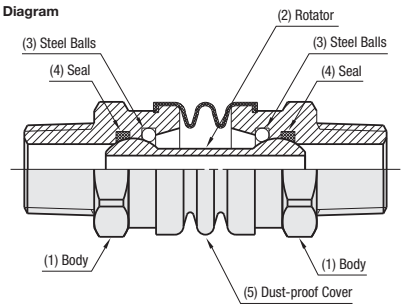
Applicable Fluid	Compressed Air
Operation Temperature Range	-5~60°C
Max. Operating Pressure	1MPa (10.1kgf/cm²)

Days to Ship: **8 Days**

Express A 5,00 EUR/piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Structure Diagram



No.	Name of Parts	M Material	S Surface Treatment
(1)	Body	Steel	Electroless Nickel Plating
(2)	Rotator	Steel	Electroless Nickel Plating
(3)	Steel Balls	Steel	-
(4)	Seal	Nitrile Rubber	-
(5)	Dust-proof Cover	Urethane Rubber	-

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Miniature One-Touch Coupling Connectors

Price Reduction
Up to 51%

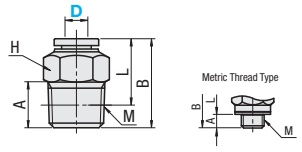
CAD Data

■Miniature One-Touch Coupling Connectors -Connectors-



RoHS

MNCN



M Material: Polybutylene Terephthalate
Thread: Brass (Electroless Nickel Plating)

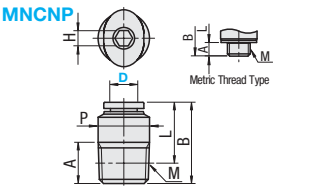
Part Number Type	D	Nominal Diameter	A	B	L	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNCN	4	M3	2.5	15.1	12.6	8	M3x0.5	0.9	2.4		
		M5	3	15.6			M5x0.8	3.8	3.2		
		1	8		11.6	10	R1/8	6.4	6.6		
	6	M5	3	17	14	10	M5x0.8	3.6	4.5		
		1	8	17.6	13.6		R1/8	6.3	6		

■Miniature One-Touch Coupling Connectors -Connectors with Hexagon Socket-



RoHS

MNCNP



M Material: Polybutylene Terephthalate
Thread: Brass (Electroless Nickel Plating)

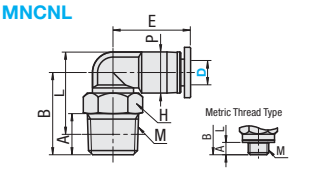
Part Number Type	D	Nominal Diameter	A	B	L	Opposite Side H	P	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNCNP	4	M3	2.5	15.1	12.6	1.5	8	M3x0.5	1.8	2.2		
		M5	3	15.6	12.6	2.5	8	M5x0.8	5.1	3		
		1	8	15.8	11.8	3	10	R1/8	7.4	6.2		
	6	M5	3	17.5	14.5	2.5	10	M5x0.8	5.2	4.4		
		1	8	17.9	13.9	4	10	R1/8	13	5.6		

■Miniature One-Touch Coupling Connectors -Elbows-



RoHS

MNCNL



M Material: Polybutylene Terephthalate
Thread: Brass (Electroless Nickel Plating)

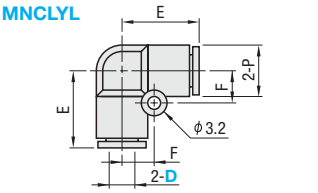
Part Number Type	D	Nominal Diameter	A	B	L	P	E	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNCNL	4	M3	2.5	14	15.5	8	15.1	8	M3x0.5	1.3	3		
		M5	3	14	14.5				M5x0.8	2.2	3.4		
		1	8	16	16			10	R1/8	4.8	6.2		
	6	M5	3	14.5	16.8	10.5	16	8	M5x0.8	3.5	4.1		
		1	8	17	18.3			10	R1/8	8.5	6		

■Miniature One-Touch Coupling Connectors -Union Elbows-



RoHS

MNCLYL



M Material: Polybutylene Terephthalate

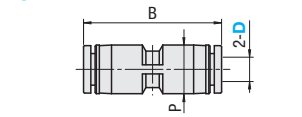
Part Number Type	D	P	E	F	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNCLYL	4	8	13.1	4.8	2.3		
	6	10.5	15	9	3.6		

■Miniature One-Touch Coupling Connectors -Unions-



RoHS

MNUN



M Material: Polybutylene Terephthalate

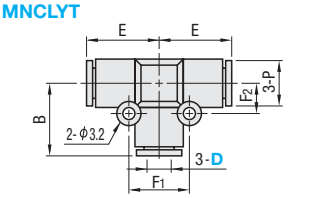
Part Number Type	D	B	P	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNUN	4	22.7	8	5.4	2		
	6	24.4	10.4	11	3.1		

■Miniature One-Touch Coupling Connectors -Union Tees-



RoHS

MNCLYT



M Material: Polybutylene Terephthalate

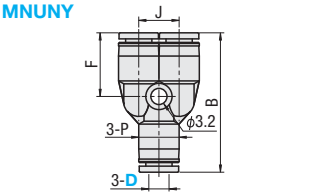
Part Number Type	D	B	P	E	F_1	F_2	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNCLYT	4	13.1	8	13.1	11.2	5.6	3.3		
	6	15	10.5	14.95	13.2	6.6	5.3		

■Miniature One-Touch Coupling Connectors -Union Y-



RoHS

MNUNY



M Material: Polybutylene Terephthalate

Part Number Type	D	B	P	J	F	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNUNY	4	27.6	8	8	12.6	2.3	3.4		
	6	31	10.5	10.5	14	6.8	5.5		

Order Example

Part Number	-	Nominal Diameter
MNCN4 MNUN6	-	M5

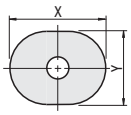
Days to Ship: 6 Days

P.87

Specifications

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	1MPa
Operating Vacuum Level	-100kPa

■Release Ring Shape of Miniature 1-Touch Couplings



D	X	Y
4	9.8	7.8
6	11.8	9.8

All Stainless Steel One-Touch Couplings

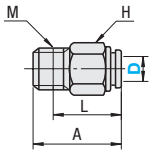
CAD Data

■Compressed Air - Miniature Connector Fittings



RoHS

MLCNLSS



M Material: 1.4401/X5CrNiMo17-12-2 (Gasket: Fluoro-rubber)

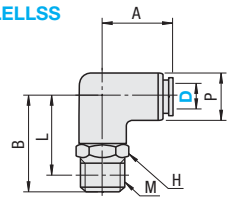
Part Number Type	D	Nominal	A	Width across flats H	L	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MLCNLSS	4	M5	20.5	10	18.5	M5x0.8	26.8		
		1	21	10	17	R1/8	27.6		
		2	19.5	14	14	R1/4	33.9		
	6	M5	23.5	12	21.5	M5x0.8	26.7		
		1	23	12	19	R1/8	27.5		
		2	22.5	14	17	R1/4	35.0		
		3	21	17	15	R3/8	45.0		
	8	1	27.5	14	23.5	R1/8	38.0		
		2	26.5	14	21	R1/4	41.7		
		3	22	17	16	R3/8	53.5		
	10	2	29.5	17	24	R1/4	60.1		
		3	28.5	17	22.5	R3/8	68.6		
		4	26.5	22	19	R1/2	91.4		
	12	3	30.5	19	24.5	R3/8	116.2		
		4	30	22	22.5	R1/2	131.8		

■Compressed Air - Miniature Connector Fittings - 90 Deg. Elbow



RoHS

MLELLSS



M Material: 1.4401/X5CrNiMo17-12-2 (Gasket: Fluoro-rubber)

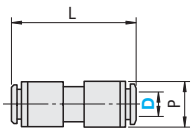
Part Number Type	D	Nominal	A	B	P	Width across flats H	L	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MLELLSS	4	M5	17.5	22.5	12	12	20.5	M5x0.8	6.5		
		1		24.5		12	20.5	R1/8	8.9		
		2		27.5		14	22	R1/4	14.8		
	6	M5	20	23.5		12	21.5	M5x0.8	9.8		
		1		25.5		12	21.5	R1/8	10.9		
		2		28.5		14	23	R1/4	16.0		
		3		29.5		17	23.5	R3/8	23.9		
	8	1	22	26.5	14	14	22.5	R1/8	17.6		
		2		29.5		14	24	R1/4	18.4		
		3		31.5		17	25.5	R3/8	23.1		
	10	2	25.5	31.5	17	17	26	R1/4	23.6		
		3		33		17	27	R3/8	28.4		
		4		36		22	28.5	R1/2	44.8		
	12	3	27.5	34.5	22	22	28.5	R3/8	30.3		
		4		37.5		22	30	R1/2	46.4		

■Union Straight



RoHS

UNSTLS



M Material: 1.4401/X5CrNiMo17-12-2 (Gasket: Fluoro-rubber)

Part Number Type	D	L	P	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
UNSTLS	4	32	10	11.5		
	6	35	12	15.8		
	8	37	14	21.3		
	10	42	17	34.3		
	12	44	20	47.0		

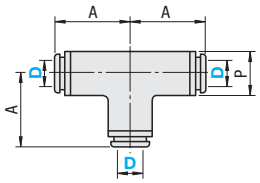
For orders larger than indicated quantity, please request a quotation.

■Union Tees



RoHS

UNTELS



M Material: 1.4401/X5CrNiMo17-12-2 (Gasket: Fluoro-rubber)

Part Number Type	D	A	P	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
UNTELS	4	18	12	29.8		
	6	20.5	12	29.7		
	8	22.5	14	42.3		
	10	26	17	66.4		
	12	28	22	124.6		

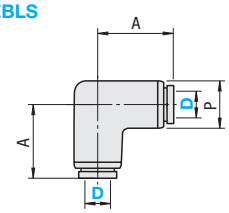
For orders larger than indicated quantity, please request a quotation.

■Union Elbows



RoHS

UNEBLS



M Material: 1.4401/X5CrNiMo17-12-2 (Gasket: Fluoro-rubber)

Part Number Type	D	A	P	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
UNEBLS	4	18	12	23.2		
	6	20.5	12	23.1		
	8	22.5	14	32.5		
	10	26	17	57.1		
	12	28	22	107.0		

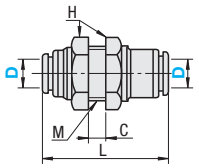
For orders larger than indicated quantity, please request a quotation.

■Bulkhead Unions



RoHS

MLBULSS



M Material: 1.4401/X5CrNiMo17-12-2 (Gasket: Fluoro-rubber)

Part Number Type	D	L	Width across flats H	Thread Size M	C (max)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
MLBULSS	4	31.5	14	M12x1.0	4	18.8		
	6	34.5	17	M14x1.0	6	29.3		
	8	37.5	19	M16x1.0	9	38.0		
	10	42.5	23	M20x1.0	11.5	63.5		
	12	44.5	26	M22x1.0	11.5	79.3		

For orders larger than indicated quantity, please request a quotation.

Specifications

Applicable Fluid	Compressed Air
Operating Pressure	0~1MPa
Negative Pressure	10Torr
Operation Temperature	-15 ~ 120°C (Not to be frozen)

1Torr=133.32Pa

Order Example

Part Number	-	Nominal
MLELLSS4	-	2
UNSTLS8		

Days to Ship

- MLCNLSS / MLELLSS: 6 Days P.87
- Other Than Those Above: 8 Days | Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Heat-Resistant One-Touch Fittings / High Heat-Resistant One-Touch Fittings

NEW

Price Reduction Up to 37%

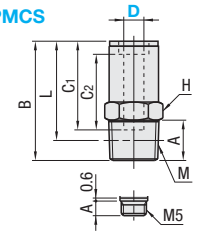
CAD Data

Heat resistant One-Touch Couplings -Straight-



RoHS

KPMCS



Operation Temperature: 0 ~ 100°C

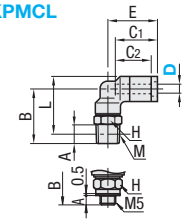
M Material: Gasket: Nitrile Rubber

Heat resistant One-Touch Couplings -Elbow-



RoHS

KPMCL



Operation Temperature: 0 ~ 100°C

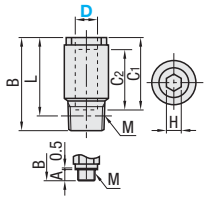
M Material: Gasket: Nitrile Rubber

Heat resistant One-Touch Couplings -Hexagon Socket Straight-



RoHS

KPMCC



Operation Temperature: 0 ~ 100°C

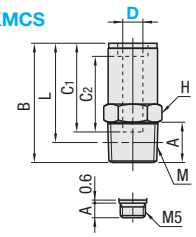
M Material: Gasket: Nitrile Rubber

High Heat-Resistant One-Touch Fittings -Straight-



RoHS

KKMCS



Operation Temperature: 0 ~ 120°C

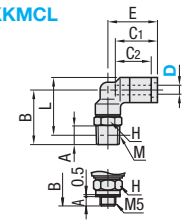
M Material: Gasket: Fluoro Rubber

High Heat-Resistant One-Touch Fittings -Elbow-



RoHS

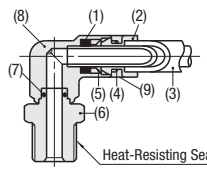
KKMCL



Operation Temperature: 0 ~ 120°C

M Material: Gasket: Fluoro Rubber

Structure Diagram of Heat-resistant One-Touch Couplings



*When using Sputter Proof Tubes, peel back outer insulation to C2 dimension. Non-insulated tubes can be used also.

Part Number Type	D	Nominal	Thread Size M	B	C1	C2	A	L	Opposite Side H	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
KPMCS	4	M5	M5x0.8	22.7	17.6	15	2.9	19.8	10	2	12		
		1	R1/8	23.7			8	19.7		4.5	13		
		2	R1/4	26.7			11	20.7	14		22		
	6	M5	M5x0.8	25.5	19.5	16	2.9	22.6	12	2	17		
		1	R1/8	25.1			8	21.1		11	14		
		2	R1/4	29.1			11	23.0	14		23		
		3	R3/8				12	22.7	17		34		
	8	1	R1/8	29.9	20.2	17	8	25.9	14	20	27		
		2	R1/4	28.6			11	22.6			25		
		3	R3/8	28.9			12	22.6	17		32		
	10	1	R1/8	33.3	23.2	20	8	29.3	17	23	40		
		2	R1/4				11	27.3		35	39		
		3	R3/8	31.8			12	25.5			46		
		4	R1/2	35.8			15	27.6	22		67		
	12	2	R1/4	38.9	26.3	22	11	32.9	21	47	61		
		3	R3/8	34.9			12	28.6		50	62		
		4	R1/2	36.9			15	28.6	22		74		

Part Number Type	D	Nominal	Thread Size M	A	B	L	C1	C2	E	Opposite Side H	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
KPMCL	4	M5	M5x0.8	3	19.8	22	17.6	15	20.7	10	1.5	18		
		1	R1/8	8	22.8	24.1					3.5	21		
		2	R1/4	11	25.8	25				14		31		
	6	M5	M5x0.8	3	22	25.3	19.4	16	23	12	1.9	26		
		1	R1/8	8	25	27.3					9	28		
		2	R1/4	11	28	28.2				14		36		
		3	R3/8	12	29.8	29.7				17		49		
	8	1	R1/8	8	28	31.3	20.2	17	24.8	14	16	36		
		2	R1/4	11	31	32.2						41		
		3	R3/8	12	32.8	33.7				17		55		
	10	1	R1/8	8	32.5	37.8	23.2	19.5	29.3	17	22.5	67		
		2	R1/4	11	35.5	38.8					30	69		
		3	R3/8	12	38.5	39.5						78		
		4	R1/2	15	39.5	40.6				22		104		
	12	2	R1/4	11	37.5	42.3	26.3	23	33.4	21	38	107		
		3	R3/8	12	38.5	43				39		113		
		4	R1/2	15	41.5	44.1				22		129		

Part Number Type	D	Nominal	Thread Size M	B	C1	C2	A	L	Opposite Side H	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
KPMCC	4	M5	M5x0.8	22.6	17.6	15	2.9	19.7	2	2	11		
		1	R1/8	23.7			8		2.5	5.2	12		
		2	R1/4	24.7			11	18.7	2.5		19		
	6	M5	M5x0.8	25.5	19.5	16	2.9	22.6	2	2	15		
		1	R1/8	25.1			8	21.1	4	11	13		
		2	R1/4				11	19	4		18		
		3	R3/8	26.1			12	19.7	4		27		
	8	1	R1/8	29.9	20.2	17	8	25.9	5	17	20		
		2	R1/4	28.6			11	22.6	6	23	20		
		3	R3/8	25.9			12	19.6			26		
	10	1	R1/8	33.3	23.2	20	8	29.3	5	17	35		
		2	R1/4	32.3			11	26.3	6	20	33		
		3	R3/8	31.8			12	25.4			38		
		4	R1/2	32.8			15	24.6			56		
	12	2	R1/4	38.9	26.3	22	11	32.9	8	40	56		
		3	R3/8	34.9			12	28.6			49		
		4	R1/2	36.9			15	28.7			64		

Part Number Type	D	Nominal	Thread Size M	B	C1	C2	A	L	Opposite Side H	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
KKMCS	4	M5	M5x0.8	22.7	17.6	15	2.9	19.8	10	2	12		
		1	R1/8	23.7			8	19.7		4.5	13		
	6	M5	M5x0.8	25.5	19.5	16	2.9	22.6	12	2	17		
		1	R1/8	25.1			8	21.1		11	14		
		2	R1/4	29.1			11	23.0	14		23		
	8	1	R1/8	29.9	20.2	17	8	25.9	14	20	27		
		2	R1/4	28.6			11	22.6			25		
	10	1	R1/8	33.3	23.2	20	8	29.3	17	23	40		
		2	R1/4				11	27.3		35	39		
		3	R3/8	31.8			12	25.5			46		
	12	3	R3/8	34.9	26.3	22	12	28.6	21	50	62		
		4	R1/2	36.9			15	28.6	22		74		

Part Number Type	D	Nominal	Thread Size M	A	B	L	C1	C2	E	Opposite Side H	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
KKMCL	4	M5	M5x0.8	3	19.8	22	17.6	15	20.7	10	1.5	18		
		1	R1/8	8	22.8	24.1					3.5	21		
	6	M5	M5x0.8	3	22	25.3	19.4	16	23	12	1.9	26		
		1	R1/8	8	25	27.3					9	28		
		2	R1/4	11	28	28.2				14		36		
	8	1	R1/8	8	28	31.3	20.2	17	24.8	14	16	36		
		2	R1/4	11	31	32.2						41		
	10	1	R1/8	8	32.5	37.8	23.2	19.5	29.3	17	22.5	67		
		2	R1/4	11	35.5	38.8					30	69		
		3	R3/8	12	38.5	39.5						78		
	12	3	R3/8	12	38.5	43	26.3	23	33.4	21	39	113		
		4	R1/2	15	41.5	44.1				22		129		

Order Example: Part Number KPMCS6 - Nominal 1

Days to Ship: 6 Days P.87

No.	Name of Parts	Material
(1)	Elastic Sleeve	H-NBR / FKM
(2)	Release Ring	Brass / Electroless Nickel Plating
(3)	Tube	Sputtering Resistant Tubes
(4)	Guide Ring	Brass / Electroless Nickel Plating
(5)	Lock Pawl	Stainless Steel
(6)	Thread Body	Brass / Electroless Nickel Plating
(7)	O Ring	H-NBR / FKM
(8)	Metal Body	Brass / Electroless Nickel Plating
(9)	Cover	Brass / Electroless Nickel Plating

Specifications

Type	Heat resistant	Super Heat resistant
Applicable Fluid	Compressed Air / Water	
Operation Temperature Range	0~100°C	0~120°C
Max. Operating Pressure	1.0MPa	
Operating Vacuum Level	-100kPa	

*When using with water, keep the surge pressure to below max. pressure rating. For water, Inserts for Soft Tubes (**P.1261** PUIT / PUSIT) must be used.

NEW

One-Touch Couplings For Clean Applications
-PP Resin Type-

Price Reduction up to 35%

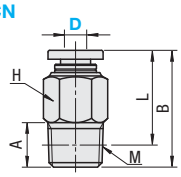
CAD Data

■ Couplings for Clean Applications
-Connector-



RoHS

PPCN



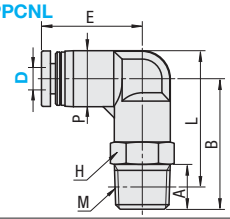
Part Number Type	D	Nominal	A	B	L	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPCN	4	1	8	21	17	12	R1/8	3.4	2.5		
	6	1	8	22.7	18.7	14	R1/8	9.1	3		
		2	11	24.7			R1/4		3.5		
	8	1	8	27.9	23.9	17	R1/8	22.1	4.5		
		2	11	26.6	20.6		R1/4				
		3	12	27.5	21.2		R3/8		6		
	10	2	11	32.4	26.4	19	R1/4	30.5	7		
		3	12	33.6	27.3		R3/8		8		
	12	3	12	37.4	31.1	22	R3/8	40.7	11.5		

■ Couplings for Clean Applications
-Elbow-



RoHS

PPCNL



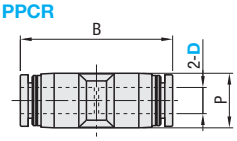
Part Number Type	D	Nominal	A	B	L	P	E	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPCNL	4	1	8	23.3	24.3	10	18	10	R1/8	3.4	4		
	6	1	8	25	27.3	12.5	19.8	12	R1/8	8.7	5		
		2	11	28	28.2			14	R1/4		5.5		
	8	1	8	28	31.3	14.5	22.7	14	R1/8	17.2	7		
		2	11	31	32.2				R1/4		7.5		
		3	12	32.8	33.7			17	R3/8		8.5		
	10	2	11	36	38.7	17.5	26.2	17	R1/4	25.9	12		
		3	12	37	39.4				R3/8		13		
	12	3	12	39	43.2	21	29.4	22	R3/8	37.6	17.5		

■ Couplings for Clean Applications
-Union Straight-



RoHS

PPCR



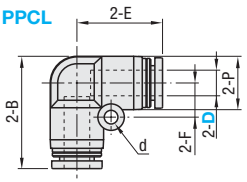
Part Number Type	D	B	P	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPCR	4	31	10	4	5.3		
	6	35.2	12.5	5.5	12.5		
	8	37.8	14.5	8	20		
	10	43.8	17.5	13	35		
	12	48.2	21	19	59		

■ Couplings for Clean Applications
-Union Elbow-



RoHS

PPCL



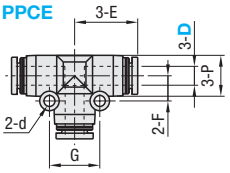
Part Number Type	D	B	P	E	d	F	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPCL	4	22	10	17	3.2	6.5	4.5	4.2		
	6	26.5	12.5	20.2	3.2	8	6	10		
	8	30	15	22.4	4.2	10	9	16.5		
	10	35.2	17.5	26.4	4.2	12	14	30		
	12	40.1	21	29.6	4.2	14	20	47		

■ Couplings for Clean Applications
-Union Tee-



RoHS

PPCE



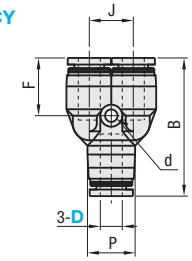
Part Number Type	D	P	E	d	F	G	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPCE	4	10	17	3.2	6.5	13	6.5	5.3		
	6	13	20.2	3.5	8	16	9	12.5		
	8	15	22.2	3.5	9	18	13	20		
	10	17.5	25.4	4.2	12	24	21	35		
	12	21	28.6	4.2	14	28	30	59		

■ Couplings for Clean Applications
-Union Y-



RoHS

PPCY



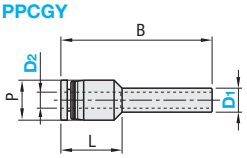
Part Number Type	D	B	P	J	d	F	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPCY	4	33	10	11	3.4	14.2	6.5	4.2		
	6	38	13	12	3.4	15.9	9	10		
	8	42.4	15	14	3.4	17.2	13	16.5		
	10	48.8	18	18	4.5	19.7	22	27		
	12	55.2	21.5	20	4.2	22.4	31	38		

■ Couplings for Clean Applications
-Reducer-



RoHS

PPCGY



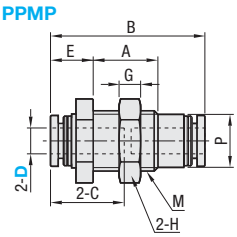
Part Number Type	D1	D2	B	L	P	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPCGY	6	4	37.8	15.3	10	3.5	5.3		
	8	4	40.3	16.8	12.5	4	5.3		
		6	40.9	17.4		4.5	9		
	10	6	43.9	18.9	12.5	5.5	9		
		8	43.7	18.7	14.5	6.5	20		
	12	8	49.7	20.7	14.5	8.5	20		
		10	50.2	21.2	17.5	10	35		

■ Couplings for Clean Applications
-Panel Mount-



RoHS

PPMP



Part Number Type	D	B	E	A	P	C	H	G	Thread Size M	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPMP	4	31.6	9.3	12	10	15	14	5	M12x1.5	7.2	4.2		
	6	35.8	9.9	15	12.3	17.1	17	5	M14x1.5	10.2	10.7		
	8	38.4	10.7	15.5	14.2	18.4	19	6	M16x1.5	14.3	19.1		
	10	43.4	13.2	18.5	17.5	20.9	24	6	M20x1.5	24.4	39.6		
	12	38.8	13.4	20.5	21	23.6	27	6	M24x1.5	30.4	47.6		

Order Example

Part Number	-	Nominal
PPCN6	-	1
PPCNL4	-	1

Days to Ship: 6 Days P.87

One-Touch Couplings For Clean Applications
-PP Resin - Thread SUS Type-

NEW

Price Reduction
Up to 19%

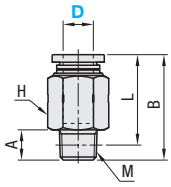
CAD Data

■ Couplings for Clean Applications
-Straight-



RoHS

PPSCN



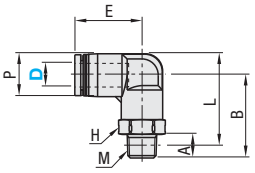
Part Number Type	D	Nominal	A	B	L	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPSCN	4	1	8	20.1	17.1	10	R1/8	5.3	8		
	6	1	8	22.7	18.7	12	R1/8	12.5	8.5		
		2	11	24.7			R1/4		16		
	8	1	8	27.9	23.9	14	R1/8	20	14.5		
		2	11	26.6	20.6		R1/4				
		3	12	23.9	17.6	17	R3/8		21.5		
	10	2	11	30	24	17	R1/4	35	18.5		
		3	12	29.5	23.2		R3/8		24		
	12	3	12	32.1	25.8	21	R3/8	59	32.5		

■ Couplings for Clean Applications
-Elbow-



RoHS

PPSCNL



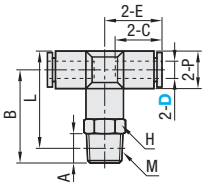
Part Number Type	D	Nominal	A	B	L	P	E	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPSCNL	4	1	8	23.3	24.3	10	18	10	R1/8	4.2	10		
	6	1	8	25	27.3	12.5	19.8	12	R1/8	10	12.5		
		2	11	28	28.2			14	R1/4		20		
	8	1	8	28	31.3	14.5	22.7	14	R1/8	16.5	16		
		2	11	31	32.2				R1/4		21.5		
		3	12	32.8	33.7			17	R3/8		35		
	10	2	11	36	38.7	17.5	26.2	17	R1/4	30	30.5		
		3	12	37	39.4				R3/8		38		
	12	3	12	39	43.2	21	29.4	21	R3/8	47	45.5		

■ Couplings for Clean Applications
-Tee-



RoHS

PPSCE



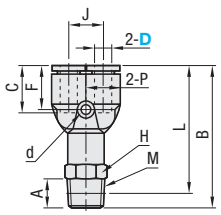
Part Number Type	D	Nominal	A	B	L	P	C	E	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPSCE	4	1	8	23.3	24.3	10	15	17	10	R1/8	4.1	12		
	6	1	8	26	28.5	13	17.1	20.3	12	R1/8	10	15.5		
		2	11	29	29.5				14	R1/4		23		
	8	1	8	26.3	29.8	15	18.4	22.4	14	R1/8	16.5	19.5		
		2	11	29.3	30.8					R1/4		25		
		3	12	31.1	32.3				17	R3/8		37.5		
	10	2	11	36	38.7	17.5	20.4	25.4	17	R1/4	30	36.5		
		3	12	37	39.4					R3/8		44		
	12	3	12	39	43.2	21	23.1	28.6	21	R3/8	47	54.5		

■ Couplings for Clean Applications
-Branch Y-



RoHS

PPSCY



Part Number Type	D	Nominal	A	B	L	P	C	J	d	F	Opposite Side H	Thread Size M	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PPSCY	4	1	3	40.7	36.7	10	15	11	3.4	14.2	10	R1/8	4.2	12.5		
	6	1	8	44.5	40.5	12.5	17.1	12	3.2	15.9	12	R1/8	10	15.5		
		2	11	47.5	41.5						14	R1/4		23		
	8	1	8	48.7	44.7	14.5	18.1	14	3.2	17.2	14	R1/8	16.5	20.5		
		2	11	51.7	45.7							R1/4		25.5		
		3	12	53.5	47.2						17	R3/8		24.5		
	10	2	11	58.5	52.5	18	20.9	18	4.5	19.7	17	R1/4	30	38		
		3	12	59.5	53.2							R3/8		45.5		
	12	3	12	64.7	58.4	21	23.6	20	4.2	22.4	22	R3/8	37	56.5		

Order Example

Part Number	-	Nominal
PPSCN4	-	1
PPSCY6	-	1

Days to Ship: **6 Days**

P.87

■ Features

- Clean environment compatible PP (polypropylene) is used for the main body. Plastic body is semitransparent so that fluid is recognizable from the outside.

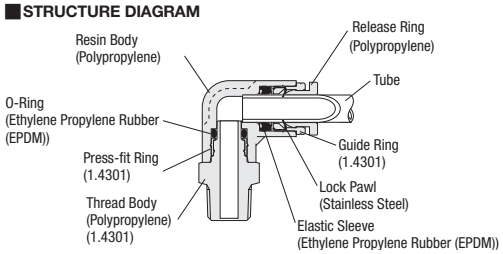
Specifications

Applicable Fluid	Compressed Air · Water · Some Medicine
Operation Temperature Range	0~80°C
Max. Operating Pressure	0.9MPa (20°C)
Operating Vacuum Level	-100kPa

■ Precautions for Use

- For water, Inserts for Soft Tubes (**P.1261** PUIT · PUSIT) must be used, and keep the surge pressure to below max. pressure rating.
- If threaded portion is made of PP, tighten coupling by screwing hand tight, then giving 2 or 3 turns with a wrench.
  Over tightening may damage threads. Insufficient tightening may cause loosening or leaking.
- Due to creep deformation, screws may become loose and minute leakages may occur.
  Periodical tightening maintenance is recommended.
  If retightening does not work, then replace the coupling in use.
- When possibilities of machine and equipment damages exist due to fluid medium leakages, consider providing protective measures such as covers prior to use.
- Oil is prohibited from use for the couplings.

■ STRUCTURE DIAGRAM



‹Recommended Tightening Torque›
Thread Body: Polypropylene
R1/8: 0.5N-m R1/4: 0.7N-m R3/8: 1.0N-m
Thread: 1.4301/X5CrNi18-10
R1/8: 7~9N-m R1/4: 12~14N-m R3/8: 22~24N-m
(The values are for seal tape 2 rotations. Tighten more max. 2 rotations if required.)

Rotary Joints / High Rotary Joints

Price Reduction
Up to 21%

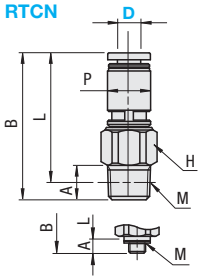
CAD Data

■Rotary Joints -Connector-



RoHS

RTCN



Metric Thread Type

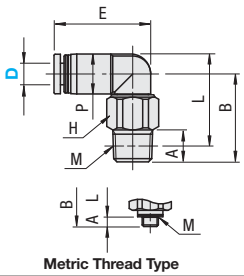
Part Number Type	D	Nominal	Thread Size M	A	B	L	P	Opposite Side H	Allowable Revolutions (r.p.m.)	Turning Torque (g-cm)	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
RTCN	4	M5	M5	3	32.6	29.6	10	12	500	60	1.9	13		
		1	R1/8	8	34.1	30.1					3.6	14		
	6	M5	M5	3	36.2	33.2	12.5	14	500	120	-	19		
		1	R1/8	8	36.9	32.9					9	18		
		2	R1/4	11	38.9	32.8						23		
	8	1	R1/8	8	45.3	41.3	14.5	17	400	150	20	34		
		2	R1/4	11	44.3	38.3						32		
		3	R3/8	12		38						39		
	10	2	R1/4	11	58.8	52.8	17.8	22	300	200	35	74		
		3	R3/8	12	56.8	50.5						70		

■Rotary Joints -Elbow-



RoHS

RTCNL



Metric Thread Type

Part Number Type	D	Nominal	Thread Size M	A	B	L	P	E	Opposite Side H	Allowable Revolutions (r.p.m.)	Turning Torque (g-cm)	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Disc. Qty. 10~
RTCNL	4	M5	M5	3	20.5	22.5	10	19.7	12	500	60	1.5	13		
		1	R1/8	8	22	23						2.9	15		
	6	M5	M5	3	23.3	26.5	12.5	22.8	14	500	120	-	20		
		1	R1/8	8	24	26.2						7.5	19		
		2	R1/4	11	26								24		
	8	1	R1/8	8	31.5	34.7	14.5	25.7	17	400	150	16.5	35		
		2	R1/4	11	30.5	31.7							33		
		3	R3/8	12	30.5	31.4							41		
	10	2	R1/4	11	38.3	41	17.5	29.5	22	300	200	21	67		
		3	R3/8	12	36.3	38.7						30	63		

Turning torque is the torque necessary for the joint to turn when it is free of compressed air pressure.

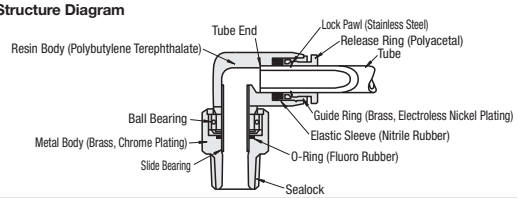
■Features

- Use as handy couplings for connecting tubes to swivel and rotary parts of general pneumatic equipment.
- With ball bearings used at the rotary part, rotary joints offer suitable use for tube connecting to fast-moving swivel and rotary equipment parts.

Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	1MPa
Operating Vacuum Level	–100kPa

■Structure Diagram

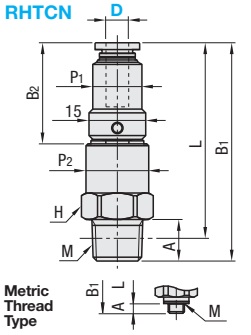


■High Rotary Joints -Straight-



RoHS

RHTCN



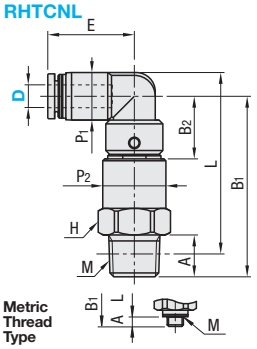
Part Number Type	D	Nominal	Thread Size M	A	B1	B2	L	P1	P2	Opposite Side H	Allowable Revolutions (r.p.m.)	Turning Torque (g-cm)	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Disc. Qty. 10~
RHTCN	4	M5	M5	3	43.2	22.7	40.2	11	11.6	12	1500	150	2.2	24		
		1	R1/8	8	47.7		43.7						3.4	28		
	6	1	R1/8	8	54.8	26.8	50.8	13	16.6	17	1200	150	12	51		
		2	R1/4	11	57.8		51.7						11.5	56		
	8	1	R1/8	8	58.1	30.1	54.1	15	16.6	17	1200	150	12	57		
		2	R1/4	11	61.1		55.1						12.5	63		

■High Rotary Joints -Elbow-



RoHS

RHTCNL



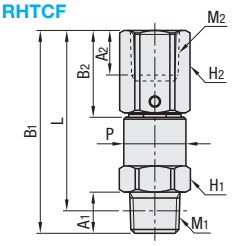
Part Number Type	D	Nominal	Thread Size M	A	B1	B2	E	L	P1	P2	Opposite Side H	Allowable Revolutions (r.p.m.)	Turning Torque (g-cm)	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Disc. Qty. 10~
RHTCNL	4	M5	M5	3	33.7	13.2	19.7	35.7	10	11.6	12	1500	150	2.2	21		
		1	R1/8	8	38.2		19.7	39.2						4.1	26		
	6	1	R1/8	8	44.5	16.5	22.8	46.7	12.5	16.6	17	1200	150	10	47		
		2	R1/4	11	47.5		22.8	47.7						10.5	53		
	8	1	R1/8	8	45.5	17.5	25.7	48.7	14.5	16.6	17	1200	150	11.5	50		
		2	R1/4	11	48.5		25.7	49.7						13	56		

■High Rotary Joints -Bushing-



RoHS

RHTCF



Part Number Type	No	M1	M2	A1	A2	B1	B2	L	P	Opposite Side H1	Opposite Side H2	Allowable Revolutions (r.p.m.)	Turning Torque (g-cm)	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Disc. Qty. 10~
RHTCF	11	R1/8	Rc1/8	8	9.5	47.2	19.2	43.2	16.6	17	14	1200	150	13.9	50		
	22	R1/4	Rc1/4	11	13.5	54.2	23.2	48.2	16.6	17	17	1200	150	11.2	68		
	33	R3/8	Rc3/8	12	14.5	62.1	26.6	55.8	23.6	24	22	900	250	47.2	133		

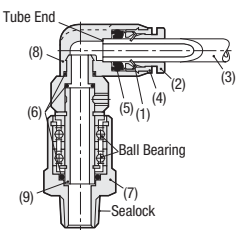
■Features

- Use as handy couplings for connecting tubes to swivel and rotary parts of general pneumatic equipment.
- With ball bearings used at the rotary part, rotary joints offer suitable use for tube connecting to fast-moving swivel and rotary equipment parts.

Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	1MPa
Operating Vacuum Level	–100kPa

■Structure Diagram



No.	Name of Parts	Material
(1)	Lock Pawl	Stainless Steel
(2)	Release Ring	POM / Polyacetal
(3)	Tube	Polyurethane etc.
(4)	Guide Ring	Brass (Electroless Nickel Plating)
(5)	Elastic Sleeve	NBR, Nitrile Rubber
(6)	O-Ring	FKM / Fluoro Rubber
(7)	Metal Body	Brass (Electroless Nickel Plating)
(8)	Resin Body	PBT / Polybutylene Terephthalate
(9)	Shaft	Stainless Steel

Order Example

Part Number	-	Nominal
RTCN4	-	M5
RHTCN6	-	2

Days to Ship: 6 Days P.87

Ball Valves
-One-Touch Coupling-

Price Reduction
Up to 19%

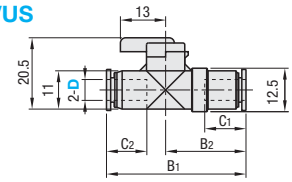
CAD Data

■Union Straight Single Handle



RoHS

BVUS



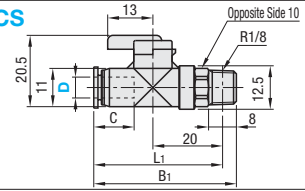
Part Number Type	D	B1	B2	C1	C2	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BVUS	4	36.9	20.3	10.9	11	3.4	13		
	6	40.1	23.1	11.7	11.6	10.3	13		

■Straight Single Handle



RoHS

BVCS



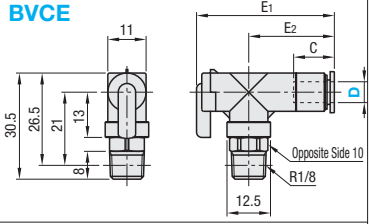
Part Number Type	D	B1	L1	C	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BVCS	4	40.6	36.6	11	3.8	15		
	6	41	37	11.6	10.5	15		

■Elbow Single Handle



RoHS

BVCE



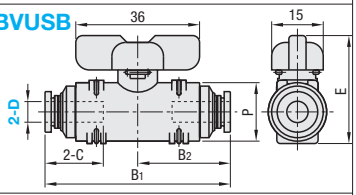
Part Number Type	D	C	E1	E2	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BVCE	4	10.9	36.8	21.8	4	21		
	6	11.7	39.6	24.6	8	21		

■Union Straight Double Handle



RoHS

BVUSB



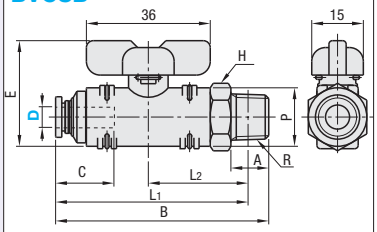
Part Number Type	D	B1	B2	P	C	E	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BVUSB	6	53.9	27	17	17	31.4	10.5	45		
	8	55.4	27.7	17	18.2	31.4	20.5	41		
	10	65.4	32.7	24	20.7	37.8	41	104		
	12	68.6	34.3	24	23.3	37.8	55.5	100		

■Straight Double Handle



RoHS

BVCSB



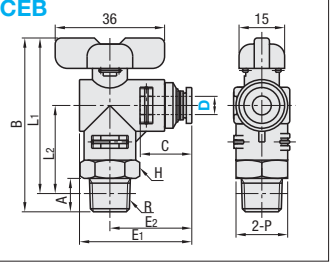
Part Number Type	D	Nominal	R	A	B	L1	L2	P	C	E	Opposite Side H	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Disc. Qty. 10~
BVCSB	6	1	1/8	8	59	55	28	17	17	31.4	17	12.5	56		
		2	1/4	11	62	55.9	29						59		
	8	1	1/8	8	59.7	55.7	28	17	18.2	31.4	17		22		
		2	1/4	11	62.7	56.7	29						23		
	10	2	1/4	11	73.7	67.7	35	24	20.7	37.8	24		39.5	131	
		3	3/8	12	74.7	68.4	35.7						41	134	

■Elbow Double Handle



RoHS

BVCEB



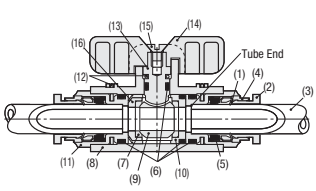
Part Number Type	D	Nominal	R	A	B	L1	L2	P	C	E1	E2	Opposite Side H	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Disc. Qty. 10~
BVCEB	6	1	1/8	8	54.2	50.2	28	17	17	37	27	17	11.5	57		
		2	1/4	11	57.2	51.2	29							60		
	8	1	1/8	8	54.2	50.2	28	17	18.2	37.7	27.7	17	17.5	54		
		2	1/4	11	57.2	51.2	29						18.5	58		
	10	2	1/4	11	68.7	62.7	37.5	24	20.7	44.7	32.7	24	35.5	134		
		3	3/8	12	69.7	63.4	38.2						36	136		

Order Example

Part Number	-	Nominal
BVUS6		
BVCSB6	-	2

Days to Ship 6 Days P.87

■Structure Diagram



No.	Name of Parts	Material
(1)	Lock Pawl	Stainless Steel
(2)	Release Ring	POM / Polyacetal
(3)	Tube	Polyurethane or Nylon
(4)	Guide Ring	Brass (Electroless Nickel Plating)
(5)	Elastic Sleeve	NBR, Nitrile Rubber
(6)	O-Ring	NBR, Nitrile Rubber
(7)	Ball Seal	Teflon Resin
(8)	Resin Body	Single Handle Type: PBT / Polybutylene Terephthalate Double Handle Type: PPS / Polyphenylene sulfide
(9)	Ball	Brass (Electroless Nickel Plating)
(10)	Ball Holder	Brass (Electroless Nickel Plating)
(11)	Coupling Metal Body	Brass (Electroless Nickel Plating)
(12)	Lock Pin	Stainless Steel
(13)	Stem	Brass (Electroless Nickel Plating)
(14)	Handles	POM / Polyacetal
(15)	Flat pan-head screw	Steel
(16)	Ball Holder	Brass (Electroless Nickel Plating)

■Features

Single handle type has a scale on lever and is able to control the flow.
Double handle type is possible to flow water.

Specification

Type	Single Handle	Double Handle
Applicable Fluid	Air	Air - Water (*)
Operation Temperature Range	0~60°C	
Max. Operating Pressure	0~0.7MPa	0~0.9MPa
Operating Vacuum Level	–100kPa	

* Observe following conditions when water is the applicable fluid.
1. Operating Pressure: 0~0.3MPa
2. No water hammer (impulsive flow)
3. Attach insert for soft tube (**P.1261**) to plumbing tube.

Hand Valves

-Shutoff Valves with One-Touch Couplings (Residual Pressure Release Valves)-

Price Reduction
Up to 25%

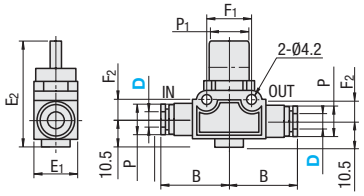
CAD Data

■Hand Valves with One-Touch Couplings

RoHS

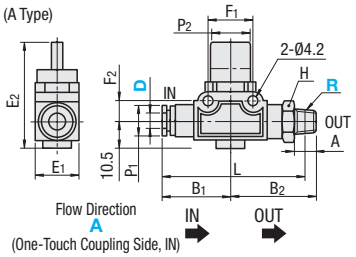


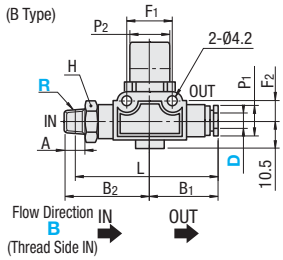
BVHVU



Marked inside body.

BVHV





Shown above is an "open" state.
Close condition can be obtained by counterclockwise rotation of 90°.

M Material: Resin Part: Polybutylene Terephthalane
Metal Part: Brass (Electroless Nickel Plating)
O-Ring: Nitrile Rubber

Part Number Type	Part Number Tube Outer Diameter (mm) D	2-Way Valve 3-Way Valve Selection	Handle Color	E1	E2	P	P1	B	F1	F2	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BVHVU	4	2 (2-Way Valve) 3 (3-Way Valve)	Not Specified (Blue)	17	40.5	10	16.5	25.8	18	8	3.4	24		
	6			17	40.5	12.5	16.5	26.4	18	8	7.2	25		
	8			17	40.5	15	16.5	27.7	18	8	8.7	28		
	10		R (Red)	21.7	41	17.5	19.5	32.2	24	11	17.4	45		
	12			21.7	41	21	19.5	34.9	24	11	18.1	51		

Part Number Type	Part Number Tube Outer Diameter (mm) D	R (PT) Selection	2-Way Valve 3-Way Valve Selection	Flow Direction Selection	A	E1	E2	L	P1	P2	B1	B2	H (Width across Flats)	F1	F2	Effective Sectional Area (mm²) A Type	Effective Sectional Area (mm²) B Type	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BVHV	6	1(R1/8) 2(R1/4) 3(R3/8)	2 (2-Way Valve) 3 (3-Way Valve)	A B	8	17	40.5	55.9	12.5	16.5	26.4	33.5	14	18	8	7.5	8.3	34		
					11			56.8				36.5				7.7	8.5	40		
					12			58.3				38.3	17			7.5	8.2	53		
	8	1(R1/8) 2(R1/4) 3(R3/8)			8	17	40.5	57.2	15	16.5	27.7	33.5	14	18	8	8.7	8.9	35		
					11			58.2				36.5				8.9	8.9	41		
					12			59.7				38.3	17			8.6	8.9	54		
	10	2(R1/4) 3(R3/8) 4(R1/2)			11	21.7	41	68.7	17.5	19.5	32.2	42.5	17	24	11	16.2	16.6	62		
					12			69.4				43.5				16	16.9	71		
					15			70.5				46.5	21			15.7	16.5	93		
	12	2(R1/4) 3(R3/8) 4(R1/2)			11	21.7	41	71.4	21	19.5	34.9	42.5	17	24	11	16.3	17	66		
					12			72.1				43.5				16.3	17.1	74		
					15			73.2				46.5	21			16.1	16.8	96		

Order Example

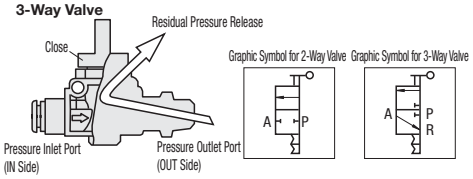
Part Number	-	2-Way Valve · 3-Way Valve	-	Color
BVHVU8	-	3		
BVHVU4	-	2	-	R

Part Number	-	R (PT)	-	2-Way Valve · 3-Way Valve	-	Flow Direction
BVHV6	-	2	-	3	-	B

Days to Ship: 6 Days P.87

■Features
- Capable of opening and closing air pressure inlet to equipment.
- 3-Way valve exhausts residual pressure from outlet side (equipment).
- 2-Way valve has no function to exhaust residual pressure.

■3-Way Valve and 2-Way Valve

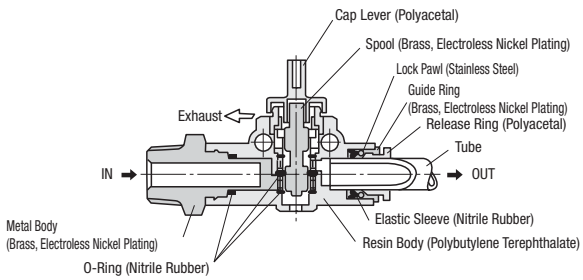


- 3-Way valve releases residual pressure from outlet side (equipment) when air is shut off to ensure safety during adjustment and repair of equipment.
- 2-Way valve has no function to exhaust residual pressure and is suitable for use with air supply lines of equipment where residual pressure release is not desired, such as a tank and etc. Also suitable for vacuum plumbing.

Specification

Applicable Fluid	Compressed Air
Operating Pressure Range	0~0.9MPa
Operating Vacuum Level	-100kPa
Operation Temperature Range	0~60°C

■Structure Diagram (BVHV, 3-Way Valve, Flow Direction B, Closed State)



Change Valves / Check Valves

-Flow Directional Valves with One-Touch Coupling / Check Valves with One-Touch Coupling-

Price Reduction
Up to 31%

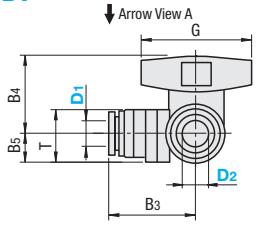
CAD Data

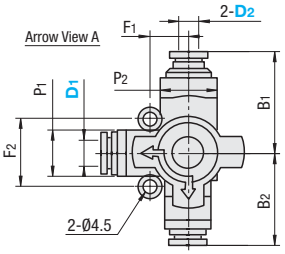
■Change Valves

RoHS



BVHBV



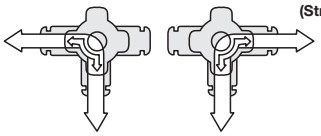


M Material: Resin Body: Glass Fiber Filled PBT Ball / Guide Ring: Brass (Electroless Nickel Plating) O-Ring: Nitrile Rubber

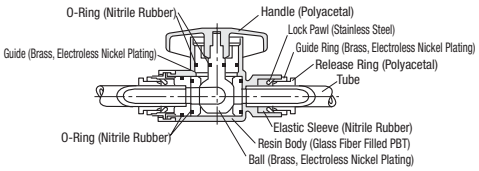
Part Number		Tube Outer Diameter (mm) D2	B1	B2	B3	B4	B5	T	F1	F2	P1	P2	G	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price	Volume Discount
Type	Tube Outer Diameter (mm) D1															Qty. 1~9	Qty. 10~
BVHBV	6	6	26.9	28.8	27	23.8	8.9	16.2	12	20	14.5	17.8	34.5	9	52		
	8	6	26.9	28.8	26.9	23.8	8.9	16.2	12	20	14.5	17.8	34.5	11	53		
		8	28.5	28.7										17	52		
	10	10	36.1	36.5	34.8	28	11.9	22.4	15	25	21	23.8	44	24	124		
	12	10	36.1	36.5	35	28	11.9	22.4	15	25	21	23.8	44	24.5	125		
		12	36.6	36.7										34.5	120		

■Features

- Changes the direction of air passage by 90°.
- Resin body is compact and lightweight.
- Easy to handle for changing air passage.



(Structure Diagram)



SX Specification

Applicable Fluid	Compressed Air
Operating Pressure Range	0~0.7MPa
Operating Vacuum Level	-100kPa
Operation Temperature Range	0~60°C

Order Example

Part Number	-	D2
BVHBV8	-	6

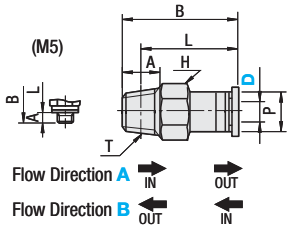
Days to Ship: 6 Days P.87

■Check Valves

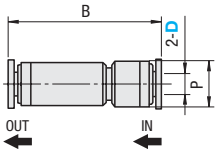
RoHS



BVCVP



(Nominal 4, 6, 8)

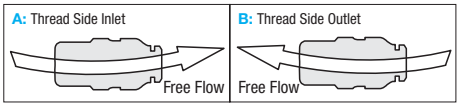


(Color Ring Shape)



M Material: Resin Part: Polybutylene Terephthalane O-Ring: Nitrile Rubber
Metal Part: Brass (Electroless Nickel Plating)

Flow Direction Selection



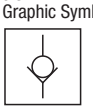
■Features

- Capable of maintaining OUT pressure unchanged to prevent a back flow of air.
- Suitable for holding vacuum and for low-pressure plumbing.
- Lightweight due to resin material.

SX Specification

Applicable Fluid	Compressed Air
Operating Pressure Range	0~0.9MPa
Operating pressure	0.01MPa
Operating Vacuum Level	-100kPa
Operation Temperature Range	0~60°C

JIS Graphic Symbol



Part Number		Nominal Selection	Flow Direction Selection	Thread Size T R (PT), M	A	B	L	P	H (Width Across Flats)	X	Y	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price	Volume Discount
Type	Tube Outer Diameter (mm) D													Qty. 1~9	Qty. 10~
BVCVP	4	M5	A B	M5x0.8	3	24.2	21.2	9	8	9.8	7.8	2.6	4.3		
		1		R1/8	8	23.9	19.9	9	10			2.7	7.7		
		4	-	-	-	31.5	-	9	-			2.9	3.7		
	6	1	A B	R1/8	8	30.5	26.5	11	10	11.8	9.8	7.2	9.0		
		2		R1/4	11	27.8	21.8		14			7.3	16.1		
		6	-	-	-	34	-	11	-			7.5	5.4		
	8	1	A B	R1/8	8	35.5	31.5	14	14	-	-	7.3	19.3		
		2		R1/4	11	39.5	33.5					14.5	21.7		
		8	-	-	-	47.3	-	15	-			15.5	13.0		

Order Example

Part Number	-	Nominal	-	Flow Direction
BVCVP4	-	M5	-	B
BVCVP6	-	6		

Days to Ship: 6 Days P.87

NEW

Flow Rate Controller

-Flow Control Valves with One-Touch Couplings-

Part Number & Spec.Change Printed in Purple

CAD Data

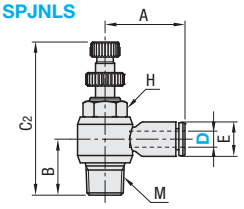
Speed Controllers with old part numbers (SPJNL, SPJNN, MNSPJ, SPJNS) are now available on our website only.

■Standard (Meter-Out/In)



RoHS

Meter-Out **SPSNL** **SPJNLS** Meter-In **SPSNN**



M Material: Electroless Nickel Plating
Thread: Brass (Nickel Plating)

Part Number Type	D	Nom.	A	B	C2	E	Width across Flats H	Thread Size M	Mass (g)	SPSNL SPSNN € Unit Price Qty. 1~9	SPSNL SPSNN Vol. Discount Qty. 10~	SPJNLS € Unit Price Q. 1~9	SPJNLS Vol. Discount Q. 10~29
SPSNL SPJNLS SPSNN	4	M5	19.1(20.8)	10(12.4)	29.45(30.2)	9(10)	8	M5x0.8	9				
		1	20.9(23.1)	14.65(16.2)	40.05(38.4)	9(10)	10(13)	R1/8	21				
	6	M5	20.95(22.3)	11.2(12.2)	29.45(30.2)	11.2(12.5)	8	M5x0.8	10				
		1	21.95(24.1)	14.65(15.7)	40.05(38.4)	11.2(12.5)	10(13)	R1/8	22				
		2	23.95(25.8)	18.2(20.0)	48(45.7)	11.2(12.5)	14(16)	R1/4	38(40)				
	8	1	25.1(25.3)	15.65(15.4)	40.05(38.4)	13.6(14.5)	10(13)	R1/8	23				
		2	27.6(27.2)	19.3(19.0)	48(45.7)	13.6(14.5)	14(16)	R1/4	41				
		3	28.6(29.5)	21.4(21.3)	54.2(52.4)	13.6(14.5)	19	R3/8	71(65)				
	10	2	29.6(29.9)	20.8(19.0)	48(45.7)	16.3(17.5)	14(16)	R1/4	46(44)				
		3	30(31.7)	23(21.8)	54.2(52.4)	16.3(17.5)	19	R3/8	74(68)				
		4	32.9(33.9)	26.5(25.2)	59.8(58.8)	16.3(17.5)	24	R1/2	106(112)				
	12	3	35.9(32.0)	24.7(21.7)	54.2(52.4)	19.7(20.0)	19	R3/8	77(69)				
		4	38.9(35.2)	28.2(25.7)	59.8(58.8)	19.7(20.0)	24	R1/2	109(113)				

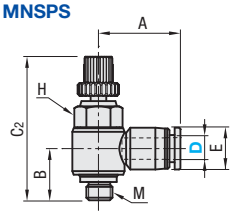
Values in ( ) are for SPJNLS. For SPSNN ring colour is red.
The picture and drawing shown to the left indicate SPSNL and SPSNN. For SPJNLS, refer to the CAD data.

■Miniature



RoHS

Meter-Out **MNSPS**



M Material: Electroless Nickel Plating
Thread: Brass (Nickel Plating)

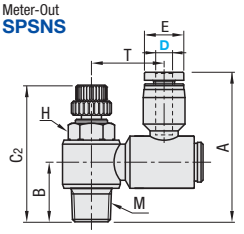
Part Number Type	D	Nom.	A	B	C2	E	Width across Flats H	Thread Size M	Mass (g)	Control Type	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNSPS	4	M3	15.7	9.9	30.5	8.0	8	M3x0.5	8	Meter-Out		
		M5	15.7	9.9	30.5	8.0	8	M5x0.8	8			
	6	M5	16.7	9.9	30.5	10.4	8	M5x0.8	10.4			

■Straight



RoHS

Meter-Out **SPSNS**



M Material: Electroless Nickel Plating
Thread: Brass (Nickel Plating)

Part Number Type	D	Nom.	A	B	C2	E	Width across Flats H	T	Thread Size M	Mass (g)	Control Type	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
SPSNS	4	1	41.4	14.85	34.1	9.8	10	18.1	R1/8	34.1	Meter-Out		
	6	M5	35.2	11.4	29.12	11.9	8	15.9	M5x0.8	29.2			
		1	38.65	14.85	34.05	11.9	10	18.1	R1/8	34.1			
		2	42.2	18.4	42.4	11.9	14	20.1	R1/4	42.4			
	8	1	40.15	14.85	33.87	13.9	10	18.1	R1/8	33.9			
		2	49.2	18.4	42.32	13.9	14	20.18	R1/4	42.4			
		3	45.9	20.6	47.6	13.9	19	22.5	R3/8	47.7			
	10	2	46.4	18.4	42.32	16.9	14	20.1	R1/4	42.4			
		3	48.6	20.6	47.6	16.9	19	22.5	R3/8	47.7			

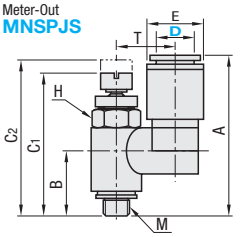
For SPSNS, the tube connection port will not move.

■Miniature Straight



RoHS

Meter-Out **MNSPJS**



M Material: Electroless Nickel Plating
Thread: Brass (Nickel Plating)

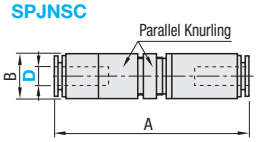
Part Number Type	D	Nom.	Body Color	A	B	C1	C2	E	Width across Flats H	T	Thread Size M	Mass (g)	Control Type	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MNSPJS	3.2	M5	W (White)	28	12.4	27.2	30.2	7.8	8	11.2	M5x0.8	13.2	Meter-Out		
	4	M3	B (Black)	28.3	11.4	25.1	27.6	7.9	7	9.3	M3x0.5	7.7			
		M5	W (White)	29	12.4	27.2	30.2	8.8	8	11.2	M5x0.8	14			
	6	M5		30.6	12.4	27.2	30.2	10.8	8	11.2	M5x0.8	15			

■In-line



RoHS

SPJNSC



M Material: Electroless Nickel Plating
Thread: Brass (Nickel Plating)

Part Number Type	D	Body Color	A Min	A Max	B	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
SPJNSC	4	B (Black)	48.8	52.3	10	13.9		
	6	W (White)	52	57	12	18.8		
	8		63	68	15	31		

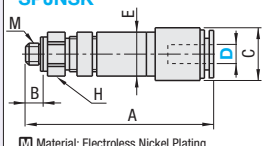
For orders larger than indicated quantity, please request a quotation.

■Miniature In-Line



RoHS

SPJNSK

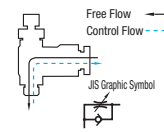


M Material: Electroless Nickel Plating
Thread: Brass (Nickel Plating)

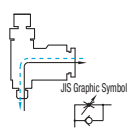
Part Number Type	D	Body Color	A Min	A Max	B	C	E	Width across Flats H	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
SPJNSK	4	B (Black)	39.8	43.3	4	10	10	9	M5x0.8	12.5		
	6	W (White)	42.8	46.3	4	12	10	9	M5x0.8	13.4		

For orders larger than indicated quantity, please request a quotation.

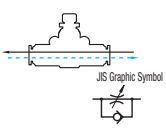
- Meter Out Type



- Meter-In Type



- In-Line Type



Order Example

Part Number	-	Nom.	-	Body Color
SPSNL4	-	M5		
MNSPJS6	-	M5	-	W

Specification

Applicable Fluid	Compressed Air
Operation Temp. Range	0~60°C
Operating Pressure Range	0.05~0.7MPa

Days to Ship

-Others: 6 Days P. 87

-SPJNSC / SPJNSK: 8 Days | Express A | 2,00 EUR/piece P. 88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Flow Rate Controllers / Valves with Adjusting Dial

-Flow Control Valves with One-Touch Couplings-

CAD Data

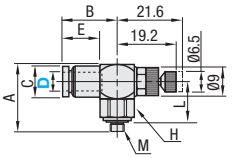
■Low-height



RoHS

Meter-Out

Low STKMNLH



Material: Main Body: 1.4305/X10CrNiS18-9
Thread: Brass (Nickel Plating)
* 1.4305/X10CrNiS18-9 Only
Body/Thread: 1.4305/X10CrNiS18-9

Part No. Type	D	Nom.	A	B	C	E	Width across Flats H	L	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~29
Low STKMNLH	4	M3	22.0	16.4	8	11.5	8	13.5	M3x0.5	17.8		
		M5	21.5					12.5	M5x0.8	17.9		
		1	23.5				10	13.5	R1/8	21.7		
	6	M5	22.5	16.5	10	12.6			M5x0.8	21.2		
		1	26.0					16.0	R1/8	24.2		

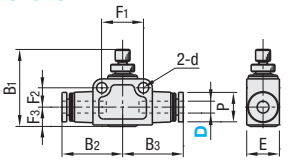
For orders larger than indicated quantity, please request a quotation.

■Union Straight

SPJYS



RoHS



Material: Electroless Nickel Plating
Thread: Brass (Nickel Plating)

Part No. Type	D	B1 Max.	B1 Min.	B2	B3	P	E	d	F1	F2	F3	Mass (g)	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~29
SPJYS	4	28.6	25.9	20.4	20.4	10.5	11	3.2	14	6.5	6.5	13		
	6	41.5	35.7	24.9	24.9	13	15	4.3	20	8.5	11	29		
	8	46	39.8	27.4	27.4	15	18	4.3	22	9.5	12	43		
	10	55.6	48	31.7	31.7	18	21	4.3	26	11	12	71		
	12	55.9	48.4	37.2	37.2	21	28	4.3	32	13	16	115		

Order Example

Part No. - Nom.

Low STKMNLH4 - M5
SPJYS10

•SPJYS
6 Days P. 87

•STKMNLH
8 Days

Express A 2,00 EUR/ piece P. 88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Specification

*Operating pressure is set at ambient temperature (20°C).

•STKMNLH

Applicable Fluid	Compressed Air
Operation Temp. Range	–5~60°C
Operating Pressure Range	0.05~0.7MPa

•SPJYS

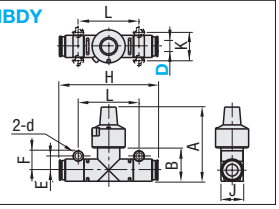
Applicable Fluid	Air
Operating Pressure Range	0.1~0.9MPa
Check Valve Operating Pressure	0.05MPa
Operation Temp. Range	0~60°C

■Valve with Adjusting Dial

NBDY



RoHS



Part No. Type	D	A	B	E	F	H	d	J	K	L	€ Unit Price Qty.1~4	Vol. Discount Qty.5~9
NBDY	4	45.5	17	8.1	11.6	55	4.3	12	16.2	30.8		
	6	45.5	17	8.1	11.6	49.5		12	16.2	30.8		
	8	50	22.5	9.5	13.1	66.5		15	19	41		
	10	58	29	11.5	15.1	75		20	23	47		
	12	58	29	11.5	15.1	79		20	23	47		

Order Example

Part No.
NBDY8

Days to Ship

8 Days P. 88

Express A 2,00 EUR/ piece

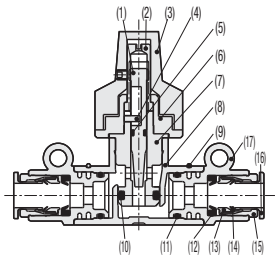
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Specification

•NBDY

Applicable Fluid	Compressed Air / N2 Gas / Low Vacuum
Max. Operating Pressure	0.7MPa
Negative Pressure	-100kPa
Proof Pressure	1.5MPa
Operation Temp. Range	5 ~ 60°C (No freezing)

■Structure Diagram



No.	Name of Parts	Material
(1)	Needle	Brass
(2)	Rotary Shaft	Brass
(3)	Dial	Aluminum Alloy, Polyamide, or others.
(4)	Dowel Pin	Stainless steel
(5)	O-Ring	Fluoro Rubber
(6)	Guide Bushing	Brass
(7)	Check Metal	Brass
(8)	Body	Thread: Brass (Electroless Nickel Plating)
(9)	Stopper Ring	Stainless steel
(10)	O-Ring	Hydrogenated Nitrile Rubber
(11)	O-Ring	Hydrogenated Nitrile Rubber
(12)	Gasket	Hydrogenated Nitrile Rubber
(13)	Holder	Brass
(14)	Chuck	Stainless steel
(15)	Outer Ring	Brass
(16)	Push Ring	Thread: Brass (Electroless Nickel Plating)
(17)	Joint Case	Thread: Brass (Electroless Nickel Plating)

All brass parts are electroless nickel plated.

■Features

- Linear flow rate characteristics proportional to needle revolutions.
- Dial display makes it easy to control value of flow rate.
- Mounting part with 360° turn provides free mounting..
- Slide locking lever provides easy locking.

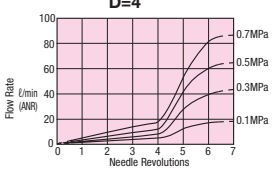
■Cautions

- Not applicable as a stop valve which requires no leakage.
- Fix the dial with slide locking lever after adjusting flow rate.
- Tighten the mounting screw at 0.8N·m or lower.

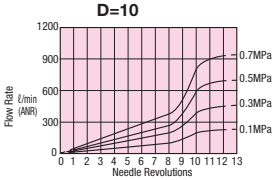
■Flow Rate Characteristics

<SPJYS>

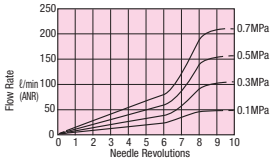
D=4



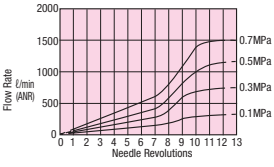
D=10



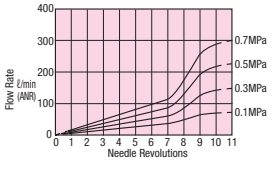
D=6



D=12



D=8



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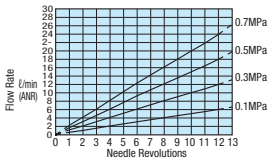
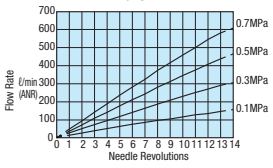
D=4



D=10 or 12



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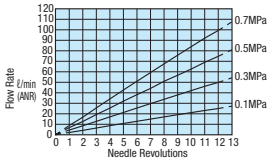
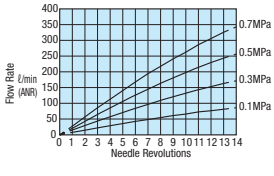
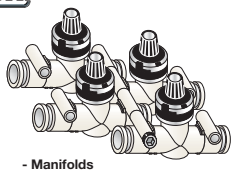


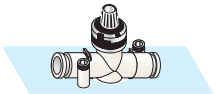
D=8



Example



- Manifolds



- Bottom Side Mounting Example

NEW

Flow Rate Controller

-Stainless Steel Type - Heat-Resistant Type - Clean Type-

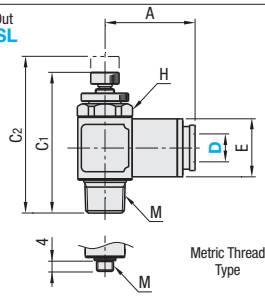
Price Reduction
Up to 28%

CAD Data

■Stainless Steel Type -Standard-



Meter-Out
ASPSL

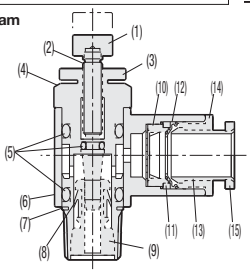


Part Number Type	D	Nominal	A	C1	C2	E	Width across Flats H	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
ASPSL	4	M5	20	32.1	36.7	12	10	M5x0.8	25.9		
		1	22	37.9	43.4	14	13	R1/8	41.0		
	6	M5	21	32.1	36.7	12	10	M5x0.8	24.9		
		1	23	37.9	43.4	14	13	R1/8	40.5		
		2	25	47.1	53.3	17	16	R1/4	73.0		
	8	1	25	37.9	434	14	13	R1/8	39.2		
		2	26	47.1	53.3	17	16	R1/4	71.8		
		3	28	55.1	61.6	22	19	R3/8	133.0		
	10	2	29	47.1	53.3	17	16	R1/4	70.7		
		3	31	55.1	61.6	22	19	R3/8	134.0		
	12	3	32	55.1	61.6	22	19	R3/8	129.8		

Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	-10~60°C
Max. Operating Pressure	1.0MPa
Operating Vacuum Level	-100kPa

■Structure Diagram



No.	Name of Parts	Material
(1)	Handles	1.4401
(2)	Spindles	1.4401
(3)	Lock Nut	1.4401
(4)	Rotary Shaft	1.4401
(5)	O-Ring	Fluorine
(6)	Rotating Object	1.4401
(7)	E-Ring	JIS SUS
(8)	V Gasket	HNBR

No.	Name of Parts	Material
(9)	Check Part	1.4401
(10)	Gasket	Fluorine
(11)]	Chuck Holder	1.4401
(12)	Chuck	1.4319
(13)	Push Ring A	1.4401
(14)	Outer Ring	1.4401
(15)	Push Ring B	1.4401

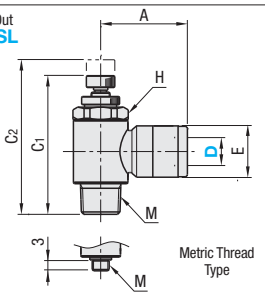
■Features

-Excels in corrosion resistance.

■Heat-Resistant Type -Standard-



Meter-Out
KSPSL

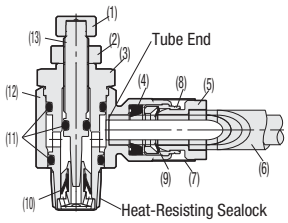


Part Number Type	D	Nominal	A	C1	C2	E	Width across Flats H	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
KSPSL	4	M5	22.6	30	32.7	12.5	11	M5x0.8	25.6		
		1	24.8	38.1	44.4	12.5	14	R1/8	43.1		
	6	M5	24.1	30	32.7	12.5	11	M5x0.8	26		
		1	26.1	38.1	44.4	12.5	14	R1/8	43.4		
		2	27.6	46.9	53.3	14.5	17	R1/4	68.9		
	8	1	26.9	38.1	44.4	14.5	14	R1/8	45.8		
		2	28.4	46.9	53.3	14.5	17	R1/4	69.1		
		3	30.1	51.2	58.4	14.5	21	R3/8	106.5		
	10	2	31.2	46.9	53.3	18.6	17	R1/4	82.4		
		3	33.0	51.2	58.4	21.5	21	R3/8	127.7		
	12	3	36.1	51.2	58.4	21.6	21	R3/8	134		

Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	0~100°C
Operating Pressure Range	0~1.0MPa
Check Valve Operating Pressure	0.05MPa

■Structure Diagram



No.	Name of Parts	Material
(1)	Knob	Brass (Electroless Nickel Plating)
(2)	Lock Nut	Brass (Electroless Nickel Plating)
(3)	Thread Body	Brass (Electroless Nickel Plating)
(4)	Elastic Sleeve	H-NBR
(5)	Release Ring	Brass (Electroless Nickel Plating)
(6)	Tube	Sputter
(7)	Cover	Brass (Electroless Nickel Plating)

No.	Name of Parts	Material
(8)	Guide Ring	Brass (Electroless Nickel Plating)
(9)	Lock Pawl	Stainless Steel
(10)	Diaphragm	H-NBR
(11)]	O-Ring	H-NBR
(12)	Metal Body	Brass (Electroless Nickel Plating)
(13)	Needle	Brass (Electroless Nickel Plating)

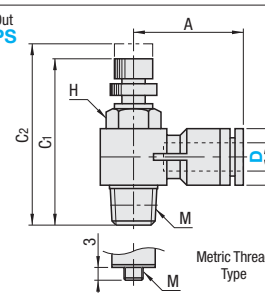
■Features

-Speed control valve that is best suited at high temperature and in spattering environment.

■Clean Type -Standard-



Meter-Out
PJSPS



Part Number Type	D	Nominal	A	C1	C2	E	Width across Flats H	Thread Size M	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
PJSPS	4	M5	20.0	27	29.7	9.9	8	M5x0.8	7		
		1	21.5	34.4	40.5	10	12	R1/8	18		
	6	M5	24.1	27	29.7	12.4	8	M5x0.8	8		
		1	23.6	34.4	40.5		12	R1/8	19		
		2	25.6	41.4	47.6		16	R1/4	38		
	8	1	26.9	34.4	40.5	14.4	12	R1/8	22		
		2	28.4	41.4	47.6		16	R1/4	41		
		3	28.9	46.5	53.5		21	R3/8	69		
	10	2	31.1	41.4	47.6	17.6	16	R1/4	44		
		3	31.4	46.5	53.5		21	R3/8	71		
	12	3	37.1	46.5	53.5	21	21	R3/8	106		

Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	0~80°C
Operating Pressure Range	0~9MPa
Check Valve Operating Pressure	0.05MPa

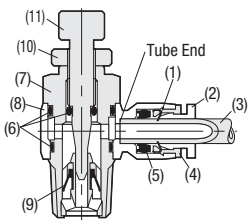
■Features

-The body is semi-transparent, so fluid is viewable from outside.

■Precautions for Use

-No oil permitted.
-Confirm if the tube is inserted to the tube end of the body.

■Structure Diagram



No.	Name of Parts	Material
(1)	Lock Pawl	Stainless Steel
(2)	Release Ring	Polypropylene
(3)	Tube	-
(4)	Guide Ring	1.4301/X5CrNi18-10
(5)	Elastic Sleeve	EPDM
(6)	O-Ring	EPDM
(7)	Metal Body	1.4301/X5CrNi18-10
(8)	Resin Body	Polypropylene
(9)	Diaphragm	EPDM
(10)	Lock Nut	1.4301/X5CrNi18-10
(11)	Needle	1.4301/X5CrNi18-10

Order Example: Part Number **ASPSL4** - Nominal **1**

For orders larger than indicated quantity, please request a quotation.

Days to Ship
-KSPSL · PJSPS: **6 Days** P.87
-ASPSL: **8 Days**

Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Throttle Valves

Price Reduction
Up to 26%

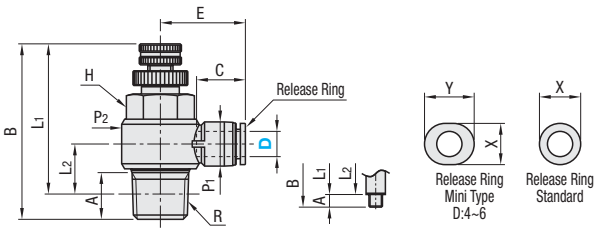
CAD Data

■Throttle Valves -Elbow-

RoHS



SEJC



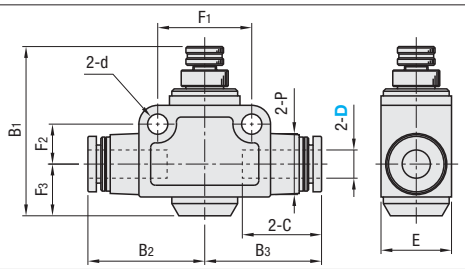
Part Number Type	D	Nominal	R	A	B Max	B Min	L1 Max	L1 Min	L2	P1	P2	C	E	Opposite Side H	X	Y	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SEJC	4	M5	M5x0.8	2.9	29.7	27	26.8	24.1	6.7	8	9.8	11	15.4	8	7.8	9.8	7.9		
		1	R1/8	8	41.3	35.2	37.3	31.2	10.7		14.4		17.7	10			18		
	6	M5	M5x0.8	2.9	29.7	27	26.8	24.1	7.58	10.5	9.8	11.6	17.5	8	9.8	11.8	8.6		
		1	R1/8	8	41.3	35.2	37.3	31.2	10.7		14.4		18.3	10			19		
		2	R1/4	11.1	48.7	41.9	42.7	35.9	11.9		18.4		20.2	14			37		
	8	1	R1/8	8	41.3	35.2	37.3	31.2	11.9	14.4	14.4	18.1	26.9	10	13.8	-	22		
		2	R1/4	11.1	48.7	41.9	42.7	35.9	13.2		18.4		28.4	14			40		
	10	2	R1/4	11.1	48.7	41.9	42.7	35.9	14.8	17.6	18.4	20.2	30.9	14	16.8	-	44		

■Throttle Valves -Unions-

RoHS



SEJR

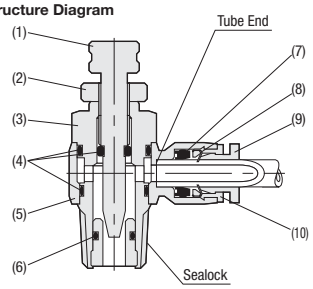


Part Number Type	D	B1 Max	B1 Min	B2	B3	P	E	C	d	F1	F2	F3	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
SEJR	4	28.6	25.9	20.4	20.4	10.5	11	14.9	3.2	14	6.5	6.5	13		
	6	41.6	36.1	24.9	24.9	13	15	16.9	4.3	20	8.5	11	30		
	8	46.2	40.6	27.4	27.4	15	18	18.4	4.3	22	9.5	12	45		
	10	52.2	45.7	31.7	31.7	18	21	20.7	4.3	26	11	12	75		

Order Example: Part Number SEJC4 - Nominal M5

Days to Ship: 6 Days P87

■Structure Diagram



■Schematic (Elbow Type: SEJC)

No.	Name of Parts	Material
(1)	Needle	Brass, Electroless Nickel Plating
(2)	Lock Nut	Aluminum Alloy
(3)	Metal Body	Brass, Electroless Nickel Plating
(4)	O-Ring	Nitrile Rubber
(5)	Resin Body	Polybutylene Terephthalate
(6)	O-Ring	Nitrile Rubber
(7)	Elastic Sleeve	Nitrile Rubber
(8)	Lock Pawl	Stainless Steel
(9)	Release Ring	Polyacetal
(10)	Guide Ring	Brass, Electroless Nickel Plating

■Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Operating Pressure Range	0~0.9MPa

*Operating Pressure shown is for a normal ambient temperature range (20°C).

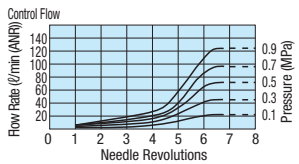
■Features

Regardless of Free Flow or Control Flow, air can be controlled from either right or left side.

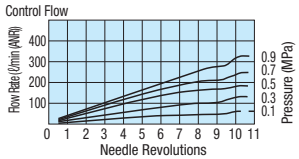
■Flow Rate Characteristics

<SEJC>

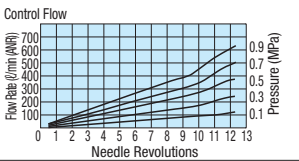
4-M5
6-M5



4-1
6-1
8-1



6-2
8-2
10-2



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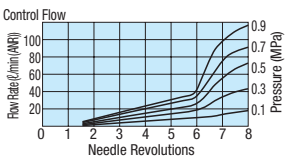

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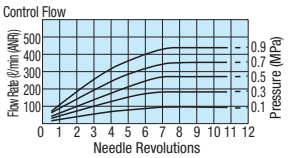

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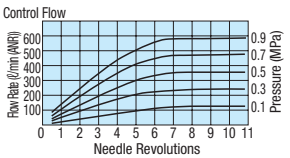

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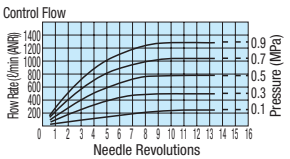


Miniature Couplings

Price Reduction
Up to 19%

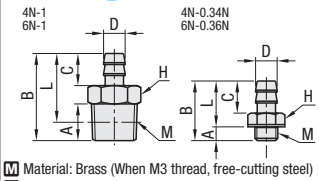
CAD Data

Barbed Couplers

RoHS



SRTG_N
BOX-SRTG_ N (50 pcs./pack)



M Material: Brass (When M3 thread, free-cutting steel)
S Surface Treatment: Electroless Nickel Plating
A Accessory: Gasket: 1.4301/X5CrNi18-10 · NBR (M3 - M5)

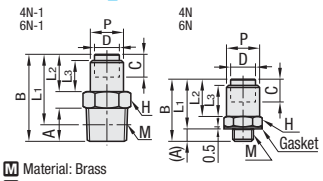
Part Number Type	Part Number No.	Tube Inner Dia.	Tube Outer Dia.	M	A	B	L	C	Opposite Side H	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~49	Volume Discount Qty. 50~	Volume Discount (50 pcs./ pack)
SRTG BOX-SRTG	4N-0.3	2.5	4	M3x 0.5	2.5	12	9.5	7	5.5	0.8	0.9			
	6N-0.3	4	6		2.5	13	10		5.5	1.3	0.9			
	4N	2.5	4	M5x 0.8	3	13	10		7	1.5	1.7			
	6N	4	6		3	13	10		7	1.5	3.8			
	4N-1	2.5	4	R1/8	8	19	15		10	1.9	2			
	6N-1	4	6		8	19	15		10	7.5	3.8			

Hose Nipples

RoHS



SRTN_N
BOX-SRTN_ N(50 pcs./pack)



M Material: Brass
S Surface Treatment: Electroless Nickel Plating
A Accessory: Gasket: 1.4301/X5CrNi18-10 · NBR (M5 only)

Part Number Type	Part Number No.	Tube Inner Dia	Tube Outer Dia	M	A	B	C	L1	L2	L3	P	Opposite Side H	Mass (g)	Effective Sectional Area (mm²)	€ Unit Price Qty. 1~49	Volume Discount Qty. 50~	Volume Discount (50 pcs./ pack)
SRTN BOX-SRTN	4N	2.5	4	M5x 0.8	3	14.5	5	11.5	8.5	7	6.5	7	2.5	2			
	6N	4	6		3	15	5.5	12	9	7.5	8	8	3.4	3.8			
	4N-1	2.5	4	R1/8	8	20.5	5	16.5	8.5	7	6.5	10	7.9	2			
	6N-1	4	6		8	21	5.5	17	9	7.5	8	10	8.9	3.8			

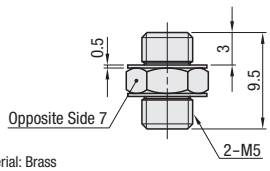
When SRT__N–1 is selected, seal adhesive is applied to thread portion.
For combination with a tube, select the same number as that of the tube diameter.

Nipples

RoHS



MNPLN



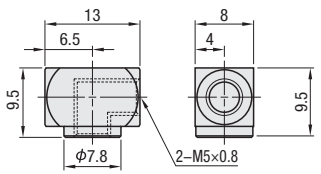
M Material: Brass
S Surface Treatment: Electroless Nickel Plating
A Accessory:Gasket: 1.4301/X5CrNi18-10 · NBR

Elbows

RoHS



MELBN



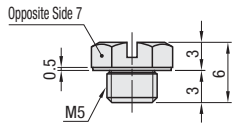
M Material: Brass
S Surface Treatment: Electroless Nickel Plating

Plugs

RoHS



MPLGN



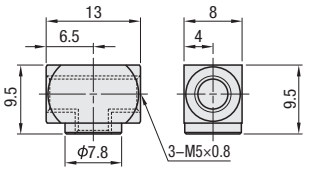
M Material: Brass
S Surface Treatment: Electroless Nickel Plating
A Accessory: Gasket: 1.4301/X5CrNi18-10 · NBR

Tees

RoHS



MTEN



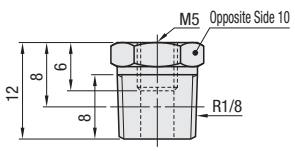
M Material: Brass
S Surface Treatment: Electroless Nickel Plating

Bushings

RoHS



MBSGN



Seal adhesive is applied to R1/8 thread portion.

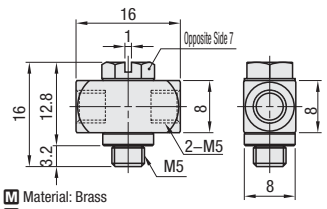
M Material: Brass
S Surface Treatment: Electroless Nickel Plating

Universal Tees

RoHS



MUTEN



M Material: Brass
S Surface Treatment: Electroless Nickel Plating
A Accessory: Gasket: Polyacetal

Part Number	Effective Sectional Area (mm²)	Mass (g)	€ Unit Price Qty. 1~49	Volume Discount Qty. 50~
MNPLN	2.1	1.5		
MPLGN	-	1.5		
MBSGN	12	5.7		
MELBN	-	5.5		
MTEN	-	5.5		
MUTEN	15	6.5		

Order Example
Part Number
SRTG4N
BOX-SRTG4N

Days to Ship
6 Days

P87.

For orders larger than indicated quantity, please request a quotation.

Specification
SRTG (Barbed Coupler)

Applicable Fluid	Air
Max. Operating Pressure	0.5MPa
Operating Vacuum Level	-100kPa
Operation Temperature Range	0~50°C

Couplings other than Left

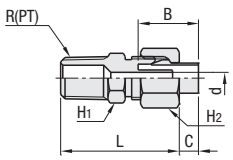
Applicable Fluid	Air
Max. Operating Pressure	1MPa
Operating Vacuum Level	-100kPa
Operation Temperature Range	0~50°C

Couplings with Tube Insert

CAD Data

Connectors — TCRH



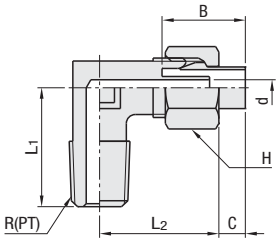


Material: Brass

Part Number Type	Applicable Tube Outer Dia. (mm)	Nominal	R (PT)	Applicable Tube Inner Dia. (mm)	L	B	C	d	H1 Width across Flats	H2 Width across Flats	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
TCRH	4	1	1/8	2.5	28	13.5	3.5	1.3	10	10	13		
		2	1/4		28.5	13.5	3.5	1.3	14	10	18		
	6	1	1/8	4	27.5	14	4.5	2.7	10	12	14		
		2	1/4		28	14	4.5	2.7	14	12	21		
	8	1	1/8	6	28	16	5.5	4.7	12	14	17		
		2	1/4		28	16	5.5	4.7	14	14	23		
		3	3/8		29.5	16	5.5	4.7	17	14	31		
	10	2	1/4	7.5	30.5	19	5.5	6	17	17	30		
		3	3/8		31.5	19	5.5	6	17	17	36		
		4	1/2		34.5	19	5.5	6	22	17	54		

Elbows — TCRL



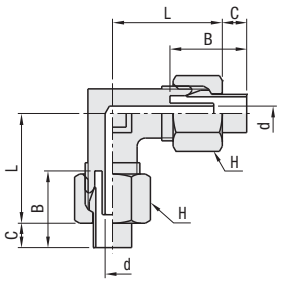


Material: Brass

Part Number Type	Applicable Tube Outer Dia. (mm)	Nominal	R (PT)	Applicable Tube Inner Dia. (mm)	L1	L2	B	C	d	H Width across Flats	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~19
TCRL	4	1	1/8	2.5	20	22	13.5	3.5	1.3	10	20		
		2	1/4		21	23	13.5	3.5	1.3	10	29		
	6	1	1/8	4	20	20	14	4.5	2.7	12	21		
		2	1/4		21	22.5	14	4.5	2.7	12	31		
	8	1	1/8	6	21	21	16	5.5	4.7	14	26		
		2	1/4		21	21	16	5.5	4.7	14	30		
		3	3/8		24	24.5	16	5.5	4.7	14	51		
	10	2	1/4	7.5	23	25	19	5.5	6	17	45		
		3	3/8		24	25	19	5.5	6	17	53		
		4	1/2		29	28.5	19	5.5	6	17	88		

Union Elbows — TCRF



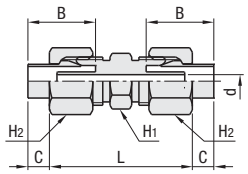


Material: Brass

Part Number Type	Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L	B	C	d	H Width across Flats	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty.10~19
TCRF	4	2.5	22	13.5	3.5	1.3	10	22		
	6	4	20	14	4.5	2.7	12	24		
	8	6	21	16	5.5	4.7	14	31		
	10	7.5	25	19	5.5	6	17	54		

Union Connectors — TCRS



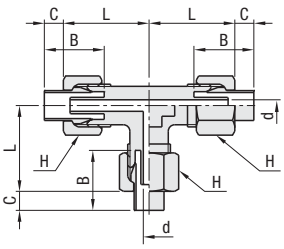


Material: Brass

Part Number Type	Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L	B	C	d	H1 Width across Flats	H2 Width across Flats	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty.10~19
TCRS	4	2.5	30.5	13.5	3.5	1.3	8	10	14		
	6	4	29.5	14	4.5	2.7	10	12	19		
	8	6	30	16	5.5	4.7	12	14	24		
	10	7.5	34	19	5.5	6	17	17	40		

Union Tees — TCRT





Material: Brass

Part Number Type	Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L	B	C	d	H Width across Flats	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty.10~19
TCRT	4	2.5	22	13.5	3.5	1.3	10	30		
	6	4	20	14	4.5	2.7	12	33		
	8	6	21	16	5.5	4.7	14	44		
	10	7.5	25	19	5.5	6	17	74		

Specification

Applicable Fluid	Air · Water · Oil
Operation Temperature Range	Air : -20~60°C Water: 0~60°C Oil: -20~60°C
Max. Operating Pressure	Applies to Maximum Operating Pressure of tubes.
Operating Vacuum Level	-100kPa

Order Example

Part Number	-	Nominal
TCRH4	-	1

Days to Ship

8 Days — Express A — 2,00 EUR/ piece — P.82

A Express Charge of 5,40 EUR for 3 or more identical pieces.

NEW

Couplings for Tubes

-Nut and Sleeve Integrated Type-

Price Reduction
Up to 29%

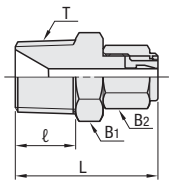
CAD Data

■Couplings for Tubes -Straight-



RoHS

MCPTK



M Material: 1.4401/X5CrNiMo17-12-2

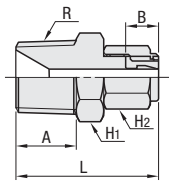
Part Number Type	Applicable Tube Outer Dia. (mm)	T R (PT) Selection	T R (PT)	Applicable Tube Inner Dia. (mm)	L	ℓ	B1 (Width across Flats)	B2 (Width across Flats)	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
MCPTK	3.2	1	1/8	1.6	24	9	10	10		
	4	1	1/8	2	24	9	10	10		
		2	1/4		26	11	14			
	6	1	1/8	4	26	9	12	12		
		2	1/4		28.5	11	14			
		3	3/8		30	12	17			
	8	1	1/8	6	28	9	14	14		
		2	1/4		30	11	14			
		3	3/8		31	12	17			
	10	2	1/4	8	32	11	17	17		
		3	3/8		33	12	17			
		4	1/2		36	15	22			
	12	2	1/4	10	34	11	17	19		
		3	3/8		35	12	17			
		4	1/2		38	15	22			

■Couplings for Tubes -Half Union-



RoHS

MCTPTY



M Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	No.	Thread Size R (PT)	Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L	A	B	Width across Flats H1	Width across Flats H2	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
MCTPTY	4-1	1/8	4	2.5	24	9	6	10	10		
	4-2	1/4			26	11	6	14	10		
	8-1	1/8	8	5	28	9	7.5	14	14		
	8-2	1/4			30	11	7.5	14	14		
	8-3	3/8			31	12	7.5	17	14		
	10-2	1/4	10	6.5	32	11	8	17	17		
	10-3	3/8			33	12	8	17	17		
	10-4	1/2			36	15	8	22	17		
	12-2	1/4	12	8	34	11	9.5	17	19		
	12-3	3/8			35	12	9.5	17	19		
	12-4	1/2			38	15	9.5	22	19		

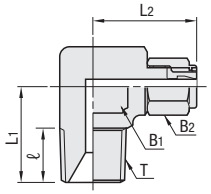
For orders larger than indicated quantity, please request a quotation.

■Couplings for Tubes -Elbow-



RoHS

MCLPTK



M Material: 1.4401/X5CrNiMo17-12-2

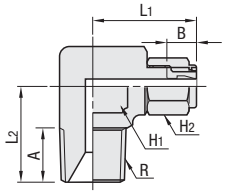
Part Number Type	Applicable Tube Outer Dia. (mm)	T R (PT) Selection	T R (PT)	Applicable Tube Inner Dia. (mm)	L1	L2	ℓ	B1 (Width across Flats)	B2 (Width across Flats)	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
MCLPTK	3.2	1	1/8	1.6	18	20	9	12	10		
	4	1	1/8	2	18	20	9	12	10		
		2	1/4		21	21	11	14			
	6	1	1/8	4	18	21.5	9	12	12		
		2	1/4		21	22.5	11	14			
		3	3/8		23	23.5	12	17			
	8	1	1/8	6	19	24	9	14	14		
		2	1/4		21	24	11	14			
		3	3/8		23	25	12	17			
	10	2	1/4	8	22	26.5	11	17	17		
		3	3/8		23	26.5	12	17			
		4	1/2		29	28.5	15	22			
	12	2	1/4	10	23	27.5	11	17	19		
		3	3/8		27	30	12	22			
		4	1/2		30	30	15	22			

■Couplings for Tubes -Half Elbow-



RoHS

MCUNE



M Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	No.	Thread Size R (PT)	Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L1	L2	A	B	Width across Flats H1	Width across Flats H2	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~29
MCUNE	4-1	1/8	4	2.5	20	18	9	6	12	10		
	4-2	1/4			21	21	11	6	14	10		
	8-1	1/8	8	5	24	19	9	7.5	14	14		
	8-2	1/4			24	21	11	7.5	14	14		
	8-3	3/8			25	23	12	7.5	17	14		
	10-2	1/4	10	6.5	26.5	22	11	8	17	17		
	10-3	3/8			26.5	23	12	8	17	17		
	10-4	1/2			28.5	29	15	8	22	17		
	12-2	1/4	12	8	27.5	23	11	9.5	17	19		
	12-3	3/8			30	27	12	9.5	22	19		
	12-4	1/2			30	30	15	9.5	22	19		

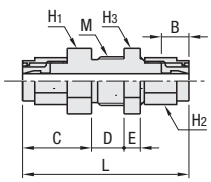
For orders larger than indicated quantity, please request a quotation.

■Couplings for Tubes -Panel Mount-



RoHS

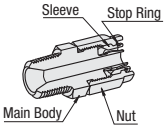
MCBU



M Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	No.	Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L	B	Width across Flats H1	Width across Flats H2	Width across Flats H3	C	D	E	M	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
MCBU	4	4	2.5	41	6	14	10	14	17	8	4	M12x1.0		
	6	6	4	44	7	17	12	17	18.5	8	4	M14x1.0		
	8	8	6	47	7.5	19	14	19	20	8	4	M16x1.0		
	10	10	8	50	8	22	17	22	21.5	8	4	M18x1.0		
	12	12	10	54	9.5	24	19	24	23	8	5	M20x1.0		

■Structure Diagram



■Features

With nut and sleeve in one piece, coupling does not twist the tube being connected.

Part Number	-	T
MCPTK4 MCBU4	-	1

-MCPTK · MCLPTK · MCBU

6 Days P.87

- Other Than Those Above

8 Days | Express A | 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Couplings for Tubes
-Nut and Sleeve Integrated Type-

Price Reduction
Up to 8%

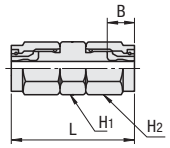
CAD Data

■Couplings for Tubes -Unions-



RoHS

MCUN



Material: 1.4401/X5CrNiMo17-12-2

Part Number		Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L	B	Width across Flats		€ Unit Price	Volume Discount
Type	No.					H1	H2	Qty. 1~9	Qty.10~19
MCUN	4	4	2.5	28	6	10	10		
	6	6	4	32	7	12	12		
	8	8	6	36	7.5	14	14		
	10-6	10	6.5	40	8	17	17		
	10	10	8	40	8	17	17		
	12-8	12	8	44	9.5	17	19		
	12-9	12	9	44	9.5	17	19		
	12	12	10	44	9.5	17	19		

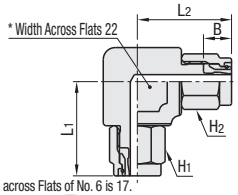
For orders larger than indicated quantity, please request a quotation.

■Union Elbows



RoHS

MCUE



* Width across Flats of No. 6 is 17.

Material: 1.4401/X5CrNiMo17-12-2

Part Number		Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L1	L2	B	Width across Flats		€ Unit Price	Volume Discount
Type	No.						H1	H2	Qty.1~4	Qty.5~9
MCUE	6	6	4	23.5	23.5	7	12	12		
	8	8	6	27	27	7.5	14	14		
	10	10	8	28.5	28.5	8	17	17		
	12	12	10	30	30	9.5	19	19		

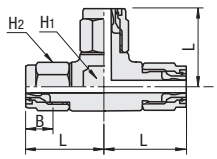
For orders larger than indicated quantity, please request a quotation.

■Couplings for Tubes -Union Tee-



RoHS

MCUT



Material: 1.4401/X5CrNiMo17-12-2

Part Number		Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L	B	Width across Flats		€ Unit Price	Volume Discount
Type	No.					H1	H2	Qty. 1~9	Qty.10~19
MCUT	4	4	2.5	20	6	12	10		
	6	6	4	21.5	7	12	12		
	8-5	8	5	23.5	7.5	14	14		
	8	8	6	23.5	7.5	14	14		
	10	10	8	28.5	8	22	17		
	12-8	12	8	30	9.5	22	19		
	12-9	12	9	30	9.5	22	19		
	12	12	10	30	9.5	22	19		

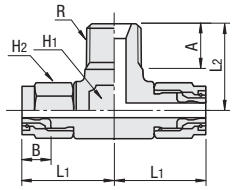
For orders larger than indicated quantity, please request a quotation.

■Couplings for Tubes -Tees-



RoHS

MCTPT



Material: 1.4401/X5CrNiMo17-12-2

Part Number		Thread Size R (PT)	Applicable Tube Outer Dia. (mm)	Applicable Tube Inner Dia. (mm)	L1	L2	A	B	Width across Flats		€ Unit Price	Volume Discount
Type	No.								H1	H2	Qty. 1~9	Qty. 10~19
MCTPT	4-1	1/8	4	2.5	20	18	9	6	12	10		
	4-2	1/4			21	21	11	6	14	10		
	6-1	1/8	6	4	21.5	18	9	7	12	12		
	6-2	1/4			22.5	21	11	7	14	12		
	8-15	1/8	8	5	23.5	19	9	7.5	14	14		
	8-1	1/8		6	23.5	19	9	7.5	14	14		
	8-2	1/4		6	23.5	21	11	7.5	14	14		
	8-3	3/8		5	25	23	12	7.5	17	14		
	8-36	3/8		6	25	23	12	7.5	17	14		
	10-2	1/4	10	8	28.5	25	11	8	22	17		
	10-36	3/8		6.5	28.5	26	12	8	22	17		
	10-3	3/8		8	28.5	26	12	8	22	17		
	12-28	1/4	12	8	30	26	11	9.5	22	19		
	12-2	1/4		10	30	26	11	9.5	22	19		
	12-3	3/8		10	30	27	12	9.5	22	19		

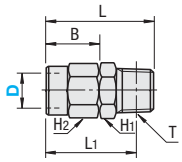
For orders larger than indicated quantity, please request a quotation.

■Couplings for Tubes -Nipples-



RoHS

TJBNC



Material: Brass

Part Number		Nominal	Hose Inner Dia. (mm)	L	L1	B	H1	H2	T R (PT)	Mass (g)	€ Unit Price	Volume Discount
Type	D (Hose Outer Dia.)										Qty. 1~9	Qty. 10~19
TJBNC (Brass)	6	1	4	26	22	12.5	12	12	R1/8	18		
		2		28.5	22.5		14	12	R1/4	26		
	8	1	5	28	24	14	14	14	R1/8	25		
		2		30	24		14	14	R1/4	30		
		3		31	24.6		17	14	R3/8	41		
	10	2	6.5	32	26	15.5	17	17	R1/4	43		
		3		33	26.6		17	17	R3/8	50		
	12	2	8	34	28	17	17	19	R1/4	49		
		3		35	28.6		17	19	R3/8	57		

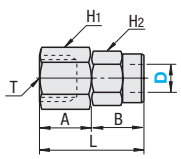
For orders larger than indicated quantity, please request a quotation.

■Couplings for Tubes -Socket-



RoHS

TJBSC



Material: Brass

Part Number		Nominal	Hose Inner Dia. (mm)	L	A	B	H1	H2	T Rc (PT) · G (PF)	Mass (g)	€ Unit Price	Volume Discount
Type	D (Hose Outer Dia.)										Qty. 1~9	Qty. 10~19
TJBSC (Brass)	6	1	4	23.5	11	12.5	14	12	Rc1/8	20		
		2		26.5	14		17	12	Rc1/4	31		
	8	2	5	28	14	14	17	14	Rc1/4	33		
		2F		28	14		17	14	G1/4	33		
		3		30	16		22	14	Rc3/8	51		
	10	2F	6.5	29.5	14	15.5	17	17	G1/4	42		
		3		31.5	16		22	17	Rc3/8	59		
	12	2	8	31	14	17	19	19	Rc1/4	55		
		2F		31	14		19	19	G1/4	55		
		3		33	16		22	19	Rc3/8	66		

For orders larger than indicated quantity, please request a quotation.

Specification

Material	1.4401	Brass
Applicable Fluid	Compressed Air · Water	
Operation Temperature Range	-65~260°C (Air) 0~100°C (Water)	-40~80°C
Max. Operating Pressure	It applies to Maximum Operating Pressure of tubes.	
Operating Vacuum Level	-100kPa	

Part Number	-	Nominal
MCTPT6-2		
TJBNC6	-	2

-MCUN · MCUT · MCTPT
6 Days P.87

-Other than above
8 Days | Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Fluororesin Couplings

CAD Data

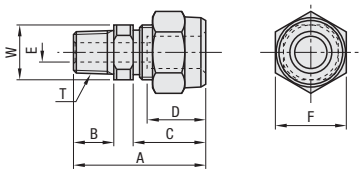
For tube, refer to Fluororesin Tubes on **P.1260** and Fluoro Rubber Tubes on **P.1261**.

■Fluororesin Couplings
-Male Thread Connectors-
-Bore-through Connectors-



RoHS

FENL (Male Thread Connectors)
FECT (Bore-through Connectors)



Part Number Type	Applicable Tube Outer Ø (mm)	Nominal	T R (PT)	A	B	C	D	E	F	W	FENL € Unit Price Qty.1~4	FENL Volume Discount Qty. 5~	FECT € Unit Price Qty.1~4	FECT Volume Discount Qty. 5~
FENL FECT	4	1	1/8	26	9	11	7	3	10	10				
		2	1/4	30	13					14				
	6	1	1/8	29	9	14	10	4	12	10				
		2	1/4	33	13					14				
		3	3/8	33						17				
	8	1	1/8	33	9	18	12	4	17	14				
		2	1/4	36	13			6		14				
		3	3/8	37				6		17				
	10	2	1/4	40	13	21	16	6	22	17				
		3	3/8	40				8		17				
		4	1/2	43	17			8		22				

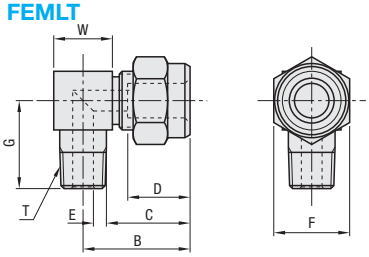
FECT has inner diameter penetrated. Tube can pass through the body and set at free position.

■Fluororesin Couplings
-Male Thread Elbows-



RoHS

FEMLT



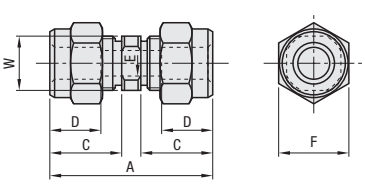
Part Number Type	Applicable Tube Outer Dia. (mm)	Nominal	T R (PT)	B	C	D	E	F	G	W	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
FEMLT	4	1	1/8	17	11	7	3	10	16	11		
		2	1/4	18					20	14		
	6	1	1/8	20	14	10	4	12	17	11		
		2	1/4	21					21	14		
		3	3/8	23					22	17		
	8	1	1/8	25	18	12	4	17	20	14		
		2	1/4	25			6		24	14		
		3	3/8	27			6		25	17		
	10	2	1/4	30	21	16	6	22	26	17		
		3	3/8	30			8		27	17		
		4	1/2	32			8		31	22		

■Fluororesin Couplings
-Unions-



RoHS

FETP



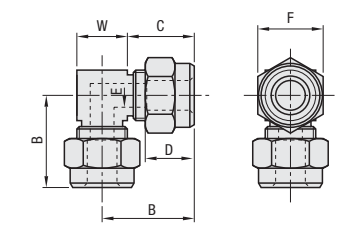
Part Number Type	Applicable Tube Outer Dia. (mm)	A	C	D	E	F	W	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
FETP	4	27	11	7	3	10	8		
	6	33	14	10	4	12	10		
	8	42	18	12	6	17	14		
	10	48	21	16	8	22	17		

■Fluororesin Couplings
-Union Elbows-



RoHS

FEUE



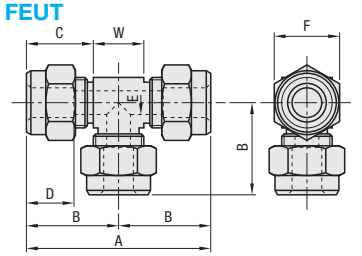
Part Number Type	Applicable Tube Outer Dia. (mm)	B	C	D	E	F	W	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
FEUE	4	15	11	7	3	10	8		
	6	19	14	10	4	12	10		
	8	25	18	12	6	17	14		
	10	30	21	16	8	22	17		

■Fluororesin Couplings
-Union Tees-



RoHS

FEUT



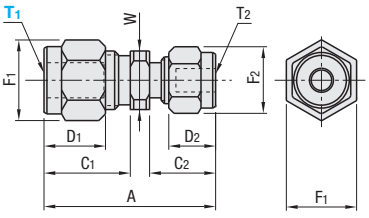
Part Number Type	Applicable Tube Outer Dia. (mm)	A	B	C	D	E	F	W	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
FEUT	4	30	15	11	7	3	10	8		
	6	38	19	14	10	4	12	10		
	8	50	25	18	12	6	17	14		
	10	60	30	21	16	8	22	17		

■Fluororesin Couplings
-Stepped Unions-



RoHS

FEUR



Part Number Type	Applicable Tube Outer Dia. (mm) T1	Applicable Tube Outer Dia. (mm) T2	A	C1	C2	D1	D2	W	F1	F2	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
FEUR	6	4	31	14	11	10	7	10	12	10		
	8	6	37	18	14	12	10	14	17	12		
	10	8	45	21	18	16	12	17	22	17		
	12	10	53	25	21	18	16	19	26	22		

Order Example

Part Number	-	Nominal
FENL4	-	1

Days to Ship

6 Days P.87

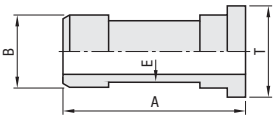
Fluororesin Couplings / Fluororesin Valves

CAD Data

■Fluororesin Couplings -Tube Insert-

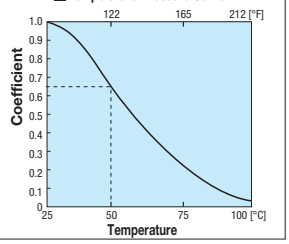
FETBS



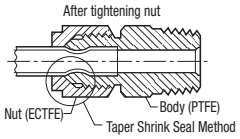


Part Number Type	Applicable Tube Outer Dia. (mm)	T	A	B	E	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
FETBS	4	4	10	3	2		
	6	6	12	4	2.5		
	8	8	16	6	4.3		
	10	10	20	8	6.8		

■Temperature-Pressure Curve



■Structure Diagram



■Tightening Torque of Nuts (Reference Values)

Tube Size mm		Tightening Torque N·m	Tightening Torque kgf-cm	No. of Revolution
4x3	-	0.12	1.2	1
6x4	6.35x4.3	0.23	2.3	1-1/4
8x6	-	0.45	4.6	1-1/4
10x8	9.53x6.3	0.8	8.2	1-1/2

(Note) 1. PFA tube is used in the measurement.
2. General tolerance of tube is absorbed if secured by the above torque value.
3. No. of revolution is from when tightening becomes fixed suddenly after lightly tightened by hand.

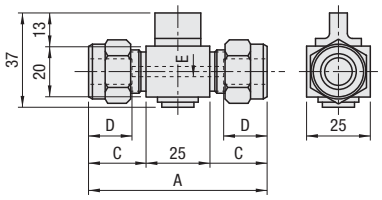
■Specifications

Applicable Fluid	Super Pure Water, Acid, Alkali, Organic Solvent
Operation Temperature Range	0~100°C
Max. Operating Pressure	Nominal Diameter 4~8: 0.8MPa Nominal Diameter 10: 0.6MPa

■Fluororesin Couplings -2-Way Valve-

FBT





■Features Excels in chemical resistance.
Possible to tighten the nut with a spanner without using special tools.

Part Number Type	Applicable Tube Outer Dia. (mm)	A	C	D	E	€ Unit Price Qty. 1	Volume Discount Qty. 2~
FBT	4	47	11	7	4		
	6	53	14	10	4		
	8	61	18	12	4		
	10	67	21	16	4		

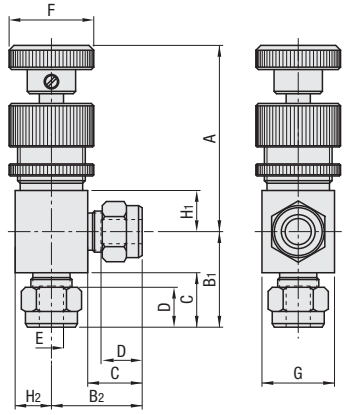
■Specifications

Applicable Fluid	Super Pure Water, Acid, Alkali, Organic Solvent
Operation Temperature Range	Ambient Temperature
Max. Operating Pressure	0.2MPa
Applicable Material	PTFE - ECTFE - Fluoro Rubber

■Fluororesin Couplings -Needle Valve-

FBNB





■Features
- Excels in chemical and corrosion resistance.
- Can be used in space-saving because of its compact size.

■Specifications

Applicable Fluid	Super Pure Water, Acid, Alkali, Organic Solvent
Operation Temperature Range	0~100°C
Max. Operating Pressure	0.5MPa
Applicable Material	PTFE / PCTFE / ECTFE / PP

■Features
- Excels in chemical and corrosion resistance.
- Possible to finely adjust flow rate by turning the handle.

Part Number Type	Applicable Tube Outer Dia. (mm)	A Max.	A Min.	B1	B2	C	D	E	F	G	H1	H2	€ Unit Price Qty. 1	Volume Discount Qty. 2~
FBNB	4	76	67	23	22.5	11	7	3	30	23	12	11.5		
	6	76	67	26	25.5	14	10	4	30	23	12	11.5		
	8	76	67	30	29.5	18	12	6	30	23	12	11.5		
	10	87	77	38	36	21	16	8	35	30	17	15		

Order Example — Part Number: FBT8

Days to Ship — 6 Days P.87

Quick Exhaust Valves / Pressure Gauges

Price Reduction
Up to 23%

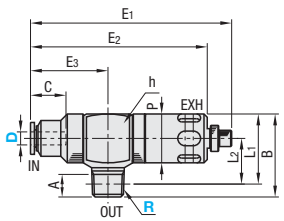
CAD Data

Standard Open Air (With Exhaust Throttle)



RoHS

EQXCE



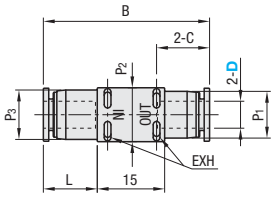
Material: Body: Aluminum
Needle portion: Brass (Electroless Nickel Plating)
Element: Polyvinyl Formal

Straight Open Air



RoHS

EQUS



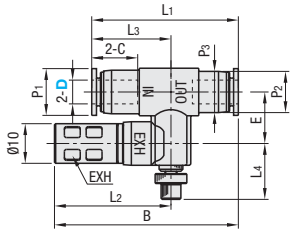
Material: Polybutylene Terephthalate

Union Open Air (With Exhaust Throttle)



RoHS

EQEJ



Material: Polybutylene Terephthalate
Needle portion: Brass (Electroless Nickel Plating)
Element: Polyvinyl Formal

Standard Open Air (With Exhaust Throttle)

Part Number		R (PT)	Nominal	A	B	L1	L2	P	C	E1		E2	E3	Opposite Side h	Effective Sectional Area (mm²)		Mass (g)	€ Unit Price	Volume Discount
Type	Tube Outer Dia. (mm) D									Max	Min				IN→OUT	OUT→EX		Qty. 1~9	Qty. 10~
EQXCE	4	1 (R1/8)	1	8	25.5	21.5	14	15	10.9	66.7	61.8	54.3	23.8	15	4	8	23		
	6	1 (R1/8)	1	8	25.5	21.5	14	15	11.7	67	62.1	54.6	24.1	15	6	8	23		
			2		29	25	16	18		77.4	71.6	63.1	28.1	18	9	15	35		
		2 (R1/4)	1	11	31												37		
	8	1 (R1/8)	1	8	29	25	16	18	18.2	82.7	76.9	68.4	33.4	18	12	15	39		
		2 (R1/4)	1	11	31												41		

Straight Open Air

Part Number		B	L	P1	P2	P3	C	Effective Sectional Area (mm²)		Mass (g)	€ Unit Price	Volume Discount
Type	Tube Outer Dia. (mm) D							IN→OUT	OUT→EX		Qty. 1~9	Qty. 10~
EQUS	4	34.6	11	8.4	10	9	11	1.8	1.8	3.3		
	6	37	12	10.4	12	11	11.6	4	4	4.9		

Specification

Applicable Fluid	Air
Operating Pressure Range	0.1~0.7MPa
Max. Pressure	1.35MPa
Operation Temperature Range	5~60°C (No freezing)
Min. Operating Pressure	0.05MPa

Features

- Applicable to high-speed driving cylinder since air is quickly exhausted. For exhaust throttle type, the driving speed of cylinder can be adjusted.

Notes

- For exhaust throttle type, due to clogging of elements, exhaust resistance may increase and cause deterioration in general system function. In such case, discontinue the use and replace the main body.
- Not applicable as shuttle valve.

Union Open Air (With Exhaust Throttle)

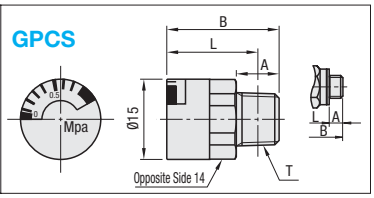
Part Number		B	L1	L2	L3	L4		P1	P2	P3	C	E	Effective Sectional Area (mm²)		Mass (g)	€ Unit Price	Volume Discount
Type	Tube Outer Dia. (mm) D					Max	Min						IN→OUT	OUT→EX		Qty. 1~9	Qty. 10~
EQEJ	4	44.7	34.6	28.6	18.5	17.4	13.5	9	10	8.4	11	11	1.8	1.7	8.3		
	6	46.7	37	29.4	20	19	14	11	12	10.4	11.6	13	4	3.2	12		

Straight



RoHS

GPCS



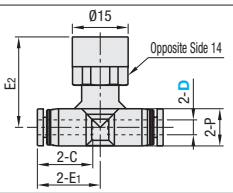
Part Number		T	A	B	L	Mass (g)	€ Unit Price	Volume Discount
Type	No.						Qty. 1~9	Qty. 10~
GPCS	1	R1/8	8	21	17	8		
	2	R1/4	11	24	18	16.5		
	5	M5x0.8	3	16.5	13.5	6		

Union Straight



RoHS

GPUS



Part Number		P	C	E1	E2	Mass (g)	€ Unit Price	Volume Discount
Type	Tube Outer Diameter D						Qty. 1~9	Qty. 10~
GPUS	4	10	15	17	24.5	12.5		
	6	13	17	20	26	15.5		
	8	15	18.5	22	28	20		

Specification

Applicable Fluid		Air
Indicated Pressure Range		0~0.8MPa
Accuracy		±5% (Full Scale*)
Operation Temperature Range		0~60°C
Scale Angle		150°
Material	Cap	Acrylic
	Metal Body	Brass (Nickel Plating)
	Resin Body	PBT

*Limits to display position error at single stroke deflection from 0 to maximum 0.8MPa.

- Direction of GPUS can be changed by rotating hexagonal part of gauge body.

Order Example

Part Number	-	R (PT)	-	Nominal
EQXCE4	-	1	-	1

Part Number
EQUS4

Part Number
GPCS2

Days to Ship

6 Days P87

Regulators
-One-Touch Coupling Built-in Regulators-

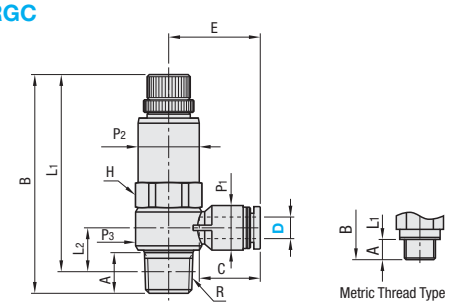
Price Reduction
Up to 12%

CAD Data

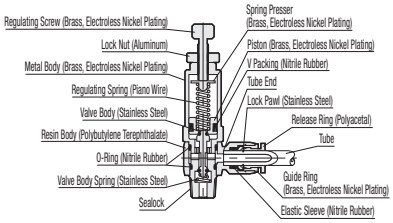
■Regulators -Elbow- RoHS

RGC





■Structure Diagram (Elbow Type: RGC)



■Graphic Symbol

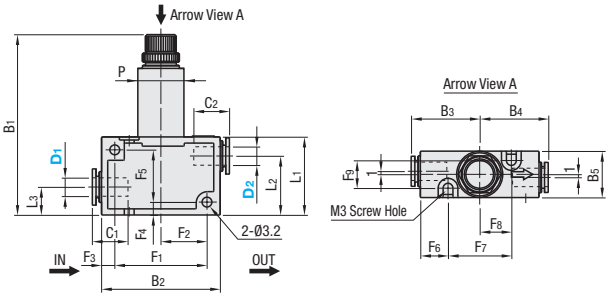


Part Number		Nominal	R	A	B		L1		L2	P1	P2	P3	C	E	Opposite Side H	Mass (g)	€ Unit Price	Volume Discount
Type	Tube Outer Diameter (mm) D				Max	Min	Max	Min									Qty. 1~9	Qty. 10~
RGC	4	M5	M5x0.8	2.9	48.7	44.6	45.8	41.7	7.6	8	10	9.8	11	15.4	10	16		
		1	R1/8	7.8	60	56	56	52	10.5	10	14	14.4	14.9	21.4	14	36		
	6	M5	M5x0.8	2.9	48.7	44.6	45.8	41.7	8.4	10.5	10	9.8	11.6	17.5	10	16		
		1	R1/8	7.8	60	56	56	52	10.7	12.4	14	14.4	17	23.5	14	36		
		2	R1/4	11.3	64.8	60.8	58.8	54.8	12.2		17	18.4		25.5	17	59		
	8	1	R1/8	7.8	60	56	56	52	11.7	14.4	14	14.4	18.1	26.9	14	38		
		2	R1/4	11.3	64.8	60.8	58.8	54.8	13.2		17	18.4		28.4	17	60		

■Regulators -Unions- RoHS

RGUJ





Part Number		D2	B1		B2	B3	B4	B5	L1	L2	L3	P	C1	C2	F1	F2	F3	F4	F5	F6	F7	F8	F9	Mass (g)	€ Unit Price	Volume Discount
Type	D1		Max	Min																					Qty. 1~9	Qty. 10~
RGUJ	4	4	63.3	58.8	38.6	21.9	21.9	15.1	25.4	19.2	9.1	15	11	11	30	15	4.3	4.2	17	9	20.6	10.3	9	36		
	6	4	63.3	58.8	38.6	22.3	21.9	15.1	25.4	19.2	9.1	15	11.6	11	30	15	4.3	4.2	17	9	20.6	10.3	9	37		
		6					22.3							11.6												
	8	6	67.5	63.2	47.6	28.5	28.6	19.2	29.5	21.3	9	19.2	19.6	17	39.6	19.8	4	4	21.5	12.1	23.4	11.7	13	61		
		8					28.5							19.6										62		

Order Example

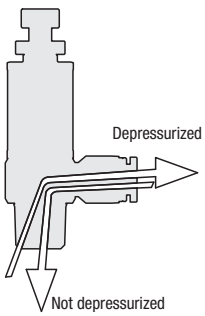
Part Number	-	Nominal - D2
RGC4	-	M5

Days to Ship

6 Days P.87

■Features

-As with a relief mechanism, the pressure will be reduced and flow out from the lever part when the primary pressure is set.



Regulators with Gauge

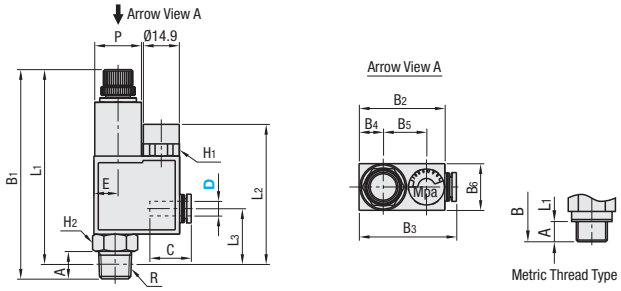
CAD Data

■Regulators with Gauge -Elbow-

RoHS



RGCM



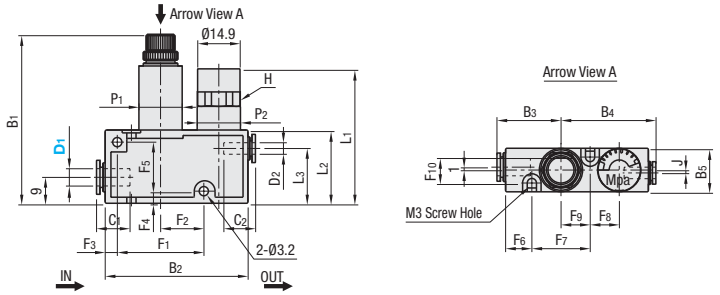
Part Number Type	Tube Outer Dia. (mm) D	Nominal	R	A	B1 Max	B1 Min	B2	B3	B4	B5	B6	L1 Max	L1 Min	L2	L3	C	E	P	Opposite Side H1	Opposite Side H2	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
RGCM	4	M5	M5x0.8	3	60.6	56.6	24.8	27.4	5.8	13.7	15.1	57.6	53.6	42.8	11.8	11	4.7	11	14	8	28		
		1	R1/8	7.8	81.8	77.4	32	36.2	7.8	15.8	15	77.8	73.4	51.6	18.6	15.9	7.3	15.2		12	55		
	6	M5	M5x0.8	3	60.6	56.6	24.8	27.8	5.8	13.7	15.1	57.6	53.6	42.8	11.8	11.6	4.7	11	14	8	28		
		1	R1/8	7.8	81.8	77.4	32	36.8	7.8	15.8	15	77.8	73.4	51.6	18.6	17	7.3	15.2		12	56		
		2	R1/4	11.3	90	85.7	35.1	39.9	9.9	17.7	19.1	84	79.7	57.3	22.8		8.7	19.1	16	16	84		
	8	1	R1/8	7.8	81.8	77.4	32	36.7	7.8	15.8	15	77.8	73.4	51.6	18.6	18.1	7.3	15.2	14	12	56		
		2	R1/4	11.3	90	85.7	35.1	39.8	9.9	17.7	19.1	84	79.7	57.3	22.8		8.7	19.1	12	16	85		

■Regulators with Gauge -Unions-

RoHS



RGUN



Part Number Type	No.	D1	D2	B1 Max	B1 Min	B2	B3	B4	B5	L1	L2	L3	P1	P2	C1	C2	J	Opposite Side H	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
RGUN	4	4	4	63.4	58.9	49.5	21.8	32.9	15.1	46.6	25.4	19	15	15	11	11	1	14	30	15	4.2	4.2	17	9.1	20.2	10.1	10.1	9	47		
	6-4	6	4	63.4	58.9	49.5	22.2	32.9	15.1	46.6	25.4	19	15	15	11.6	11	1	14	30	15	4.2	4.2	17	9.1	20.2	10.1	10.1	9	47		
	6	6	6					33.3								11.6															
	8-6	8	6	67.4	63.2	59.7	28.5	40.7	19.2	48.5	29.4	21.3	19	15.2	18.1	17	0	14	39.7	19.8	3.9	4.1	21.3	12.2	23.2	9.1	11.6	13	74		
	8	8	8					40.6								18.1															

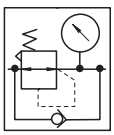
■Features

- This is a compact type regulator with a pressure gauge.
- The gauge can be changed in direction using the hexagonal part of its body.

■Precautions for Use

- To avoid equipment damage or malfunction, do not use the regulator in such a way that the pressure exceeds the preset level due to large secondary pressure fluctuations. It may result in equipment damage or malfunction. In the case of such possibility, provide separate safety device.
- Set the pressure upward (dial clockwise). Downward setting (dial counterclockwise) does not provide accurate regulation.
- When the pressure has been set at the desired level, be sure to tighten the lock nut to hold the setting.

Regulator with Pressure Gauge Graphic Symbol



Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	0~60°C
Operating Pressure Range	0~0.9MPa
Set Pressure Range	0.1~0.8MPa
Indicated Pressure Range	0~0.8MPa
Gauge Precision	±5% (Full Scale*)

*Limits to display position error at single stroke deflection from 0 to maximum 0.8MPa.

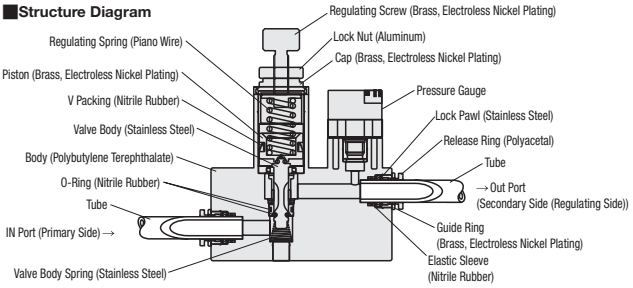
Order Example

Part Number	-	Nominal
RGCM4 RGUN4	-	M5

Days to Ship

6 Days P.87

■Structure Diagram



Digital Pressure Sensors

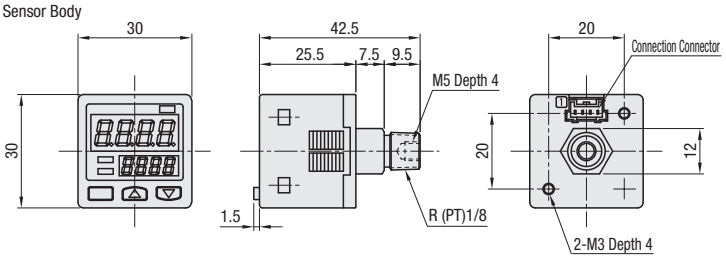
CAD Data



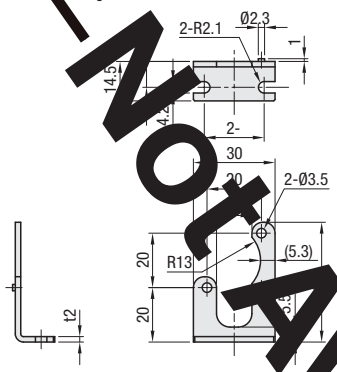
(Low Pressure Type)

(High Pressure Type)

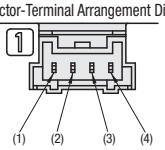
Sensor Body



Sensor Bracket (Accessory)
* Two mounting screws are included.

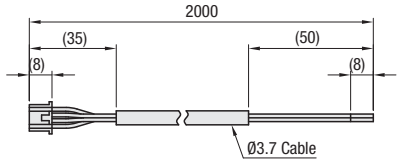


Connector-Terminal Arrangement Diagram



Terminal No.	Name
(1)	+V
(2)	Comparator Output 1
(3)	Comparator Output 2
(4)	0V

Cable with Connector (Accessory)



RoHS

Part Number	Type	Rated Pressure Range	Comparator Output	€ Unit Price
	Low Pressure Type	-100.0~+100.0kPa	NPN Transistor Open Collector	
	High Pressure Type	-0.100~+1.000MPa		

Order Example — Part Number

Days to Ship — 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Features

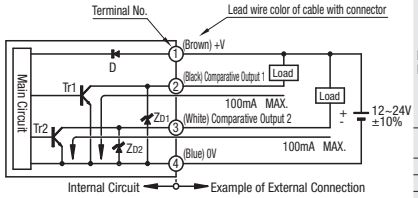
- A compact type sensor with a size of 30x30mm
- Dual display shows the current value and threshold value simultaneously. It makes a smooth checking and setting of a threshold value without switching the display mode.
- The color of the main display panel changes by the output ON/OFF operation. Displayed in 3 colors which provides excellent operability and visibility.
- Response time can be set at 10 levels between 2.5ms and 5,000ms. It prevents chattering or malfunctions caused by rapid pressure changes.

■Precautions for Use

Do not use this product as a detection device for human body protection.
(For human body protection, use products compliant with the local laws and regulations such as OSHA, ANSI, and IEC)

- Be sure to use within the range of rated pressure.
- Do not apply pressure that exceeds a withstanding pressure. Don't put wire into the pressure port. It damages the diaphragm and normal operation cannot be obtained.
- Avoid using during the power-on transitional state (0.5s).
- Avoid use where exposed to vapor or dust.
- Avoid direct contact with solvent such as thinner, water, oil or grease.
- Don't operate the buttons with pointed objects such as a needle tip.

■Input/Output Circuit Diagram



D : Power supply reverse polarity protection diode.
Z_{D1} and Z_{D2} : Zener diode for surge protection
Tr1 and Tr2 : NPN output transistor

■Specification

Type			
Type / Use		Low Pressure Type / (Mainly) for Negative Pressure	High Pressure Type / (Mainly) for Positive Pressure
Pressure Type		Gauge Pressure	
Rated / Set Pressure Range		-100.0~+100.0kPa	-0.100~+1.000MPa
Pressure Resistant		500kPa	1.5MPa
Applicable Fluid		Non-corrosive gas (Not applicable for liquid or corrosive gas)	
Power supply voltage		12~24V DC ±10% Ripple P-P10% or less	
Power Consumption		Normal State: 840mW or less (Supply Voltage: 24V, consumption current: 35mA or less)	
Comparator Output		NPN Transistor / Open Collector · Max. Allowed Current: 100mA · Applied Voltage: 30V DC or less (Between comparator output and 0V) · Residual Voltage: 2V or less (load current 100mA)	
	Output Operation	Select NO or NC by key operation	
	Hysteresis	1 digit minimum (variable)	
	Repeatability	±0.1%F.S (±2 digits or less)	±0.1%F.S (±2 digits or less)
	Response Time	Select from (2.5, 5, 10, 25, 50, 100, 250, 500, 1,000, 5,000) ms.	
	Short Circuit Protection	YES	
External Input		Not applicable	
Analog Voltage Output		Not applicable	
Display		4 digits + 4 digits and 3 colors LCD display (display update cycle: select from 250, 500 and 1,000ms)	
Indicated Pressure Range		-100.0~+100.0kPa	-0.100~+1.000MPa
Indicator Light		Orange LED	
Environmental Resistance	Protection Structure	IP40 (IEC)	
	Operating Ambient Temperature	-10~+50°C, for storage: -10~+60°C	
	Operation Environment Humidity	35~85%RH (No condensation, no freezing), for storage: 35~85%RH	
	Withstanding Voltage	AC 1,000V 1 minute between hot and case	
	Insulation Resistance	50MΩ or more with DC500V mega between hot and case	
	Vibration Resistance	Endurance 10~500Hz Full Wave Amplitude of 3mm 2 Hours, in X, Y, Z Direction each	
	Impact Resistance	Endurance 100m/s2 (Approx. 10G) 3 times for X, Y, Z Direction each	
Temperature Characteristics		within ±0.5% F.S. (+20°C as a reference)	within ±1% F.S. (+20°C as a reference)
Pressure Port		M5 Female +R (PT) 1/8 Male	
How to Connect		Connector	
Wire Length		100m long cable with sectional area of 0.3 square millimeter or more	
Material		Case: PBT, LCD Display: Acrylic, Switch: Silicon Rubber Pressure Port: 1.4305/X10CrNiS18-9 Bracket Screw: Brass (Nickel Plating) Mounting Bracket: Low STKM (Trivalent STKM STKM Bright Chromate)	
Body Mass		Approx. 40g	

* The ambient operating temperature is +20°C for the measurement conditions without any specification.

Not Available

Pressure Switches / Drain Traps

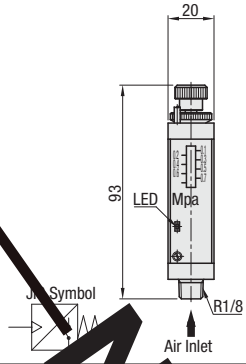
-2 Port Type-

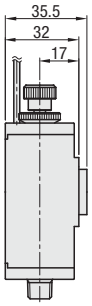
CAD Data

Pressure Switch

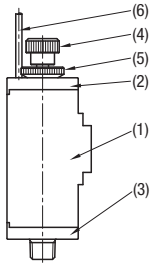


RoHS





Configuration of Parts



Components List

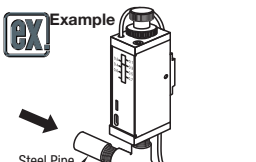
No.	Name	Quantity	Material
(1)	Body	1	ZC0400/ZnAl4
(2)	Head Cover	1	ZC0400/ZnAl4
(3)	Joints	1	ZC0400/ZnAl4
(4)	Handles	1	EN AW-2017
(5)	Lock Nut	1	EN AW-2017
(6)	Leads	1m	Vinyl

Part Number		€ Unit Price
Type	No.	
	6A	

Specification

Applicable Fluid	Air
Set Pressure Range (Mpa)	0.1~0.7
Max. Operating Pressure (Mpa)	0.8
Pressure Resistance (Mpa)	1.0
Operating Temperature Range (°C)	5~60
Connection Bore Diameter	R1/8
Sensor Switch	Lead Switch (Contact Type)
	Normally Open / LED, lights when ON
	Lead Wire Length 1m
	Contact Capacity: AC85~115V/DC5~30V, 25mA or less
Mass	185g

Example



Features

- A contact type pressure switch with a built-in lead switch.
- Working pressure can be easily set by handle rotating operation.
  LED display allows easy checking of ON/OFF operation.

Order Example — Part Number

Days to Ship — Days P.87

Price

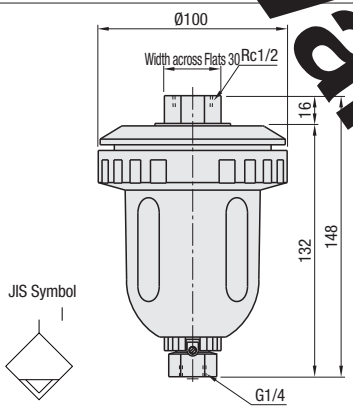
Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

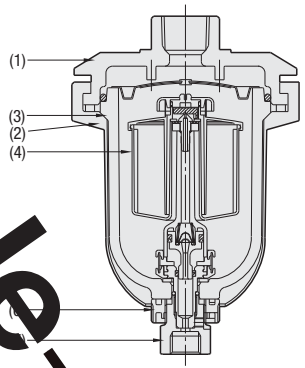
For orders larger than indicated quantity, please request a quotation.

Moisture Trap





Structure Diagram



Part Number		€ Unit Price
Type	No.	
	15A	

Do not use for exhausting heavy drain such as a mixture of dirt and oil in lower part of air tank.

Components List

No.	Name	Material
(1)	Cover	ZC0400/ZnAl4
(2)	Clamp Ring	ZC0400/ZnAl4
(3)	Case	PC
(4)	Float Assembly	-
(5)	Joints	POM
(6)	Coupling	POM

Specification

Pneumatic Fitting Port	Rc1/2
Drain Exhaust Port	G1/4
Applicable Fluid	Air or Drain
Operating Pressure	0.14~1.0MPa
Pressure Resistant	1.5MPa
Ambient Temperature	5~60°C
Capacity	10cc/1 time
Product Mass	0.7kg

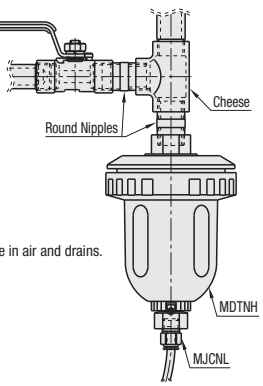
Features

- Float type prevents unnecessary air exhausts.
- Magnetic mechanism ensures positive drainage.

When operating pressure is 0.05MPa or less, drain exhaust port opens.

Dirt clogging in the float may cause air leakages. In such a case, clean the float. Never use drain trap under dusty air tanks.

Example



Order Example — Part Number

Days to Ship — 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Not Available

Service Units

Price Reduction
14% in Average

CAD Data

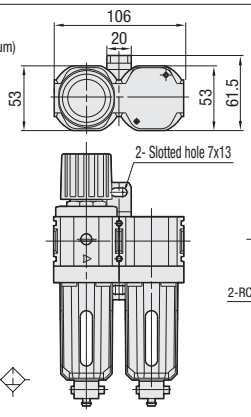
■Regulators with Filter + Filter



RoHS

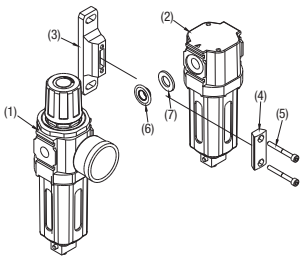
MSFRAF

Regulators with Filter (5μm) + Air Filter (0.3μm)

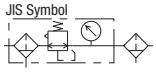


A Accessory: Pressure Gauge1 pc.
Bracket 1 pc.

Structure Diagram



JIS Symbol



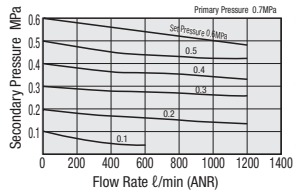
Part Number Type	No.	Rc (PT)	Nomi. Filtration Rating (μm)	Operating Pressure Range MPa	Set Pressure Range MPa	Pressure Resistant MPa	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	€ Unit Price Qty.1~4
MSFRAF	8A	1/4	5+0.3	0.05~1.0	0.05~0.85	1.5	5~60	Air	780	
	10A	3/8								

For orders larger than indicated quantity, please request a quotation.

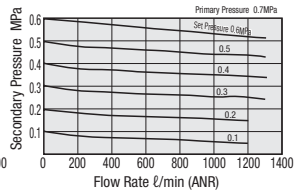
■Characteristic Data

This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.

MSFRAF8A Flow Rate Characteristics



MSFRAF10A Flow Rate Characteristics



■Components List

No.	Name	Material
(1)	Regulators with Filter	MSFR
(2)	Air Filter	MSAF 0.3μm
(3)	Bracket	EN AC-46100/G-AlSi12Cu
(4)	Attachment	EN AC-46100/G-AlSi12Cu
(5)	Hexagon Socket Head Cap Screw	1.7220/34CrMo4
(6)	#1 Gaskets	NBR
(7)	#2 Gaskets	NBR

The drain valve automatically drains when the pressure declines to 0.05 MPa or less.

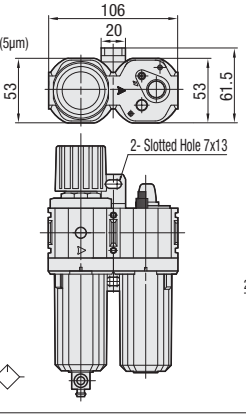
■Regulators with Filter + Lubricator



RoHS

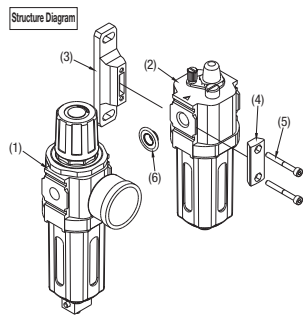
MSFRRR

Regulators with Filter (5μm) + Lubricator

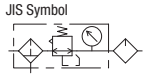


A Accessory: Pressure Gauge1 pc.
Bracket 1 pc.

Structure Diagram



JIS Symbol



Part Number Type	No.	Rc (PT)	Nomi. Filtration Rating (μm)	Operating Pressure Range MPa	Set Pressure Range MPa	Pressure Resistant MPa	Oil Storage Capacity (cm3)	Minimal Flow Rate for Charging (ℓ/min)	Recommended Oil	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	€ Unit Price Qty.1~4
MSFRRR	8A	1/4	5	0.05~1.0	0.05~0.85	1.5	55	50	Turbine Oil (ISO VG32)	5~60	Air	780	
	10A	3/8						60					

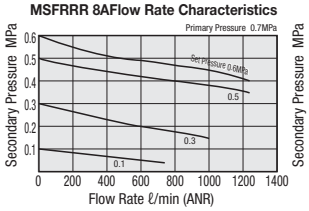
Minimum flow rate for charging indicates flow rate (ANR) when primary pressure is 0.5MPa.

For orders larger than indicated quantity, please request a quotation.

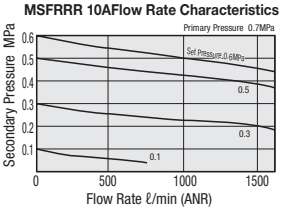
■Characteristic Data

This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.

MSFRRR 8AFlow Rate Characteristics



MSFRRR 10AFlow Rate Characteristics



■Components List

No.	Name	Material
(1)	Regulators with Filter	MSFR
(2)	Lubricator	MSRR
(3)	Bracket	EN AC-46100/G-AlSi12Cu
(4)	Attachment	EN AC-46100/G-AlSi12Cu
(5)	Hexagon Socket Head Cap Screw	1.7220/34CrMo4
(6)	Gasket	NBR

The drain valve automatically drains when the pressure declines to 0.05 MPa or less.

Order Example Part Number MSFRAF8A

Days to Ship 6 Days P.87

Add. Spec. Air Regulators with Filter / Lubricator

Price Reduction 3% in Average

CAD Data

Air Regulators with Filter





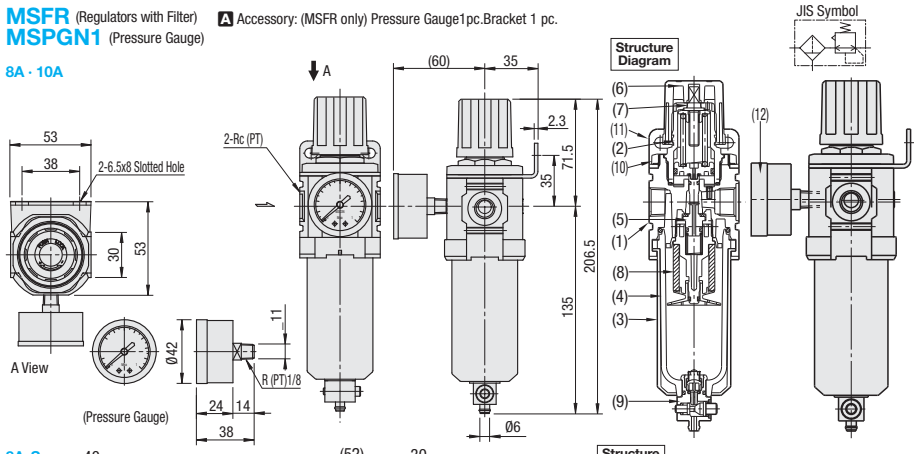
Pressure Gauge

RoHS

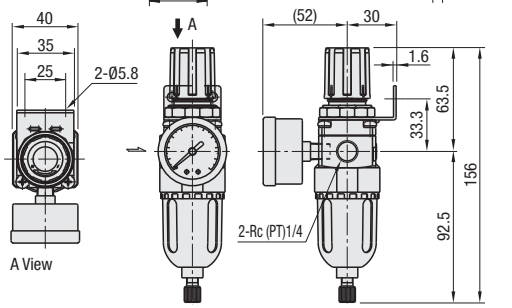
MSFR (Regulators with Filter)
MSPGN1 (Pressure Gauge)

A Accessory: (MSFR only) Pressure Gauge1pc.Bracket 1 pc.

8A · 10A



8A-S



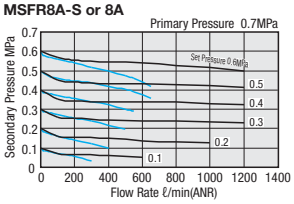
Part Number Type	No.	Rc (PT)	Nomi. Filtration Rating (μm)	Operating Pressure Range MPa	Set Pressure Range MPa	Pressure Resistant MPa	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	€ Unit Price
MSFR	8A-S	1/4	40	0~1.0	0.05~0.85	1.5	5~60	Air	210	
	8A		5	0.05~1.0					460	
	10A	3/8								

Part Number	€ Unit Price
MSPGN1 (Pressure Gauge)	

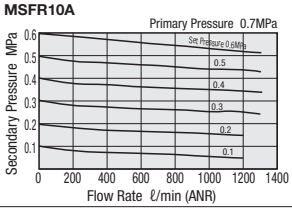
The drain valve (9) in the structural drawing automatically drains when the pressure declines to 0.05 MPa or less.

This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.

MSFR8A-S or 8A



MSFR10A



Components List

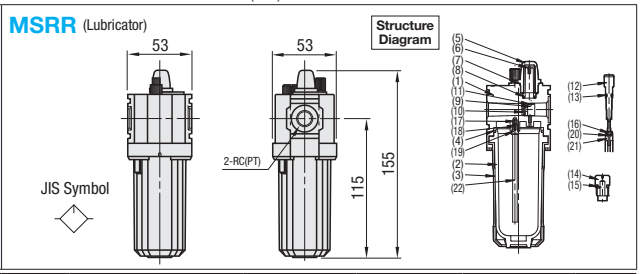
No.	Name	Material 8A-S	Material 8A · 10A	No.	Name	Material 8A-S	Material 8A or 10A
(1)	Body	EN AB-46200/EN AB-AlSi8Cu3		(7)	Adjustment Screw	1.0038/S235JR	
(2)	Bonnets	PBT	POM	(8)	Element	PE	
(3)	Case Guard	EN AC-46100	PC	(9)	Drain Valve	CW614N	POM
(4)	Case	PC		(10)	Lock Nut	EN AW-6063	POM
(5)	Valve	Nitrile Rubber		(11)	Bracket	Low JIS STKM	
(6)	Handles	POM		(12)	Pressure Gauge	-	

Lubricator



RoHS

MSRR (Lubricator)



Part Number Type	No.	Rc (PT)	Operating Pressure Range MPa	Pressure Resistant MPa	Operation Temperature Range (°C)	Oil Storage Capacity (cm³)	Minimal Flow Rate for Charging (ℓ/min)	Recommended Oil	Applicable Fluid	Mass (g)	€ Unit Price Qty.1~4
MSRR	8A	1/4	0~1.0	1.5	5~60	55	50	Turbine Oil (ISO VG32)	Air	270	
	10A	3/8					60				

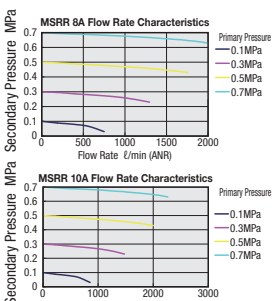
Minimum flow rate for charging indicates flow rate (ANR) when primary pressure is 0.5MPa.

Components List

No.	Name	Material	No.	Name	Material	No.	Name	Material
(1)	Body	EN AB-46200	(9)	Flow Guide Holder	POM	(17)	#2 Check Valve	1.4301
(2)	Case	PC	(10)	Flow Guide	NBR	(18)	Check Valve Spring	1.4301
(3)	Case Guard	PC	(11)	Holder Gasket	NBR	(19)	Air Nozzle	CW614N
(4)	Case Gasket	NBR	(12)	Needle Valve	1.0038	(20)	Check Valve Gasket	NBR
(5)	Outer Dome	PC	(13)	Needle Valve Gasket	NBR	(21)	Check Valve Body	CW614N
(6)	Inner Dome	PC	(14)	Feed Plug	CW614N	(22)	Siphoning Tube	PU
(7)	Outer Dome Gasket	NBR	(15)	Feed Plug Gasket	NBR			
(8)	Inner Dome Gasket	NBR	(16)	#1 Check Valves	1.4301			

Characteristic Data

This graph shows that when the primary pressure is constant, the secondary set pressure drops according to the flow rate used.



Order Example: Part Number MSFR8A-S, MSRR8A

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	Price List	5%

For orders larger than indicated quantity, please request a quotation.

Air Filters / Air Regulators

Price Reduction
Up to 15%

CAD Data

Air Filters

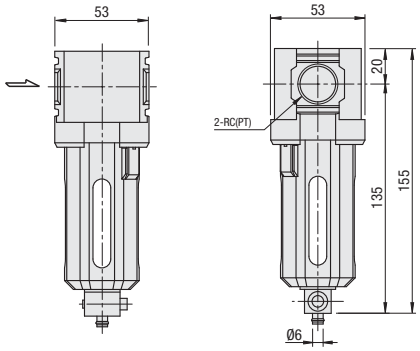


MSAF (Air Filter)

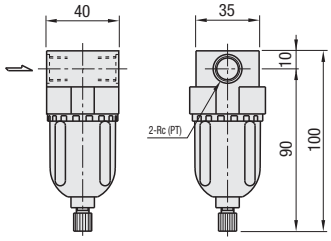
JIS Symbol



8A · 10A



8A-S



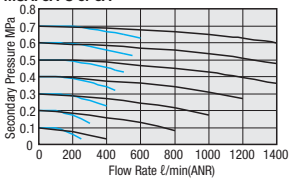
For the structural drawing, please refer to the Air Regulators with Filters on the left page.

RoHS

Characteristic Data

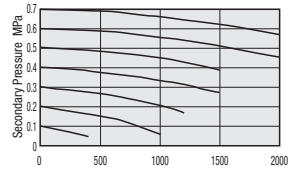
This graph shows that when the primary pressure is constant, the secondary set pressure drops according to the flow rate used.

MSAF8A-S or 8A



MSAF10A

Nominal Filtration Rating 5μ, 0.3μ, 0.01μ Flow Rate Characteristics



Part Number Type	No.	Nominal Filtration Rating (μm) Selection	Rc (PT)	Operating Pressure Range MPa	Pressure Resistant MPa	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	€ Unit Price
MSAF	8A-S	40	1/4	0~1.0	1.5	5~60	Air	140	
	8A	0.01		0.05~1.0				250	
		0.3						270	
		5							
	10A	0.01	3/8					250	
		0.3						270	
		5							

Air Regulators



MSR (Air Regulator)

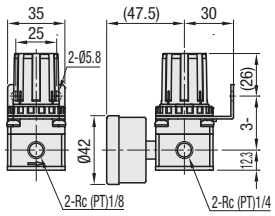
A Accessory: Pressure 1 pc. Bracket 1 pc.

In the lateral view, the included pressure gauge is installed.

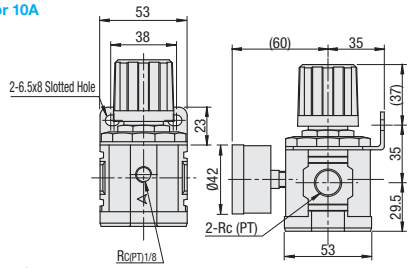
JIS Symbol



8A-S



8A or 10A



For the structural drawing, please refer to the Air Regulators with Filters on the left page.

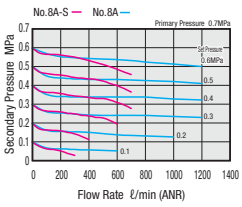
RoHS

Part Number Type	No.	Rc (PT)	Operating Pressure Range MPa	Set Pressure Range MPa	Pressure Resistant MPa	Ambient Temperature Range (°C)	Applicable Fluid	Mass (g)	€ Unit Price
MSR	8A-S	1/4	0.05~1.0	0.05~0.85	1.5	5~60	Air	250	
	8A							420	
	10A	3/8							

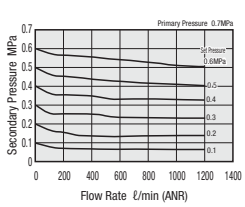
Characteristic Data

This graph shows that when the primary pressure is constant at 0.7 MPa, the secondary set pressure drops according to the flow rate used.

MSR8A-S, 8A Flow Rate Characteristics



MSR10A Flow Rate Characteristics



Order Example

Part Number	-	Nomi. Filtration Rating
MSAF8A-S MSR8A	-	40

Days to Ship

6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

One-Touch Articulated Connector / Resin Couplers

CAD Data

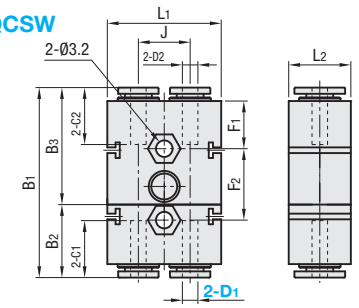
One-Touch Articulated Connector -Male - Female Set-

RoHS

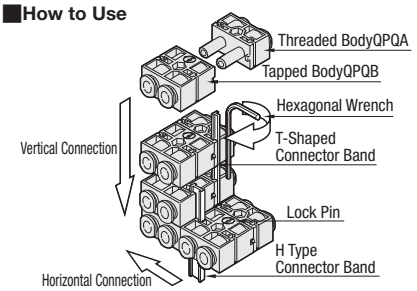


M Material: Polyacetal
A Accessory: T - H-Type Connector Band (2 pcs. each)

QCSW



How to Use



Part Number Type	D1	D2	B1	B2	B3	L1	L2	C1	C2	F1	F2	J	Effective Sectional Area (mm2)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
QCSW	4	4	36.7	14.1	22.6	22	12	11	11	11.8	13.8	10	4.2	11		
	6	6	37.5	14.5	23	22	12	11.6	11.6	12.2	13.8	10	10.4	11		
	8	8	53.9	20.7	33.2	29	17	18.1	18.1	17.2	19.5	14	10.9	31		

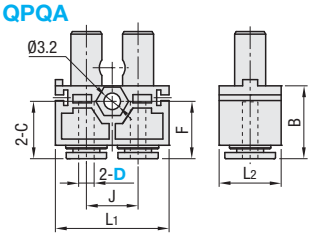
One-Touch Articulated Connector -Male Unit-

RoHS



M Material: Polyacetal
A Accessory: T - H-Type Connector Band (2 pcs. each)

QPQA



Part Number Type	D	B	L1	L2	C	F	J	Mass (g)	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~
QPQA	4	14.1	22	12	11	11.1	10	4.7		
	6	14.5	22	12	11.6	11.5	10	4.8		
	8	20.7	29	17	18.1	17.2	14	14		

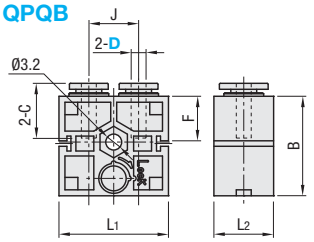
One-Touch Articulated Connector -Female Unit-

RoHS



M Material: Polyacetal
A Acessory: T - H-Type Connector Band (2 pcs. each)

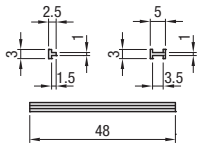
QPQB



Part Number Type	D	B	L1	L2	C	F	J	Mass (g)	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~
QPQB	4	22.6	22	12	11	11.8	10	5.8		
	6	23.0	22	12	11.6	12.2	10	6.2		
	8	33.2	29	17	18.1	17.2	14	17		

Connector Band (Accessories)

RoHS



M Material: Polyacetal

Specification

Applicable Fluid	Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	0.9MPa
Operating Vacuum Level	-100kPa

Feature (One-Touch Articulated Connector)

-Able to attach and detach multiple tubes at a time.
-Able to combine multiple connectors using connector bands.

Cautions

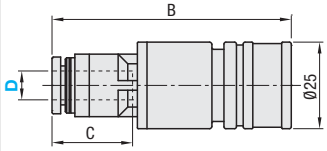
-For the combination of threaded and tapped connectors, Ø4 and Ø6 are available, but Ø8 is not available.
-Make sure to lock the lock pin at the center of the body with a flathead screwdriver or hexagonal wrench after attaching the male and female bodies.
-Max. 4 pcs. are attachable vertically or horizontally.

Resin Connectors -Socket-

RoHS



JCPS



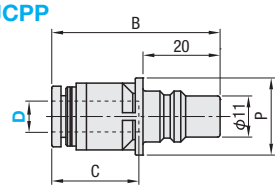
Part No. Type	D	B	C	Effective Sectional Area (mm2)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~
JCPS	6	54.8	17	11.5	23		
	8	54.7	18.1	19.8	24		
	10	59.8	20.2	22.6	28		

Resin Connectors -Male Thread-

RoHS



JCPP

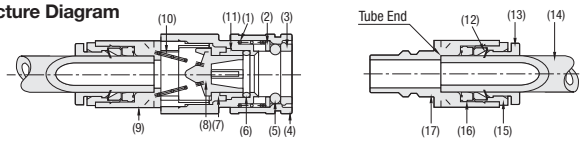


Part No. Type	D	B	P	C	Effective Sectional Area (mm2)	Mass (g)	€ Unit Price Qty. 1~9	Vol. Discount Qty. 10~
JCPP	6	45.5	16	17	12.5	7		
	8	45.2	16	18.1	23.3	7		
	10	45.2	20	20.2	33.8	13		

Order Example — Part Number: JCPP6

Days to Ship: 6 Days P. 87

Structure Diagram



No.	Name of Parts	Material (Surface Treatment)
(1)	Sleeve Spring	Stainless Steel
(2)	Ball Holder	POM / Polyacetal
(3)	Socket Body	POM / Polyacetal
(4)	Sleeve	POM / Polyacetal
(5)	Lock Ball	Stainless Steel
(6)	O-Ring	NBR, Nitrile Rubber
(7)	Valve Body Seal	NBR, Nitrile Rubber
(8)	Valve Body	POM / Polyacetal
(9)	Body	Glass Fiber Filled PBT
(10)	Valve Body Spring	Stainless Steel
(11)	Valve Body Guide	POM / Polyacetal

No.	Name of Parts	Material (Surface Treatment)
(12)	Lock Pawl	Stainless Steel
(13)	Release Ring	POM / Polyacetal
(14)	Tube	Polyurethane - Nylon, etc.
(15)	Guide Ring	Brass (Electroless Nickel Plating)
(16)	Elastic Sleeve	NBR, Nitrile Rubber
(17)	Plug Body	Glass Fiber Filled PBT

Feature (Resin Coupler)

- Lightweight and easy to attach and detach.
- Built-in stop mechanism.

Graphic Symbol



Specification

Applicable Fluid	Air
Operation Temperature Range	0~60°C
Max. Operating Pressure	0.9MPa
Operating Vacuum Level	-100kPa

Air Couplers
-Tube Connecting-

Price Reduction
Up to 29%

CAD Data

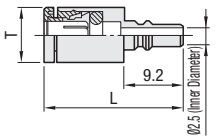
Not usable in combination with different type.

■Plugs



RoHS

Type	M Material	S Surface Treatment
MCPC	Brass	Chrome Plating
MCPCS	1.4401/X5CrNiMo17-12-2	-



Part Number Type	No.	L	T	Mass (g)	MCPC € Unit Price Qty. 1~9	MCPC Vol. Discount Qty. 10~	MCPCS € Unit Price Qty. 1~9	MCPCS Vol. Discount Qty. 10~
MCPC	4	24.5	8.1	3 (5.5)				
MCPCS	6	28.0	10.1	5 (9)				

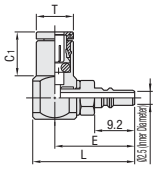
Values in ( ) are for MCPCS.

■Plugs



RoHS

Type	M Material	S Surface Treatment
MCPCL	Brass	Chrome Plating
MCPCLS	1.4301/X5CrNi18-10	-



Part Number Type	No.	L	T	E	C1	Mass (g)	MCPCL € Unit Price Qty. 1~9	MCPCL Vol. Discount Qty. 10~	MCPCLS € Unit Price Qty. 1~9	MCPCLS Vol. Discount Qty. 10~
MCPCL	4	23.8 (23.3)	8.1	18.3	10 (11)	10 (10.9)				
MCPCLS	6	24.3 (26.3)	10.1	18.8 (19.8)	12 (13)	13.5 (19.7)				

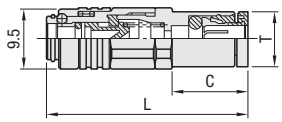
Values in ( ) are for MCPCLS.

■Sockets



RoHS

Type	M Material	S Surface Treatment
MCSC	Brass	Chrome Plating
MCSCS	1.4301/X5CrNi18-10	-



Part Number Type	No.	L	C	T	Mass (g)	MCSC € Unit Price Qty. 1~9	MCSC Vol. Discount Qty. 10~	MCSCS € Unit Price Qty. 1~9	MCSCS Vol. Discount Qty. 10~
MCSC	4	31.5 (34.6)	11.8 (11)	8.1	9 (11.4)				
MCSCS	6	33.5 (37)	12.5 (13)	10.1	11.5 (16.2)				

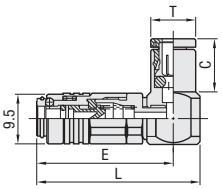
Values in ( ) are for MCSCS.

■Sockets



RoHS

Type	M Material	S Surface Treatment
MCSCL	Brass	Chrome Plating
MCSCLS	1.4301/X5CrNi18-10	-



Part Number Type	No.	L	C	T	E	Mass (g)	MCSCL € Unit Price Qty. 1~9	MCSCL Vol. Discount Qty. 10~	MCSCLS € Unit Price Qty. 1~9	MCSCLS Vol. Discount Qty. 10~
MCSCL	4	30.8	10 (11)	8.5 (8.1)	25.8	16 (15.5)				
MCSCLS	6	31.8 (33.8)	12.5 (13)	10.3 (10.1)	26.3 (27.3)	19 (24.3)				

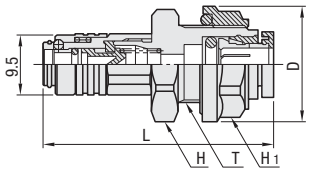
Values in ( ) are for MCSCLS.

■Sockets



RoHS

Type	M Material	S Surface Treatment
MCSCB	Brass	Chrome Plating
MCSCBS	1.4301/X5CrNi18-10	-



Part Number Type	No.	L	D	T	Width across Flats H	Width across Flats H1	Mass (g)	MCSCB € Unit Price Qty. 1~9	MCSCB Volume Discount Qty. 10~	MCSCBS € Unit Price Qty. 1~9	MCSCBS Volume Discount Qty. 10~
MCSCB	4	34 (42.1)	16 (19.6)	M10x1 (M12x1)	13 (15)	13 (17)	15 (26.2)				
MCSCBS	6	36 (45)	18 (25.4)	M12x1 (M16x5)	15 (18)	15 (22)	18.5 (45.4)				

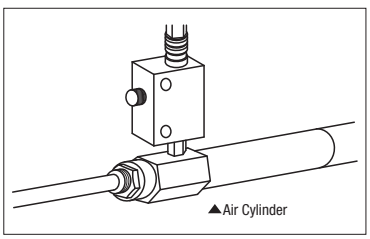
Values in ( ) are for MCSCBS.

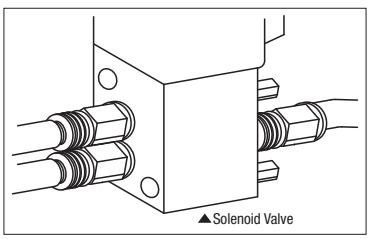
Specification

Seal Material	Operation Temperature	Max. Operating Pressure MPa (kgf/cm²)	Pressure Resistance MPa(kgf/cm²)	Applicable Fluid
Nitrile Rubber (NBR)	-20~60°C	Brass: 1.0 (10) 1.4301/X5CrNi18-10: 1.0 (10)	Brass: 1.5 (15) 1.4301/X5CrNi18-10: 1.5 (15)	Air

Single Passage Opening Closing System (Valve is provided on socket side.)
For combination with a tube, select the same number as that of the tube diameter.
The specifications in description are those concerning coupling bodies. The actual pressure specification, operating temperature range and etc. vary depending on the material of the tubes.

Example





Order Example
Part Number
MCPC4
MCSC6

Days to Ship
6 Days
P. 87

NEW

Air Couplers -Plugs-

-Standard-

Price Reduction
Up to 51%

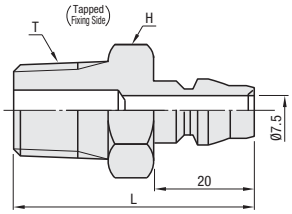
CAD Data

Not usable in combination with different type.

-Male Thread-

Type	Material	Surface Treatment
MCPM	Steel	Chrome Plating
MCPMS	1.4305/X10CrNiS18-9	-





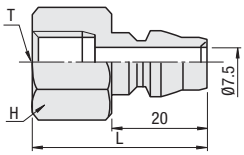
RoHS

Part Number Type	No.	Thread Dia. T	L	Width across Flats H	Mass (g) MCPM	Mass (g) MCPMS	MCPM € Unit Price Qty.1~29	MCPM Volume Discount Qty.30~	MCPMS € Unit Price Qty. 1~9	MCPMS Volume Discount Qty.10~
MCPM MCPMS	20	R 1/4	41	14	25	27				
	30	R 3/8	42	19	43	40				
	40	R 1/2	46	22	59	62				

-Female Thread-

Type	Material	Surface Treatment
MCPF	Steel	Chrome Plating
MCPFS	1.4305/X10CrNiS18-9	-





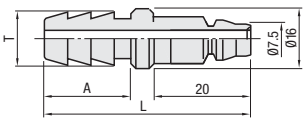
RoHS

Part Number Type	No.	Thread Dia. T	L	Width across Flats H	Mass (g) MCPF	Mass (g) MCPFS	MCPF € Unit Price Qty.1~29	MCPF Volume Discount Qty.30~	MCPFS € Unit Price Qty.1~29	MCPFS Volume Discount Qty.30~
MCPF MCPFS	20	Rc 1/4	36	17	28	30				
	30	Rc 3/8	37	21	39	41				
	40	Rc 1/2	38	29	70	69				

-Tube Connecting-

Type	Material	Surface Treatment
MCPH	Steel	Chrome Plating
MCPHS	1.4305/X10CrNiS18-9	-





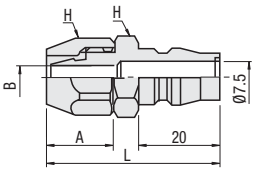
RoHS

Part Number Type	No.	Tube Inner Dia. (mm)	L	A	T	Mass (g) MCPH	Mass (g) MCPHS	MCPH € Unit Price Qty.1~29	MCPH Volume Discount 30~	MCPHS € Unit Price Qty. 1~9	MCPHS Volume Discount Qty.10~
MCPH MCPHS	6.5	6.5	54	27	7.2	24	26				
	8	8	57	30	9	28					

-Nut Tightening-

Type	Material	Surface Treatment
MCPCN	Steel	Chrome Plating





RoHS

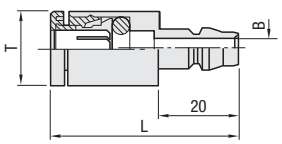
Part Number Type	No.	L	A	B	H	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty.20~
MCPCN	8	43	17	4.5	17	30		
	10	43	17	5.3	17	42		
	12	45	19	7.5	19	50		

When MCPCN is used in combination Awith tube, select the same No. as that of the tube outer diameter.

-One-touch Coupling-

Type	Material	Surface Treatment
MCPC	Brass	Chrome Plating
MCPCS	1.4305/X10CrNiS18-9	-





RoHS

Part Number Type	No.	L	T	Inner Dia. B	Mass (g)	MCPC € Unit Price Qty. 1~9	MCPC Volume Discount Qty. 10~	MCPCS € Unit Price Qty. 1~9	MCPCS Volume Discount Qty. 10~
MCPC MCPCS	8	41.0 (46.5)	16.5 (12.5)	6.5 (7.5)	30 (40)				
	10	45.0 (50)	19.5 (15)	7.5	43 (50)				

When MCPC is used in combination with tube, select the same No. as that of the tube outer diameter.
Values in () are for MCPCS.

EX Specification

Type	Plugs - Sockets	Sockets-High Flow Rate Type
Applicable Fluid	Air · Water (SUS Type)	Air
Operation Temperature Range	-20~80°C	-20~60°C
Max. Operating Pressure	1.5MPa	1.5MPa
Pressure Resistant	2.0MPa	2.0MPa
Seal Material	Nitrile Rubber	
Structure of Valve	Single Passage Opening Closing Type (Only socket has valve structure)	

Order Example — Part Number: MCPC8

Days to Ship — 6 Days P.87

Air Couplers -Sockets-

-Standard-

Price Reduction
Up to 41%

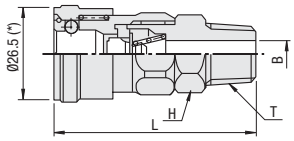
CAD Data

Not usable in combination with different type.

-Male Thread-

Type		Material	Surface Treatment
Standard	High Flow Rate		
MCSM	MCHSM	Steel	Chrome Plating
MCSMS	-	1.4305/ X10CrNiS18-9	-





RoHS

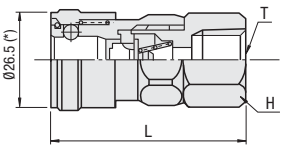
* MCSHS is for 25.4.

Part Number Type	No.	Thread Dia. T	L	Width across Flats H	Inner Dia. B	Mass (g) MCSM	MCSMS	MCHSM	MCSM € Unit Price Qty. 1~29	MCSM Volume Discount 30~	MCSMS € Unit Price Qty. 1~9	MCSMS Volume Discount 10~	MCHSM € Unit Price Qty. 1~9	MCHSM Volume Discount 10~
MCSM MCSMS	20	R 1/4	55.5	19	7	101	96	-						
	30	R 3/8	56.5	19	8	108	105	-						
	40	R 1/2	59.5	23	9	131	120	-						
MCHSM	20	R 1/4	60	19	7.5	-	-	89						
	30	R 3/8	60.5	19	10	-	-	91						
	40	R 1/2	56	24	13	-	-	102						

-Female Thread-

Type		Material	Surface Treatment
Standard	High Flow Rate		
MCSF	MCHSF	Steel	Chrome Plating
MCSFS	-	1.4305/ X10CrNiS18-9	-





RoHS

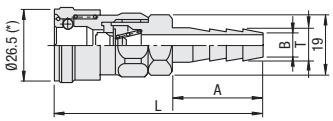
* MCSHS is for 25.4.

Part Number Type	No.	Thread Dia. T	L	Width across Flats H	Mass (g) MCSF	MCSFS		MCSF € Unit Price Qty. 1~29	MCSF Volume Discount 30~	MCSFS € Unit Price Qty. 1~29	MCSFS Volume Discount 30~	MCHSF € Unit Price Qty. 1~29	MCHSF Volume Discount 30~
MCSF MCSFS	20	Rc 1/4	49.5	19	95	98	-						
	30	Rc 3/8	50.5	21	103	99	-						
	40	Rc 1/2	52.5	29	139	138	-						
MCHSF	20	Rc 1/4	57.5	19	-	-	94						
	30	Rc 3/8	55.5	22	-	-	103						
	40	Rc 1/2	57.5	29	-	-	138						

-Tube Connecting-

Type		Material	Surface Treatment
Standard	High Flow Rate		
MCSH	MCHSH	Steel	Chrome Plating
MCSHS	-	1.4305/ X10CrNiS18-9	-





RoHS

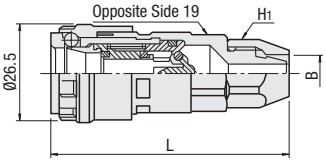
* MCSHS is for 25.4.

Part Number Type	No.	Tube Inner Diameter (mm)	L	A	T	Inner Diameter B	Mass (g) MCSH	MCSHS	MCHSH	MCSH € Unit Price Qty. 1~29	MCSH Volume Discount 30~	MCSHS € Unit Price Qty. 1~4	MCSHS Volume Discount 5~	MCHSH € Unit Price Qty. 1~29	MCHSH Volume Discount 30~
MCSH MCSHS	6.5	6.5	69.5	27	7.2	4.5	99	99	-						
	8	8	72.5	30	9	5	103	100	-						
MCHSH	6.3	6.3	77	27	7.2	4.5	-	-	86						
	9.5	9.5	79	32	11.3	7.5	-	-	92						
	12.7	12.7	79.5	32	15	10	-	-	104						

-Nut Tightening-

Type	Material	Surface Treatment
MCSCN	Steel	Chrome Plating





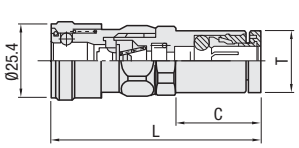
RoHS

Part Number Type	No.	L	B	H1	Mass (g)	MCSCN € Unit Price Qty.1~29	MCSCN Volume Discount Qty.30~
MCSCN	8	64.5	4.5	17	105		
	10	64.5	5.3	17	106		
	12	65.5	7.5	19	1-2		

-One-touch Coupling-

Type	Material	Surface Treatment
MCSC	Brass	Chrome Plating
MCSCS	1.4305/ X10CrNiS18-9	-





RoHS

Part Number Type	No.	L	C	T	Mass (g)	MCSC € Unit Price Qty.1~4	MCSC Volume Discount 5~	MCSCS € Unit Price Qty.1~4	MCSCS Volume Discount 5~
MCSC MCSCS	8	52.5 (58)	14.0 (18.5)	13 (12.5)	97 (102)				
	10	56.0 (62)	17.5 (22)	15.4 (14.5)	107 (115)				

■Features (High Flow Rate Type)
- Unlike conventional types, pushing in the plug is all that is required to connect it to the socket.
- Low pressure-loss valve structure has increased the flow rate by 15%.

■Precautions for Use (All Standard Type)
- Be sure that the fluid flows from the socket side to the plug side.
- Not available for vacuum service as unit or connected.

Specification

Type	Plugs · Sockets	Sockets-High Flow Rate Type
Applicable Fluid	Air · Water (SUS Type)	Air
Operation Temperature Range	-20~80°C	-20~60°C
Max. Operating Pressure	1.5MPa	1.5MPa
Pressure Resistant	2.0MPa	2.0MPa
Seal Material	Nitrile Rubber	
Structure of Valve	Single Passage Opening Closing Type (Only socket has valve structure)	

Order Example — Part Number: MCSCS10

Days to Ship: 6 Days P87.

Air Couplers
-Rotary Type / Locking Type-

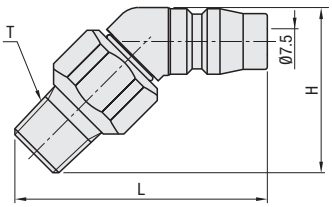
CAD Data

Rotary Type

Usable in combination with Standard Type (P.1299).

-Male Thread- MCPRM





RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia. T	L	H	Mass (g)	MCPRM € Unit Price Qty.1~4	MCPRM Volume Discount Qty.5~
MCPRM	20	R 1/4	52.1	34.1	52		
	30	R 3/8	50.8	32.8	73		

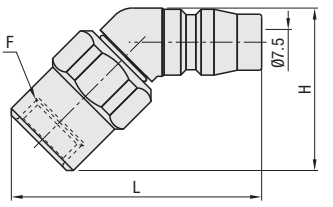
Specification

Applicable Fluid	Air
Operation Temperature Range	-20~80°C
Max. Operating Pressure	1.5MPa
Pressure Resistant	2.0MPa
Seal Material	Nitrile Rubber

Features
-Rotary function allows 360° rotation.

-Female Thread- MCPRF





RoHS

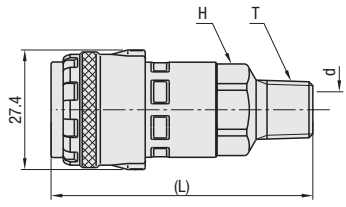
Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia. F	L	H	Mass (g)	MCPRF € Unit Price Qty.1~4	MCPRF Volume Discount Qty.5~
MCPRF	20	G 1/4	51.3	33.3	57		

Locking Type (Sockets)

-Male Thread- MCSTM





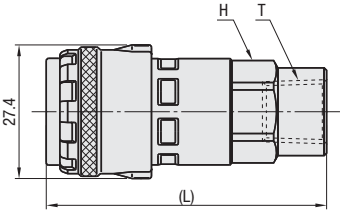
RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia. T	(L)	H	d	Mass (g)	MCSTM € Unit Price Qty.1~4	MCSTM Volume Discount Qty.5~
MCSTM	20	R 1/4	60	19	7.5	89		
	30	R 3/8	60.5	19	10	91		
	40	R 1/2	56	24	13	102		

-Female Thread- MCSTFN





RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia. T	(L)	H	Mass (g)	MCSTFN € Unit Price Qty.1~4	MCSTFN Volume Discount Qty.5~
MCSTFN	20	Rc 1/4	57.5	19	94		
	30	Rc 3/8	55.5	22	103		
	40	Rc 1/2	57.5	29	138		

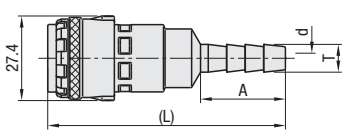
Specification

Applicable Fluid	Air
Operation Temperature Range	-20~60°C
Max. Operating Pressure	1.5MPa
Pressure Resistant	2.0MPa
Seal Material	Nitrile Rubber

Features
-Built-in locking mechanism prevents coupler from falling off after installation.
-Connection by single action makes it easy to handle, improving work efficiency.

-Tube Connecting- MCSTH





RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	(L)	A	T	d	Mass (g)	MCSTH € Unit Price Qty.1~4	MCSTH Volume Discount Qty.5~
MCSTH	20	77	27.5	9	5	90		
	30	79	32	11.3	7.5	92		
	40	79.5	32	15	10	104		

Order Example

Part Number
MCPRM20

Days to Ship

6 Days P. 87

Air Couplers
Branch Type

Price Reduction
Up to 5%

CAD Data

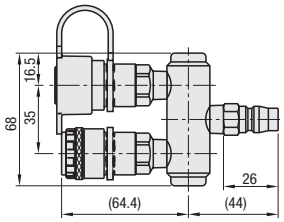
Branch Type (Fixed)

Usable in combination with Standard Type (P.1299).

-2 Positions Fixed- RoHS

MCRN



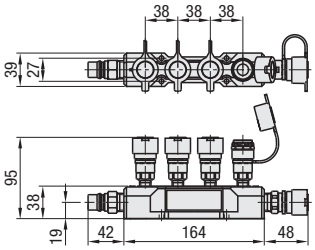


Part Number		€ Unit Price	Volume Discount
Type	No.	Qty.1~4	Qty. 5~
MCRN	4		

-4 Positions Fixed- RoHS

MCRT





Part Number		€ Unit Price	Volume Discount
Type	No.	Qty.1~4	Qty. 5~
MCRT	4		

Specification

Seal Material	Nitrile Rubber (NBR)
Operation Temperature Range	-20~60°C
Applicable Fluid	Air
Max. Operating Pressure MPa (kgf/cm2)	1.5 (15)
Pressure Resistance MPa(kgf/cm2)	2.0 (20)

Features

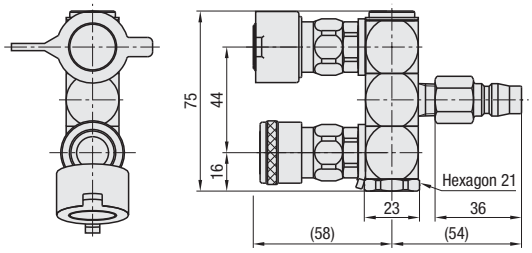
Allows branching from one pipe into multiple pipes.

Branch Type (Swivel)

-2 Positions Swivel- RoHS

MCLTR



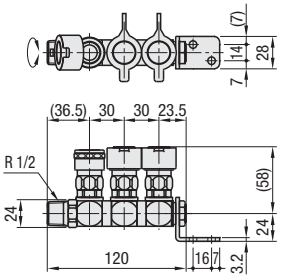


Part Number		€ Unit Price	Volume Discount
Type	No.	Qty.1~4	Qty. 5~
MCLTR	2		

-3 Positions Swivel- RoHS

MCRE





Part Number		€ Unit Price	Volume Discount
Type	No.	Qty.1~4	Qty. 5~
MCRE	3		

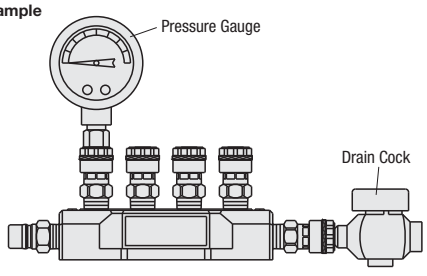
Specification

Seal Material	Nitrile Rubber (NBR)
Operation Temperature Range	-20~60°C
Applicable Fluid	Air
Max. Operating Pressure MPa (kgf/cm2)	1.5 (15)
Pressure Resistance MPa(kgf/cm2)	2.0 (20)

Features

- Allows branching from one pipe into multiple pipes.
- 360° turn port.

Example



Order Example

Part Number
MCRN2
MCLTR2

Days to Ship

6 Days P. 87

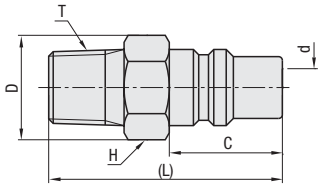
Air Couplers
-Lightweight Type-

CAD Data

Plugs
Not usable in combination with different type.

-Male Thread- KSCPM





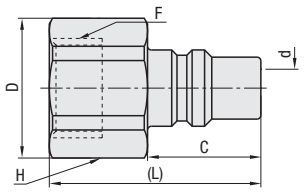
RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia. T	(L)	C	D	Width across Flats H	d	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCPM	10	R 1/8	31	15	-	12	6	12		
	20	R 1/4	34	15	18.5	17	6	22.7		

-Female Thread- KSCPF





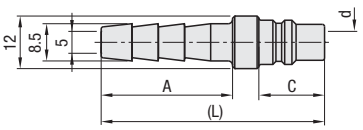
RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia F	(L)	C	D	Width across Flats H	d	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCPF	20	G 1/4	28	15	18.5	17	6	17.7		

-Tube Connecting- KSCPH





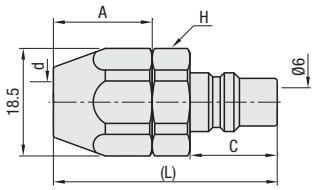
RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	(L)	C	A	d	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCPH	20	51	15	30	6	16		

-Urethane Hose Mounting- KSCPN





RoHS

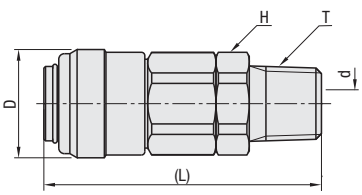
Material: Brass (Nickel Plating)

Part Number Type	No.	(L)	C	A	d	Width across Flats H	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCPN	8	38.5	15	17	3.8	17	27.6		
	10				5.3				

Sockets

-Male Thread- KSCSM





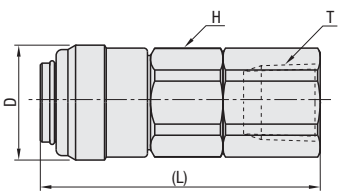
RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia. T	(L)	D	Width across Flats H	d	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCSM	20	R 1/4	50	19.5	17	6	57		

-Female Thread- KSCSF





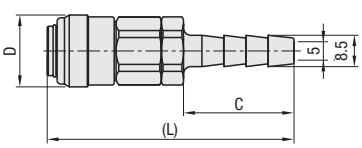
RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	Thread Dia. T	(L)	D	Width across Flats H	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCSF	20	Rc 1/4	47.5	19.5	17	26		

-Tube Connecting- KSCSH





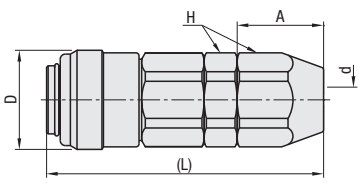
RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	(L)	C	D	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCSH	20	67	30	19.5	56		

-Urethane Hose Mounting- KSCSN





RoHS

Material: Brass (Nickel Plating)

Part Number Type	No.	(L)	A	D	d	Width across Flats H	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
KSCSN	8	54.5	17	19.5	3.8	17	35		
	10				5.3				

Order Example — Part Number: KSCPM10

Days to Ship — 6 Days P.87

Single Passage Opening Closing System (Valve is provided on socket side.)

Specification

Seal Material	Operation Temperature Range	Applicable Fluid
Nitrile Rubber (NBR)	-20°C~80°C	Air

Max. Operating Pressure MPa (kgf/cm²)	Pressure Resistance MPa(kgf/cm²)
1.0 (10)	1.5 (15)

Air Couplers
-Miniature Type-

Price Reduction Up to 15%

CAD Data

Plugs

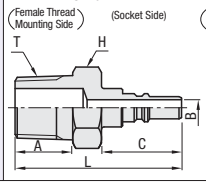
Not usable in combination with different type.

-Male Thread-

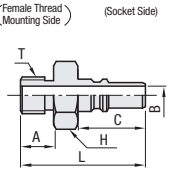


Type	Material	Surface Treatment
NMCPM	Brass	Electroless Nickel Plating
NMCPMS	1.4301/X5CrNi18-10	-

No.10



No.5

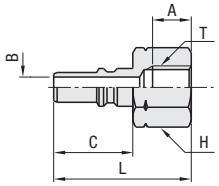


Part Number Type	No.	Thread Dia. T	L	C	A	Width across Flats H	Inner Dia. B	Mass (g)	NMCPM € Unit Price Qty.1~19	NMCPM Volume Discount Qty. 20~	NMCPMS € Unit Price Qty.1~19	NMCPMS Volume Discount Qty. 20~
NMCPM	5	M5	17	9.2	4.5	8	2.4	2				
NMCPMS	10	R 1/8	26	12.5	9	11		8.7				

-Female Thread-



Type	Material	Surface Treatment
NMCPF	Brass	Electroless Nickel Plating
NMCPFS	1.4301/X5CrNi18-10	-

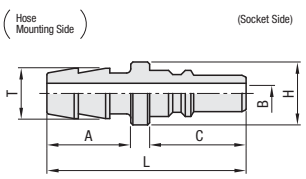


Part Number Type	No.	Thread Dia. T	L	C	A	Width across Flats H	Inner Dia. B	Mass (g)	NMCPF € Unit Price Qty.1~19	NMCPF Volume Discount Qty. 20~	NMCPFS € Unit Price Qty.1~19	NMCPFS Volume Discount Qty. 20~
NMCPF	5	M5	16	9.2	4.5	8	2.9	2.4				
NMCPFS	10	Rc 1/8	21.4	9.2	7	14	2.4	14				

-Tube Connecting-



Type	Material	Surface Treatment
NMCPH	Brass	Electroless Nickel Plating
NMCPHS	1.4301/X5CrNi18-10	-

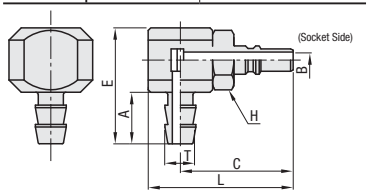


Part Number Type	No.	Tube Inner Dia. (mm)	L	C	A	T	H	Inner Dia. B	Mass (g)	NMCPH € Unit Price Qty.1~19	NMCPH Volume Discount Qty. 20~	NMCPHS € Unit Price Qty.1~19	NMCPHS Volume Discount Qty. 20~
NMCPH	2.5	2.5	18	9.2	7	3.5	6	1.6	1.4				
NMCPHS	4	4	19		8	4.8		2.4	1.5				

-L-Shape Tube Connecting-



Type	Material	Surface Treatment
NMCPHL	Brass	Electroless Nickel Plating
NMCPHLS	1.4301/X5CrNi18-10	-



Part Number Type	No.	Tube Inner Dia. (mm)	L	C	A	E	T	Width across Flats H	Inner Dia. B	Mass (g)	€ Unit Price Qty.1~19	Volume Discount Qty. 20~
NMCPHL	4	4	22.5	17.5	8	18	4.8	8	2.4	9.4		
NMCPHLS												

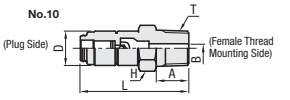
Sockets

-Male Thread-

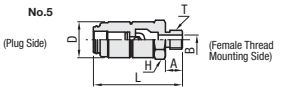


Type	Material	Surface Treatment
NMCSM	Brass	Electroless Nickel Plating
NMCSMS	1.4301/X5CrNi18-10	-

No.10



No.5

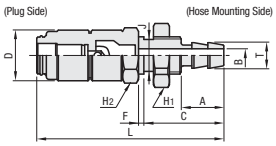


Part Number Type	No.	Thread Dia. T	L	D	A	Width across Flats H	Inner Dia. B	Mass (g)	NMCSM € Unit Price Qty. 1~9	NMCSM Volume discount Qty. 10~	NMCSMS € Unit Price Qty. 1~9	NMCSMS Volume discount Qty. 10~
NMCSM	5	M5	23.6	9.5	4.5	9	2.5	9				
NMCSMS	10	R 1/8	30		9	11	4	13.5				

-Panel Mounting-



Type	Material	Surface Treatment
NMCSHB	Brass	Electroless Nickel Plating
NMCSHBS	1.4301/X5CrNi18-10	-

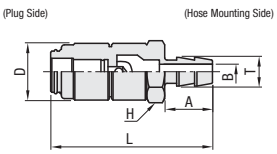


Part Number Type	No.	Tube Inner Dia. (mm)	L	C	A	D	T	Width across Flats H1	Inner Dia. B	F	J	Width across Flats H2	Mass (g)	NMCSHB € Unit Price Qty. 1~9	NMCSHB Volume Discount Qty. 10~	NMCSHBS € Unit Price Qty. 1~9	NMCSHBS Volume Discount Qty. 10~
NMCSHB	4	4	35	15	8	9.5	4.8	11	2.4	1	7	9	11.6				
NMCSHBS																	

-Tube Connecting-



Type	Material	Surface Treatment
NMCSH	Brass	Electroless Nickel Plating
NMCSHS	1.4301/X5CrNi18-10	-

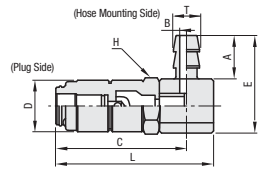


Part Number Type	No.	Tube Inner Dia. (mm)	L	D	A	T	H	Inner Dia. B	Mass (g)	NMCSH € Unit Price Qty. 1~9	NMCSH Volume Discount Qty. 10~	NMCSHS € Unit Price Qty. 1~9	NMCSHS Volume Discount Qty. 10~
NMCSH	2.5	2.5	26	9.5	7	3.5	9	1.6	7.9				
NMCSHS	4	4	27		8	4.8		2.4	8				

-L-Shape Tube Connecting-



Type	Material	Surface Treatment
NMCSHL	Brass	Electroless Nickel Plating
NMCSHLS	1.4301/X5CrNi18-10	-



Part Number Type	No.	Tube Inner Dia. (mm)	L	C	E	A	D	T	Width Across Flats H	Inner Dia. B	Mass (g)	NMCSHL € Unit Price Qty. 1~9	NMCSHL Volume Discount Qty. 10~	NMCSHLS € Unit Price Qty. 1~9	NMCSHLS Volume Discount Qty. 10~
NMCSHL	4	4	29	24	18	8	9.5	4.8	9	2.4	15.2				
NMCSHLS															

Order Example — Part Number: NMCPH4

Days to Ship: 6 Days P87

Single Passage Opening Closing System (Valve is provided on socket side.)

Specification

Seal Material	Operation Temperature Range	Applicable Fluid	Max. Operating Pressure MPa (kgf/cm2)	Pressure Resistance MPa(kgf/cm2)
Nitrile Rubber (NBR)	-20°C~60°C	Air	Brass: 1.0 (10) Stainless Steel: 1.0 (10)	Brass: 1.5 (15) Stainless Steel: 1.5 (15)

Quick Couplings
-No Valve Type-

Price Reduction
Up to 7%

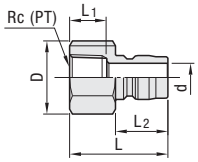
CAD Data

⊗Combination of No Valve Type · Valve Type · High flow Rate Valve Type, High Pressure Valve Type (next page) is not applicable.

■No Valve Type Female Thread Plugs

QNPFC(Brass)
QNPFS(1.4301/X5CrNi18-10)





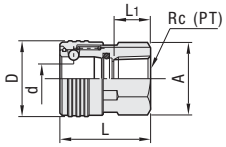
RoHS

Part Number Type	No.	Rc (PT)	D	d	L	L1	L2	€ Unit Price QNPFC	€ Unit Price QNPFS
QNPFC QNPFS	1	1/8	14	4.5	28.5	11	15.5		
	2	1/4	17	6.5	35	14	18		
	3	3/8	21	10	40	15	21.5		
	4	1/2	29	13	45	17	24		
	6	3/4	35	17	51	19	28		
	8	1	41	25	60	21	36.5		

■No Valve Type Female Thread Sockets

QNSFC(Brass)
QNSFS(1.4301/X5CrNi18-10)





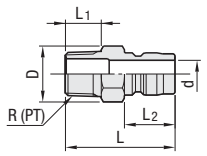
RoHS

Part Number Type	No.	Rc (PT)	D	d	L	L1	A	€ Unit Price QNSFC	€ Unit Price QNSFS
QNSFC QNSFS	1	1/8	18	4.5	27	9.5	14		
	2	1/4	24	8	32	13	19		
	3	3/8	28	12	35	13	23		
	4	1/2	35	16	42	17	29		
	6	3/4	45	20	48.1	19	38		
	8	1	57	26	59.3	21	50		

■No Valve Type Male Thread Plugs

QNPMC(Brass)
QNPMS(1.4301/X5CrNi18-10)





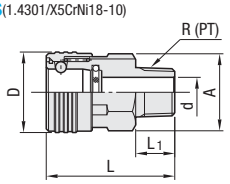
RoHS

Part Number Type	No.	R (PT)	D	d	L	L1	L2	€ Unit Price QNPMC	€ Unit Price QNPMS
QNPMC QNPMS	1	1/8	12	4.5	32	10	15.5		
	2	1/4	14	6.5	38	13	18		
	3	3/8	19	10	43	13	21.5		
	4	1/2	23	13	52	17	24		
	6	3/4	32	17	59	19	28		
	8	1	41	25	73	22	36.5		

■No Valve Type Male Thread Sockets

QNSMC(Brass)
QNSMS(1.4301/X5CrNi18-10)





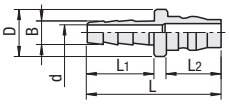
RoHS

Part Number Type	No.	R (PT)	D	d	L	L1	A	€ Unit Price QNSMC	€ Unit Price QNSMS
QNSMC QNSMS	1	1/8	18	4.5	30	9	14		
	2	1/4	24	7	42	13	19		
	3	3/8	28	10	46	13	23		
	4	1/2	35	13	56	17	29		
	6	3/4	45	18	65.1	19	38		
	8	1	57	24	76.3	22	50		

■No Valve Type Hose Connection Plugs

QNPHC(Brass)
QNPHS(1.4301/X5CrNi18-10)





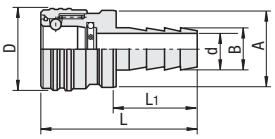
RoHS

Part Number Type	No.	B	D	d	L	L1	L2	€ Unit Price QNPHC	€ Unit Price QNPHS
QNPHC QNPHS	6	6.5	11	3	41	20	15.5		
	9	11	18	7	60	30	21.5		
	12	15	22	10	66	35	24		
	19	21	28	15	79	43	28		
	25	27	40	19	98	50	36.5		

■No Valve Type Hose Connection Sockets

QNSHC(Brass)
QNSHS(1.4301/X5CrNi18-10)





RoHS

Part Number Type	No.	B	D	d	A	L	L1	€ Unit Price QNSHC	€ Unit Price QNSHS
QNSHC QNSHS	6	6.5	18	3	16	40	20		
	9	11	28	7	25	60	30		
	12	15	35	10	32	69	35		
	19	21	45	15	40	84.1	43		
	25	27	57	19	52	95.3	50		

Select the identical Type No. of hose inner diameter.

Select the identical Type No. of hose inner diameter.

Order Example — Part Number QNPFC3

Days to Ship — -QNPMC · QNPMS · QNSMC · QNSMS QNPHC · QNPHS · QNSHC · QNSHS: **6 Days** P.87

-Others: **8 Days** — Express A 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~24	25~29	30~49
Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Specification

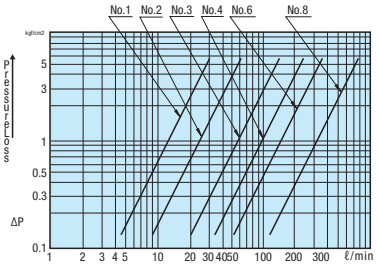
Body Material	Brass	1.4301/X5CrNi18-10
Applicable Fluid	Water - Oil - Air	Water - Oil - Air
Seal Material	Nitrile Rubber	Fluoro Rubber
Operation Temperature Range	-20~80°C	-15~180°C
Max. Operating Pressure	4.9MPa 2.9MPa for No.6- 8	7.4MPa 4.4MPa for No.6- 8
Pressure Resistant	7.5MPa 4.5MPa for No.6- 8	9.4MPa 6.4MPa for No.6- 8

Plug, Socket Compatibility

Female Thread No.	Male Thread No.	Hose Connection No.
1	1	6
2	2	-
3	3	9
4	4	12
6	6	19
8	8	25

(Ex.) Good QNPFC2-QNSMC2
Good QNPMC3-QNSHC9
Poor QNPFC1-QNSFC8 (Because the sizes are different)
Poor QBPFC4-QNSMC4 (Because the types are different)
Poor QBPHT2-QBSHT4 (Because the sizes are different)

No Valve Type Pressure Loss - Flow Rate Properties



[Measurement Condition] Daphne Hydraulic Fluid (Operation Oil) 30°C±5°C

NEW

Quick Couplings

-Valve Type / High flow Rate Valve Type / High Pressure Valve Type-

Price Reduction
Up to 24%

CAD Data

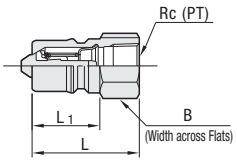
⊗Combination of No Valve Type (previous page) · Valve Type · High Flow Rate Valve Type, High Pressure Valve Type is not applicable.

■Valve Type Plugs



RoHS

Type		M Material
Standard	High Flow Rate	
QBPFC	QBPFCH	Brass
QBPFS	QBPFSH	1.4301

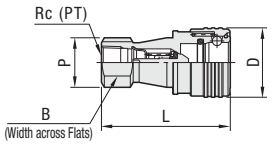


■Valve Type Sockets



RoHS

Type		M Material
Standard	High Flow Rate	
QBSFC	QBSFCH	Brass
QBSFS	QBSFSH	1.4301



Part Number Type	No.	Rc (PT)	L	L1	B	€ Unit Price QBPFC	QBPFS	QBPFCH	QBPFSH
QBPFC QBPFS QBPFCH QBPFSH	1	1/8	29	19	14				
	2	1/4	35.5 (33)	22	17				
	3	3/8	39.9 (37)	25.2	21				
	4	1/2	44	28	29				
	6	3/4	52	36.5	35				

Values in ( ) are for QBPFCH and QBPFSH.

Part Number Type	No.	Rc (PT)	L	D	P	B	€ Unit Price QBSFC	QBSFS	QBSFCH	QBSFSH
QBSFC QBSFS QBSFCH QBSFSH	1	1/8	48	24	18 (15.5)	14				
	2	1/4	58 (55)	28	22 (19)	17				
	3	3/8	65 (62)	35	25 (23.5)	21				
	4	1/2	71.7	45	35 (32)	29				
	6	3/4	88	55	41 (39)	35				

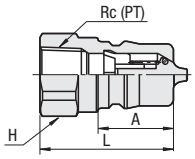
Values in ( ) are for QBSFCH and QBSFSH.

■210 High Pressure Valve Type Plugs



RoHS

QBPHT



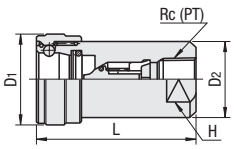
M Material: Special JIS STKM S Surface Treatment: Electroless Nickel Plating

■210 High Pressure Valve Type Sockets



RoHS

QBSHT



M Material: Special JIS STKM S Surface Treatment: Electroless Nickel Plating

Part Number Type	No.	Rc (PT)	L	A	Width across Flats H	€ Unit Price
QBPHT	2	1/4	34.5	17.5	19	
	3	3/8	40	22.5	23	
	4	1/2	44	27.5	29	
	6	3/4	50	27.5	32	

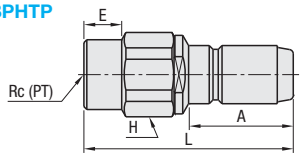
Part Number Type	No.	Rc (PT)	L	D1	D2	Width across Flats H	€ Unit Price
QBSHT	2	1/4	51.6	28	24	19	
	3	3/8	60	34	28.6	23	
	4	1/2	72.2	43	38.5	35	
	6	3/4	72.2	43	38.5	35	

■350 High Pressure Valve Type Plugs



RoHS

QBPHTP



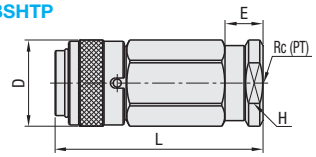
M Material: Special JIS STKM S Surface Treatment: Electroless Nickel Plating

■350 High Pressure Valve Type Sockets



RoHS

QBSHTP



M Material: Special JIS STKM S Surface Treatment: Electroless Nickel Plating

Part Number Type	No.	Rc (PT)	L	A	E	H	€ Unit Price Qty.1~4
QBPHTP	2	1/4	72	36	13	27	
	3	3/8	72	36	13	27	
	4	1/2	82.5	40.5	18	32	
	6	3/4	90	44.5	18	41	

For orders larger than indicated quantity, please request a quotation.

Part Number Type	No.	Rc (PT)	L	D	E	H	€ Unit Price Qty.1~4
QBSHTP	2	1/4	82	34	13	30	
	3	3/8	82	34	13	30	
	4	1/2	93.5	41	16	36	
	6	3/4	105.5	49	18	46	

For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number: QBPFC3

Days to Ship

•Valve Type: 6 Days P.87

•210 and 350 High Pressure Valve Type: 8 Days — Express A — 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

•Except 350 High Pressure Valve Type

■Volume Discount (Round down to one Cent.) P.87

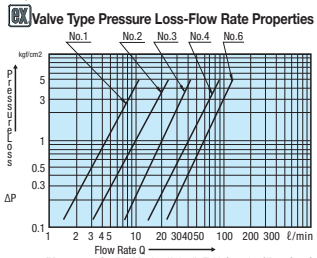
Quantity	1~19	20~24	25~29	30~49
Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

⊗Specification

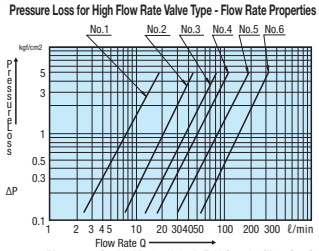
Body Material	Special JIS STKM
Applicable Fluid	Oil
Seal Material	Nitrile Rubber
Operation Temperature Range	-20~80°C
Max. Operating Pressure	20.6MPa (210 Type) 34.3MPa (350 Type)
Pressure Resistant	30.9MPa (210 Type) 51.5MPa (350 Type)

⊗Valve Type Pressure Loss-Flow Rate Properties



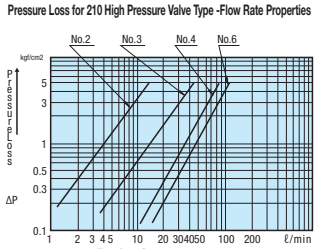
[Measurement Condition] Daphne Hydraulic Fluid (Operation Oil) 35°C±5°C

Pressure Loss for High Flow Rate Valve Type - Flow Rate Properties



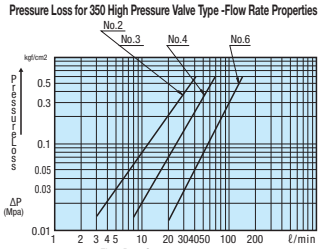
[Measurement Condition] Daphne Hydraulic Fluid (Operation Oil) 35°C±5°C

Pressure Loss for 210 High Pressure Valve Type -Flow Rate Properties



[Measurement Condition] Daphne Hydraulic Fluid (Operation Oil) 35°C±5°C

Pressure Loss for 350 High Pressure Valve Type -Flow Rate Properties



[Measurement Condition] Daphne Hydraulic Fluid (Operation Oil) 35°C±5°C

Air Couplers

-Chemical Resistant Type- 1.4401/X5CrNiMo17-12-2

CAD Data

Not usable in combination with different type.

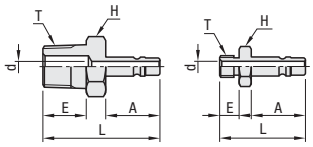
Plugs -Male Thread-

RoHS



MCPMSS

(Tapped Mounting Side) No.10 (Socket Side) (Tapped Mounting Side) No.5 (Socket Side)



M Material: 1.4401/X5CrNiMo17-12-2

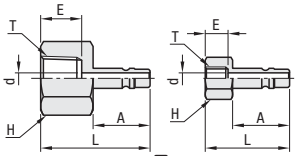
Plugs -Female Thread-

RoHS



MCPFSS

(Threaded Mounting Side) No.10 (Socket Side) (Threaded Mounting Side) No.5 (Socket Side)



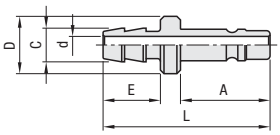
M Material: 1.4401/X5CrNiMo17-12-2

Plugs -Tube Connection-

RoHS



MCPHSS



M Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	No.	Thread Dia. T	L	A	E	Width across Flats H	Inner Dia. d	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MCPMSS	5	M5	19.8	12.5	4.5	7 (8)	2.4	3		
	10	R 1/8	27		10	12		9		

Part Number Type	No.	Thread Dia. T	L	A	E	Width across Flats H	Inner Dia. d	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MCPFSS	5	M5	18.5	12.5	5	8	2.4	3		
	10	Rc 1/8	24		9	14		12		

Part Number Type	No.	Tube Inner Dia. (mm)	L	A	D	C	E	Inner Dia. d	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MCPHSS	2.5	2.5	23.3	12.5	8	2.9	7	1.6	4		
	4	4				4.7	8	2.4	12		

Specification

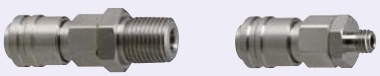
Type	Plugs - Sockets
Applicable Fluid	Air or Water
Operation Temperature Range	-15~180°C
Max. Operating Pressure	0.98MPa
Pressure Resistant	1.47MPa
Seal Material	Fluorine
Structure of Valve	Single Passage Opening Closing Type (Only socket has valve structure)

Features

- The socket has the embedded automatic valve which is excellent in pressure resistance.
- Made of 1.4401/X5CrNiMo17-12-2 and excellent in chemical and corrosion resistance.

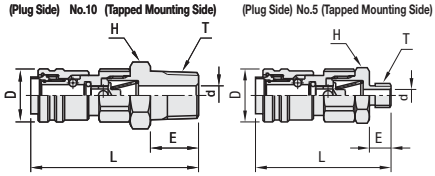
Sockets -Male Thread-

RoHS



MCSMSS

(Plug Side) No.10 (Tapped Mounting Side) (Plug Side) No.5 (Tapped Mounting Side)



M Material: 1.4401/X5CrNiMo17-12-2

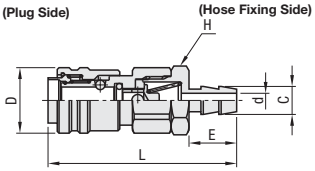
Sockets -Tube Connection-

RoHS



MCSHSS

(Plug Side) (Hose Fixing Side)



M Material: 1.4401/X5CrNiMo17-12-2

Part Number Type	No.	Thread Dia. T	L	D	E	Width across Flats H	Inner Dia. d	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MCSMSS	5	M5	28.2	11	4.5	10	2.5	10		
	10	R 1/8	34.9		10	12	4	16		

Part Number Type	No.	Tube Inner Dia. (mm)	L	D	C	E	H	Inner Dia. d	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
MCSHSS	2.5	2.5	30.7	11	2.9	7	10	1.6	12		
	4	4	31.7		4.7	8		2.4	19		

Order Example

Part Number

MCPMSS5
MCSMSS10

Days to Ship

8 Days | Express A | 2,00 EUR/ piece | P.88

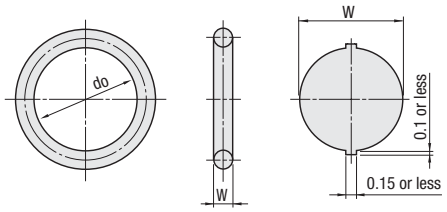
A Express Charge of 5,40 EUR for 3 or more identical pieces.

High Chemical Resistant Products · High Heat Resistant Seals

CAD Data



Type	Grade	Color	Max. Operating Temp.	Material
MPPEM	Chemical Resistant	Black	260°C	Perfluoro Rubber
MPPEJ	Special Heat Resistant	Black	320°C	



Features

(1)Excellent resistance required in extreme conditions such as strong acid, strong alkali, amines, steam and high temperature polar solvent (260 to 320°C).
(2)Low gas precipitation, with low out-gas property and can be used under high vacuum.
(3)Heavy metal and molding agents are not used in the process of production.

P Series (For Mounting · Dynamic)

Part Number Type	No.	Nominal Number	W	Inner Dia. do	Inner Dia. MPPEM · MPPEJ Tolerance	Matching Material d	Matching Material Tolerance	Matching Material D	Matching Material Tolerance	MPPEM € Unit Price Qty. 1~19	MPPEM Volume Discount Qty. 20~	MPPEJ € Unit Price Qty. 1~19	MPPEJ Volume Discount Qty. 20~
	3	3	1.9±0.08	2.8	±0.16	3	0 -0.05	6	+0.05 0				
	4	4		3.8		4		7					
	5	5		4.8	±0.18	5		8					
	6	6		5.8		6		9					
	7	7		6.8	±0.19	7		10					
	8	8		7.8		8		11					
	9	9		8.8	±0.20	9		12					
	10	10		9.8		10		13					
MPPEM (Chemical Resistant) MPPEJ (Special Heat Resistant Grade)	11	11	2.4±0.09	10.8	±0.21	11	0 -0.06	15	+0.06 0				
	12	12		11.8	±0.22	12		16					
	14	14		13.8		14		18					
	15	15		14.8	±0.24	15		19					
	16	16		15.8		16		20					
	18	18		17.8	±0.25	18		22					
	20	20		19.8	±0.26	20		24					
	21	21		20.8	±0.27	21		25					
	22	22		21.8	±0.28	22		26					
	24	24	3.5±0.1	23.7		24	0 -0.08	30	+0.08 0				
	25	25		24.7	±0.30	25		31					
	26	26		25.7	±0.31	26		32					
	28	28		27.7	±0.33	28		34					
	29	29		28.7	±0.34	29		35					
	30	30		29.7		30		36					

Specification

Type		MPPEM Chemical Resistant	MPPEJ Special Heat Resistant
Color		Black	Black
Hardness	(Shore)	75	74
Tensile Strength	(kgf/cm²)	216	161
Elongation	(%)	183	205
Operation Temperature Range	(°C)	260	320
Compression Set	200°C x 70h (%)	21	19
	230°C x 70h (%)	31	26

Order Example — Part Number: MPPEM5

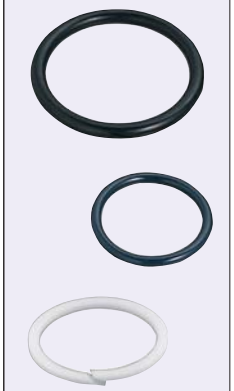
Days to Ship: 6 Days P87

Chemical Resistance Data (MPPEM Chemical Resistant)
[Evaluation] A: ΔV=5% or Less B: 5~20% C: 21~35%

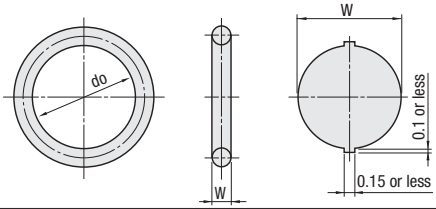
Chemicals	Soaking Temperature (°C)	Soaking Time (Day)	Volume Change (ΔV%)
Sodium Hydroxide (50%)	150	7	A
Ammonia Water (35%)	45	20	A
Ammonia	100	7	A
N-Butylamine	23	7	A
Formic Acid (12%)	100	7	B
Chlorosulfonic Acid	23	7	A
Hydrochloric Acid (37%)	24	28	B
Nitric Acid (65%)	40	30	B
Sulfuric Acid (94%)	70	14	A
Phosphoric Acid (45%)	60	7	A
Hydrogen Sulfide	70	7	A
Hydrogen Fluoride (50%)	80	7	B
MIBK (Methyl isobutyl ketone)	118	7	A
Dimethylformamide	153	7	B
1.2-Dichlorobenzene	180	7	B
Chlorobenzol	100	7	A
R123(CFC)	24	28	C
Steam	121	7	A
Phenol	220	7	A
Ethylene Oxide	23	7	A

*Data above are not guaranteed values but experimental log.
For actual use, confirm the applicability under specific conditions.

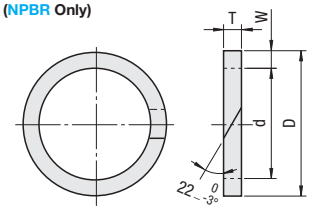
O-Ring
-P Series-



Type	M Material	H Hardness (JIS Hs)	Color	Operation Temperature Range	JIS Symbol	Usage	Features
NPA	Nitrile Rubber	70±5	Black	−30~100°C	Class 1 A	Mineral Oil Resistant	Most representative material with superior oil / abrasion resistance and heat stability.
NPB	Nitrile Rubber	90±5	Black	−25~100°C	Class 1 B		
NPSW	Silicon Rubber	50±5	Milky White	−50~200°C	-	Heat Resistant	Having excellent high and low temperature resistances, this material has the widest range of operating temperatures among synthetic rubbers. It is suitable for food-related applications.
NPS	Silicon Rubber	70±5	Blue	−50~200°C	Class 4 D	Heat Resistant	
NPF	Fluoro Rubber	70±5	Black	−15~200°C	Class 4 D		Best in oil / chemical resistance and heat stability as synthetic rubber. Suitable for a wide range of applications.
NPFH	Fluoro Rubber	90±5	Black	−15~200°C	-	Heat Resistant	
NPEG	Ethylene Propylene Rubber	70±5	Black	−45~130°C	-	For weather resistant items	NPBR
NPBR	Fluorine Resin	-	White	Subject to O-ring	-	High Voltage Use	Used when the pressure resistance of O-ring is insufficient.

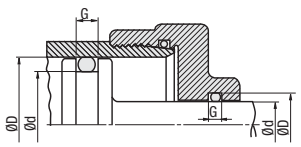


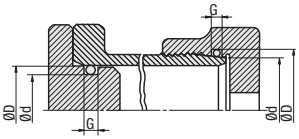
(NPBR Only)



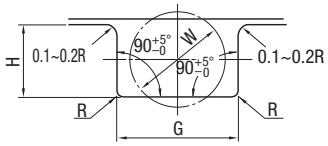
Detailed Fitting Sizes

Type	No.	G Dimension (Tolerance $^{+0.25}_{0}$) No Back-Up Ring	G Dimension Back-Up Ring on One Side	G Dimension Back-Up Rings on Both Sides	H Dimension H±0.05	R Dimension Max. Value
NPA NPB NPSW NPS NPF NPFH NPEG NPBR	3~10	2.5	3.9	5.4	1.4	0.4
	10A~22	3.2	4.4	6.0	1.8	0.4
	22A~50	4.7	6.0	7.8	2.7	0.8
	50A~80	7.5	9.0	11.5	4.6	0.9

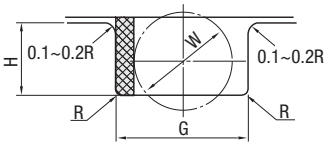




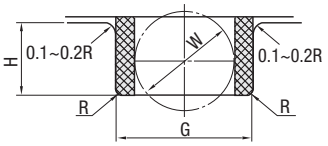
No Back-Up Ring



Back-Up Ring on One Side



Back-Up Rings on Both Sides



JIS B 2407 Back-Up Rings (For the P Series · Bias Cut)

Part Number Type	No.	Nominal No. of Applicable O-Rings	W		d		D		T		€ Unit Price Qty.1~19	Volume Discount Qty. 20~
NPBR (Fluorine Resin, White)	15	P15	2.0	+0.03 -0.05	15	+0.15 0	19	0 -0.15	1.25	±0.1		
	16	P16			16		20					
	18	P18			18		22					
	20	P20			20		24					
	21	P21			21		25					
	22	P22			22		26					
	22A	P22A	3.0		22	+0.20 0	28	0 -0.20				
	24	P24			24		30					
	25	P25			25		31					
	26	P26			26		32					
	28	P28			28		34					
	30	P30			30		36					
	32	P32			32		38					
	34	P34			34		40					
	38	P38			38		44					
	40	P40			40		46					
	42	P42			42		48					
	48	P48			48		54					
	50	P50			50		56					

JIS B 2401 P Series (For Mounting and Dynamic)

Part Number				Inner Diameter				Matching Material				NPA			NPB		NPSW		NPS		NPF			NPFH		NPEG	
Type	No.	JIS Nominal Number	W	do	NPA · NPB Tolerance	NPS · NPSW NPEG Tolerance	NPF · NPFH Tolerance	d	Tolerance	D	Tolerance	€ Unit Price Qty. 1-9	€ Unit Price Qty. 10-199	Volume Discount Qty. 200-	€ Unit Price Qty. 1-199	Volume Discount Qty. 200-	€ Unit Price Qty. 1-199	Volume Discount Qty. 200-	€ Unit Price Qty. 1-199	Volume Discount Qty. 200-	€ Unit Price Qty. 1-9	€ Unit Price Qty. 10-199	Volume Discount Qty. 200-	€ Unit Price Qty. 1-199	Volume Discount Qty. 200-	€ Unit Price Qty. 1-199	Volume Discount Qty. 200-
	3	P3	1.9±0.08	2.8	±0.14	±0.21	±0.16	3	0 -0.05	6	+0.05 0																
	4	P4		3.8				4		7																	
	5	P5		4.8	±0.15	±0.22	±0.18	5		8																	
	6	P6		5.8				6		9																	
	7	P7		6.8	±0.16	±0.24	±0.19	7		10																	
	8	P8		7.8				8		11																	
	9	P9		8.8	±0.17	±0.25	±0.20	9		12																	
	10	P10		9.8				10		13																	
	10A	P10A	2.4±0.09	9.8				10	0 -0.06	14	+0.06 0																
	11	P11		10.8	±0.18	±0.27	±0.21	11		15																	
	11.2	P11.2		11.0				11.2		15.2																	
	12	P12		11.8	±0.19	±0.28	±0.22	12		16																	
	12.5	P12.5		12.3				12.5		16.5																	
	14	P14		13.8				14		18																	
	15	P15		14.8	±0.20	±0.30	±0.24	15		19																	
	16	P16		15.8				16		20																	
	18	P18		17.8	±0.21	±0.31	±0.25	18		22																	
	20	P20		19.8	±0.22	±0.33	±0.26	20		24																	
	21	P21		20.8	±0.23	±0.34	±0.27	21		25																	
	22	P22		21.8	±0.24	±0.36	±0.28	22		26																	
	22A	P22A	3.5±0.1	21.7				22	0 -0.08	28	+0.08 0																
	22.4	P22.4		22.1				22.4		28.4																	
	24	P24		23.7				24		30																	
	25	P25		24.7	±0.25	±0.37	±0.30	25		31																	
	25.5	P25.5		25.2				25.5		31.5																	
	26	P26		25.7	±0.26	±0.39	±0.31	26		32																	
	28	P28		27.7	±0.28	±0.42	±0.33	28		34																	
	29	P29		28.7	±0.29	±0.43	±0.34	29		35																	
	29.5	P29.5		29.2				29.5		35.5																	
	30	P30		29.7				30		36																	
	31	P31		30.7	±0.30	±0.45	±0.36	31		37																	
	31.5	P31.5		31.2	±0.31	±0.46	±0.37	31.5		37.5																	
	32	P32		31.7				32		38																	
	34	P34		33.7	±0.33	±0.49	±0.39	34		40																	
	35	P35		34.7	±0.34	±0.51	±0.40	35		41																	
	35.5	P35.5		35.2				35.5		41.5																	
	36	P36		35.7				36		42																	
	38	P38		37.7	±0.37	±0.55	±0.44	38		44																	
	39	P39		38.7				39		45																	
	40	P40		39.7				40		46																	
	41	P41		40.7	±0.38	±0.57	±0.45	41		47																	
	42	P42		41.7	±0.39	±0.58	±0.48	42		48																	
	44	P44		43.7	±0.41	±0.61	±0.49	44		50																	
	45	P45		44.7				45		51																	
	46	P46		45.7	±0.42	±0.63	±0.50	46		52																	
	48	P48		47.7	±0.44	±0.66	±0.52	48		54																	
	50	P50		49.7	±0.45	±0.67	±0.54	50		56																	
	50A	P50A	5.7±0.13						0 -0.10	60	+0.10 0																
	52	P52		51.6	±0.47	±0.70	±0.56	52		62																	
	53	P53		52.6	±0.48	±0.72	±0.57	53		63																	
	55	P55		54.6	±0.49	±0.73	±0.58	55		65																	
	56	P56		55.6	±0.50	±0.75	±0.60	56		66																	
	58	P58		57.6	±0.52	±0.78	±0.62	58		68																	
	60	P60		59.6	±0.53	±0.79	±0.63	60		70																	
	62	P62		61.6	±0.55	±0.82	±0.66	62		72																	
	63	P63		62.6	±0.56	±0.84	±0.67	63		73																	
	65	P65		64.6	±0.57	±0.85	±0.68	65		75																	
	67	P67		66.6	±0.59	±0.88	±0.70	67		77																	
	70	P70		69.6	±0.61	±0.91	±0.73	70		80																	
	71	P71		70.6	±0.62	±0.93	±0.74	71		81																	
	75	P75		74.6	±0.65	±0.97	±0.78	75		85																	
	80	P80		79.6	±0.69	±1.03	±0.82	80		90																	

NPA (Nitrile Rubber, Black)

NPB (Nitrile Rubber, Black)

NPSW (Silicon Rubber, Milky White)

NPS (Silicon Rubber, Blue)

NPF (Fluoro Rubber, Black)

NPFH (Fluoro Rubber, Black)

NPEG (Ethylene Propylene Rubber, Black)

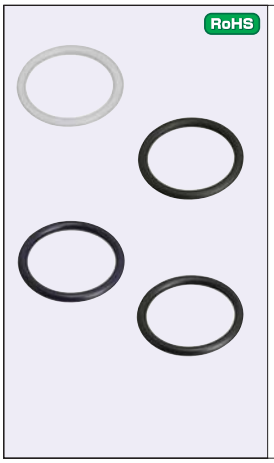
Order Example — Part Number: NPS25.5

Days to Ship: 6 Days

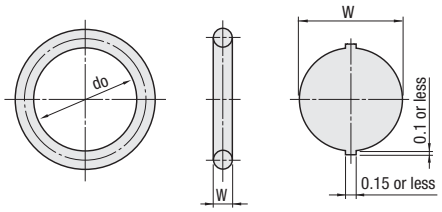
P.87

O-Ring
-S Series-

CAD Data



Type	Material	Hardness (JIS Hs)	Color	Operation Temperature Range	Usage	Features
NSA	Nitrile Rubber	70±5	Black	-30~100°C	Mineral Oil Resistant	Most representative material with superior oil / abrasion resistance and heat stability.
NSB	Nitrile Rubber	90±5	Black	-25~100°C		
NSSW	Silicon Rubber	50±5	Milky White	-50~200°C	Heat Resistant	Having excellent high and low temperature resistances, this material has the widest range of operating temperatures among synthetic rubbers. It is suitable for food-related applications.
NSS	Silicon Rubber	70±5	Blue	-50~200°C	Heat Resistant	
NSF	Fluoro Rubber	70±5	Black	-15~200°C		Best in oil / chemical resistance and heat stability as synthetic rubber. Suitable for a wide range of applications.
NSFH	Fluoro Rubber	90±5	Black	-15~200°C	Heat Resistant	



Type	No.	G Dimension (Tolerance $^{+0.25}_{0}$)			H Dimension H±0.05	R Dimension Max. Value
		No Back-Up Ring	Back-Up Ring on One Side	Back-Up Rings on Both Sides		
NSA · NSB · NSSW NSS · NSF · NSFH	3~22	2.5	-	-	1.0	0.2
	22.4~50	2.7	-	-	1.5	0.4

S Series

Part Number				Inner Diameter				Matching Material				NSA		NSB		NSSW		NSS		NSF		NSFH	
Type	No.	Nominal Number	W	do	NSA · NSB Tolerance	NSSW · NSS Tolerance	NSF · NSFH Tolerance	d	Tolerance	D	Tolerance	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
												Qty. 1~49	Qty. 50~	Qty. 1~49	Qty. 50~	Qty. 1~49	Qty. 50~	Qty. 1~49	Qty. 50~	Qty. 1~49	Qty. 50~	Qty. 1~49	Qty. 50~
	3	3	1.5±0.1	2.5	±0.15	±0.45	±0.30	3	0 -0.05	5	+0.05 0												
	4	4		3.5				4		6													
	5	5		4.5				5		7													
	6	6		5.5				6		8													
	7	7		6.5				7		9													
	8	8		7.5				8		10													
	9	9		8.5				9		11													
	10	10		9.5				10		12													
NSA (Nitrile Rubber, Black)	11.2	11.2		10.7				11.2		13.2													
	12	12		11.5				12		14													
	12.5	12.5		12.0				12.5		14.5													
	14	14		13.5				14		16													
NSB (Nitrile Rubber, Black)	15	15		14.5				15		17													
	16	16		15.5				16		18													
	18	18		17.5				18		20													
	20	20		19.5				20		22													
NSSW (Silicon Rubber, Milky White)	22	22		21.5				22		24													
	22.4	22.4	2.0±0.1	21.9				22.4		25.4													
	24	24		23.5				24		27													
	25	25		24.5				25		28													
NSS (Silicon Rubber, Blue)	26	26		25.5				26		29													
	28	28		27.5				28		31													
	29	29		28.5				29		32													
	30	30		29.5				30		33													
NSF (Fluoro Rubber, Black)	31.5	31.5		31.0				31.5		34.5													
	32	32		31.5				32		35													
	34	34		33.5				34		37													
	35	35		34.5				35		38													
NSFH (Fluoro Rubber, Black)	35.5	35.5		35.0				35.5		38.5													
	36	36		35.5				36		39													
	38	38		37.5				38		41													
	39	39		38.5				39		42													
	40	40		39.5				40		43													
	42	42		41.5	±0.25	±0.75	±0.50	42		45													
	44	44		43.5				44		47													
	45	45		44.5				45		48													
	46	46		45.5				46		49													
	48	48		47.5				48		51													
	50	50		49.5				50		53													

Order Example

Part Number
NSA25

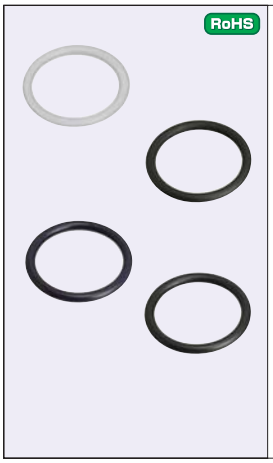
Days to Ship

6 Days

P.87

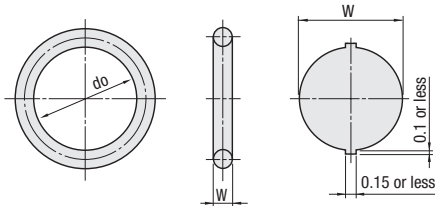
O-Ring
-G Series-

CAD Data

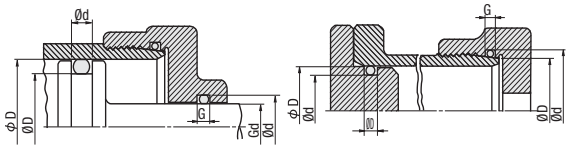


RoHS

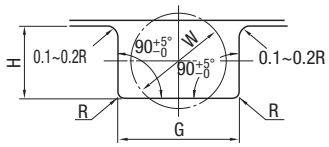
Type	Material	(JIS Hs)	Color	Operation Temperature Range	JIS Symbol	Usage	Features
NGA	Nitrile Rubber	70±5	Black	-30~100°C	Class 1 A	Mineral Oil Resistant	Most representative material with superior oil / abrasion resistance and heat stability.
NGB	Nitrile Rubber	90±5	Black	-25~100°C	Class 1 B	Heat Resistant	It has almost equivalent characteristics with the class 1A besides higher hardness and better pressure resistance.
NGSW	Silicon Rubber	50±5	Milky White	-50~200°C	-		Having excellent high and low temperature resistances, this material has the widest range of operating temperatures among synthetic rubbers. It is suitable for food-related applications.
NGS	Silicon Rubber	70±5	Blue	-50~200°C	Class 4 D	Heat Resistant	
NGF	Fluoro Rubber	70±5	Black	-15~200°C	Class 4 D	Heat Resistant	Best in oil / chemical resistance and heat stability as synthetic rubber. Suitable for a wide range of applications.



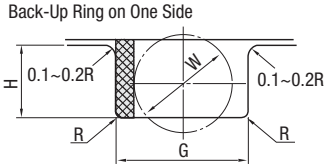
Type	No.	G Dimension (Tolerance $^{+0.25}_{0}$) No Back-Up Ring	G Dimension Back-Up Ring on One Side	G Dimension Back-Up Rings on Both Sides	H Dimension H±0.05	R Dimension Max. Value
NGA · NGB · NGSW NGS · NGF	25~170	4.1	5.6	7.3	2.4	0.7



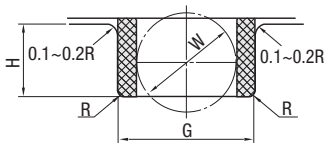
No Back-Up Ring



Back-Up Ring on One Side



Back-Up Rings on Both Sides



■JIS B 2401 G Series (For Fixation)

Part Number Type	No.	JIS Nominal Number	W	Inner Diameter do	Inner Diameter NGA · NGB Tolerance	Inner Diameter NGSW · NGS Tolerance	Inner Diameter NGF Tolerance	Matching Material d	Matching Material Tolerance	Matching Material D	Matching Material Tolerance	NGA € Unit Price Qty. 1~49	NGA Volume Discount Qty. 50~	NGB € Unit Price Qty. 1~49	NGB Volume Discount Qty. 50~	NGSW € Unit Price Qty. 1~49	NGSW Volume Discount Qty. 50~	NGS € Unit Price Qty. 1~49	NGS Volume Discount Qty. 50~	NGF € Unit Price Qty. 1~49	NGF Volume Discount Qty. 50~
NGA (Nitrile Rubber, Black)	25	G25	3.1±0.1	24.4	±0.25	±0.38	±0.30	25	0 -0.10	30	+0.10 0										
	30	G30		29.4	±0.29	±0.44	±0.35	30		35											
	35	G35		34.4	±0.33	±0.50	±0.40	35		40											
NGB (Nitrile Rubber, Black)	40	G40		39.4	±0.37	±0.56	±0.45	40		45											
	45	G45		44.4	±0.41	±0.62	±0.50	45		50											
	50	G50		49.4	±0.45	±0.68	±0.54	50		55											
	55	G55		54.4	±0.49	±0.74	±0.59	55		60											
NGSW (Silicon Rubber, Milky White)	60	G60		59.4	±0.53	±0.80	±0.64	60		65											
	65	G65		64.4	±0.57	±0.86	±0.69	65		70											
	70	G70		69.4	±0.61	±0.92	±0.74	70		75											
NGS (Silicon Rubber, Blue)	75	G75		74.4	±0.65	±0.98	±0.78	75		80											
	80	G80		79.4	±0.69	±1.04	±0.83	80		85											
	105	G105		104.4	±0.87	-	±0.87	105		110											
NGF (Fluoro Rubber, Black)	120	G120		119.4	±0.98		±0.98	120		125											
	145	G145		144.4	±1.16		±1.16	145		150											
	170	G170	5.7±0.1	169.3	±1.33		±1.33	170		180											

Order Example

Part Number
NGA25

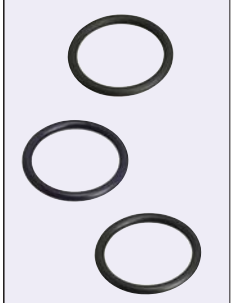
Days to Ship

- Others
6 Days P87

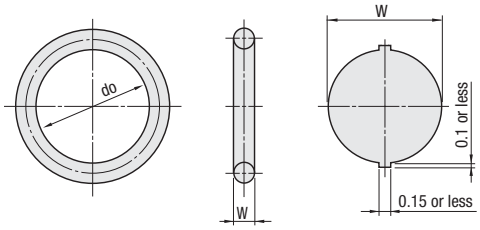
No.105~170
8 Days

O-Ring
-V Series · AS Series-

CAD Data



Type	Material	Hardness (JIS Hs)	Color	Operation Temperature Range	JIS Symbol	Usage
NVA	Nitrile Rubber	70±5	Black	-30~100°C	Class 1 A	Mineral Oil Resistant
NVF	Fluoro Rubber	70±5	Black	-15~200°C	Class 4 D	Heat Resistant
NASA	Nitrile Rubber	70±5	Black	-30~100°C	-	Mineral Oil Resistant
NASF	Fluoro Rubber	70±5	Black	-15~200°C	-	Heat Resistant



■JIS B 2401 V Series

Part Number		JIS Nominal Number	W	Inner Dia.			NVA		NVF	
Type	No.			do	NVA Tolerance	NVF Tolerance	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
							Qty. 10~49	Qty. 50~	Qty. 1~49	Qty. 50~
NVA (Nitrile Rubber, Black)	15	V15	4.0±0.1	14.5	±0.20	±0.24				
	24	V24		23.5	±0.24	±0.29				
	34	V34		33.5	±0.33	±0.40				
	40	V40		39.5	±0.37	±0.45				
	55	V55		54.5	±0.49	±0.59				
	70	V70		69.0	±0.61	±0.74				
NVF (Fluoro Rubber, Black)	85	V85		84.0	±0.72	±0.87				
	100	V100		99.0	±0.83	±1.00				
	120	V120		119.0	±0.97	±1.17				
	150	V150		148.5	±1.18	±1.42				
	175	V175		173.0	±1.36	±1.63				

■AS568 AS Series

Part Number		W	Inner Dia.		NASA		NASF	
Type	No.		do	Tolerance	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
					Qty. 1~49	Qty. 50~	Qty. 1~49	Qty. 50~
NASA (Nitrile Rubber, Black) NASF (Fluoro Rubber, Black)	001	1.02±0.07	0.74	±0.10				
	002	1.27±0.07	1.07					
	003	1.52±0.07	1.42					
	004	1.78±0.07	1.78	±0.12				
	005		2.57					
	006		2.90					
	007		3.68					
	008		4.47					
	009		5.28					
	010		6.07					
	011		7.65					
	012		9.25					
	013		10.82					
	014		12.42					
	015		14.00					
	016		15.60					
	017		17.17					
	018		18.77					
	019		20.35	±0.15				
	020		21.95					
	021		23.52					
	022		25.12					
	023		26.70					
	024		28.30					
	025		29.87					
	026		31.47					
	027		33.05					
	028		34.65					
	029		37.82	±0.25				
	030		41.00					

Order Example | Part Number: NASA001

Days to Ship: 6 Days P.87

Large Diameter O-Rings
-Configurable Type-

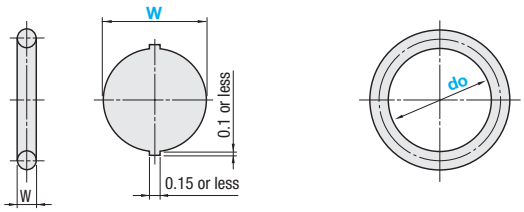
CAD Data

■Large Diameter O-Rings RoHS



Type	Material	Hardness (JIS Hs)	Color	Operation Temperature Range	JIS Symbol
DFA	Nitrile Rubber	70±5	Black	-30~100°C	Class 1 A
DFB	Nitrile Rubber	90±5	Black	-25~100°C	Class 1 B
DFF	Fluoro Rubber	70±5	Black	-15~200°C	Class 4 D

■Features
(1)Wire diameter and inner diameter are selectable.
(2)Able to keep high level of air tightness because of vulcanization molding.
(3) No breaks from joint parts.



Part Number Type	Wire Dia. W	Wire Dia. Tolerance	Inner Dia. do 1mm Increment
DFA (Nitrile Rubber 70 - Black)	3.1	±0.13	300~2000
	3.53		
	4		
	5.33	±0.15	
	5.7		
	6		
	7		
DFB (Nitrile Rubber 90 - Black)	8	±0.20	
	8.4		
	9	±0.25	
	10	±0.30	
DFF (Fluoro Rubber - Black)	11		
	12		
	13	±0.39	
	15		
	16	±0.48	
	18		
	20		

Inner Dia.	Inner Dia. Tolerance
300~400	±2.82
401~500	±3.30
501~600	±4.00
601~700	±4.70
701~800	±5.30
801~900	±6.00
901~1000	±6.70
1001~1100	±7.50
1101~1200	
1201~1300	
1301~1400	
1401~1500	
1501~1600	±8.80
1601~1700	±9.40
1701~1800	+10.0~-10.4
1801~1900	+10.0~-11.2
1901~2000	+10.0~-11.7

Wire and inner diameter tolerances of DFF are 1.5 times larger than those in the above table.

The price of this product is the price shown in the table multiplied by each material coefficient. (Round down to ten Cent.)
(Ex.) Part Number DFB10 - do 550 (Price in the table) 38,60 X (Material Coefficient) 1.3 = (Standard Type) 50,18 EUR Unit price 50,10 EUR

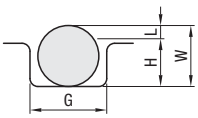
Type	Inner Dia. do	€ Unit Price Wire Dia. W 3.1~4	5.33~7	8 or 8.4	9	10~12	13 or 15	16~20
Type Material Coefficient	300~400							
	401~500							
	501~600							
	601~700							
	701~800							
	801~900							
DFA (x1.0) (Nitrile Rubber 70 - Black)	901~1000							
	1001~1100							
	1101~1200							
	1201~1300							
DFB (x1.3) (Nitrile Rubber 90 - Black)	1301~1400							
	1401~1500							
	1501~1600							
	1601~1700							
	1701~1800							
	1801~1900							
	1901~2000							

Type	Inner Dia. do	€ Unit Price Wire Dia. W 3.1~4	5.33~7	8 or 8.4	9	10~12	13 or 15	16~20
DFF (Fluoro Rubber - Black)	300~400							
	401~500							
	501~600							
	601~700							
	701~800							
	801~900							
	901~1000							
	1001~1100							
	1101~1200							
	1201~1300							
	1301~1400							
	1401~1500							
	1501~1600							
	1601~1700							
	1701~1800							
	1801~1900							
	1901~2000							

■Material Specification Table (JISB2401)

Type	DFA	DFB	DFF
JIS Symbol	Class 1 A	Class 1 B	Class 4 D
Tensile Strength (MPa)	9.8	14	9.8
Elongation (%)	250	100	200
Tensile Stress (MPa)	2.7	-	1.9
Compression Set (%)	40	40	40

■Design Standards of O-Rings and Groove Dimension
(1)In case of internal or external pressure seal on flat surfaces, set crush rate at 8 to 30% as a guide.



Setting Crush Ratio (Operating Range 8~30%)

$$E = \frac{L \times 100}{W}$$

E(%) : Crush Rate
d (mm) : Crush Width (=W-H)
W(mm) : O-Ring Wire Dia.
H (mm) : Groove Depth

(2)Design Standards of Internal and External Circumstances (Reference)
Inner Diameter Expansion Rate (%) 0 ~ 5%
Outer Tensil Rate (%) 0~3%

Order Example: Part Number DFA4 - do 850

Days to Ship: 13 Days

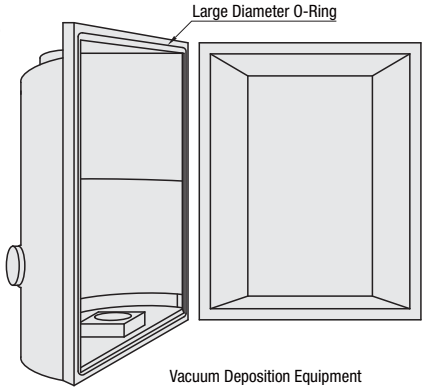
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Example



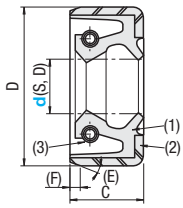
Vacuum Deposition Equipment

Oil · Oil Free Seals

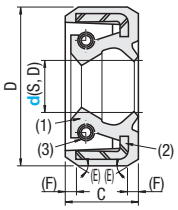


Type	Material (1) Oil Seal; Rubber Hardness	(2) Metal Ring	(3) Spring	Usage
MUDN	Nitrile Rubber (NBR); Hs70	1.0330/DC01	JIS-SWB	Ø6 Stick for Rotary Motion
MUEN	Nitrile Rubber (NBR); Hs70	1.0330/DC01	JIS-SWB	Ø6 Stick for Rotary Motion

MUDN
(Outer Metal Type)



MUEN
(Outer Rubber Type)



JIS B2402 (Oil Seal)

Part Number Type	d	D		C		(E)	(F)	€ Unit Price
MUDN	10	20	+0.09 +0.04	7	±0.3	30°	1	
	12	25		7		20°	1.5	
	15	25		7		30°	1	
	20	32	+0.11 +0.05	8		30°	1	
	25	38		8		20°	1	
	30	42		8		30°	1	
	35	50		8		30°	1	
	40	62	+0.14 +0.06	12	±0.4	30°	1	
	45	62		9	±0.3	30°	1	
	50	65		9		20°	1	

Part Number Type	d	D		C		(E)	(F)	€ Unit Price
MUEN	10	20	+0.30 +0.10	7	±0.3	30°	1.0	
	12	25		7		20°		
	15	25		7		30°		
	17	30		7		30°		
	20	32	+0.35 +0.10	8		30°		
	25	38		8		20°		
	30	42		8		30°		
	35	50		8		30°		
	40	62		8		30°		
	45	62		9		30°		
	50	65		9		20°		

Order Example

Part Number
MUEN10

Days to Ship

8 Days

Express A | 2,00 EUR/piece P. 88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P. 87

Quantity	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Features
Oil seal for cases with seal subject substance on one side and small amounts of dust on the other.

Usage
Seals for oil hydraulic with dust

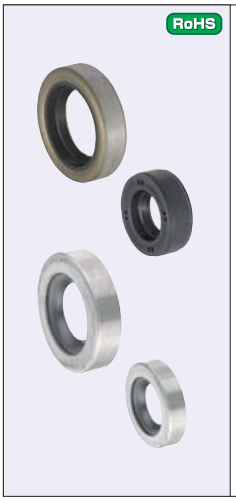
Conditions of Oil Seal Use

Operation Temperature Range	–25~120°C
Operating Pressure	0.03MPa or less
Wind Velocity	10m/sec. or less
Shaft Tolerance	h8 (or g6)
Shaft Coarseness	3S or less
Sealed Substance	Oil - Grease

*Shafts with tolerance g6 on 1-P.107 to 1-P.182 are available.
*The operating temperature range is heat resistant temperature of rubber material.
*The oil seal, when in use, withstands heat 20 to 30°C below the specified heat-resistance level at most.

Price Reduction
Up to 18%

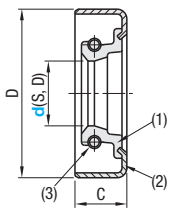
CAD Data



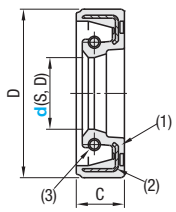
Type	Material (1) Oil Seal; Rubber Hardness	(2) Metal Ring	(3) Spring	Usage
MUSB	Nitrile Rubber (NBR); Hs70	1.0330/DC01	JIS SWB	Ø6 Stick for Rotary Motion
MUSC	Nitrile Rubber (NBR); Hs70	1.0330/DC01	JIS SWB	Ø6 Stick for Rotary Motion

Type	Material (1) Resin Part	(2) Metal Part	Usage
MFHN	Polytetrafluoroethylene (PTFE)	1.4301/ X5CrNi18-10	Ø6 Stick for Rotary Motion

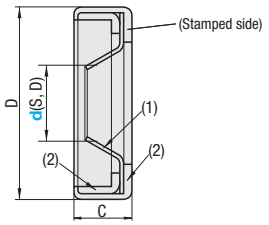
MUSB
(Outer Metal Type)



MUSC
(Outer Rubber Type)



MFHN



Part Number Type	d	D		C		€ Unit Price
MUSB	20	32	+0.11 +0.05	8	±0.3	
	25	38		7		
	30	40		7		
	35	50		8		

Part Number Type	d	D		C		€ Unit Price
MUSC	10	20	+0.09 +0.04	7	±0.3	
	12	22		7		
	15	35		7		
	20	35	+0.11 +0.05	8		
	25	40		8		
	30	42		8		

Part Number Type	d	D		C		€ Unit Price
MFHN	10	25	+0.09 +0.04	7.0	±0.3	
	12					
	15	30				
	20	40	+0.11 +0.05	11.0	±0.4	
	25	45				
	30	50				
	35	55	+0.14 +0.06			
	40	62				
	50	72		12.0		

Features
Oil seal for cases with seal subject substance on one side and no dust on the other.

Usage
Seals for oil hydraulic with dust

Order Example

Part Number
MUSC30
MFHN25

Days to Ship

-MUSB / MUSC
10 Days
-MFHN
8 Days

Express A | 2,00 EUR/piece | P. 88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P. 87

Quantity	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Conditions of Oil Seal Use

Operation Temperature Range	–25~120°C
Operating Pressure	0.03MPa or less
Wind Velocity	10m/sec. or less
Shaft Tolerance	h8 (or g6)
Shaft Coarseness	3S or less
Sealed Substance	Oil - Grease

*Shafts with tolerance g6 on 1-P.107 to 1-P.182 are available.
*The operating temperature range is heat resistant temperature of rubber material.
*The oil seal, when in use, withstands heat 20 to 30°C below the specified heat-resistance level at most.

Conditions of Use for Oil Free Seal

Operation Temperature Range	–60~200°C
Operating Pressure	0.03MPa or less
Wind Velocity	30m/sec. or less
Shaft Tolerance	h7 (or g6)
Shaft Coarseness	Ra: 0.2~0.45μmRz: 0.8~1.8μm
Sealed Substance	High Temperature Vapor, Water, Chemicals, Oil

*Shafts with tolerance g6 on 1-P.107 to 1-P.182 are available.
*The operating temperature range is heat resistant temperature of resin material.
*The oil seal, when in use, withstands heat 20 to 30°C below the specified heat-resistance level at most.

Seal Plugs / Seal Washers

-Bolt Head - Fixed Type-

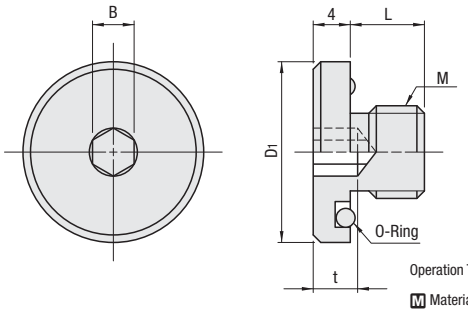
Part Number & Spec.Change Printed in Purple

■Seal Plugs

RoHS



FSPS



Operation Temperature Range –40~200°C

M Material: Body: 1.4301/X5CrNi18-10
O-Ring: Fluoro Rubber (H Hardness: Shore A75)
(JIS B2401 4 Type D)

Part Number Type	No.	M (Fine)	L	D_1	B	t	O-Rings No.	Recommended Tightening Torque (N·m)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Rate Qty. 10~
FSPS	8	M 8x1.0	7	16	5	3.5	P10	10.9	4		
	10	M10x1.0	8	19.5	5	4	P12.5	13.7	7		
	12	M12x1.5	12	21	6	5	P14	19.2	14		
	14	M14x1.5	12	23	6	5	P16	27.4	19		
	16	M16x1.5	12	25	8	6	P18	44.5	25		

Order Example — Part Number: FSPS8

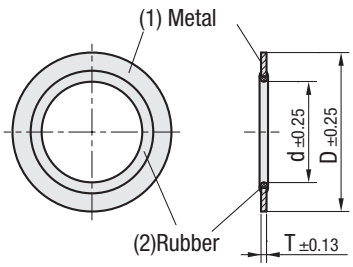
Days to Ship: 6 Days P. 87

■Bolt Head, Fixed Type

RoHS



GSW
GSWF
SGSW
SGSWF



Type	(1) Retainer M Material	(1) Retainer S Surface Treatment	(2) Rubber M Material	(2) Rubber H Hardness	Operation Temperature Range	Max. Allowable Pressure
GSW	1.0330/DC01	Chromate	Nitrile Rubber (NBR)	Shore A65	-30~100°C	30 MPa (5MPa ···› No.3, 4, 5)
GSWF			Fluoro Rubber (FKM)	Shore A70	-10~200°C	
SGSW	1.4301/X5CrNi18-10	-	Nitrile Rubber (NBR)	Shore A65	-30~100°C	
SGSWF			Fluoro Rubber (FKM)	Shore A70	-10~200°C	

Part Number Type	No.	D	T	d	Tightening Torque N·m MIN.	Tightening Torque N·m MAX.	Applicable Bolts	Size of Application Part Hole Inner Dia. A MAX.	Size of Application Part Tightening Face Outer Dia. B MIN.	GSW € Unit Price Qty. 1~49	GSW Volume Discount Qty. 50~	GSWF € Unit Price Qty. 1~49	GSWF Volume Discount Qty. 50~	SGSW € Unit Price Qty. 1~49	SGSW Volume Discount Qty. 50~	SGSWF € Unit Price Qty. 1~49	SGSWF Volume Discount Qty. 50~
GSW (Nitrile Rubber) GSWF (Fluoro Rubber) SGSW (Stainless Steel / Nitrile Rubber) SGSWF (Stainless Steel / Fluoro Rubber)	3	7.8	1.0	2.85	0.7	1.2	M3	3.3	5.4								
	4	10.2	1.3	3.85	1	2.2	M4	4.4	7								
	5	12.5		4.85	2.2	3.8	M5	5.3	8								
	6	14		5.85	3	8.5	M6	6.5	10								
	8	17.5		7.8	4.5	20	M8	8.7	13								
	10	20		9.8	6	25	M10	10.8	15								
	12	24		11.8	8	56	M12	13.7	17.5								
	16	30.3		15.8	10	125	M16	17.5	22								
	20	32.7		19.8	40	135	M20	21.5	26								
	24	37.6		23.8	60	190	M24	25	30								

Order Example — Part Number: GSW8

Days to Ship: 6 Days P. 87

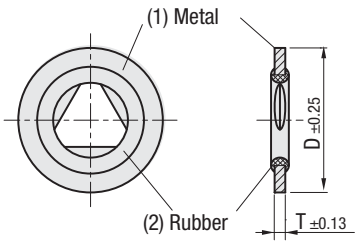
Part Number & Spec.Change Printed in Purple

CAD Data

■Thread Part · Fixed Type RoHS



GSWM
GSWMF
SGSWMF



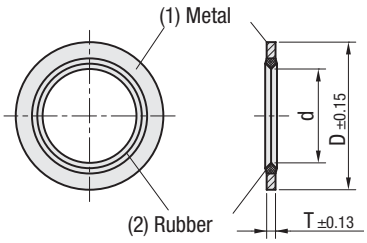
Type	(1) Retainer		(2) Rubber		Operation Temperature Range	Max. Allowable Pressure
	M Material	S Surface Treatment	M Material	H Hardness		
GSWM	1.0330/DC01	Chromate	Nitrile Rubber (NBR)	Shore A65	-30~100°C	30MPa (5MPa ⋯› No.3, 4, 5)
GSWMF			Fluoro Rubber (FKM)	Shore A70	-10~200°C	
SGSWMF	1.4301/ X5CrNi18-10	-	Fluoro Rubber (FKM)	Shore A70	-10~200°C	

Part Number Type	No.	D	T	Tightening Torque N·m MIN.	Tightening Torque N·m MAX.	Applicable Screws Nominal	Pitch Coarse	Pitch Fine	Size of Application Part Hole Inner Dia. A MAX.	Size of Application Part Tightening Face Outer Dia. B MIN.	Size of Application Part Chamfering C MAX.	GSWM € Unit Price Qty. 1~49	GSWM Volume Discount price Qty. 50~	GSWMF € Unit Price Qty. 1~49	GSWMF Volume Discount price Qty. 50~	SGSWMF € Unit Price Qty. 1~49	SGSWMF Volume Discount price Qty. 50~
GSWM (Nitrile Rubber) GSWMF (Fluoro Rubber) GFSWMF (Stainless Steel / Fluoro Rubber)	3	7.8	1.0	0.7	1.2	M3	0.5	0.35	3.3	5.4	0.2						
	4	10.2	1.3	1	2.2	M4	0.7	0.5	4.4	7	0.2						
	5	12.5		2.2	3.8	M5	0.8	0.5	5.3	8	0.2						
	6	14		3	8.5	M6	1	0.75	6.5	10	0.2						
	8	17.5		4.5	20	M8	1.25	1	8.7	13	0.4						
	10	20.3	1.5	6	25	M10	1.5	1.25	10.8	15	0.4						
	12	24.3	2	8	56	M12	1.75	1.5	13.7	17.5	0.4						
	16	30.3		10	125	M16	2	1.5	17.5	23	0.8						
	20	36.5	3	40	135	M20	2.5	2	21.5	28	0.8						
	24	42.8		60	190	M24	3	2	25	34	0.8						

■Hexagon Socket Head Cap Screws, Fixed Type RoHS



GSWC
GSWCF



Type	(1) Retainer M Material	(2) Rubber M Material	(2) Rubber H Hardness	Operation Temperature Range	Max. Allowable Pressure
GSWC	1.4319/X3CrNiN17-8	Nitrile Rubber (NBR)	Shore A80	-30~100°C	30MPa
GSWCF		Fluoro Rubber (FKM)	Shore A75	-10~200°C	

Part Number Type	No.	D	T	d	Tightening Torque N·m MIN.	Tightening Torque N·m MAX.	Applicable Bolts	Size of Application Part Hole Inner Dia. A MAX.	Size of Application Part Counterbore Dia. Z MIN.	GSWC € Unit Price Qty. 1~49	GSWC Volume Discount Rate 50~	GSWCF € Unit Price Qty. 1~49	GSWCF Volume Discount Rate 50~
GSWC (Stainless Steel / Nitrile Rubber) GSWCF (Stainless Steel / Fluoro Rubber)	3	6	0.7	2.9	0.7	1.4	M3	3.3	6.6				
	4	7.5		3.9	1.1	3.1	M 4	4.2	8.2				
	5	9		4.9	2.2	6.5	M 5	5.2	10				
	6	10.5	1	5.9	3	15	M 6	6.2	11.5				
	8	13.5		7.9	4.5	37	M 8	8.2	14.5				
	10	17		9.9	6	73	M10	10	18				
	12	19	1.5	11.9	8	115	M12	12.5	21				
	16	25		15.9	10	290	M16	16.5	27				

Order Example Part Number GSWC12

Days to Ship 6 Days P. 87

■Applicable Fluids

Rubber Material	
Nitrile Rubber (NBR)	Fluoro Rubber (FKM)
Industrial Hydraulic Oil, Turbine Oil, Gear Oil, Spindle Oil, Machine Oil, Gasoline, B or C Heavy Oil, Insulating Oil, Water, Water and Glycol-Type Hydraulic Oil, Air, Low Vacuum	Steam, Chemicals Skydrol, Ketone, Ether, Ester, Organic Acids, Amino Compounds and Other Fluids

Please use air under 0.98MPa.

Vacuum Generators / Vacuum Pressure Sensors

NEW

Price Reduction
Up to 22%

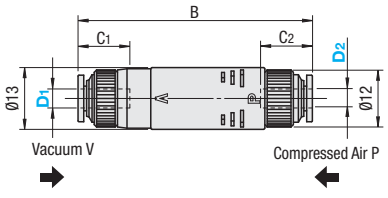
CAD Data

Vacuum Generators -Union Straight-



RoHS

VUHK



For nozzle diameter, see the schematic drawing.

Part Number Type	D1	D2	Nozzle Dia. Nominal	Nozzle Dia. (mm)	B	C1	C2	Ultimate Vacuum (-kPa)	Suction Flow Rate (ℓ/min (ANR))	Flow Consumption (ℓ/min (ANR))	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VUHK	4	4	5	0.5	49.3	11	11	90	7	11.5	18.5		
			7	0.7	56.1			92	12.5	23	20		
	6	6	5	0.5	51.2	11.7	11.7	90	7	11.5	17.5		
			7	0.7	57.7			92	12.5	23	18.5		

Order Example: Part Number - D2 - Nozzle Dia. Nominal
VUHK4 - 4 - 7
VUB6

Days to Ship: 6 Days P.87

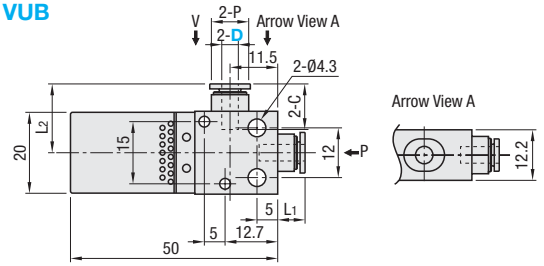
Larger nozzle diameter provides more suction flow and shortens time required to vacuum inner volume from the generator to work. In this case, however, air consumption is larger.

Vacuum Generators -Square Union-



RoHS

VUB

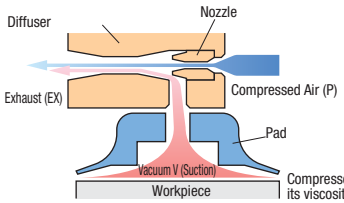


Part Number Type	D	Nozzle Dia. (mm)	P	C	L1	L2	Operating Pressure (Mpa)	Ultimate Vacuum (-kPa)	Suction Flow Rate (ℓ/min (ANR))	Flow Consumption (ℓ/min (ANR))	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VUB	4	0.5	9	11	6.6	16.6	0.5	90	7	11.5	18		
	6	0.7	10.5	11.6	7	17	0.5	93	13	23	18.5		

Specification

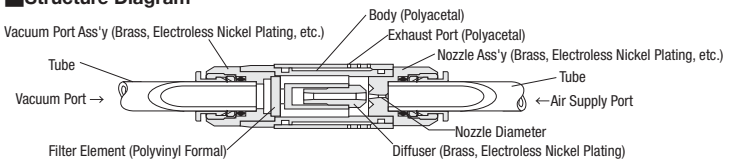
Applicable Fluid	Air
Operation Temperature Range	0~60°C
Operating Pressure Range	0.15MPa~0.7MPa
Rated Supply Pressure	0.5MPa

Principle of Vacuum Generation

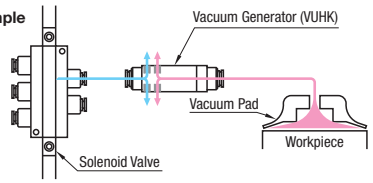


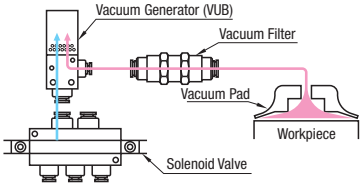
Compressed air introduced draws secondary air through its viscosity, generating vacuum function force.

Structure Diagram



Example





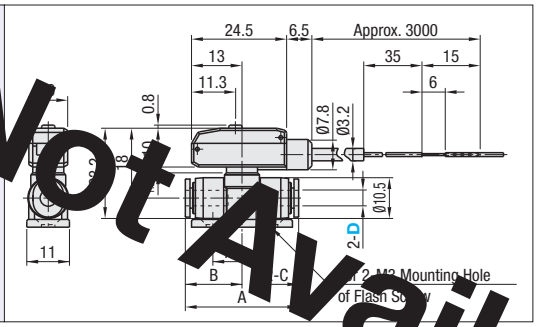
Cautions

-Dusts on work material may cause damage to the vacuum generator. Use in combina e vacuum filter on the next page.

Vacuum Pressure Sensor -Union-



RoHS



Specification of Sensor Head

Applicable Fluid		Compressed Air
Pressure Detection Method		Diffusion Semiconductor Pressure Switch
Power Supply		DC10.8 ~ 30V (Ripple included)
Power Consumption		20mA or less (at DC24V, no load)
Operating Pressure Range		-100~0kPa
Max. Pressure		200kPa
Storage Temp. Range		-20 ~ 70°C (Atmospheric pressure, Humidity 60% or less)
Operation Temperature Range		0 ~ 60°C (Not to be frozen)
Operating Humidity Range		35 ~ 85% (Not to be frozen)
Protection Structure		IEC Standards (conforming to IP40)
Switch Output	No. of Pressured Positions	1
	Switch Output	NPN Open Connector Output 30V80mA or less Residual Voltage 0.8V or less / Residual Voltage 0.8V or Less
	Operation Indicator	N.O. (Red LED On at or above set pressure)
	Operating Difference	Fixed (2%F.S. or less)
	Operation Accuracy	±3% F.S. max.(at Ta=25 degree)
	Response	Approx.1m·sec
	Set Pressure Range	-100~0kPa

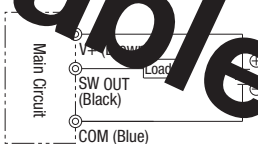
Not Available

Part Number Type	D	C	A	B	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
	4	11	29.2	14.6	48		
	6	11.6	30	15	48		

Order Example: Part Number

Days to Ship: 6 Days P.87

Electrical Circuit



Vacuum Filters

Price Reduction
Up to 29%

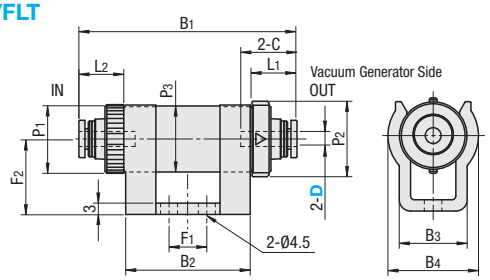
CAD Data

■Vacuum Filters/Elements for Replacement

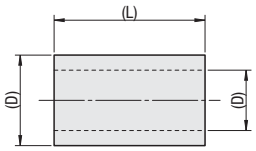


RoHS

VFLT



VFLTE (Element for Replacement)



Material: Body: Polycarbonate
Element: Polyvinyl Formal

Part Number Type	D	B1	B2	B3	B4	L1	L2	P1	P2	P3	C	F1	F2	Filtration Area (cm²)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VFLT	4	58	33	18	24	11.9	11.9	18.2	20	17.5	14.9	10	20	7.5	18		
	6	60				13	13				16				19		

Part Number	(D)	(D)	(L)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VFLTE	12	8	20		

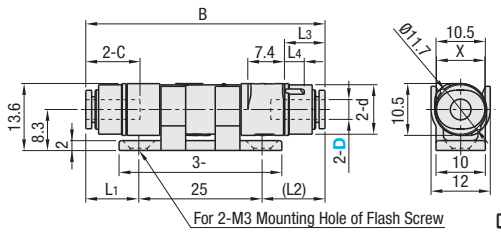
Applicable to both VFLT4 and VFLT6.

■Vacuum Filters / Elements for Replacement -Small-

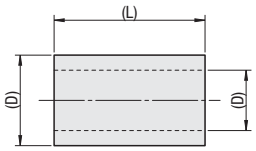


RoHS

VFS



VFSE (Element for Replacement)



Material: Body: Polycarbonate
Element: Polyvinyl Formal

Part Number Type	D	B	C	L1	(L2)	L3	L4	d	X	Element Length	Filtration Area (cm2)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VFS	4	48.5	11	10.8	12.7	8.2	4	10	9.8	15	2.8	5.1		
	6	53.4	11.6	13.2	15.2	10.6	4.5	10.5	11.8			6		

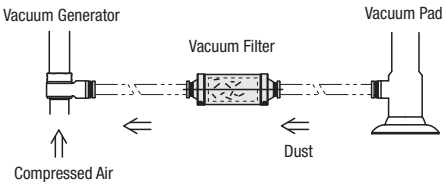
Part Number	(D)	(D)	(L)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VFSE	6	4	15		

Order Example — Part Number: VFS4

Days to Ship — 6 Days P.87

■Plumbing Example

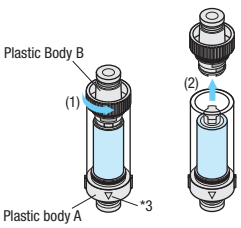
Plumbing between Vacuum Generator and Vacuum Pad removes dusts entered from Pad and prevent Generator from failures.



■Element Replacements

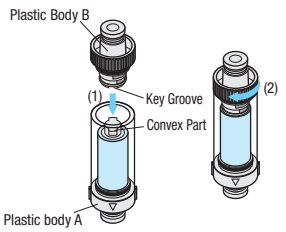
■How to Remove

(1) Turn plastic body B 45° counterclockwise.*
(2) Pull out plastic body B.
* Do not turn the plastic body B beyond 45°. It may damage the plastic body.



■How to Lock

(1) Press-fit plastic body B completely to plastic body A. Be sure that the lug of plastic body A aligns with the key slot in plastic body B.
(2) Turn plastic body B 45° clockwise*1 to lock.
* 1. Do not turn the plastic body B beyond 45°. It may damage the plastic body.
* 2. When locking, be sure that the lug of plastic body A comes to the center of the hole in plastic body B.



*3. Be sure that the vacuum generator is installed on the Δ marked side. If installed on the opposite side, the element inside will become fouled, making it impossible to know the proper time for maintenance.

Specification

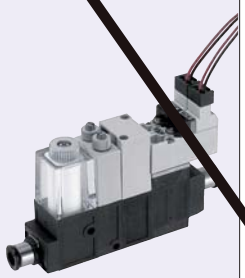
Applicable Fluid	Air
Operation Temperature Range	0~60°C
Operating Pressure Range	-100~0kPa
Filtration Accuracy	10μm

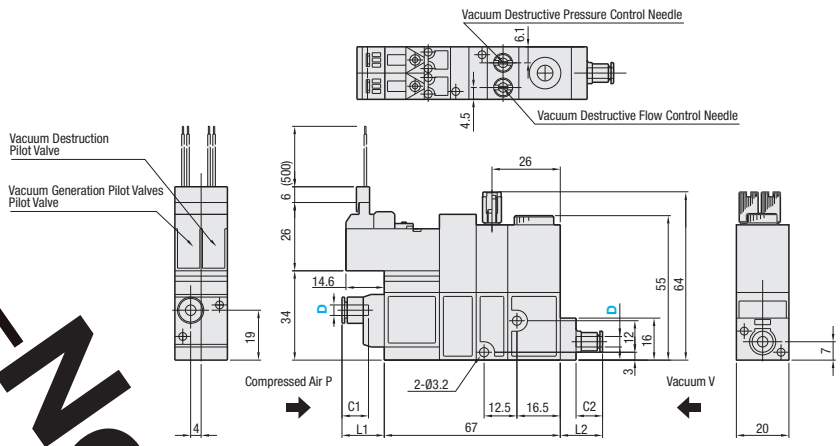
Vacuum Ejectors
-Standard-

Price Reduction
Up to 64%

CAD Data

■Vacuum Ejectors -Standard-

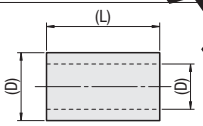




Part Number Type	D	Nozzle Dia. Nominal	Nozzle Dia. (mm)	L1				Ultimate Vacuum (-kPa)	Suction Flow Rate (ℓ/min (ANR))	Flow Consumption (ℓ/min (ANR))	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
	4	5	0.5	14.6	14.3		10.9	90.4	7	11.5	164.5		
		7	0.7					93.1	13	23			
	6	5	0.5	17.1	17.2	11.7	11.7	90.4	7	11.5			
		7	0.7						13	23			

■Elements for Replacement





Material: Polyvinylformal

Part Number	(D)	(D)	(L)	Filtration Level	Filter Surface Area	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
	12	8	30	10μm	1130mm²		

VJHBE is special element for replacement for vacuum ejector.

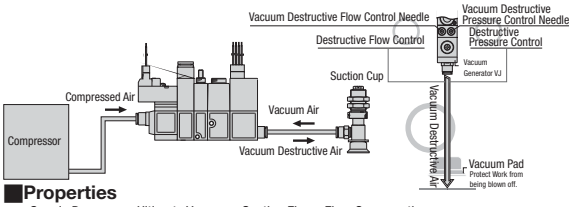
Part Number - Nozzle Dia. Nominal
- 7

6 Days

P.87

■Features

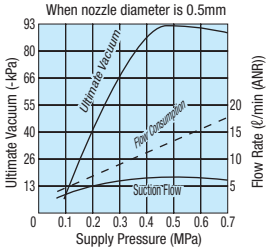
· Vacuum generator with built-in electromagnetic valve enables compact wiring.
· Because of the vacuum break air (air used for release vacuum environment) pressure, work is protected from being blown off.
· Relief function (relieves extra pressure) on vacuum release circuit shortens vacuum break time.



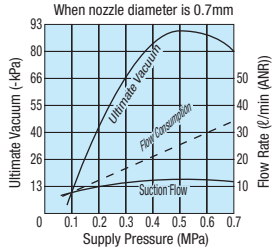
■Properties

· Supply Pressure – Ultimate Vacuum · Suction Flow · Flow Consumption

When nozzle diameter is 0.5mm



When nozzle diameter is 0.7mm



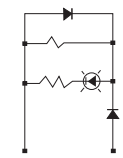
1. The characteristic supply pressure above is for vacuum generation.
2. Valve can cause abnormal sounds just before the supply pressure (0.4~0.45Mpa) of Ultimate Vacuum is reached. This abnormal sound indicates unstable properties, and the noise will be large. It may affect the sensor and other objects and cause troubles. Please reset supply pressure.
[Ex. 1] When pressure is 0.5Mpa with vacuum generator operating, pressure supply declines until 0.43Mpa due to pressure drop and abnormal noise occurs.
→Reset the supply pressure to 0.5Mpa when vacuum generator is operating.

[Ex. 2] Though the pressure is 0.5Mpa when vacuum generator is operating, abnormal sound occurs.
→Insufficient supply air flow rate (Air flow is squeezed by pipe resistance in the vacuum generator, not obtaining supply air flow rate that meets the characteristics).
→Select plumbing and equipment to confirm necessary effective sectional area.
[Ex. 3] When nozzle diameter is 0.5mm, the sectional area is 0.25×0.25×π×3=0.59mm²
→Select plumbing and equipment to spare necessary effective sectional area, 0.6mm2 or more.

■Material List

No.	Material
Body	Glass Fiber Filled PBT (Polybutylene Terephthalate)
Seal Rubber	Nitrile Rubber
Main Valve	Aluminum Alloy
Joint Portion	Brass + Electroless Nickel Plating
Vacuum Filter Cover	PCT (Polycarbonate)
Filter Cover Holder	Aluminum Alloy
Vacuum Generation Nozzles	Brass + Electroless Nickel Plating
Vacuum Generation	Brass + Electroless Nickel Plating
Break Air Flow Rate Control Needle	Brass + Electroless Nickel Plating

■Electrical Circuit (Electromagnetic Valve)



■Specification

Applicable Fluid	Air
Operation Temperature Range	5~50°C
Operating Pressure Range	0.3~0.7MPa
Rated Supply Pressure	0.5MPa
Break Air Flow Rate	0~50ℓ/min (ANR)) (When Supply Pressure 0.5MPa)
Structure of Break Air Relief Valves	Elastic Seal, Poppet Valve
Relief Pressure Selecting Range	0.005~0.05MPa

■Electromagnetic Valve Specifications

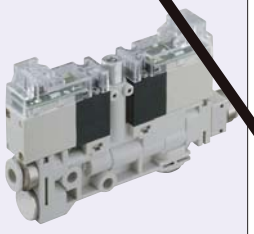
Item		Electromagnetic Valve for Vacuum Generation	Electromagnetic Valve for Vacuum Destruction
Pilot Valve	Operation Method	Direct operation	
	Valve Structure	Elastic Seal, Poppet Valve	
	Rated Voltage	DC24V	
	Allowable Voltage Range	DC24V±10%	
	Surge Protection Circuit	Diodes	
	Power Consumption	1.2W (With LED)	
	Manual Operation	Push Type - Non-Locking	
	Operation Indicator	Coil Excitation Operation: Red LED On	
	Connection Method	Red: DC24VBlack: COM	
Switching Valves	Operation Method	Air pressure operation with Pilot Valve	
	Valve Structure	Elastic Seal, Poppet Valve	
	Max. Pressure	1.05MPa	
	Valve Type	NC (Normally Closed)	
	Lubrication	Not Required	
	Effective Sectional Area	Air Supply Port Size: Ø4: 3.5mm² Ø6: 5mm²	1mm²

Not Available

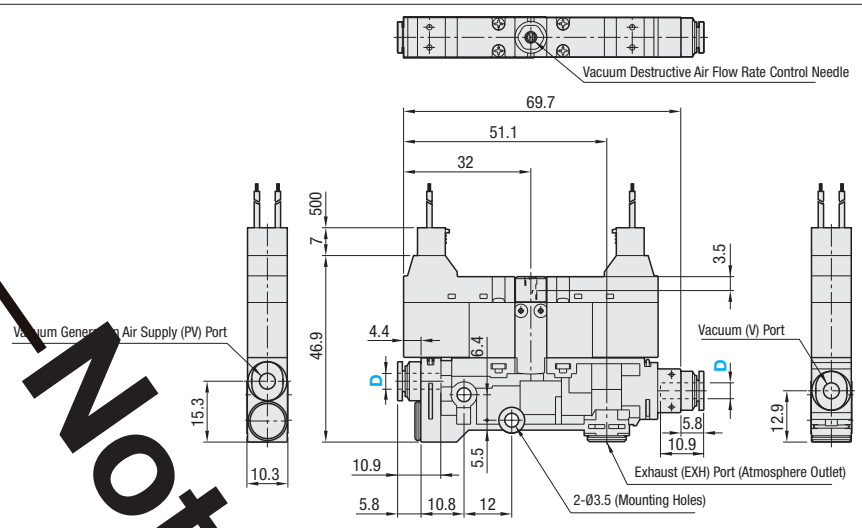
Vacuum Ejectors
-Compact Type-

CAD Data

■Vacuum Ejectors -Compact-



RoHS



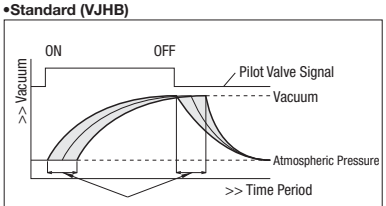
Part Number Type	D	Nozzle Dia. Nominal	Nozzle Dia. (mm)	Rated Supply Pressure (Mpa)	Ultimate Vacuum (-kPa)	Suction Flow Rate (ℓ/min(ANR))	Flow Consumption (ℓ/min(ANR))	Mass (g)	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
	4	5	0.5	0.5	0.4	7	11.5	50.5		
		6	0.6	0.5		9.5	16			

Part Number - Nozzle Dia. Nominal
- 6

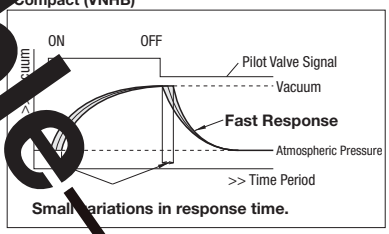
6 Days P.87

■Features
- Compact and lightweight and usable in small space.
- High speed and stable response (ON→OFF = 5m / sec or less)
- Vacuum Filters are not built-in. Use vacuum filters on P.1320

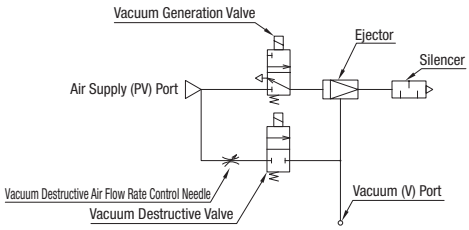
•Standard (VJHB)



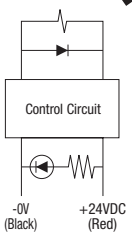
•Compact (VNHB)



■Circuit Diagram

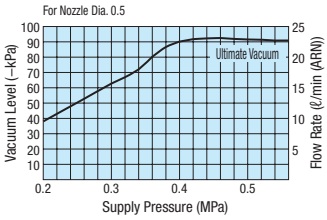


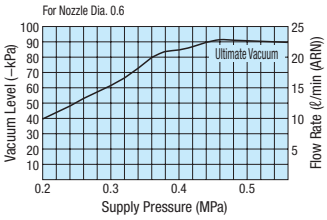
■Electrical Circuit (Electromagnetic Valve)



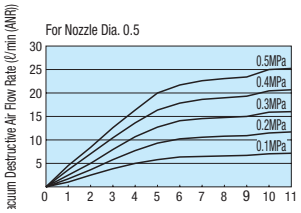
■Properties

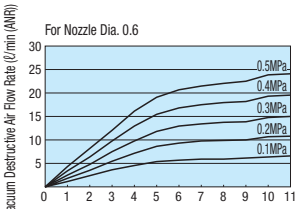
• Supply Pressure - Ultimate Vacuum - Suction Air Rate - Flow Consumption





• Vacuum Break Air Flow Rate- Needle Gate Opening (Revolutions)





■Specification

Applicable Fluid	Compressed Air
Operation Temperature Range	5~50 Degrees (Celsius) (Not to be dewed)
Operating Pressure Range	0~0.55MPa
Operation Temperature Range	35~85% AH(No condensation)
Protection Structure	IEC Standards (conforming to IP40)
Vibration Resistance / Impact Resistance	50m / s² Less/150m/s² or Less
Break Air Flow Rate	0~20ℓ/min (ANR) (When Supply Pressure 0.5MPa)

■Electromagnetic Valve Specifications

Item	Electromagnetic Valve for Vacuum Supply	Electromagnetic Valve for Vacuum Destruction
Operation Method	Direct operation	
Valve Structure	Elastic Seal, Poppet Valve	
Rated Voltage	DC24V	
Allowable Voltage Range	±10%	
Surge Protection Circuit	Built-in Surge Killer Circuit	
Power Consumption	At the start-up point : 2.2W, Retention Time : 0.6W (Built-in Electrical Power Saving Circuit)	
Operation Indicator	Green LED	
Operating Pressure Range	0~0.55MPa	0~0.55MPa
Valve Type	Normal Close Type	
Response Time	Vacuum Start (OFF→ON) / Vacuum Stop (ON→OFF) Both are 5m / sec or less.	
Connection Method	Connector Style (Cable Length: 500mm) Red Lead Wire: +24DC, Black Lead Wire: -0V	

Not Available

Vacuum Generators with Vacuum Break Function · Special Vacuum Filters

Price Reduction
Up to 61%

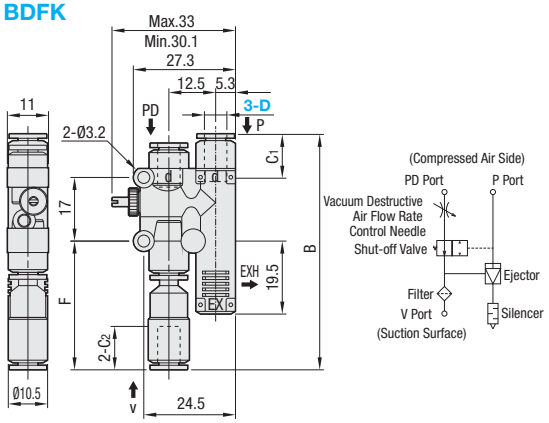
CAD Data

Vacuum Generators with Vacuum Break Function



RoHS

BDFK

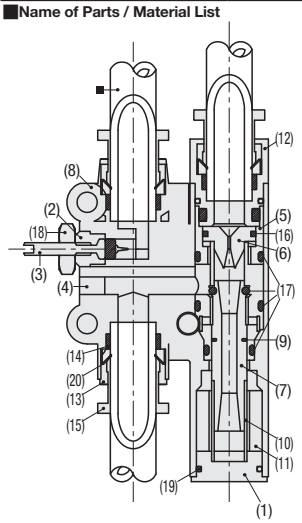


Part Number Type	D	Suction Flow Rate (ℓ/min (ANR))	B	F	C_1	C_2	Nozzle Dia. (mm)	Pressure Rating (Mpa)	Ultimate Vacuum (-kPa)	Flow Consumption (ℓ/min (ANR))	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BDFK	4	7	59.7	34.1	10.9	11	0.5	0.5	90	11.5	20.5		
	6	12.5	62.9	34.4	11.7	11.6	0.7		92	23	21.5		

Specification

Applicable Fluid	Air
Operating Pressure Range	0.3~0.7MPa
Operation Temperature Range	5~50°C
Lubrication	Not Required

Name of Parts / Material List

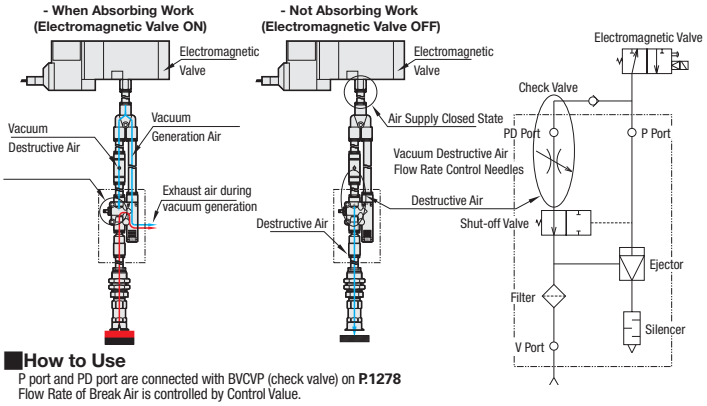


•Features

Vacuum break air is introduced to the suction line to shorten vacuum destructing time. Hence shorter time for suctioning and moving work improves activity efficiency.

How to Use

<Circuit Diagram>



How to Use

P port and PD port are connected with BVCVP (check valve) on **P.1278**
Flow Rate of Break Air is controlled by Control Value.

See the following BDFL for construction of filter.

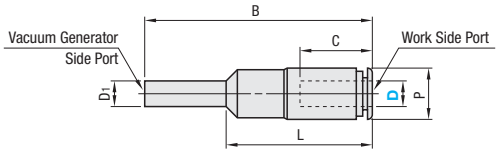
No.	Name of Parts	Material
(1)	End Plug	Brass, Electroless Nickel Plating
(2)	Upper Stopper	Brass, Electroless Nickel Plating
(3)	Break Needle	1.4305/X10CrNiS18-9
(4)	Stopper 2	Brass, Electroless Nickel Plating
(5)	Sleeve	Brass, Electroless Nickel Plating
(6)	Nozzle Piston	Brass, Electroless Nickel Plating
(7)	Diffuser Spool	Brass, Electroless Nickel Plating
(8)	Resin Body	PBT Glass 15%
(9)	Spool Gasket	Nitrile Rubber (H-NBR)
(10)	Diffuser Spring	Stainless Steel
(11)	Silencer Element	Polyvinyl Formal (PVF)
(12)	Cartridge	-
(13)	Guide Ring	Brass, Electroless Nickel Plating
(14)	Elastic Sleeve	Nitrile Rubber (NBR)
(15)	Release Ring	Polyacetal (POM)
(16)	Y Parking	Nitrile Rubber (NBR)
(17)	ORing	Nitrile Rubber (NBR)
(18)	Lock Nut	Aluminum Alloy
(199	Spring Pins	Stainless Steel
(20)	Lock Pawl	Stainless Steel
(21)	Tube	Urethane or Nylon

Special Vacuum Filters



RoHS

BDFL



Part Number Type	Tube Outer Ø D	Applicable Fitting Ø D_1	B	L	C	P	Mass (g)	Filtration Area (cm2)	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
BDFL	4	4	34.7	21.5	11.0	8.0	1.5	0.8		
	6	6	35.2	21.8	11.6	10.5	2.5	1.1		

Special vacuum filters for BDFK.

Order Example

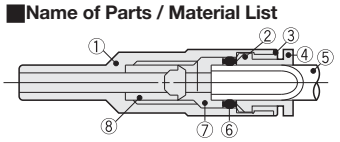
Part Number	-	Suction Flow Rate
BDFK4 BDFL4	-	7

Days to Ship: 6 Days P.87

Specification

Applicable Fluid	Air
Operating Pressure Range	-100~0kPa
Filtration Accuracy	10μm
Operation Temperature Range	0~60°C
Filtration Area	Joint Size 44: 0.8cm²
	Joint Size 66: 1.1cm²

Name of Parts / Material List



No.	Name of Parts	Material
(1)	Resin Body	Polypropylene (PP)
(2)	Lock Pawl	Stainless Steel
(3)	Guide Ring	Brass, Electroless Nickel Plating
(4)	Release Ring	Polyacetal (POM)
(5)	Tube	Urethane or Nylon
(6)	Elastic Sleeve	Nitrile Rubber (NBR)
(7)	Element Presser	Polyacetal (POM)
(8)	Filter Element	Polyvinyl Formal (PVF)

Fall Prevention

Price Reduction
Up to 15%

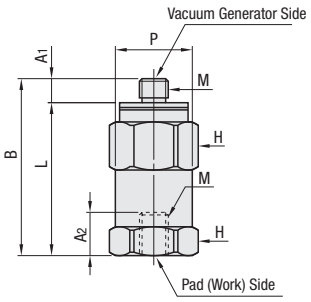
CAD Data

■Fall Prevention



RoHS

BAFP



Part Number		Thread Size M	A1	A2	B	L	P	Opposite Side H	Valve Operation Suction Flow Rate (ℓ/min (ANR))	Non-attached Vacuum Decline Level (kPa)	Effective Sectional Area (mm²)		Mass (g)	€ Unit Price	Volume Discount
Type	No.										Free Flow	Control Flow		Qty. 1~9	Qty. 10~
BAFP	4	M4x0.7	3	4.5	19.9	16.9	10	10	5	2	1.63	0.09	7.9		
	6	M6x1.0	4	4.9	28.1	24.1	12	12	13	2	4.06	0.09	12.4		

Order Example — Part Number: BAFP4

Days to Ship: 6 Days P.87

Specification

Applicable Fluid	Air
Operating Pressure Range	Positive Pressure: 0~0.7MPa
	Negative Pressure: 0~−100kPa
Min. Operating Pressure	-7kPa
Operation Temperature Range	0~60°C

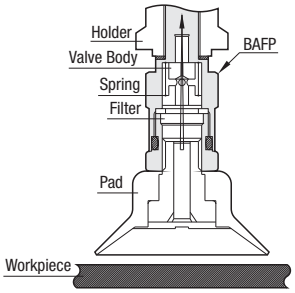
■Selecting Method

	M4	M6
Min. Valve Operation Suction Flow (ℓ/min (ANR))	5.0	13.0
Non-attached Vacuum Decline Level (kPa)	2.0	2.0

Name of Parts	Material	
	M4	M6
Metal Body A	Stainless Steel	Aluminum, Electroless Nickel Plating
Metal Body B	Brass, Electroless Nickel Plating	Aluminum, Electroless Nickel Plating
Valve Body	Aluminum Alloy	
Stopper	Brass, Electroless Nickel Plating	
Spring	1.4301/X5CrNi18-10	
Filter	Polyvinyl Formal (PVF)	
O-Ring	Nitrile Rubber (NBR)	
Gasket	1.4301/X5CrNi18-10+Nitrile Rubber (NBR)	

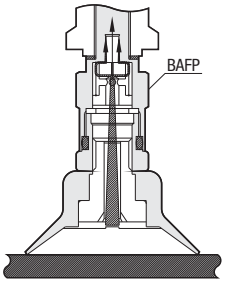
■Description of Fall Prevention Valve

-Fall Prevention Valve Operating Condition



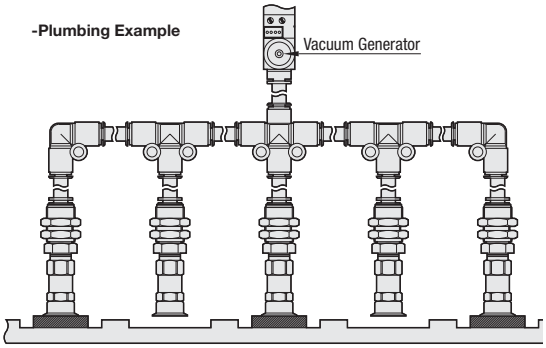
When a work is away from the vacuum pad, airflow pushes up the valve and shuts the air passage. During operation, the valve sucks small amount of air through a small hole in the middle.

-While Holding Work



When a work is tightly stuck to vacuum pad, the suction flow is reduced and the spring inside pushes down the valve. As the result, the air passage between the valve and body opens.

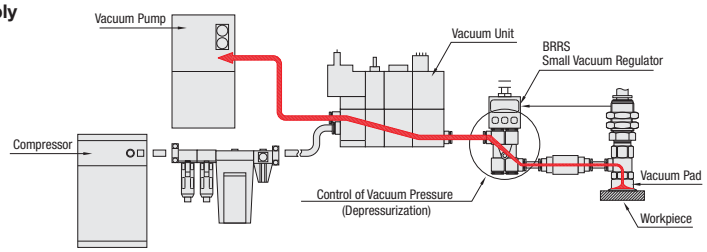
-Plumbing Example



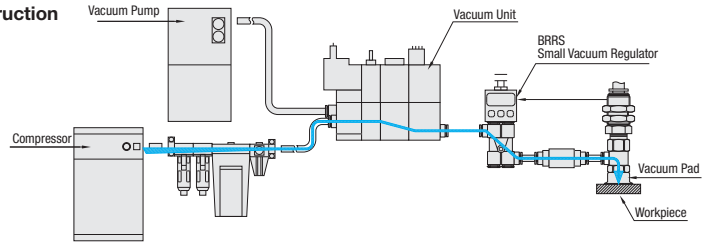
Prevents process stop problems by lowering vacuum decline levels on open pads due to missed pickups or absence of work pieces, when a single vacuum source is used for multiple pads. For adopting this system, the maximum number of open pads should be confirmed. If unsafe numeber of open pads is used, be sure to provide a safety measure.

Example –Plumbing Example–

■Vacuum Supply



■Vacuum Destruction



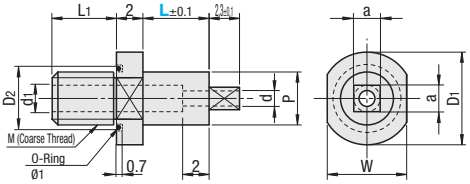
Holders for Mini Suction Cup · Mini Suction Cups

CAD Data

Holders for Mini Suction Cup



MHLDM (Male Thread)



M Material: Body 1.4305/X10CrNiS18-
0-Ring NBR (JIS B2401 1 Type A)

RoHS

Part Number Type	No.	L Selection	a Tolerance		M Coarse	P	d	d1	L1	D1	D2	W	€ Unit Price Qty. 1~9	Volume Discount 10~19 pieces
MHLDM	1.7	5 10 15	1.7	0 -0.03	M5	5	1.2	2	6	9	7	8		
	2.7		2.7		M6	6	2.3	3	8	10	8	9		

Order Example: Part Number MHLDM1.7 - L 10

Days to Ship: 8 Days

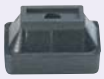
Express A 3,00 EUR/ piece P.88

For orders larger than indicated quantity, please request a quotation.

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Mini Suction Cups



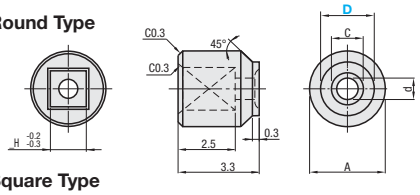


RoHS

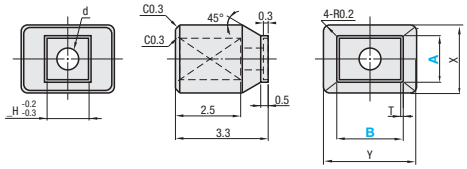
The photograph is enlarged.

Type Round	Type Square	M Material	H Hardness	Heat Resistance Temp.	Electrical Resistance
RBTR	RBTS	Nitrile Rubber (Black)	Shore A80	–20~150°C	1.0x105Ω
SCTR	SCTS	Silicon Rubber (Black)	Shore A60	–70~200°C	1.0x105Ω

Round Type



Square Type



Part Number Type	D	C	A	d	H	Applicable Holders	€ Unit Price RBTR	€ Unit Price SCTR
<Round Type> RBTR SCTR	1	-	4	0.5	1.7	MHLDM		
	1.25	-						
	1.5	0.9		1				
	1.75	1.2						
	2	1.4						
	2.5	1.9						
	3	2.3						
	4	3.2	5					
	5	4.2			2.7			
	6	4.9	7					
	7	5.9						

Part Number Type	A	B	X	Y	T	d	H	Applicable Holders	€ Unit Price RBTS	€ Unit Price SCTS
<Square Type> RBTS SCTS	2	4	4	6	0.4	1	1.7	MHLDM		
	2.5	5								
	3	6		7	0.5		2.7			
	4	8	5	9						
	5	10	6	10.5						
	6	12	6.5	12.5						
	7	14	7.5	14.5						

Order Example: Part Number RBTR2 RBTS2.5 - B 5

Days to Ship: 6 Days P.87

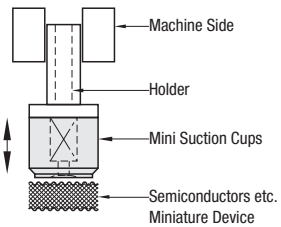
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~29	30~49	50~99
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

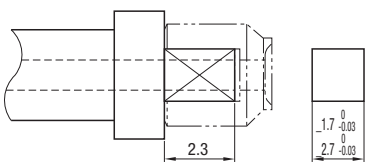
Example



What is Mini Suction Cup

This is a pad for vacuum pickup, developed to definitely vacuum pickup, attach and remove miniture devices without damaging them. This can be used for vacuum of for packaging equipment, as well as for manufacturing and inspection of semiconductors as with die holders and IC handlers.

Holder End Machining Guide



Features

1. Makes no scratch on devices.
2. Easy replacement by sharing the holder insert part.
3. Devices can be definitely absorbed and attached or removed.
   Although up to size and shape of device, the tip of Mini Suction Cup is selectable, holder insertion part has only 2 types to select, and used in common, to provide easy insertion and replacement of this product.
   To vacuum, use it while applying air pressure.
   To remove, stop the air pressure.
   The surface of the absorptive portion of the mini suction cups is treated with satin finish, providing easy device removal.
   The material of RBTR - RBTS is NBR (Nitrile Rubber) and can vacuum (convey) with no scratch on devices.
   The material of SCTR and SCTS is silicon rubber and excels in chemical, heat, low temperature and weather resistance.

Vacuum Fittings · Suction Cups

CAD Data

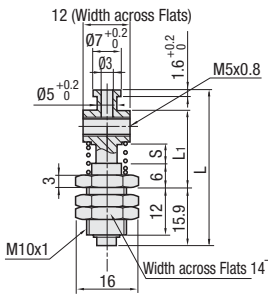
Vacuum Fittings

RoHS

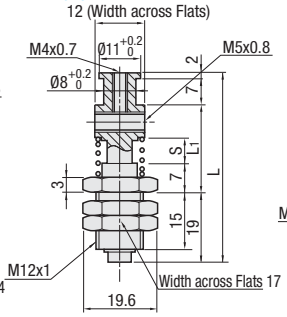


Type	Material			Surface Treatment	
	Body	Spring	Nuts	Body	Nuts
SRK SRKN SRKNS	EN AW-2011/ AlCu6BiPb-B	JIS SWP-A	1.0038/ S235JR	Clear Anodizing	Nickel Plating

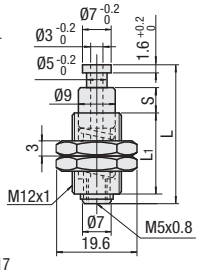
SRK10 1010 1015



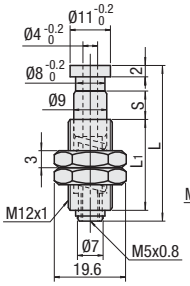
SRK20 2010 2015



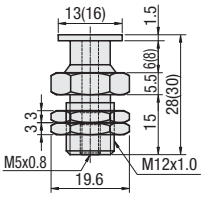
SRKN10 1010 1015



SRKN20 2010 2015



SRKNS40 50



Dimensions in ( ) are for SRKNS50.

Part Number Type	No.	Stroke S	L	L1	Spring Constant	Max. Load	Applicable Pads	€ Unit Price Qty. 1~49	Vol. Discount Qty. 50~
SRK	10	5	40	19	0.030kgf	0.55kgf	SRP6~12 SRPF12		
	1010	10	45	24	0.025kgf				
	1015	15	50	29	0.020kgf				
	20	5	48	20	0.037kgf		SRP15~40 SRPF20		
	2010	10	53	25	0.032kgf				
	2015	15	58	30	0.027kgf				

Part Number Type	No.	Stroke S	L	L1	Spring Constant	Max. Load	Applicable Pads	€ Unit Price Qty. 1~49	Vol. Discount Qty. 50~
SRKN	10	5	35	22	0.030kgf	0.55kgf	SRP6~12 SRPF12		
	1010	10	45	27	0.025kgf				
	1015	15	55	32	0.020kgf				
	20	5	39	22	0.037kgf		SRP15~40 SRPF20		
	2010	10	49	27	0.032kgf				
	2015	15	59	32	0.027kgf				

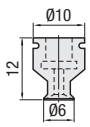
Part Number Type	No.	Applicable Pads	€ Unit Price Qty. 1~49	Volume Discount Qty. 50~
SRKNS	40	SRPS40		
	50	SRPS50		

Suction Cups

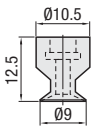
RoHS



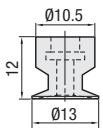
SRP6



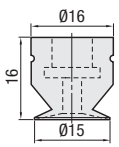
SRP9



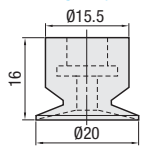
SRP12



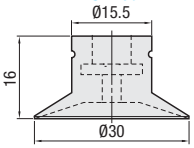
SRP15



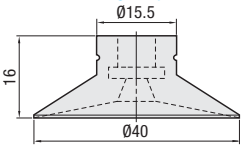
SRP20



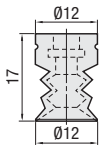
SRP30



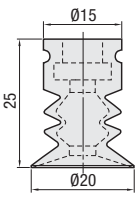
SRP40



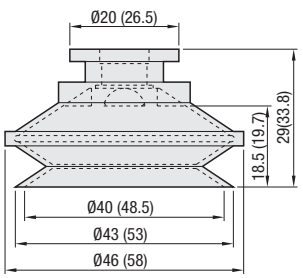
SRPF12



SRPF20



SRPS40 (50)



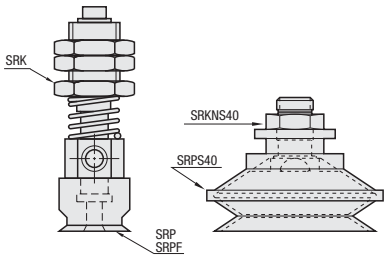
Type	Material	Color	Hardness
SRP SRPF	Silicon Rubber	Sky Blue	Shore A40
SRPS		Translucent	Shore A50

Dimensions in ( ) are for SRPS50.

Part Number Type	No.	Applicable Vacuum Fitting	Mounting Type	€ Unit Price Qty. 1~49	Volume Discount Qty. 50~
SRP	6	SRK10	Recessed Type		
	9				
	12				
	15	SRK20			
	20				
	30				
	40				
SRPF	12	SRK10			
	20	SRK20			
SRPS	40	SRKNS40			
	50	SRKNS50			

Not usable in combination with vacuum fittings on **P.1327** · **P.1329** · **P.1331** and **P.1333**

Example



Order Example — Part Number: SRK10, SRP30

Days to Ship: 6 Days

P.87

Suction Cups
-Standard · Deep · Small -

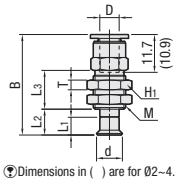
Fixed Type Up: One-Touch Type (Shape K)



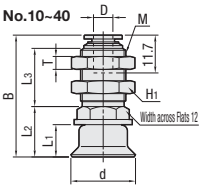
Type	Accessory		Shape	Pad Material
MVPKN	Suction Cups	VPNT	Standard	Nitrile Rubber
MVPKE		VPUE		Conductive Silicon Rubber
MVPKF		VPUF		Fluoro Rubber
MVFKN		VPFT	Deep	Nitrile Rubber
MVFKF		VPFF		Fluoro Rubber

Standard and Deep

No.2~8



No.10~40



Dimensions in ( ) are for Ø2~4.

RoHS

M Metal Material: Brass S Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Mat.	No.	D	d	L1	K Shape B	L2	L3	*H1	T	M	Mass g	€ Unit Price MVPKN	MVPKE	MVPKF
MVPK (Standard)	N E F	2	4	2	4	28.3	6	10	8	2	M6x0.75	6			
		3	4	3	4	28.3	6	10	8	2	M6x0.75	6			
		4	4	4	4	28.3	6	10	8	2	M6x0.75	6			
		6	6	6	7	32.6	9.5	12	12	3	M10x1.0	12.5			
		8	6	8	5.5	31.1	8	12	12	3	M10x1.0	12.5			
		10	6	10	8	34.1	12	18.5	14	4	M12x1.0	21			
		15	6	15	9	35.1	13	18.5	14	4	M12x1.0	21.5			
		20	6	20	10	37.5	37.7	18	17	4	M14x1.0	36.5			

Part Number Type	Pad Mat.	No.	D	d	L1	K Shape B	L2	L3	*H1	T	M	Mass g	€ Unit Price MVFKN	MVFKF
MVFK (Deep)	N F	20	6	20	11	38.7	16.6	18	17	4	M14x1.0	36.5		
		25	6	25	12	39.7	17.6	18	17	4	M14x1.0	37		
		30	6	30	14	41.7	19.6	18	17	4	M14x1.0	39		
		40	6	40	17.5	45.2	23.1	18	17	4	M14x1.0	47		

* Width across Flats

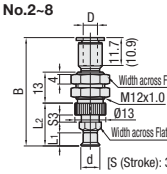
Spring Type Up: One-Touch Type (Shape T)



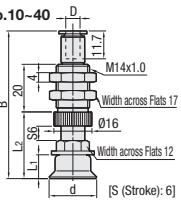
Type	Accessory		Shape	Pad Material
MVPTN	Suction Cups	VPNT	Standard	Nitrile Rubber
MVPTE		VPUE		Conductive Silicon Rubber
MVPTF		VPUF		Fluoro Rubber
MVFTN		VPFT	Deep	Nitrile Rubber
MVFTF		VPFF		Fluoro Rubber

Standard and Deep

No.2~8



No.10~40



Dimensions in ( ) are for Ø2~4.

RoHS

M Metal Material Brass S Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Mat.	No.	D	d	L1	T Shape B	L2	Mass g	Spring Max. Load (N)	€ Unit Price MVPTN	MVPTE	MVPTF
MVPT (Standard)	N E F	2	4	2	4	43.2	17.5	17	0.9~1.9			
		3	4	3	4	43.2	17.5	17				
		4	4	4	4	43.2	17.5	17				
		6	6	6	7	43.2	19.5	18.5				
		8	6	8	5.5	45.6	18	18.5				
		10	6	10	8	60	26	35.5	4.0~7.1			
		15	6	15	9	61	27	36				
		20	6	20	10	62	28	39.5	7.0~12.6			

Part Number Type	Pad Mat.	No.	D	d	L1	T Shape B	L2	Mass g	Spring Max. Load (N)	€ Unit Price MVFTN	MVFTF
MVFT (Deep)	N F	20	6	20	11	63.1	29	39.5	7.0~12.6		
		25	6	25	12	64.1	30	40			
		30	6	30	14	66.1	32	42.5			
		40	6	40	17.5	69.6	35.5	50.5			

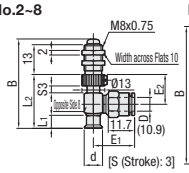
Spring Type Side: One-Touch Type (Shape L)



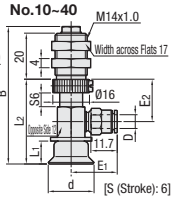
Type	Accessory		Shape	Pad Material
MVPLN	Suction Cups	VPNT	Standard	Nitrile Rubber
MVPLE		VPUE		Conductive Silicon Rubber
MVPLF		VPUF		Fluoro Rubber
MVFLN		VPFT	Deep	Nitrile Rubber
MVFLF		VPFF		Fluoro Rubber

Standard and Deep

No.2~8



No.10~40



Dimensions in ( ) are for Ø2~4.

RoHS

M Metal Material: Brass S Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Mat.	No.	D	d	L1	L Shape B	L2	E1	E2	Mass g	Spring Max. Load (N)	€ Unit Price MVPLN	MVPLE	MVPLF
MVPL (Stand-ard)	N E F	2	4	2	4	40	24	16.7	12.5	13.5	0.9~1.9			
		3	4	3	4	40	24	16.7	12.5	13.5				
		4	4	4	4	40	24	16.7	12.5	13.5				
		6	6	6	7	41	25	18.1	13	15.5				
		8	6	8	5.5	39.5	23.5	18.1	13	15.5				
		10	6	10	8	58.1	35	20.1	18.5	47.5	4.0~7.1			
		15	6	15	9	59.1	36	20.1	18.5	48				
		20	6	20	10	60.1	37	20.1	18.5	51.5	7.0~12.6			

Part Number Type	Pad Mat.	No.	D	d	L1	L Shape B	L2	E1	E2	Mass g	Spring Max. Load (N)	€ Unit Price MVFLN	MVFLF
MVFL (Deep)	N F	20	6	20	11	61.1	38	20.1	18.5	51.5	7.0~12.6		
		25	6	25	12	62.1	39	20.1	18.5	52			
		30	6	30	14	64.1	41	20.1	18.5	54			
		40	6	40	17.5	67.6	44.5	20.1	18.5	62			

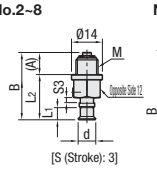
Direct-Mount Spring Type Screw Type (Shape S)



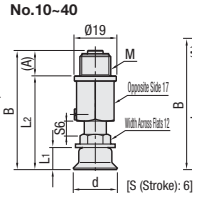
Type	Accessory		Shape	Pad Material
MVPSN	Suction Cups	VPNT	Standard	Nitrile Rubber
MVPSE		VPUE		Conductive Silicon Rubber
MVPSF		VPUF		Fluoro Rubber
MVFSN		VPFT	Deep	Nitrile Rubber
MVFSF		VPFF		Fluoro Rubber

Standard and Deep

No.2~8



No.10~40



RoHS

M Metal Material: Brass S Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Mat.	No.	d	L1	S Shape M	(A)	B	L2	Mass g	Spring Max. Load (N)	€ Unit Price MVPSN	MVPSE	MVPSF
MVPS (Stand-ard)	N E F	2	2	4	M10x1	9.5	32	22.5	14.5	2.3~3.9			
		3	3	4	M10x1	9.5	32	22.5	14.5				
		4	4	4	M10x1	9.5	32	22.5	14.5				
		6	6	7	M10x1	9.5	32	22.5	14.5				
		8	8	5.5	M10x1	9.5	30.5	21.0	14.5				
		10	10	8	M14x1	11.7	52	39.3	55.5	7.9~15.0			
		15	15	9	M14x1	11.7	54	40.3	56				
		20	20	10	M14x1	11.7	55	42.3	58.5				

Part Number Type	Pad Mat.	No.	d	L1	S Shape M	(A)	B	L2	Mass g	Spring Max. Load (N)	€ Unit Price MVFSN	MVFSF
MVFS (Deep)	N F	20	20	11	M14x1	11.7	55	43.3	58.5	7.9~15.0		
		25	25	12	M14x1	11.7	56	44.3	59			
		30	30	14	M14x1	11.7	58	46.3	61			
		40	40	17.5	M14x1	11.7	61.5	49.8	69			

Spring Type Long Stroke Type (Shape R)

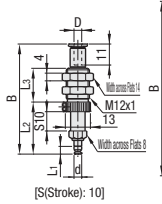


Type	Accessory		Shape	Pad Material
MVPRN	Suction Cups	VPNT	Standard	Nitrile Rubber
MVPRE		VPUE		Conductive Silicon Rubber
MVPRF		VPUF		Fluoro Rubber
MVFRN		VPFT	Deep	Nitrile Rubber
MVFRF		VPFF		Fluoro Rubber

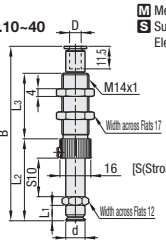
Standard and Deep

M Metal Material: Brass
S Surface Treatment: Electroless Nickel Plating

No.4~8



No.10~40



RoHS

Part Number Type	Pad Mat.	No.	D	d	L1	Shape R B	L2	L3	Mass g	Spr. Max. Load (N)	€ Unit Price MVPRN	MVPRE	MVPRF
MVPR (Stand-ard)	N E F	4	4	4	4	57.2	27	17.5	20.5	0.6~1.7			
		6	4	6	7	56.7	26.5	17.5	20	0.8~2.7			
		8	4	8	5.5	55.2	25	17.5	20	0.8~2.7			
		10	6	10	8	64.6	30.5	20	36.5	2.0~5.2			
		15	6	15	9	65.6	31.5	20	37	2.0~5.2			
		20	6	20	10	68.1	34	20	42	3.3~10.0			

Part Number Type	Pad Mat.	No.	D	d	L1	Shape R B	L2	L3	Mass g	Spring Max. Load (N)	€ Unit Price MVFRN	MVFRF
MVFR (Deep)	N F	20	6	20	10	69.1	35	20	42	2.0~5.2		
		25	6	25	11	70.1	36	20	42.5	3.3~10.0		
		30	6	30	12	72.1	38	20	44.5	3.3~10.0		
		40	6	40	14	75.6	41.5	20	53	3.3~10.0		

NEW

Price Reduction
Up to 56%

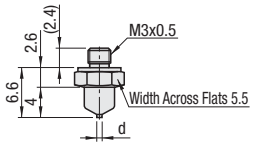
CAD Data

Direct Mounting Type Small Type (Shape J)



RoHS

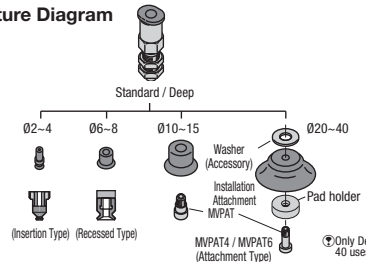
Type	Accessory		Shape	Pad Material
MVPJN	Suction Cups	VPJN	Small	Nitrile Rubber
MVPJS		VPJS		Conductive Silicon Rubber
MVPJF		VPJF		Fluoro Rubber



M Metal Material: Brass S Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Material	No.	d	€ Unit Price MVPJN	MVPJS	MVPJF
MVPJ (Small)	N S F	0.7	0.7			
		1	1			
		1.5	1.5			
		2	2			
		3	3			
		4	4			

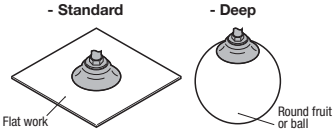
Structure Diagram



Only Deep Type No. 40 uses pad holder.

Example

- Standard Type is suitable for adsorption on flat work.
- Deep Type is suitable for adsorption on round objects.



Suction Cups RoHS

Standard



Deep

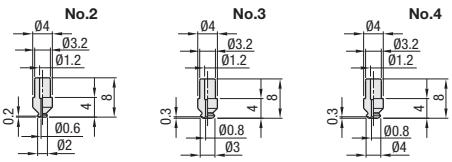


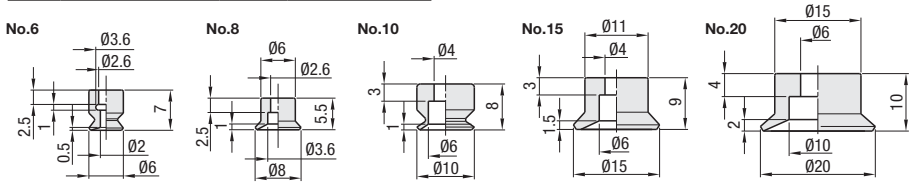
Small



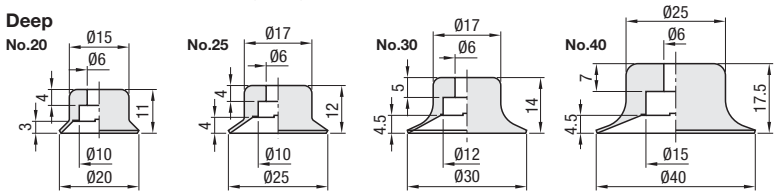
Type	Material	Pad Shape	Hardness	Color
VPNT	Nitrile Rubber	Standard	Shore A55	Black
VPUE	Conductive Silicon Rubber		Shore A60	Black
VPUF	Fluoro Rubber		Shore A55	Gray
VPFT	Nitrile Rubber	Deep	Shore A55	Black
VPFF	Fluoro Rubber		Shore A55	Gray
VPJN	Nitrile Rubber	Small	Shore A55	Black
VPJS	Conductive Silicon Rubber		Shore A60	Black
VPJF	Fluoro Rubber		Shore A55	Gray

Standard

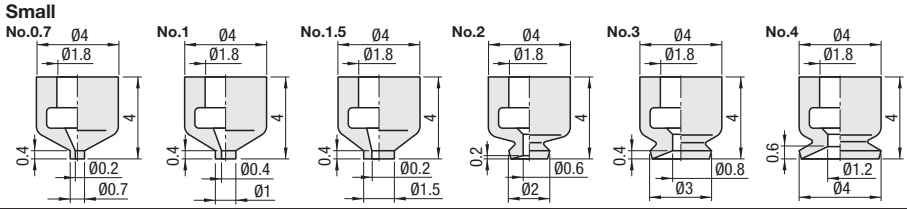




Deep



Small



Part Number Type	No.	Applicable Vacuum Fitting No.	Mounting Type	VPNT € Unit Price Qty. 1~9	VPNT Volume Discount Qty. 10~	VPUE € Unit Price Qty. 1~9	VPUE Volume Discount Qty. 10~	VPUF € Unit Price Qty. 1~9	VPUF Volume Discount Qty. 10~
VPNT VPUE VPUF	2	2	Insertion Type						
	3	3							
	4	4							
	6	6	Recessed Type						
	8	8							
	10	10	Attachment Type						
	15	15							
	20	20							

Specification

Type	VPNT · VPFT · VPJN	VPUE · VPJS	VPUF · VPFF · VPJF
Max. Operation Temperature	110°	180°	230°
Min. Operation Temperature	–30°	–40°	–10°
Weather Resistance	△	◎	○
Ozone Resistance	△	◎	◎
Acid Resistance	△	○	◎
Alkali Resistance	○	◎	×
Oil Resistance (Gasoline, Light Oil)	◎	△	◎
Resistance (Benzene, Toluene)	△	△	◎
Surface Resistivity	-	10^4~10^8Ω/sq	-

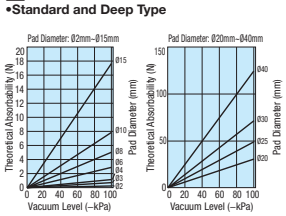
Part Number Type	No.	Applicable Vacuum Fitting MVF_	Mounting Type	VPFT € Unit Price Qty. 1~9	VPFT Volume Discount Qty. 10~	VPFF € Unit Price Qty. 1~9	VPFF Volume Discount Qty. 10~
VPFT VPFF	20	20	Attachment Type				
	25	25					
	30	30					
	40	40					

Not usable in combination with vacuum fittings (SRK, SRKN, SRKNS) P.1326

Part Number Type	No.	Applicable Vacuum Fitting MVPJ_	VPJN € Unit Price Qty. 1~9	VPJN Volume Discount Qty. 10~	VPJS € Unit Price Qty. 1~9	VPJS Volume Discount Qty. 10~	VPJF € Unit Price Qty. 1~9	VPJF Volume Discount Qty. 10~
VPJN VPJS VPJF	0.7	0.7						
	1	1						
	1.5	1.5						
	2	2						
	3	3						
	4	4						

Characteristic Data

•Standard and Deep Type



Order Example

Part Number
MVPKN4
VPFF30

Days to Ship

6 Days P. 87

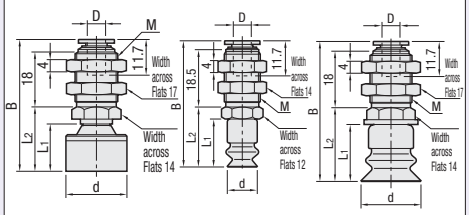
Suction Cups
-Sponge Type · Bellows Type-

Fixed Type Up: One-Touch Type (Shape K)

Type	Accessory		Shape	Pad Material
MVSKS	Suction Cups	VPSK	Sponge	Chloroprene Rubber
MVBKN		VPBT	Bellows	Nitrile Rubber
MVBKE		VPBE		Conductive Silicon Rubber



Sponge Type No.10~30 / **Bellows Type No.10** / **Bellows Type No.20~40**



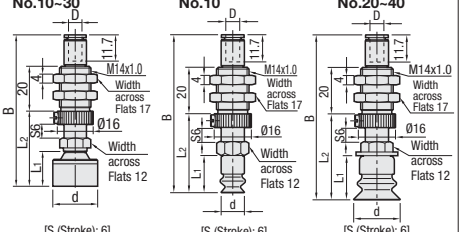
Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Spring Part Up: One-Touch Type (Shape T)

Type	Accessory		Shape	Pad Material
MVSTS	Suction Cups	VPSK	Sponge	Chloroprene Rubber
MVBTN		VPBT	Bellows	Nitrile Rubber
MVBTE		VPBE		Conductive Silicon Rubber



Sponge Type No.10~30 / **Bellows Type No.10** / **Bellows Type No.20~40**



[S (Stroke): 6] [S (Stroke): 6] [S (Stroke): 6]

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number			D	d	L1	K Shape				€ Unit Price
Type	Pad Material	No.				B	L2	M	Mass g	MVSKS
MVSK (Sponge)	S	10	6	10	9.5	37.2	15.1	M14x1.0	31.5	
		15	6	15	9.5	37.2	15.1	M14x1.0	32	
		20	6	20	15.5	43.2	21.1	M14x1.0	33.5	
		25	6	25	15.5	43.2	21.1	M14x1.0	35	
		30	6	30	15.5	43.2	21.1	M14x1.0	35	

Part Number			D	d	L1	T Shape				€ Unit Price
Type	Pad Mat.	No.				B	L2	Mass g	Spring Max. Load (N)	MVSTS
MVST (Sponge)	S	10	6	10	9.5	61.6	27.5	35	7.0~12.6	
		15	6	15	9.5	61.6	27.5	35.5		
		20	6	20	15.5	67.6	33.5	37		
		25	6	25	15.5	67.6	33.5	38.5		
		30	6	30	15.5	67.6	33.5	38.5		

Part Number			D	d	L1	K Shape				€ Unit Price	
Type	Pad Material	No.				B	L2	M	Mass g	MVBKN	MVBKE
MVBK (Bellow)	N	10	6	10	16	42.1	20	M12x1.0	21.5		
	E	20	6	20	19	46.7	24.6	M14x1.0	36.5		
		30	6	30	23	50.7	28.6	M14x1.0	40		
		40	6	40	30	57.7	35.6	M14x1.0	48.5		

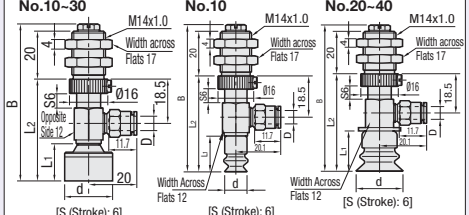
Part Number			D	d	L1	T Shape				€ Unit Price	
Type	Pad Mat.	No.				B	L2	Mass g	Spring Max. Load (N)	MVBTN	MVBTE
MVBT (Bellow)	N	10	6	10	16	68.1	34	36	4.0~7.1		
	E	20	6	20	19	71.1	37	39.5	7.0~12.6		
		30	6	30	23	75.1	41	43.5			
		40	6	40	30	82.1	48	52			

Spring Part Side : One-Touch Type (L Shape)

Type	Accessory		Shape	Pad Material
MVSLS	Suction Cups	VPSK	Sponge	Chloroprene Rubber
MVBLN		VPBT	Bellows	Nitrile Rubber
MVBLE		VPBE		Conductive Silicon Rubber



Sponge Type No.10~30 / **Bellows Type No.10** / **Bellows Type No.20~40**



[S (Stroke): 6] [S (Stroke): 6] [S (Stroke): 6]

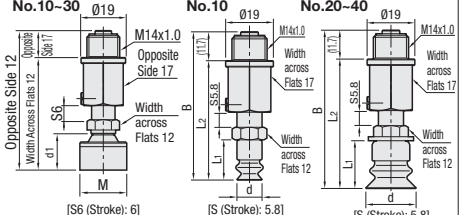
Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Direct-Mount Spring Type Screw Type (Shape S)

Type	Accessory		Shape	Pad Material
MVSSS	Suction Cups	VPSK	Sponge	Chloroprene Rubber
MVBSN		VPBT	Bellows	Nitrile Rubber
MVBSE		VPBE		Conductive Silicon Rubber



Sponge Type No.10~30 / **Bellows Type No.10** / **Bellows Type No.20~40**



[S6 (Stroke): 6] [S (Stroke): 5.8] [S (Stroke): 5.8]

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number			D	d	L1	L Shape				€ Unit Price
Type	Pad Mat.	No.				B	L2	Mass g	Spring Max. Load (N)	MVSLS
MVSL (Sponge)	S	10	6	10	9.5	59.6	36.5	46.5	7.0~12.6	
		15	6	15	9.5	59.6	36.5	47		
		20	6	20	15.5	65.6	42.5	48.5		
		25	6	25	15.5	65.6	42.5	50		
		30	6	30	15.5	65.6	42.5	50		

Part Number			D	d	L1	L Shape				€ Unit Price	
Type	Pad Mat.	No.				B	L2	Mass g	Spring Max. Load (N)	MVBLN	MVBLE
MVBL (Bellow)	N	10	6	10	16	66.1	43	48	4.0~7.1		
	E	20	6	20	19	69.1	46	51.5	7.0~12.6		
		30	6	30	23	73.1	50	55			
		40	6	40	30	80.1	57	63.5			

Part Number			d	L1	S Shape				€ Unit Price
Type	Pad Material	No.			B	L2	Mass g	Spring Max. Load (N)	MVSSS
MVSS (Sponge)	S	10	10	9.5	53.5	41.8	54	7.9~15.0	
		15	15	9.5	53.5	41.8	54.5		
		20	20	15.5	59.5	47.8	56		
		25	25	15.5	59.5	47.8	57.5		
		30	30	15.5	59.5	47.8	57.5		

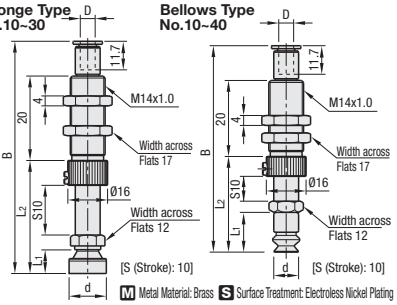
Part Number			d	L1	S Shape				€ Unit Price	
Type	Pad Material	No.			B	L2	Mass g	Spring Max. Load (N)	MVBSN	MVBSE
MVBS (Bellow)	N	10	10	16	59	47.3	56	7.9~15.0		
	E	20	20	19	63	51.3	58.5			
		30	30	23	67	55.3	62			
		40	40	30	74	62.3	70.5			

Spring Type Long Stroke Type (Shape R)

Type	Accessory		Shape	Pad Material
MVSRS	Suction Cups	VPSK	Sponge	Chloroprene Rubber
MVBRN		VPBT	Bellows	Nitrile Rubber
MVBRE		VPBE		Conductive Silicon Rubber



Sponge Type No.10~30 / **Bellows Type No.10~40**



[S (Stroke): 10] [S (Stroke): 10]

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number			D	d	L1	Shape R				€ Unit Price
Type	Pad Material	No.				B	L2	Mass g	Spring Max. Load (N)	MVSRS
MVSR (Sponge)	S	10	6	10	9.5	67.6	33.5	37.5	3.3~10.0	
		15	6	15	9.5	67.6	33.5	38	3.3~10.0	
		20	6	20	15.5	73.6	39.5	39.5	3.3~10.0	
		25	6	25	15.5	73.6	39.5	41	3.3~10.0	
		30	6	30	15.5	73.6	39.5	41	3.3~10.0	

Part Number			D	d	L1	Shape R				€ Unit Price	
Type	Pad Material	No.				B	L2	Mass g	Spring Max. Load (N)	MVBRN	MVBRE
MVBR (Bellow)	N	10	6	10	16	72.6	38.5	37	2.0~5.2		
	E	20	6	20	19	77.1	43	42	3.3~10.0		
		30	6	30	23	81.1	47	45.5	3.3~10.0		
		40	6	40	30	88.1	54	54.5	3.3~10.0		

Price Reduction
Up to 57%

CAD Data

■Suction Cups

Type	Material	Pad Shape	Hardness	Color
VPSK	Chloroprene Rubber	Sponge	-	Black
VPBT	Nitrile Rubber	Bellows	Shore A55	Black
VPBE	Conductive Silicon Rubber		Shore A60	Black

Sponge Type

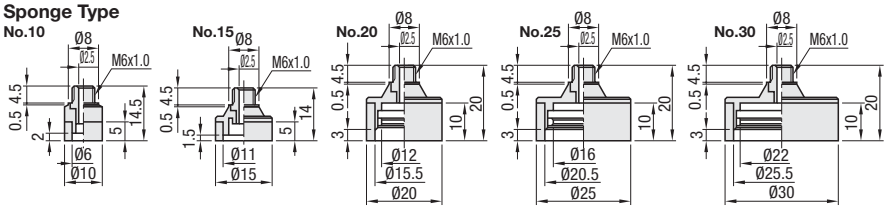


Bellows Type

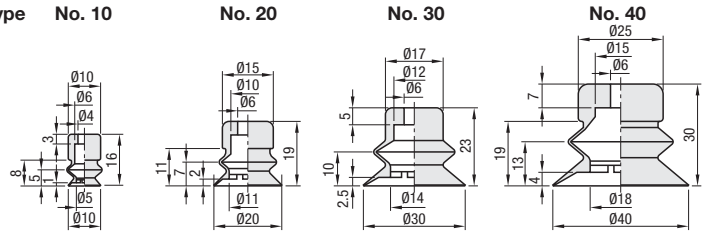


RoHS

Sponge Type



Bellows Type

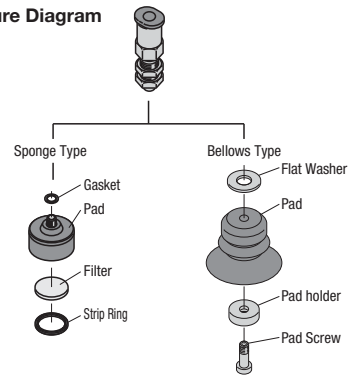


Part Number Type	No.	Applicable Vacuum Fitting MVS_	Mounting Type	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VPSK	10	10	Attachment Type		
	15	15			
	20	20			
	25	25			
	30	30			

Not usable in combination with vacuum fittings (SRK, SRKN, SRKNS) on **P.1326**

Part Number Type	No.	Applicable Vacuum Fitting MVB_	Mounting Type	VPBT € Unit Price Qty. 1~9	VPBT Volume Discount Qty. 10~	VPBE € Unit Price Qty. 1~9	VPBE Volume Discount Qty. 10~
VPBT VPBE	10	10	Attachment Type				
	20	20					
	30	30					
	40	40					

■Structure Diagram



For the Bellows Type, no flat washer or pad holder is required.

Order Example

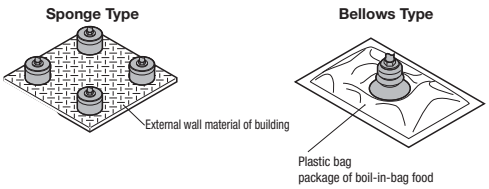
Part Number
MVBKN20
VPSK10

Days to Ship

6 Days P. 87

Example

- The Sponge Type is best suited for sticking to work pieces with uneven surfaces.
- Bellows Type is suitable for adsorption on soft work such as vinyl.

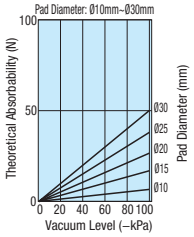


Specification

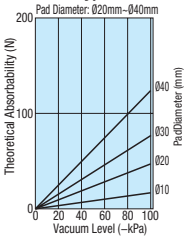
Type	VPSK	VPBT	VPBE
Max. Operation Temperature	80°	110°	180°
Min. Operation Temperature	–45°	–30°	–40°
Weather Resistance	○	△	◎
Ozone Resistance	○	△	◎
Acid Resistance	△	△	○
Alkali Resistance	◎	○	◎
Oil Resistance (Gasoline, Light Oil)	×	◎	△
Oil Resistance (Benzene, Toluene)	△	△	△
Surface Resistivity	-	-	10^4~10^8Ω/sq

■Characteristic Data

- Sponge Type



- Bellows Type



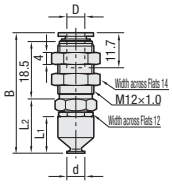
Suction Cups
-Soft Type · Soft Bellows Type-

■Fixed Type Up: One-Touch Type (Shape K)

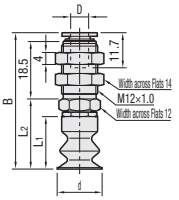


Type	Accessory		Shape	Pad Material
MVCKN	Suction Cups	VPCT	Soft	Nitrile Rubber
MVCKE		VPCE		Conductive Silicon Rubber
MVDKN		VPDT	Soft Bellows	Nitrile Rubber

Soft Type No.4~15



Soft Bellows Type No.6~15



RoHS

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Material	No.	D	d	L1	K Shape B	K Shape L2	K Shape Mass g	€ Unit Price MVCKN	€ Unit Price MVCKE
MVCK (Soft)	N E	4	6	4	12.2	40.4	18.3	9.5		
		6	6	6	12.2	40.4	18.3	16		
		8	6	8	12.2	40.4	18.3	16		
		10	6	10	14	42.2	20.1	24.5		
		15	6	15	14	42.2	20.1	24.5		

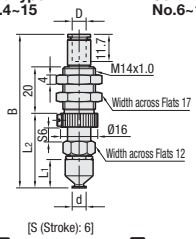
Part Number Type	Pad Material	No.	D	d	L1	K Shape B	K Shape L2	K Shape Mass g	€ Unit Price MVDKN
MVDK (Soft Bellows)	N	6	6	6	15	43.2	21.1	16	
		8	6	8	15	43.2	21.1	16	
		10	6	10	15.5	43.7	21.6	24.5	
		15	6	15	17.5	43.7	23.6	25	

■Spring Type Up: One-Touch Type (Shape T)

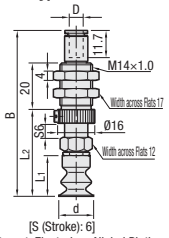


Type	Accessory		Shape	Pad Material
MVCTN	Suction Cups	VPCT	Soft	Nitrile Rubber
MVCTE		VPCE		Conductive Silicon Rubber
MVDTN		VPDT	Soft Bellows	Nitrile Rubber

Soft Type No.4~15



Soft Bellows Type No.6~15



RoHS

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Material	No.	D	d	L1	T Shape B	T Shape L2	T Shape Mass g	T Shape Spring Max. Load (N)	€ Unit Price MVCTN	€ Unit Price MVCTE
MVCT (Soft)	N E	4	6	4	12.2	66.4	32.3	20.5	4.0~7.1		
		6	6	6	12.2	66.4	32.3	22			
		8	6	8	12.2	66.4	32.3	22			
		10	6	10	14	68.2	34.1	39			
		15	6	15	14	68.2	34.1	39			

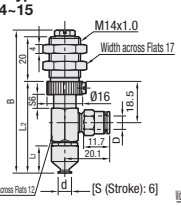
Part Number Type	Pad Material	No.	D	d	L1	T Shape B	T Shape L2	T Shape Mass g	T Shape Spring Max. Load (N)	€ Unit Price MVDTN
MVDT (Soft Bellows)	N	6	6	6	15	69.2	35.1	22	4.0~7.1	
		8	6	8	15	69.2	35.1	22		
		10	6	10	15.5	69.7	35.6	39		
		15	6	15	17.5	71.7	37.6	39.5		

■Spring Type Side: One-Touch Type (Shape L)

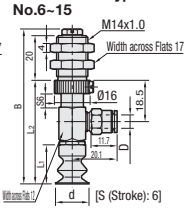


Type	Accessory		Shape	Pad Material
MVCLN	Suction Cups	VPCT	Soft	Nitrile Rubber
MVCLE		VPCE		Conductive Silicon Rubber
MVDLN		VPDT	Soft Bellows	Nitrile Rubber

Soft Type No.4~15



Soft Bellows Type No.6~15



RoHS

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Mat.	No.	D	d	L1	L Shape B	L Shape L2	L Shape Mass g	L Shape Spring Max. Load (N)	€ Unit Price MVCLN	€ Unit Price MVCLE
MVCL (Soft)	N E	4	6	4	12.2	64.4	41.3	17	4.0~7.1		
		6	6	6	12.2	64.4	41.3	19			
		8	6	8	12.2	64.4	41.3	19			
		10	6	10	14	66.2	43.1	51			
		15	6	15	14	66.2	43.1	51			

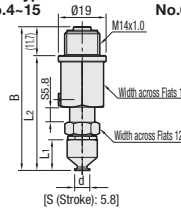
Part Number Type	Pad Mat.	No.	D	d	L1	L Shape B	L Shape L2	L Shape Mass g	L Shape Spring Max. Load (N)	€ Unit Price MVDLN
MVDL (Soft Bellows)	N	6	6	6	15	67.2	44.1	19	4.0~7.1	
		8	6	8	15	67.2	44.1	19		
		10	6	10	15.5	67.7	44.6	51		
		15	6	15	17.5	69.7	46.6	51.5		

■Direct-mount Spring Type Screw Type (Shape S)

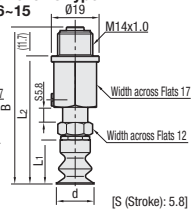


Type	Accessory		Shape	Pad Material
MVCSN	Suction Cups	VPCT	Soft	Nitrile Rubber
MVCSE		VPCE		Conductive Silicon Rubber
MVDSN		VPDT	Soft Bellows	Nitrile Rubber

Soft Type No.4~15



Soft Bellows Type No.6~15



RoHS

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Mat.	No.	d	L1	S Shape B	S Shape L2	S Shape Mass g	S Shape Spring Max. Load (N)	€ Unit Price MVCSN	€ Unit Price MVCSE
MVCS (Soft)	N E	4	4	12.2	57.3	45.6	18	7.9~15.0		
		6	6	12.2	57.3	45.6	18			
		8	8	12.2	57.3	45.6	18			
		10	10	14	58.9	47.4	59			
		15	15	14	58.9	47.4	59			

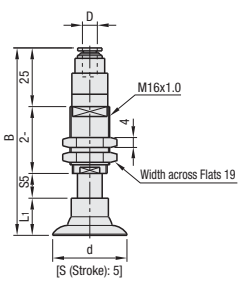
Part Number Type	Pad Mat.	No.	d	L1	S Shape B	S Shape L2	S Shape Mass g	S Shape Spring Max. Load (N)	€ Unit Price MVDSN
MVDS (Soft Bellows)	N	6	6	15	60.1	48.3	18	7.9~15.0	
		8	8	15	60.1	48.3	18		
		10	10	15.5	60.6	48.8	59		
		15	15	17.5	62.6	50.8	59.5		

■Vacuum Cylinder Type (M Shape)



Type	Accessory		Shape	Pad Material
MVCMN	Suction Cups	VPCT	Soft	Nitrile Rubber
MVCME		VPCE		Conductive Silicon Rubber

Soft Type No.4~15



RoHS

Ⓜ Metal Material: Brass Ⓢ Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Mat.	No.	D	d	L1	M Shape B	M Shape Mass g	€ Unit Price MVCMN	€ Unit Price MVCME
MVCM (Soft)	N E	4	6	4	12	64	34		
		6	6	6	12	64	34		
		8	6	8	12	64	34		
		10	6	10	14	66	34.5		
		15	6	15	14	66	34.5		

Price Reduction
Up to 65%

CAD Data

■Suction Cups

Soft Type



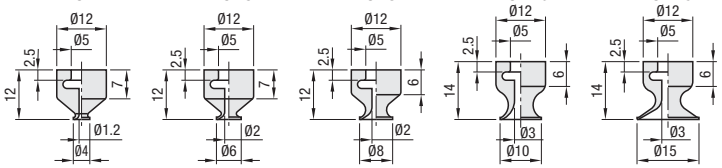
Soft Bellows Type



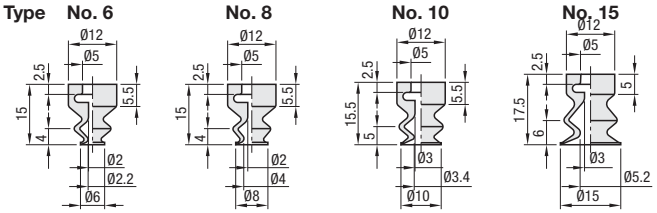
RoHS

Type	Material	Pad Shape	Hardness	Color
VPCT	Nitrile Rubber	Soft	Shore A55	Black
VPCE	Conductive Silicon Rubber		Shore A60	Black
VPDT	Nitrile Rubber	Soft Bellows	Shore A55	Black

Soft Type



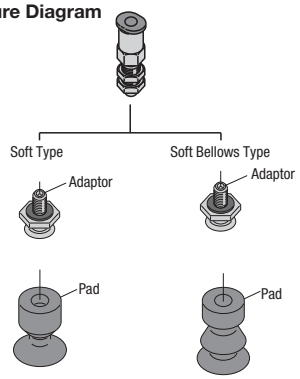
Soft Bellows Type



Part Number Type	No.	Applicable Vacuum Fitting MVC_	Mounting Type	VPCT € Unit Price Qty. 1~9	VPCT Volume Discount Qty. 10~	VPCE € Unit Price Qty. 1~9	VPCE Volume Discount Qty. 10~
VPCT VPCE	4	4	Attachment Type				
	6	6					
	8	8					
	10	10					
	15	15					

Part Number Type	No.	Applicable Vacuum Fitting MVD_	Mounting Type	€ Unit Price Qty. 1~9	Volume Discount Qty. 10~
VPDT	6	6	Attachment Type		
	8	8			
	10	10			
	15	15			

■Structure Diagram



Order Example

Part Number
MVCKN4
VPDT10

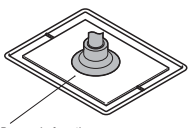
Days to Ship

6 Days P.87

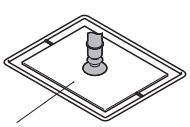
Example

- Soft Type is excellent in flexibility, vacuum is possible with comparatively no scratch on work.
- The Soft Bellows Type is excellent in flexibility and best suitable for sticking to things like paper.

Soft Type



Soft Bellows Type

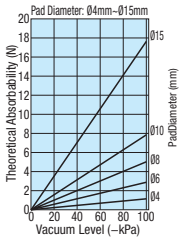


Specification

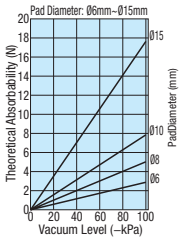
Type		VPCT · VPDT	VPCE
Max. Operation Temperature		110°	180°
Min. Operation Temperature		−30°	−40°
Weather Resistance		△	◎
Ozone Resistance		△	◎
Acid Resistance		△	○
Alkali Resistance		○	◎
Oil Resistance	(Gasoline, Light Oil)	◎	△
	(Benzene, Toluene)	△	△
Surface Resistivity		-	10^4~10^6Ω/sq

■Characteristic Data

- Soft Type



- Soft Bellows Type

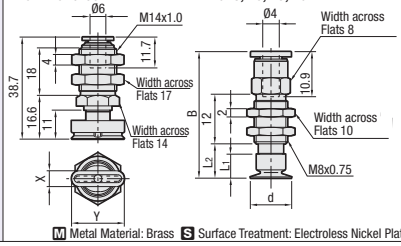


Suction Cups
-Oval Type · Thin Object Type-

Fixed Type Up: One-Touch Type (Shape K)

Type	Accessory		Shape	Pad Material
MVEKN	Suction Cups	VPET	Oval	Nitrile Rubber
MVEKS		VPES		Silicon Rubber
MVPKS		VPTS	For Thin Object	Nitrile Rubber
MVPKSS		VPTSS		Phlorosilicon

Oval Type No.4-10~6-30 / Thin Object Type No. 8, 10, 15, 20



M Metal Material: Brass S Surface Treatment: Electroless Nickel Plating

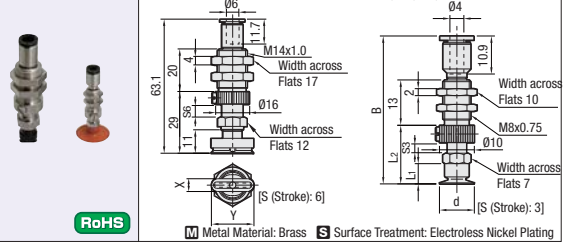
Part Number Type	Pad Material	No.	X	Y	Mass g	€ Unit Price MVEKN	MVEKS
MVEK (Oval)	N S	4-10	4	10	31.5		
		4-20		20	32		
		4-30		30	32.5		
		5-10	5	10	31.5		
		5-20		20	32		
		5-30		30	32.5		
		6-10	6	10	31.5		
		6-20		20	32		
		6-30		30	32.5		

Part Number Type	Pad Material	No.	d	L1	K Shape B	L2	Mass g	€ Unit Price MVPKS	MVPKSS
MVPK (For Thin Object)	S	8	8	5.5	30.3	8	10.2		
		10	10	5.8	30.6	8.3	10.2		
		15	15	6.5	31.3	9	10.3		
		20	20	7.3	32.1	9.8	10.4		

Spring Type Up: One-Touch Type (Shape T)

Type	Accessory		Shape	Pad Material
MVETN	Suction Cups	VPET	Oval	Nitrile Rubber
MVETS		VPES		Silicon Rubber
MVPTS		VPTS	For Thin Object	Nitrile Rubber
MVPTSS		VPTSS		Phlorosilicon

Oval Type No.4-10~6-30 / Thin Object Type No. 8, 10, 15, 20



M Metal Material: Brass S Surface Treatment: Electroless Nickel Plating

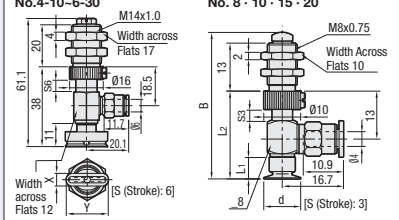
Part Number Type	Pad Material	No.	X	Y	T Shape Spring Max. Load (N)	Mass g	€ Unit Price MVETN	MVETS
MVET (Oval)	N S	4-10	4	10	7.0~12.6	35		
		4-20		20		35.5		
		4-30		30		36		
		5-10	5	10		35		
		5-20		20		35.5		
		5-30		30		36		
		6-10	6	10		35		
		6-20		20		35.5		
		6-30		30		36		

Part Number Type	Pad Mat.	No.	d	L1	T Shape B	L2	Spring Max. Load (N)	Mass g	€ Unit Price MVPTS	MVPTSS
MVPT (For Thin Object)	S	8	8	5.5	42.2	16.5	1.0~1.9	8.9		
		10	10	5.8	42.5	16.8		8.9		
		15	15	6.5	43.2	17.5		9.0		
		20	20	7.3	44	18.3		9.1		

Spring Type Side: One-Touch Type (Shape L)

Type	Accessory		Shape	Pad Material
MVELN	Suction Cups	VPET	Oval	Nitrile Rubber
MVELS		VPES		Silicon Rubber
MVPLS		VPTS	For Thin Object	Nitrile Rubber
MVPLSS		VPTSS		Phlorosilicon

Oval Type No.4-10~6-30 / Thin Object Type No. 8 · 10 · 15 · 20



M Metal Material Brass S Surface Treatment: Electroless Nickel Plating

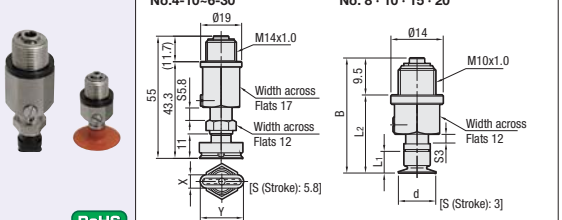
Part Number Type	Pad Material	No.	X	Y	L Shape Spring Max. Load (N)	Mass g	€ Unit Price MVELN	MVELS
MVEL (Oval)	N S	4-10	4	10	7.0~12.6	46.5		
		4-20		20		47		
		4-30		30		47.5		
		5-10	5	10		46.5		
		5-20		20		47		
		5-30		30		47.5		
		6-10	6	10		46.5		
		6-20		20		47		
		6-30		30		47.5		

Part Number Type	Pad Material	No.	d	L1	L Shape B	L2	Spring Max. Load (N)	Mass g	€ Unit Price MVPLS	MVPLSS
MVPL (For Thin Object)	S	8	8	5.5	39.5	23.5	1.0~1.9	14.2		
		10	10	5.8	39.8	23.8		14.2		
		15	15	6.5	40.5	24.5		14.3		
		20	20	7.3	41.3	25.3		14.4		

Direct-Mount Spring Type Screw Type (Shape S)

Type	Accessory		Shape	Pad Material
MVESN	Suction Cups	VPET	Oval	Nitrile Rubber
MVESS		VPES		Silicon Rubber
MVPSS		VPTS	For Thin Object	Nitrile Rubber
MVPSSS		VPTSS		Phlorosilicon

Oval Type No.4-10~6-30 / Thin Object Type No. 8 · 10 · 15 · 20



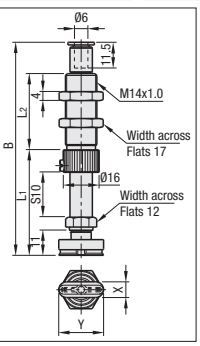
M Metal Material Brass S Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Material	No.	X	Y	S Shape Spring Max. Load (N)	Mass g	€ Unit Price MVESN	MVESS
MVES (Oval)	N S	4-10	4	10	7.9~15.0	54		
		4-20		20		54.5		
		4-30		30		55		
		5-10	5	10		54		
		5-20		20		54.5		
		5-30		30		55		
		6-10	6	10		54		
		6-20		20		54.5		
		6-30		30		55		

Part Number Type	Pad Material	No.	d	L1	S Shape B	L2	Spring Max. Load (N)	Mass g	€ Unit Price MVPSS	MVPSSS
MVPS (For Thin Object)	S	8	8	5.5	30.5	21	2.3~3.9	14.2		
		10	10	5.8	30.8	21.3		14.2		
		15	15	6.5	31.5	22		14.3		
		20	20	7.3	32.3	22.8		14.4		

Spring Type Long Stroke Type (Shape R)

Type	Accessory		Shapes	Pad Material
MVERN	Suction Cups	VPET	Oval	Nitrile Rubber
MVERS		VPES		Silicon Rubber



[S (Stroke): 10]

M Metal Material: Brass
S Surface Treatment: Electroless Nickel Plating

Part Number Type	Pad Material	No.	X	Y	Shape R B	L1	L2	Spring Max. Load (N)	Mass g	€ Unit Price MVERN	MVERS
MVER (Oval)	N S	4-10	4	10	69.1	35	20	3.3~10.0	37.5		
		4-20		20					38		
		4-30		30					38.5		
		5-10	5	10					37.5		
		5-20		20					38		
		5-30		30					38.5		
		6-10	6	10					37.5		
		6-20		20					38		
		6-30		30					38.5		

NEW

Price Reduction
Up to 61%

CAD Data

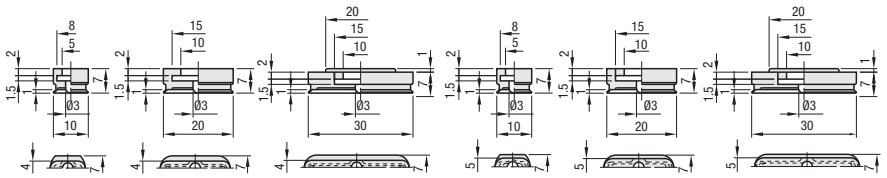
Suction Cups RoHS



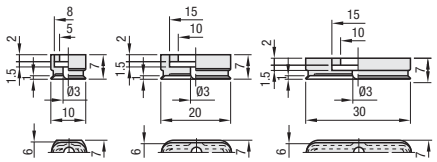
Type	Material	Shape	Hardness	Color
VPET	Nitrile Rubber	Oval	Shore A55	Black
VPES	Silicon Rubber		Shore A55	Black

Oval Type

No. 4-10 / No. 4-20 / No. 4-30 / No. 5-10 / No. 5-20 / No. 5-30



No. 6-10 / No. 6-20 / No. 6-30



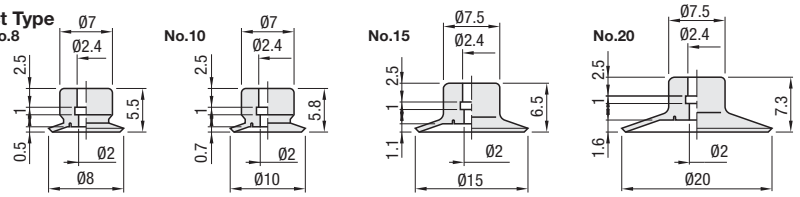
Suction Cups for Thin Objects RoHS



Type	Material	Hardness	Color
VPTS	Nitrile Rubber	Shore A55	Black
VPTSS	Phlorosilicon	Shore A55	Light Brown

Thin Object Type

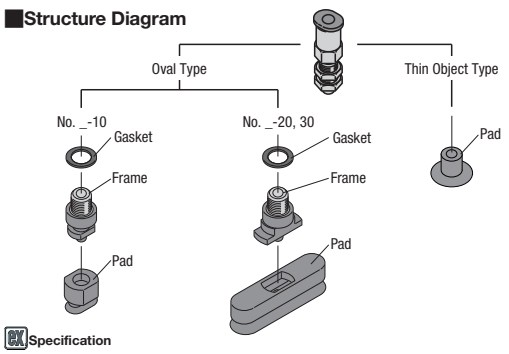
No.8 / No.10 / No.15 / No.20



Part Number Type	Part Number No.	Applicable Vacuum Fitting MVE_	Mounting Type	VPET € Unit Price Qty. 1~9	VPET Volume Discount Qty. 10~	VPES € Unit Price Qty. 1~9	VPES Volume Discount Qty. 10~
VPET VPES	4-10	4-10	Embedded Type				
	4-20	4-20					
	4-30	4-30					
	5-10	5-10					
	5-20	5-20					
	5-30	5-30					
	6-10	6-10					
	6-20	6-20					
	6-30	6-30					

Part Number Type	Part Number No.	Applicable Vacuum Fitting MVP_S · MVP_SS	Mounting Type	VPTS € Unit Price Qty. 1~9	VPTS Volume Discount Qty. 10~	VPTSS € Unit Price Qty. 1~9	VPTSS Volume Discount Qty. 10~
VPTS VPTSS	8	8	Embedded Type				
	10	10					
	15	15					
	20	20					

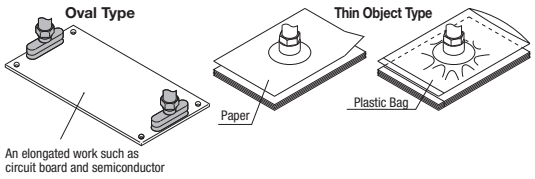
Structure Diagram



EX Specification

Type	VPET • VPTS	VPES • VPTSS
Max. Operation Temperature	110°	180°
Min. Operation Temperature	–30°	–50°
Weather Resistance	△	○
Ozone Resistance	△	◎
Acid Resistance	△	○
Alkali Resistance	○	◎
Oil Resistance (Gasoline, Light Oil)	◎	△
Oil Resistance (Benzene, Toluene)	△	△
Surface Resistivity	-	-

EX Example
- Oval Type is suitable for work requiring several small pads.
- Thin Object Type is suitable for conveying a thin paper-like object such as vinyl.

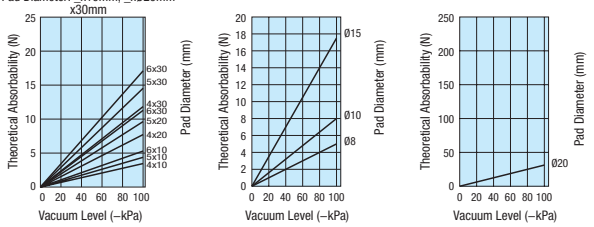


Order Example — Part Number: VPET4-10, VPTS8 — Days to Ship: 6 Days P.87

Properties

- Oval Type
- For Thin ObjectType

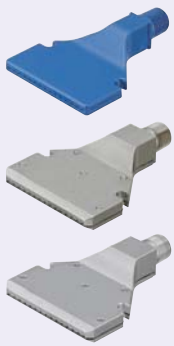
Pad Diameter: _x10mm, _xØ20mm x30mm



Air Nozzles
- Flat Type · 90° Type-

Features: Air Nozzles with even and strong jet force. Less air consumption and lower noise than the conventional metal nozzles such as Economy Type on P.1337, etc.

Flat Type RoHS

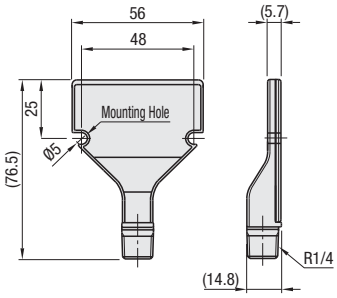


Type	Material	Max. Operating Pressure	Heat Resistant Temperature
AFTP	Thermoplastic (Denatured PPE)	0.7MPa	110°C
AFTA	EN AW-5052/AlMg2,5	0.4MPa	200°C
AFTS	1.4301/X5CrNi18-10		200°C

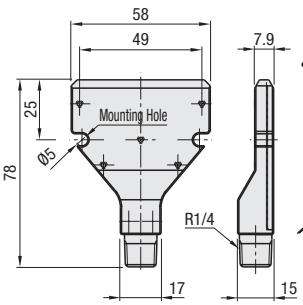
Applications: For removal of oil, water drops and scrapes, cooling / drying and air curtain, etc.
(Steel Hollows for Air Nozzles on **P.1339** is recommended for use as air curtains.)

Do not disassemble the body.
To prevent damage
· Avoid excessive tightening of screw.
· Avoid shocks to the screw.

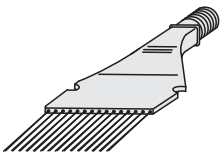
AFTP



AFTA·AFTS



•Air Spray Image

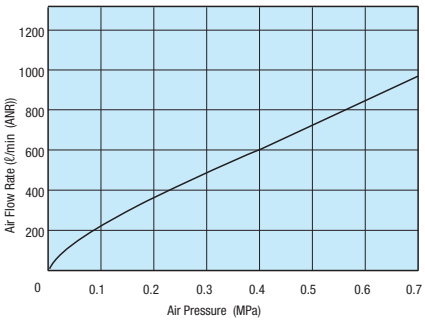


Part Number		Weight (g)			AFTP		AFTA		AFTS	
					€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	No.	AFTP	AFTA	AFTS	Qty.1-4	Qty. 5~	Qty.1-4	Qty. 5~	Qty.1-4	Qty. 5~
AFTP AFTA AFTS	15	15	60	165						

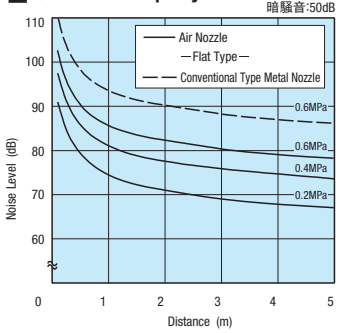
Order Example — Part Number: AFTP15

Days to Ship — 6 Days P.87

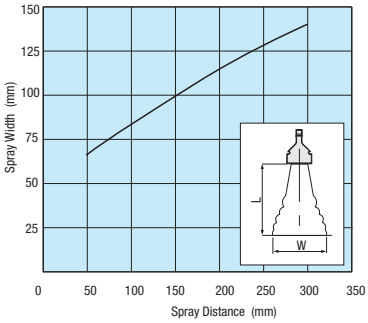
Air Flow Rate Property Table



Quietness Property Table

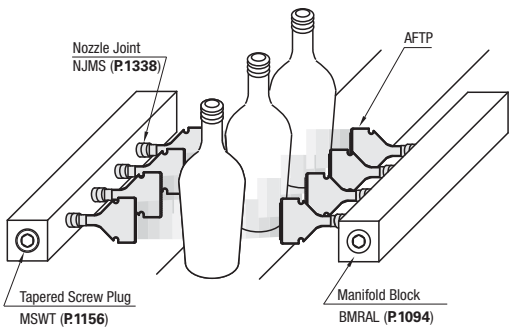


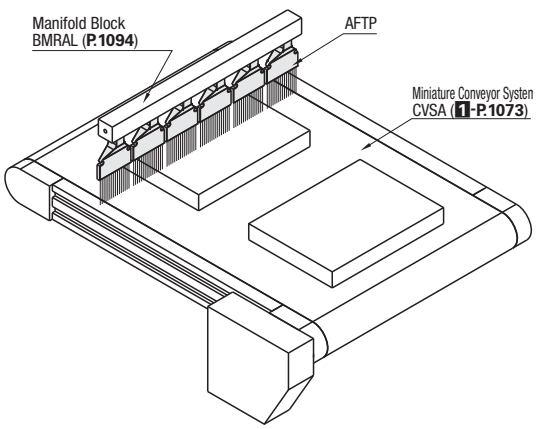
Spray Width Property Table



Values on the graph are for reference, not guaranteed.

Example





■90° Type

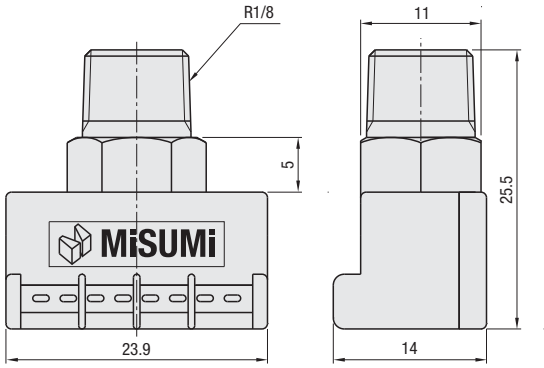
RoHS



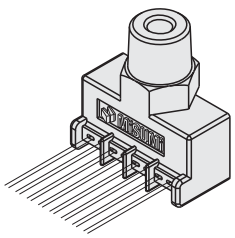
Type	Material	Max. Operating Pressure	Heat Resistant Temperature
AFTR	Thermoplastic (ABS Plastic)	0.7MPa	70°C

■**Features:** Suitable for space-saving. Easy to mount since air projection angle is vertical to the thread face.

To prevent damage
- Avoid excessive tightening of screw.
- Avoid shocks to the screw.



•Air Spray Image



Part Number Type	Part Number No.	Weight (g)	€ Unit Price Qty.1-4	Volume Discount Qty. 5~
AFTR	15	4		

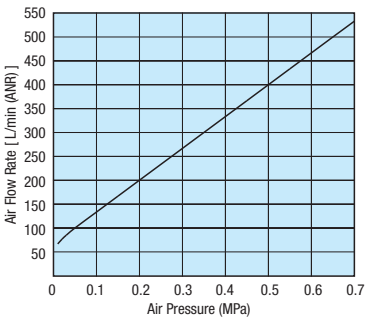
Order Example

Part Number
AFTR15

Days to Ship

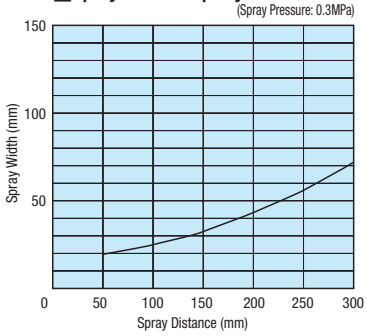
6 Days P.87

■Air Flow Rate Property Table

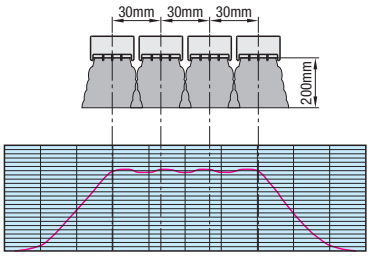


■Spray Width Property Cuvature

(Spray Pressure: 0.3MPa)

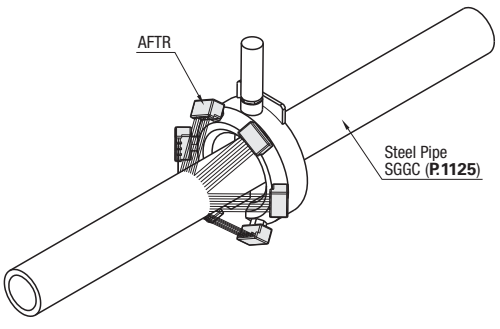


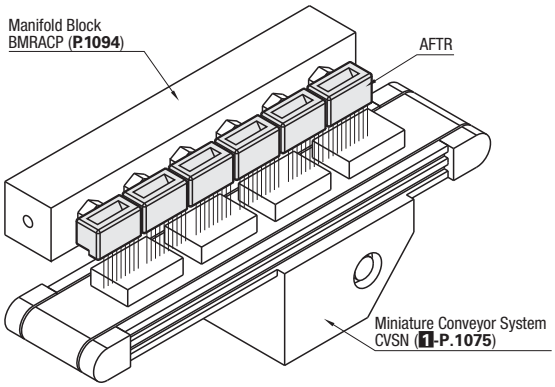
Distribution Uniform Rate (Image)



Values on the graph are for reference, not guaranteed.
Disribution Uniform Rate (Image) is given as guideline only.

Example





Air Nozzles
-Economy Type · Round Type-

CAD Data

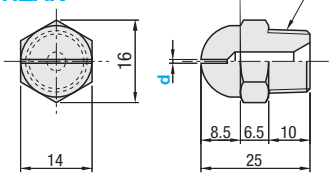
■Air Nozzles -Economy Type-

RoHS

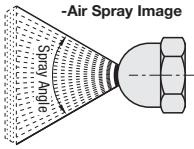




NZAK

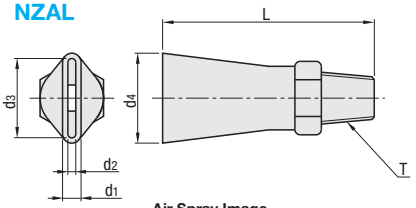


-Air Spray Image

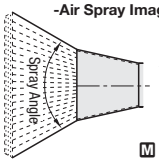


■Features:
Gas spreads fan-like in line to the slit.
■Usage:
Steam humidification, Drying, Air Blow, etc.

NZAL



-Air Spray Image



■Features:
Air sprayed at wide angle.
■Usage:
Dust Proof, Air Blow, etc.

Ⓜ Material: 1.4301/X5CrNi18-10

Part Number Type	No.	d Slot Width	T	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
NZAK	2	0.6 0.8 1.0 1.2 1.6	R1/4	22		

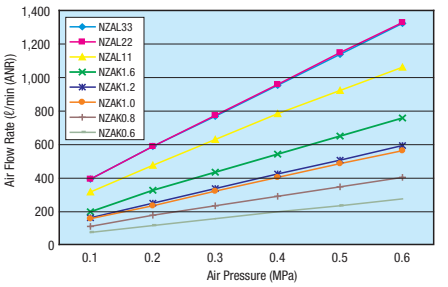
Part Number Type	No.	L	d1	d2	d3	d4	T	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
NZAL	11	40	3.1	1.5	10	11.6	R1/8	15		
	22	40	3.5	1.5	15	17		20		
	33	45	3.5	1.5	18.5	20.5		30		

■Spray Angle

Pressure [Mpa]	Spray Angle NZAK 2-0.6	2-0.8	2-1.0	2-1.2	2-1.6	NZAL 11	22	33
0.1	60°	60°	65°	65°	70°	25°	50°	55°
0.2	65°	70°	75°	70°	70°			
0.3	70°	75°	80°	75°	75°			
0.4	75°	80°	85°	80°	80°			
0.5	80°	85°	85°	85°	85°			
0.6	85°	85°	85°	85°	85°			

Ⓥ Listed values are for reference, not guaranteed.

■Air Flow Rate Property Table



Ⓥ Values on the graph are for reference, not guaranteed.

Order Example: Part Number NZAK2 - d 1.0 / NZAL11

Days to Ship: 6 Days P87

■Round Type

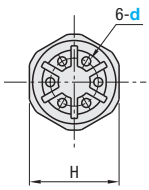
RoHS



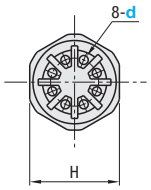
Type	Ⓜ Material	Max. Operating Pressure	Heat Resistance Temp.
ARDA	EN AW-5052	1.0MPa	200°C
ARDS	1.4305		

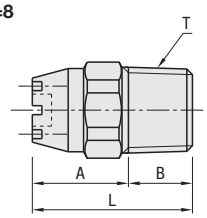
■Features: Strong straight air is sprayed through holes on the end.
■Applications: For removal of oil, water drops and scrapes, cooling / drying and air blow to narrow spaces, etc.

N (No. of Holes)=6

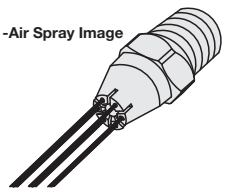


N (No. of Holes)=8





-Air Spray Image

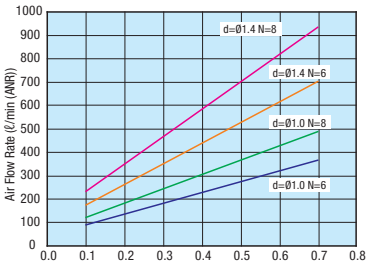


Part Number Type	d	N (No. of Holes)	T	L	A	B	H	Mass (g) ARDA	Mass (g) ARDS	ARDA € Unit Price 1~4 pieces	ARDA Volume Discount Qty. 5~	ARDS € Unit Price 1~4 pieces	ARDS Volume Discount Qty. 5~
ARDA ARDS	1.0	6	R1/4	25	15	10	14	6	15				
		8											
	1.4	6		32	22	10	17	10	28				
		8											

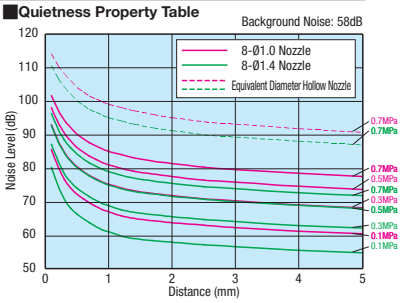
Order Example: Part Number ARDA1.0 - N (No. of Holes) 6

Days to Ship: 6 Days P87

■Air Flow Rate Property Table



■Quietness Property Table



Ⓥ Values on the graph are for reference, not guaranteed.

Nozzle Joints · Point Nozzles

CAD Data

■Nozzle Joint

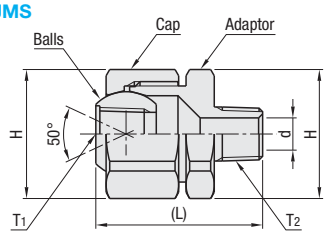
RoHS



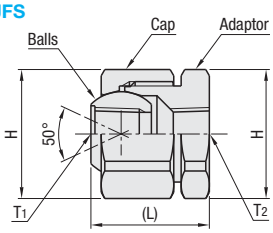
Type		Material	Max. Operating Pressure
Male Thread, Female Thread End	Both Ends Female Thread		
NJMS	NJFS	1.4305	1.0MPa

■Features
Swivel joints suitable for blows to anywhere.
Loosen a cap, tighten the joint by moving the ball, and the joint can be fixed at an arbitrary position.
Angle adjustable range is 50°.

Male Thread · Female Thread End
NJMS



Both Ends Female Thread
NJFS



※H dimension is the distance between parallel surfaces of the hexagon.

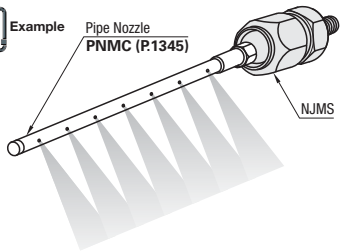
Part Number Type	No.	R/Rc (PT) T1	T2	(L)	d	H	Weight (g)	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
Male Thread, Female Thread End NJMS	1-1	1/8	1/8	32	5.5	22	80		
	1-2	1/8	1/4	36	8	22	90		
	2-2	1/4	1/4	41	8	29	170		
	2-3	1/4	3/8	43	11	29	190		
	3-3	3/8	3/8	49	11	35	290		

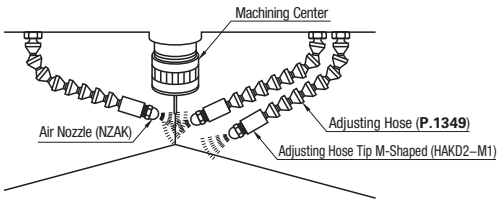
Part Number Type	No.	R/Rc (PT) T1	T2	(L)	H	Weight (g)	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
Both Ends Female Thread NJFS	1-1	1/8	1/8	24	22	65		
	1-2	1/8	1/4	24	22	65		
	2-2	1/4	1/4	30	29	140		
	2-3	1/4	3/8	30	29	140		
	3-3	3/8	3/8	35	35	240		

Order Example — Part Number: NJMS1-2

Days to Ship: 6 Days P.87

Example





Removal of Chips

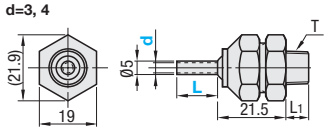
■Point Nozzles

RoHS

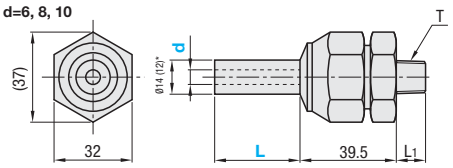


PNZRF

d=3, 4

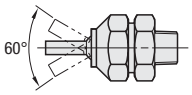


d=6, 8, 10



* When d=6, becomes dimension in ( ).

•Angle Specification Range — Tighten the hexagon nut and fix the nozzle at a desired angle.



M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	d Selection	L Selection	T	L1	€ Unit Price Qty.1~19 L10 · L15	L30	L50	L75	L100
PNZRF	5	3	10 15 30 50	M5	8					
		4								
	1	3 4	10 15 30 50 75 100	R1/8	10					
	2	3 4 6 8 10		R1/4	12					

※For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number: PNZRF2 - d: 3 - L: 10

Days to Ship: 8 Days — Express A: 3,00 EUR/piece P.88

※A Express Charge of 8,10 EUR for 3 or more identical pieces.

Steel Pipes for Air Nozzles · Steel Pipe Nozzles with Slit

CAD Data

■**Features:** Can be used as air curtains when combined with Air-Nozzles - Flat Type on **P.1335**

■Steel Pipes for Air Nozzles

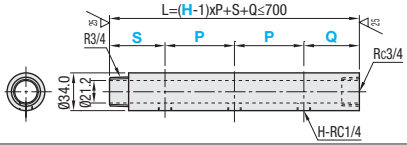


RoHS

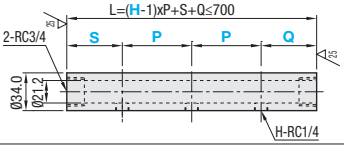
Type: Male Thread · Female Thread	Type: Both Ends Female Thread	M Material	S Surface Treatment	Normal Pressure	A Accessory
AMR	AMF	1.0305/P235G1TH	Zinc Plating	0.7MPa	Tapered Screw Plugs (1.7220/34CrMo4, Black Oxide)
AMRS	AMFS	1.4301/X5CrNi18-10-TP	-		Tapered Screw Plugs (1.4567/X3CrNiCu18-9-4)

■**Accessories**
Plumbing Terminals Tapered Screw Plug 1 pc. (with seal tape)

Male Thread · Female Thread
Threaded, Tapped Type



Both Ends Female Thread
Both Ends Tapped



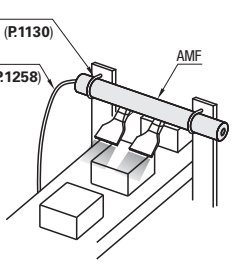
Part Number: Type	Part Number: No.	The Number of Side Female Thread Holes H	Pitch P 1mm Increment	S or Q 1mm Increment	AMR · AMF € Unit Price H1 · 2	H3 · 4	H5 · 6	H7 · 8	H9 · 10	AMRS · AMFS € Unit Price H1 · 2	H3 · 4	H5 · 6	H7 · 8	H9 · 10
(Male Thread · Female Thread) AMR AMRS / (Both Ends Female Thread) AMF AMFS	20A	1~10	60~80	35~80										

When H (the number of side tapped holes) is 1, specifying Pitch P is not necessary.

Order Example

Part Number	-	H (No. of Holes)	-	P	-	S	-	Q
AMR20A	-	1			-	S40	-	Q50
AMF20A	-	8		P70	-	S35	-	Q35

Example



Days to Ship

AMRS · AMFS **8 Days**
AMR · AMF **10 Days**

Express B | 5,00 EUR/ piece — P.87

A Express Charge of 13,50 EUR for 3 or more identical pieces.

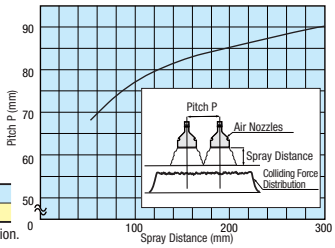
Price

■**Volume Discount** (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■**Spray Width Property Table**



The graph is the property table when Air Nozzle -Flat Type- on **P.1335** is installed.

Ex.)For spray distance at 200mm, Pitch P is 85 and colliding force becomes almost even.

Values on the graph are for reference, not guaranteed.

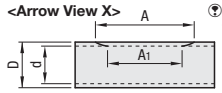
■Steel Pipe Nozzles with Slit



RoHS

Type: Male Thread · Female Thread	Type: Both Ends Female Thread	M Material	S Surface Treatment	A Accessory
SLTR	SLTF	1.0035/S185	Zinc Plating	Tapered Screw Plugs (1.7220/34CrMo4, Black Oxide)
SLTRS	SLTFS	1.4301/X5CrNi18-10-TP	-	Tapered Screw Plugs (1.4567/X3CrNiCu18-9-4)

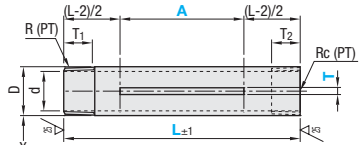
<Arrow View X>



Maximum difference of A-A1 is approx. 6mm.

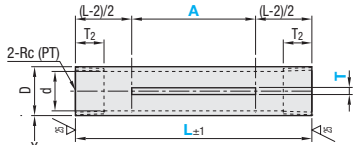
■**Accessories**
Plumbing Terminals Tapered Screw Plug 1 pc. (With Seal Tape)

Male Thread · Female Thread



A≤L-(T1+T2+10)

Both Ends Female Thread



A≤L-(2x2+10)

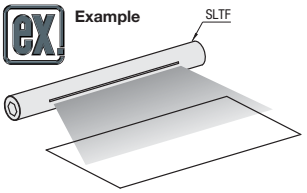
Part Number: Type	Part Number: No.	L 1mm Increment	A 1mm Increment	T 0.5mm Increment	R (PT) Rc (PT)	(T1)	(T2)	D	d: Material 1.0035/S185	d: Material 1.4301-TP	SLTR · SLTF € Unit Price L 250	L251~500	L501~700	SLTRS · SLTFS € Unit Price L 250	L251~500	L501~700
(Male Thread · Female Thread) SLTR SLTRS / (Both Ends Female Thread) SLTF SLTFS	6A	90~700	50~500	0.5~2.0	1/8	10	11	10.5	-	5.7						
	8A	100~700			1/4	15	13	13.8	9.2	7.8						
	10A				3/8	17	16	17.3	12.7	10.9						
	15A				1/2	20	18	21.7	16.1	16.1						
	20A	110~700			3/4	23	20	27.2	21.6	21.4						
	25A				1	25	22	34	27.6	27.2						

There is no surface treatment on threaded part and slit machining and its peripheral part. *Over tightening at machining threads may scratch them.
Excessive tightening may deform the female thread portion. Wrap with sealing tape for air tightness and after manual tightening, tighten it up further by giving one rotation or so.

Order Example

Part Number	-	L	-	A	-	T
SLTR8A	-	300	-	A200	-	T1.0

Example



Days to Ship 8 Days

Price

■**Volume Discount** (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■**Features:** Simple nozzles with a slit in a pipe.
Suitable when the distance to the object is short.

■**Precaution for Use:** Actual spray width and colliding force vary. And the slit width may increase in width depending on air pressure. When more even blows are required, use Air Nozzles (**P.1335**, **1336**) and Steel Pipes for Air Nozzles.

Steel Pipe Nozzles

-Both Ends Male Thread · Female Thread · One End Male Thread One End Female Thread

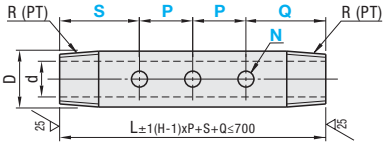
CAD Data

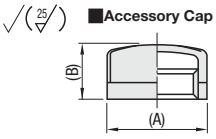


RoHS

■Both Ends Male Thread

Type		M Material	S Surface Treatment	A Accessory
S · Q Fixed	S · Q Configurable			
SGPPN	FSGPPN	1.0035/S185	Zinc Plating	Caps (JIS-FCMB270, Hot Zinc Plating)
SUTPN	FSUTPN	1.4301/X5CrNi18-10-TP	-	Caps (1.4301/X5CrNi18-10)

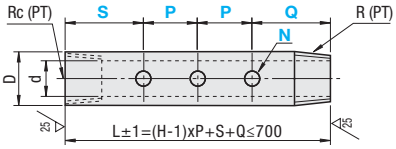




■Accessory Cap 1 pc.

■One End Male Thread / One End Female Thread

Type		M Material	S Surface Treatment	A Accessory
S · Q Fixed	S · Q Configurable			
SGPPW	-	1.0035/S185	Zinc Plating	Tapered Screw Plugs (1.7220/34CrMo4, Black Oxide)
SUTPW	FSUTPW	1.4301/X5CrNi18-10-TP	-	Tapered Screw Plugs (1.4567/X3CrNiCu18-9-4)

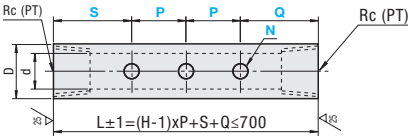


■Accessories

Plumbing Terminals Tapered Screw Plug 1 pc.
(With Seal Tape)

■Both Ends Female Thread

Type		M Material	S Surface Treatment	A Accessory
S · Q Fixed	S · Q Configurable			
SGPPF	FSGPFW	1.0035/S185	Zinc Plating	Tapered Screw Plugs (1.7220/34CrMo4, Black Oxide)
SUTPF	FSUTFW	1.4301/X5CrNi18-10-TP	-	Tapered Screw Plugs (1.4567/X3CrNiCu18-9-4)



■Accessories

Plumbing Terminals Tapered Screw Plug 1 pc.
(With Seal Tape)

* Male Thread ends are covered with sealing tapes before shipping.
There is no surface treatment for thread part.*Marks may be left on the surface when tightening screws.
Excessive tightening may deform the female thread portion. Wrap with sealing tape for air tightness and after manual tightening, tighten it up further by giving one rotation or so.

■S, Q Fixed

Part Number Type	No.	H No. of Holes	P 5mm Increment	N (Hole Dia.) 0.5mm Increment	R (PT) Rc (PT)	S, Q	D	d SGPP_	d SUTP_	Cap Dim: Both Ends Male Thread (A)	Cap Dim: Both Ends Male Thread (B)
SGPPN SUTPN SGPPW SUTPW SGPPF SUTPF	1	2~94	5~30	1.5~3.0	1/8	15	10.5	-	5.7	18	14
	2				1/4	20	13.8	9.2	7.8	22	15
	3				3/8		17.3	12.7	10.9	27	18
	4				1/2	25	21.7	16.1	16.1	31	20

■S, Q Configurable

Part Number Type	No.	H No. of Holes	P 5mm Increment	N (Hole Dia.) 0.5mm Increment	S 1mm Increment	Q 1mm Increment	R (PT) Rc (PT)	D	d FSGP_	d FSUT_	Cap Dim: Both Ends Male Thread (A)	Cap Dim: Both Ends Male Thread (B)
FSGPPN FSUTPN FSUTPW FSGPFW FSUTFW	1	2~94	5~30	1.5~3.0	15~200	15~200	1/8	10.5	-	5.7	18	14
	2				20~200	20~200	1/4	13.8	9.2	7.8	22	15
	3						3/8	17.3	12.7	10.9	27	18
	4				25~200	25~200	1/2	21.7	16.1	16.1	31	20

Order Example

Part Number	-	H (No. of Holes)	-	P	-	N	-	S	-	Q
SUTPN3	-	30	-	P10	-	N1.5				
FSUTPW2	-	40	-	P5	-	N2.0	-	S50	-	Q80

Days to Ship

8 Days | Express A | 3,00 EUR/ piece | P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

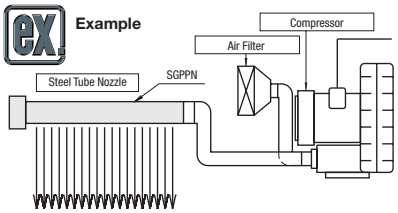
Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~19	20~34	35~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example



No.	SGPPN · SGPPF € Unit Price H2~25	H26~50	H51~75	H76~94	SUTPN · SUTPF € Unit Price H2~25	H26~50	H51~75	H76~94	SGPPW € Unit Price H2~25	H26~50	H51~75	H76~94	SUTPW € Unit Price H2~25	H26~50	H51~75	H76~94
1																
2																
3																
4																

No.	FSGPPN · FSGPFW € Unit Price H2~25	H26~50	H51~75	H76~94	FSUTPN · FSUTFW € Unit Price H2~25	H26~50	H51~75	H76~94	FSUTPW € Unit Price H2~25	H26~50	H51~75	H76~94
1												
2												
3												
4												

Nozzles for Pipe Washing · Terminals for Nozzles
-Multi-port Clamp-

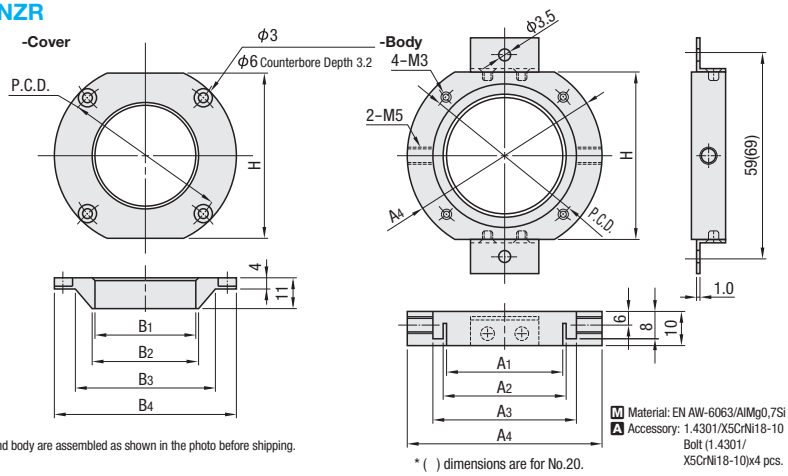
CAD Data

■Nozzles for Pipe washing



RoHS

PWNZR



* Cover and body are assembled as shown in the photo before shipping.

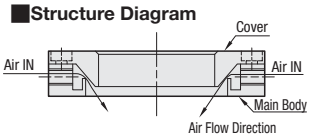
* ( ) dimensions are for No.20.

M Material: EN AW-6063/AlMg0,7Si
A Accessory: 1.4301/X5CrNi18-10 Bolt (1.4301/X5CrNi18-10)x4 pcs.

Part Number Type	No.	H	Cover Dimension B1	B2	B3	B4	Body Dimension A1	A2	A3	A4	P.C.D.	Applicable Max. Pipe Outer Ø	€ Unit Price 1~19 pcs.
PWNZR	10	49	26	28	40	57	34	36	42	57	49	Ø20	
	20	59	36	38	50	67	44	46	52	67	59	Ø30	

For orders larger than indicated quantity, please request a quotation.

■Structure Diagram

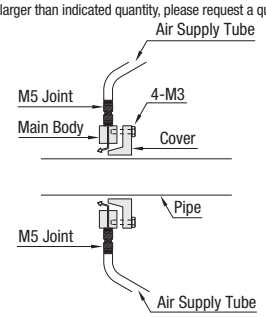


Order Example

Part Number
PWNZR10

Days to Ship 8 Days

Example



■Step

(1)Assemble body and cover, then attached pipe for cleaning to the nozzle.
(2)With air pressure from both sides by an air compressor, air out-flows evenly from internal clearance.

■Specification

Nozzle Air Pressure Mpa (kg/cm2) when service air pressure is 0.69Mpa (7kg/cm2).
-No.10 0.15 (1.54)
-No.20 0.11 (1.19)

-Use for blowing around cylindrical work (pipe, etc.).

■Terminals for Nozzles -Multi-port Clamp-

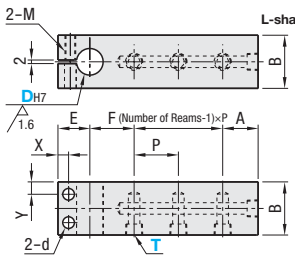


RoHS

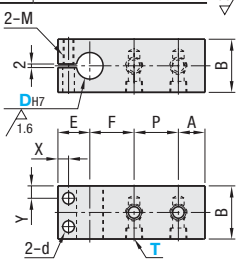
Type Through Pilot Hole	Type L-shaped Hole	M Material	S Surface Treatment	A Accessory
NZTE	NZTL	EN AW-5052/ AlMg2,5	-	Hexagon Socket Head Cap Screw (1.4301/X5CrNi18-10)
NZTEA	NZTLA		Clear Anodizing	

6.3 (1.6)

Through Pilot Hole



L-shaped Hole



* Number of reams 3 is selected in the drawing.

Number of reams 2 is selected in the drawing.

Part Number Type	D	Number of Reams	T Rc (PT) or M Selectable	P	B	E	F	A Pilot Hole	A L-shaped	Y	X	d	M	Included Bolt M-L
Through Pilot Hole NZTE NZTEA	12	1 2 3	1(1/8) 5(M5)	20	20	18	20	15	10	4.5	6	5.5	M5	M5-18
L-shaped Hole NZTL NZTLA	15													
	20		1(1/8) 2(1/4)	25	30	22	25	20	15	7	7	6.6	M6	M6-28
	25			30	40	32	35	30	16	7	10	9	M8	M8-40

DH7 tolerances is measured before slitting.

Order Example

Part Number	-	Number of Reams	-	T
NZTE15	-	1	-	1
NZTLA20	-	3	-	1

Days to Ship

-Non-anodized 8 Days

-White Alumited Products 10 Days

Express B 8,00 EUR/ piece P.88

A Express Charge of 21,60 for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

D	€ Unit Price NZTE Number of Reams 1	NZTE Number of Reams 2	NZTE Number of Reams 3	NZTEA Number of Reams 1	NZTEA Number of Reams 2	NZTEA Number of Reams 3	NZTL Number of Reams 1	NZTL Number of Reams 2	NZTL Number of Reams 3	NZTLA Number of Reams 1	NZTLA Number of Reams 2	NZTLA Number of Reams 3
12												
15												
20												
25												

Terminals for Nozzles
-Clamp Type / Block Type-

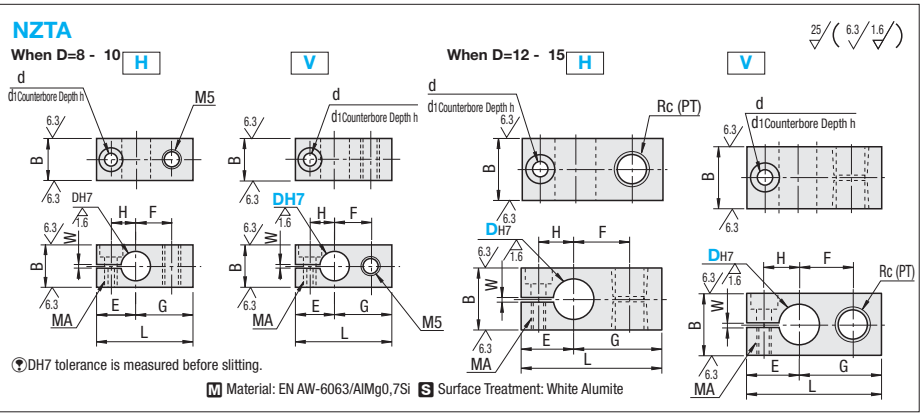
CAD Data

■Terminals for Nozzles -Clamp Type-



RoHS

NZTA



DH7 tolerance is measured before slitting.

M Material: EN AW-6063/AlMg0,7Si S Surface Treatment: White Alumite

Part Number Type	D	No.	Rc (PT)	B	L	E	G	H	F	MA	d	d1	h	W	Included Bolt	€ Unit Price
NZTA	8	H	-	12	27	11	16	7	10	M3	3.5	6.5	3.5	1	SCB3- 8	
		V														
	10	H		16	30	13.5	16.5	8.5		M4	4.5	8	4.5	1.5	SCB4-10	
		V														
	12	H	1/8	18	40	15	25	10	16	M4	4.5	8	4.5	1.5	SCB4-10	
		V														
	15	H	1/4	22	52	19	33	13	22	M5	5.5	9.5	5.5	1.5	SCB5-15	
		V														

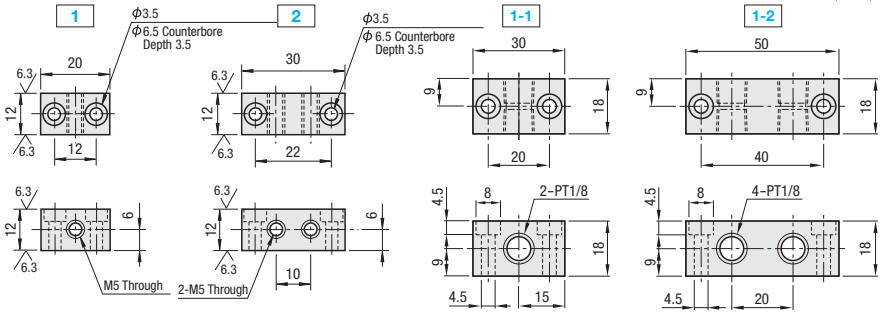
■Terminals for Nozzles -Block Type-



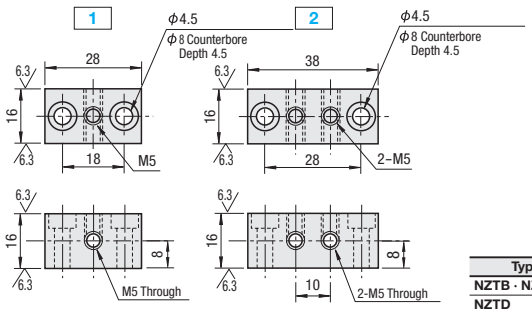


RoHS

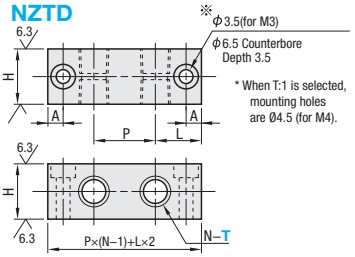
NZTB



NZTC



NZTD



* Specify No. of tapped hole 1~4.

Type	M Material	S Surface Treatment
NZTB · NZTC	EN AW-6063/AlMg0,7Si	White Alumite
NZTD	1.4301/X5CrNi18-10	-

Part Number Type	No.	€ Unit Price
NZTB	1	
	2	
	1-1	
	1-2	
NZTC	1	
	2	

Part Number Type	No.	T Thread Selection	N No. of Female Thread Holes	1/16 P	1/16 H	1/16 L	1/16 A	1/8 P	1/8 H	1/8 L	1/8 A	M3 or M5 P	M3 or M5 H	M3 or M5 L	M3 or M5 A	M6 P	M6 H	M6 L	M6 A	€ Unit Price T=0.5	€ Unit Price T=1	€ Unit Price T=3 or 5 or 6
NZTD	1	0.5(1/16)	1	-	14	12	4	-	19	15	5	-	12	10	4	-	12	10	4			
	2	1(1/8)	2	16	14	12	4	20	19	15	5	10	12	10	4	12	12	10	4			
	3	3(M3)	3	16	14	12	4	20	19	15	5	10	12	10	4	12	12	10	4			
	4	5(M5) 6(M6)	4	16	14	12	4	20	19	15	5	10	12	10	4	12	12	10	4			

Order Example

Part Number - No. - T Price

NZTA8 - H
NZTB1-1
NZTC1
NZTD4 - 0.5

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

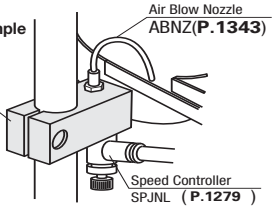
-NZTA · NZTB · NZTC: 6 Days P87

-NZTD: 8 Days Express A 3,00 EUR/piece P88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Example

NZTA



Air Blow Nozzles

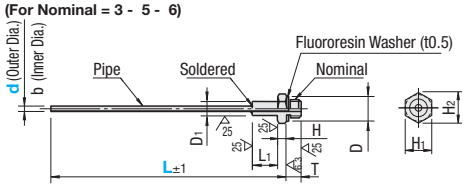
CAD Data

RoHS

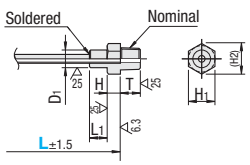


	Male Thread		Female Thread		Knurling Crisscross	Terminal Block	M Material	H Hardness
	Annealing	No Annealing	Annealing	No Annealing	Annealing	Annealing		
L Dimension Fixed	ABNZ	ABNZN	ABNZM	ABNZMN	ABNK	ABTA	Body - Hollow 1.4301	Annealing HV200 or Less No Annealing HV250 ~ 380
L Dim. Configurable	ABNZL	ABNZNL	ABNZML	ABNZMNL	ABNX	ABTAL		

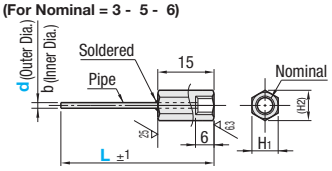
·Male Thread
(For Nominal = 3 - 5 - 6)



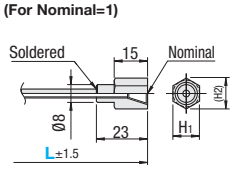
(When Nominal = 0.5 - 1)



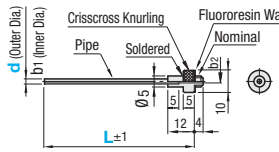
·Female Thread
(For Nominal = 3 - 5 - 6)



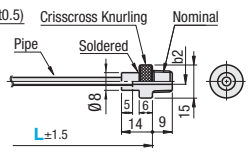
(For Nominal=1)



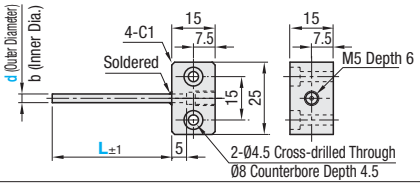
·Knurling Crisscross
(For Nominal=5)



(For Nominal=1)



·Terminal Block



■Male Thread - Female Thread

Part Number Type	Nominal	d	L Dimension Fixed Selection	L Dim. Configurable 1mm Increment	b	Thread Size R/Rc (PT)	D1	L1	T	H	H1	(H2)	D	L Dimension Fixed € Unit Price Male Thread ABNZ	L Dimension Fixed € Unit Price Female Thread ABNZN	ABNZM	ABNZMN	L Dim. Configurable € Unit Price Male Thread ABNZL	ABNZNL	Female Thread ABNZML	ABNZMNL
(L Dimension Fixed) ABNZ ABNZN ABNZM ABNZMN (L Dimension Configurable) ABNZL ABNZNL ABNZML ABNZMNL	3	1.0	100	20~99	0.5	M3	4	7	4	2.5	7	6.9	7								
		1.5			0.8																
		2.0			1.0																
	5	1.0			0.5	M5						8.1									
		1.5			0.8																
		2.0			1.0																
		2.5			1.5																
		3.0			2.0																
	6	1.0			0.5	M6	5	9	5	3	8	9.2	9								
		1.5			0.8																
		2.0			1.0																
		2.5			1.5																
		3.0			2.0																
	0.5	1.0		25~99	0.5	1/16	7	8	8	4	10	11.5	-								
		1.5			0.8																
		2.0			1.0																
		2.5			1.5																
		3.0			2.0																
	1	4.0	100	30~199	3.0	1/8	8		9	6	12	13.8									
		5.0	200		4.0																
		6.0			5.0																

■Knurling Crisscross

Part Number Type	Nominal	d	L Dim. Fixed	L Dim. Configurable 1mm Increment	b1	b2	Thread Size R (PT)	€ Unit Price L Dim. Fixed ABNK	L Dim. Config. ABNX
(L Dimension Fixed) ABNK (L Dimension Configurable) ABNX	5	1.0	100	20~99	0.5	2.0	M5		
		1.5			1.0	2.0			
		2.0			1.0	2.0			
		2.5			1.5	2.3			
		3.0			2.0	2.8			
	1	4.0			3.0	3.0	1/8		
		5.0			4.0	4.0			
		6.0			5.0	5.0			

■Terminal Block

Part Number Type	Nominal	d	L Dim. Fixed	L Dim. Configurable 1mm Increment	b	€ Unit Price L Dim. Fixed ABTA	L Dim. Conf. ABTAL
(L Dimension Fixed) ABTA (L Dimension Configurable) ABTAL	5	1.0	100	20~99	0.5		
		1.5			0.8		
		2.0			1.0		
		2.5			1.5		
		3.0			2.0		

(?)The annealed pipe of d=1.0~3.0 can be manually bent (not applicable to d=4.0 or more). Be careful to bend referring to rough standard of minimum bending radius; outer diameter x 3. Annealed pipe is available for Straight Type.
(?)An industrial cutter can cut the pipe, rolling it.
(?)The body may be tarnished due to heat by brazing.

Alterations

Part Number - d - L - (CC) → ABNX5 - d1.0 - L50 - CC45

10 Days

Alterations	Tip Cut 45°
	
Code	CC45
Spec.	Cuts the tip of nozzle at 45°. Applicable to wide-range air blow. Ordering Code CC45 (?)Knurling Crisscross Type Applicable to ABNX only.
Price Adder	2,00

Order Example

Part Number	d	L
ABNZ5	1.5	100
ABNZNL5	2.0	65

Days to Ship: 6 Days

•L Dimension Fixed (part) P.87

-L Dimension Fixed Type (Other than the Left): 8 Days

-L Dimension Configurable: 8 Days

Express A | 3,00 EUR/ piece P.88

(?)A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

Air Blow Nozzles

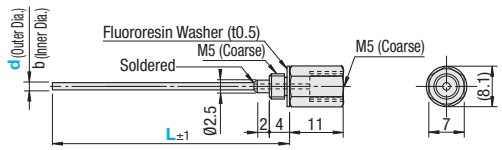
CAD Data

RoHS

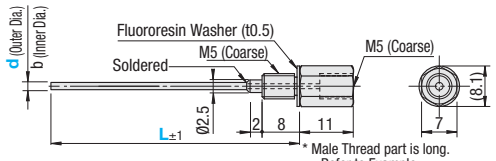


	Male Thread / Female Thread	Height Adjusting Male Thread, Female Thread	Strut Clamp Mounting Type	2-Core Male Thread	Barbed Coupler Type	Hose Nipple Type	M Material	H Hardness
L Dimension Fixed	ABNZH	ABNML	ABNZS	ABNKH	ABNZT	ABNZP	Body - Hollow 1.4301/X5CrNi18-10	HV200 or Less
L Dim. Configurable	ABNZHL	ABNMLL	ABNZSL	ABNXH	ABNZTL	ABNZPL		

-Male Thread · Female Thread ABNZH (L Dim. Fixed) **ABNZHL** (L Dim. Configurable)

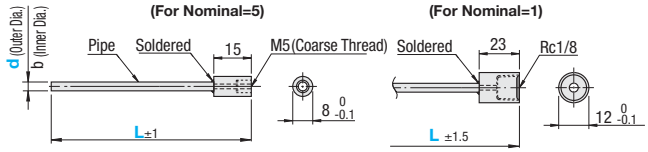


-Height Adjusting Male Thread, Female Thread ABNML (L Dim. Fixed) **ABNMLL** (L Dim. Config.)

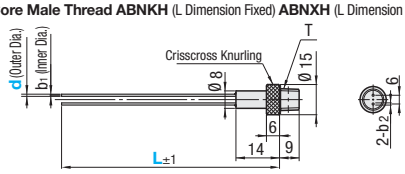


* Male Thread part is long. Refer to Example.

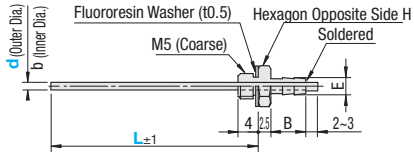
-Strut Clamp Mounting ABNZS (L Dimension Fixed) **ABNZSL** (L Dimension Configurable)



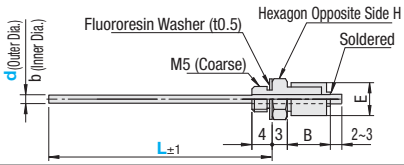
-2-Core Male Thread ABNKH (L Dimension Fixed) **ABNXH** (L Dimension Configurable)



-Barbed Coupler ABNZT (L Dimension Fixed) **ABNZTL** (L Dimension Configurable)



-Hose Nipple ABNZP (L Dimension Fixed) **ABNZPL** (L Dimension Configurable)



■Male Thread · Female Thread ■Height Adjusting Male Thread · Female Thread ■Strut Clamp Mounting

Part Number Type	Nominal	d	L Dimension Fixed Selection	L Dimension Configurable 1mm Increment	b	L Dimension Fixed € Unit Price ABNZH · ABNML	L Dimension Fixed € Unit Price ABNZS	L Dimension Configurable € Unit Price ABNZHL · ABNMLL	L Dimension Configurable € Unit Price ABNZSL
(L Dimension Fixed) ABNZH ABNML ABNZS	5	1.0 2.0 2.5	100	20~99	0.5 0.8 1.0 1.5				
(L Dimension Configurable) ABNZHL ABNMLL ABNZSL	1	3.0 4.0 5.0 6.0	100 200	30~199	2.0 3.0 4.0 5.0				

■2-Core Male Thread

Part Number Type	Nominal	Nozzle Qty.	d	L Dimension Fixed	L Dim. Configurable 1mm Increment	T R (PT)	b1	b2	€ Unit Price L Dim. Fixed ABNKH	€ Unit Price L Dim. Config. ABNXH
(L Dimension Fixed) ABNKH (L Dimension Configurable) ABNXH	1	2	1.0 1.5 2.0	100	20~99	1/8	0.5 1.0 1.0	1.0 1.5 2.0		

The annealed pipe of d=1.0~3.0 can be manually bent (not applicable to d=4.0 or more). Be careful to bend referring to rough standard of minimum bending radius; outer diameter x 3.
An industrial cutter can cut the pipe, rolling it.
The body may be tarnished due to heat by brazing.
When Barbed Coupler Type is used in combination with tube, use the same No. as outer diameter of tube on **P.1258**

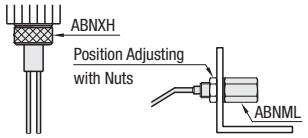
■Barbed Coupler

Part Number Type	No.	d	L Dimension Fixed	L Dim. Configurable 1mm Increment	b	B	E	H	€ Unit Price L Dim. Fixed ABNZT	€ Unit Price L Dim. Config. ABNZTL
(L Dimension Fixed) ABNZT (L Dimension Configurable) ABNZTL	4 6	1.0 1.5 2.0 2.5	100	20~99	0.5 0.8 1 1.5	6.9 7	3.4 4.8	7 7		

■Hose Nipple

Part Number Type	No.	d	L Dimension Fixed	L Dim. Configurable 1mm Increment	b	B	E	H	€ Unit Price L Dim. Fixed ABNZP	€ Unit Price L Dim. Config. ABNZPL
(L Dimension Fixed) ABNZP (L Dimension Configurable) ABNZPL	4 6	1.7 2.5	100	20~99	0.9 1.5	8.5 9.5	6.5 8.5	7 8		

Example



Order Example

Part Number	-	Nozzle Quantity	-	d	-	L
ABNZH5				1.5		100
ABNZSL1				5.0		172
ABNKH1	-	2	-	1.0	-	100

-ABNZH · ABNML · ABNZS
6 Days P.87

-ABNKH · ABNZT · ABNZP
8 Days Express A 3,00 EUR/ piece P.88
A Express Charge of 8,10 EUR for 3 or more identical pieces.

-L Dimension Configurable
10 Days Express B 3,00 EUR/ piece P.88
A Express Charge of 8,10 EUR for 3 or more identical pieces.
Express Serviceis not available for ABNXH.

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Air Blow Nozzles

-Pipe Nozzles / Copper Pipes for Air Blow / Nozzles with Attachment Plate-

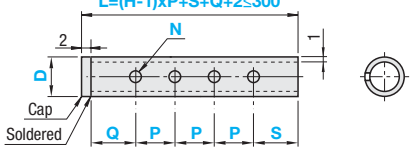
CAD Data

Pipe Nozzles

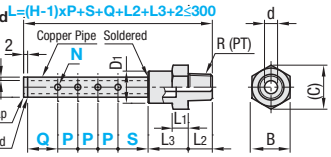


Type			Material
Straight	Male Thread	Female Thread	
PNZC	PNMC	PNRC	Copper Hollow (CW024A/Cu-DHP-T)
PNZS	PNMS	PNRS	1.4301/X5CrNi18-10

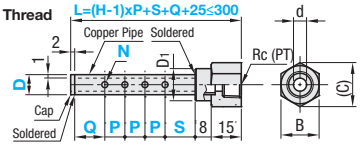
Straight



Male Thread



Female Thread



The body may be tarnished due to heat by brazing.
The above drawing is for 4 hole rows.

If threaded or tapped type is used, it is recommended to use a nozzle joint (**P.1338**) to blow at a desired angle.

Straight

Part Number Type	D	H No. of hole	P 1mm Increment	N (Hole Dia.) Selection	S · Q 1mm Increment	PNZC € Unit Price H1~9	PNZC € Unit Price H10~20	PNZS € Unit Price H1~9	PNZS € Unit Price H10~20
PNZC PNZS	6 8 10	1~20	5~30	1.0 1.5 2.0	15~50				

Male Thread - Female Thread

When H=1, specification of P (Pitch) is not necessary.

Part Number Type		D	H No. of hole	P 1mm Incr.	N (Hole Dia.) Selection	S or Q 1mm Increment	R/Rc (PT)	B	L1	L2	L3	D1	d	(C)	PNMC · PNRC € Unit Price H1~9	PNMC · PNRC € Unit Price H10~20	PNMS · PNRS € Unit Price H1~9	PNMS · PNRS € Unit Price H10~20
(Male Thread)	(Female Thread Type)	6	1~20	5~30	1.0 1.5 2.0	15~50	1/8	12	6	9	14	10	4	13.8				
PNMC	PNRC	8					1/4	16		12		14	6	18.4				
PNMS	PNRS	10						19	8			20	16	6.5	21.9				

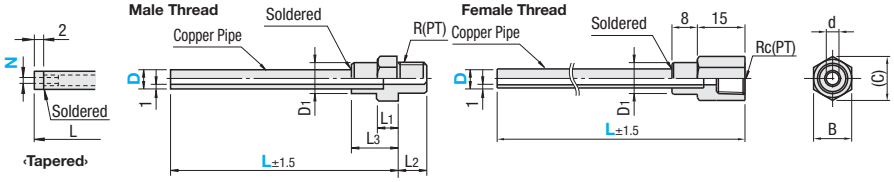
When H=1, specification of P (Pitch) is not necessary.

Copper Pipes for Air Blow



Type			Material			
Male Thread		Female Thread				
Straight	Tapered	Straight	Body	Pipe		Tapered
DKNZ	DKNZP	DKNZF	CW614N	CW024A/Cu-DHP-T		CW614N
DKNZN	DKNZNP	DKNZFN		Annealed Copper Pipe (CW024A/Cu-DHP-T – 0)		

The body may be tarnished due to heat by brazing.
The Annealing Copper Pipe is slightly bent.



Straight

Part Number Type	D	L Selection	R/Rc (PT)	B	L1	L2	L3	D1	d	(C)	DKNZ · DKNZF € Unit Price L100	DKNZ · DKNZF € Unit Price L200	DKNZ · DKNZF € Unit Price L300	DKNZ · DKNZF € Unit Price L500	DKNZN · DKNZFN € Unit Price L100	DKNZN · DKNZFN € Unit Price L200	DKNZN · DKNZFN € Unit Price L300	DKNZN · DKNZFN € Unit Price L500
DKNZ DKNZN DKNZF DKNZFN	6 8 10	100 200 300 500	1/8	12	6	9	14	10	4	13.8								
			1/4	16		12		14	6	18.4								
				19	8			20	16	6.5	21.9							

Tapered

Part Number Type	D	L 1mm Increment	Ø of Tapered Hole N	R/Rc (PT)	B	L1	L2	L3	D1	d	(C)	DKNZP € Unit Price L50~250	DKNZP € Unit Price L251~500	DKNZNP € Unit Price L50~250	DKNZNP € Unit Price L251~500
DKNZP DKNZNP	6 8 10	50~500	1.0 1.5 2.0	1/8	12	6	9	14	10	4	13.8				
				1/4	16		12		14	6	18.4				
					19	8			20	16	6.5	21.9				

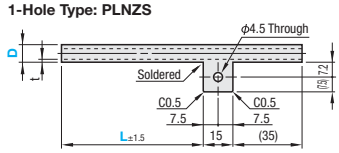
Nozzles with Attachment Plate -1-Hole Type- · 2-Hole Type-



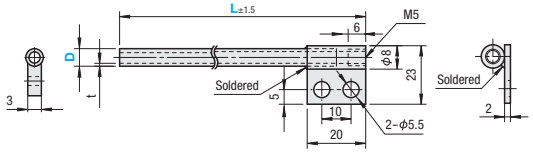
Type	No. of Holes	Material Hollow	Material Body	Material Plate
PLNZS	1Hole	1.4301/X5CrNi18-10		
PLNZC	2Holes	CW024A/Cu-DHP-T	CW614N/CuZn39Pb3	1.4301/X5CrNi18-10

The body may be tarnished due to heat by brazing.

1-Hole Type: PLNZS



2-Hole Type: PLNZC



Part Number Type	D	L 1mm Increment	t	€ Unit Price L50~150	€ Unit Price L151~300
PLNZS	3	100~300	0.5		
PLNZC	4 6	50~300	0.5 1.0		

Order Example

Pipe Nozzles

Part Number	-	H (No. of rows of hole)	-	P	-	N	-	S	-	Q
PNZC8	-	10	-	P10	-	N1.5	-	S15	-	Q15
PNMS10	-	1			-	N1.0	-	S20	-	Q20

Copper Pipes for Air Blow

Part Number	-	L	-	N
DKNZFN8	-	300		
DKNZP8	-	200	-	N1.0

Nozzles with Attachment Plate

Part Number	-	L
PLNZC6	-	150

Days to Ship

· PNZ_ · PNM_ · PNR_ · DKN_ · PLNZS

8 Days

Express A | 3,00 EUR/ piece | **P.88**

A Express Charge of 8,10 EUR for 3 or more identical pieces.

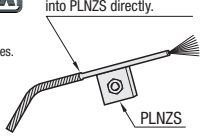
· PLNZC

10 Days

Express B | 3,00 EUR/ piece | **P.88**

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Insert tube with inner dia. Ø2.5 (Ex. PUT4 on **P.1258**) into PLNZS directly.



Price

Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

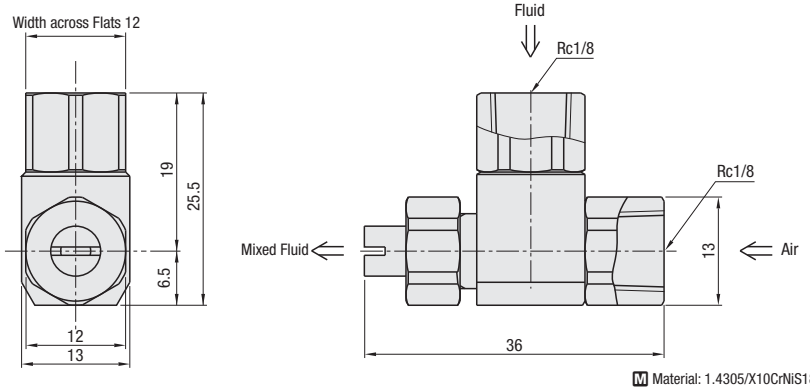
Two-Fluid Nozzles

CAD Data

RoHS



WANR



M Material: 1.4305/X10CrNiS18-9

Part Number		Fluid Min. Passage Dia. (mm)	Mass (g)	€ Unit Price	Volume discount price
Type	No.			Qty. 1~4	Qty. 5~
WANR	0.5	0.5	35		

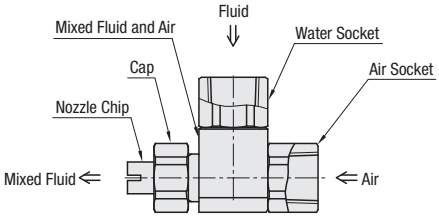
Order Example

Part Number
WANR0.5

Days to Ship

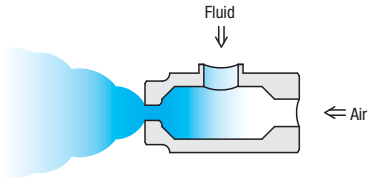
6 Days P.87

Component Details



Principle of Operation

Fluid and air are mixed in the nozzle.



Features

-Able to spray fine mists by mixing fluid and air at the same time.
(Produces finer particles than the Spray Nozzles (**P.1347·1348**)
-Compact and lightweight and useable in small space.
-Fluid flow rate and air are adjustable by adjusting pressure. Particle diameter gets finer as air percentage (air-water volume ratio) gets higher.

Usage

Humidification, cooling, spray of chemical solution, etc.

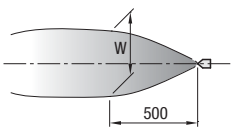
Air Pressure (MPa)	Water Qty. (mℓ/min) / Air Qty. (ℓ/min (ANR)) of Hydraulic Pressure below (MPa)								Spray Width (mm) at Water Pressure (MPa) below (Spray Distance 500mm)		
	0.2		0.3		0.4		0.5				
	Water Qty.	Air Qty.	Water Qty.	Air Qty.	Water Qty.	Air Qty.	Water Qty.	Air Qty.	0.2	0.3	0.4
0.1	182	28	228	27	258	26	284	25	800	900	900
0.2	146	47	200	45	248	43	280	41	800	800	900
0.3	102	65	168	63	222	61	259	59	700	800	900
0.4	58	83	127	82	189	80	232	78	600	800	900
0.5	-	-	92	97	158	96	207	95	-	800	900

[-] indicates that the amount of water spray is too little or only air is sprayed.
Spray Width (mm) is the length shown in the drawing below.

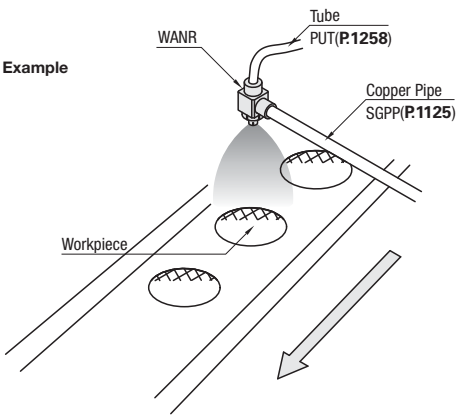
Spray Photo



Spray Width W (mm)



Example



Add. Spec. Spray Nozzles

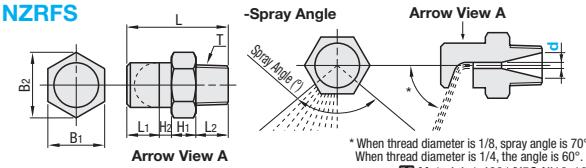


RoHS

Spray Shape: Fan-shaped



NZRFS



* When thread diameter is 1/8, spray angle is 70°.
When thread diameter is 1/4, the angle is 60°.

M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	d (Hole Ø)	T	L	L1	L2	H1	H2	B1	B2	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
NZRFS	1	1.0	R1/8	25.0	8.0	8.0	6.0	3.0	12.0	13.6	15.0		
		1.2											
		1.6											
		2.0											
		2.5											
	2	2.0	R1/4	32.0	12.0	10.0	6.0	4.0	14.0	16.0	28.0		
		2.5											
		3.2											
		4.0											

Features: Water is sprayed at wide angle under low pressure, and forms water film.

Applications: Cleaning, liquid application on glass or film surface.

NZRFS Specification

Size	Hole Dia. (mm)	1.0					1.2					1.6					2.0					2.5				
1/8	Water Pressure (MPa)	0.05	0.07	0.10	0.15	0.20	0.05	0.07	0.10	0.15	0.20	0.05	0.07	0.10	0.15	0.20	0.05	0.07	0.10	0.15	0.20	0.05	0.07	0.10	0.15	0.20
	Water Quantity (ℓ/min)	0.39	0.47	0.54	0.67	0.78	0.58	0.69	0.79	0.97	1.12	1.08	1.26	1.48	1.81	2.09	1.72	2.02	2.34	2.89	3.35	2.71	3.17	3.64	4.45	5.19
	Spray Angle (°)	60	70	85	95	110	75	85	100	105	110	100	110	120	120	125	115	125	135	140	145	115	125	130	135	140
Size	**Hole Dia. (mm)**	**2.0**					**2.5**					**3.2**					**4.0**									
1/4	Water Pressure (MPa)	0.05	0.07	0.10	0.15	0.20	0.05	0.07	0.10	0.15	0.20	0.05	0.07	0.10	0.15	0.20	0.05	0.07	0.10	0.15	0.20					
	Water Quantity (ℓ/min)	1.69	2.01	2.32	2.86	3.32	2.82	3.34	3.84	4.72	5.45	4.33	5.09	5.79	7.14	8.14	7.08	8.29	9.34	11.55	13.35					
	Spray Angle (°)	105	110	115	125	130	115	120	125	130	135	115	120	130	135	135	120	125	135	135	140					

Listed values are not guaranteed values but representative values.

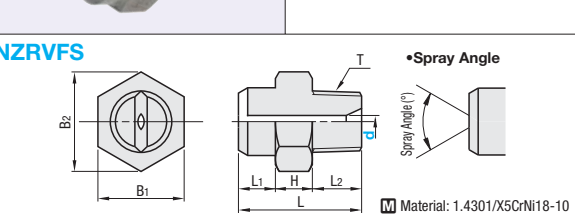


RoHS

Spray Shape: Fan-shaped



NZRVFS



M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	d (Hole Ø)	T	L	L1	L2	H	B1	B2	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
NZRVFS	1	2.0	R1/8	20.0	6.0	8.0	6.0	12.0	13.6	13.0		
		2.5										
		3.2										
		3.6										
	2	4.0	R1/4	22.0	6.0	10.0	6.0	14.0	16.0	20.0		
		5.0										
		6.4										
		7.0										

Features: It is suitable for high pressure cleaning that requires strong impact by water pressure.

Applications: Cleaning of semiconductor and pretreatment e.g. washing before liquid application.

NZRVFS Specification

Size	Hole Dia. (mm)	2.0				2.5				3.2				3.6			
1/8	Water Pressure (MPa)	0.10	0.20	0.30	0.50	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50
	Water Quantity (ℓ/min)	1.12	1.58	1.92	2.49	1.38	1.94	2.37	3.08	1.32	1.81	2.51	3.07	3.97	1.77	2.41	3.38	4.15	5.34
	Spray Angle (°)	50	60	65	70	55	55	55	60	45	50	60	60	65	45	55	60	65	65
Size	**Hole Dia. (mm)**	**4.0**				**5.0**				**6.4**				**7.0**					
1/4	Water Pressure (MPa)	0.05	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50
	Water Quantity (ℓ/min)	2.48	3.37	4.72	5.79	7.43	3.62	4.89	6.88	8.44	10.88	5.62	7.57	10.62	13.07	16.9	6.58	8.82	12.54	15.3	19.78
	Spray Angle (°)	50	60	60	65	70	55	60	70	70	75	60	65	70	75	75	55	60	65	65	70

Listed values are not guaranteed values but representative values.

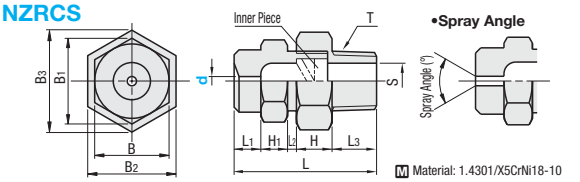


RoHS

Spray Shape: Full-Circular Shape



NZRCS



M Material: 1.4301/X5CrNi18-10

Part Number Type	No.	d (Hole Ø)	T	S	L	L1	L2	L3	H	H1	B	B1	B2	B3	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
NZRCS	1	1.6	R1/8	Ø5	23.5	3	1	8.5	6	5	12	14	12	14	16.0		
		2.0															
	2	2.0	R1/4	Ø8	32	6	2	10	8	6	14	16	17	19.5	29.0		
		2.4															
		2.6															
		3.2															

Features: It is suitable for wide-range cleaning that requires large water droplet.

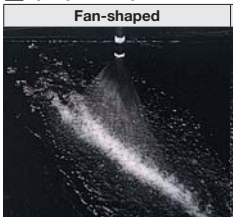
Applications: Wide-range washing, cooling etc.

NZRCS Specification

Size	Hole Dia. (mm)	1.6					2.0				
1/8	Water Pressure (MPa)	0.05	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50
	Water Quantity (ℓ/min)	1.08	1.51	2.09	2.55	3.26	1.29	1.79	2.48	3.05	3.91
	Spray Angle (°)	50	55	60	60	60	50	55	60	65	65
Size	**Hole Dia. (mm)**	**2.0**					**2.4**				
1/4	Water Pressure (MPa)	0.05	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50
	Water Quantity (ℓ/min)	1.63	2.19	3.02	3.66	4.70	2.26	3.13	4.48	5.47	7.05
	Spray Angle (°)	40	45	50	50	50	45	55	60	60	60
Size	**Hole Dia. (mm)**	**2.6**					**3.2**				
1/4	Water Pressure (MPa)	0.05	0.10	0.20	0.30	0.50	0.05	0.10	0.20	0.30	0.50
	Water Quantity (ℓ/min)	2.72	3.72	5.24	6.41	8.35	3.76	5.11	7.22	8.73	11.23
	Spray Angle (°)	55	55	60	65	65	55	60	65	65	65

Listed values are not guaranteed values but representative values.

Spray Examples

Fan-shaped	Full-Circular Shape
	

Order Example

Part Number	-	d
NZRFS1	-	1.0

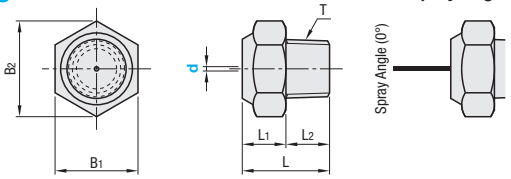
Days to Ship

6 Days P87

CAD Data



Spray Shape: Rod shape



Material: 1.4301/X5CrNi18-10

Part Number Type	No.	d (Hole Ø)	T	L	L_1	L_2	B_1	B_2	Mass (g)	€ Unit Price Qty. 1~4	Volume Discount Qty. 5~
NZRS	1	0.5	R1/8	18	10	8	12	13.6	13		
		0.7									
		1.0									
		1.2									
		1.6									
	2	1.6	R1/4	20	10	10	14	16	18		
		2.0									
		2.5									
		3.0									
		3.6									

Features: The impact changes as water flow jets rod-like due to water pressure.
Applications: Pinpoint washing, air blow, etc.
Note: Hole with small diameter may clog.

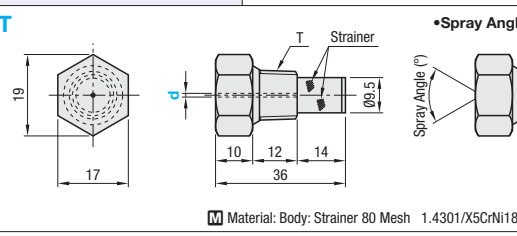
NZRS Specification

Size	Hole Dia. (mm)	0.5				0.7				1.0				1.2				1.6			
1/8	Water Pressure (MPa)	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7
	Water Quantity (ℓ/min)	0.14	0.18	0.22	0.26	0.31	0.37	0.47	0.55	0.91	1.12	1.46	1.70	1.29	1.56	1.79	2.09	2.26	2.41	3.06	3.59
Size	**Hole Dia. (mm)**	**1.6**				**2.0**				**2.5**				**3.0**				**3.6**			
1/4	Water Pressure (MPa)	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7	0.2	0.3	0.5	0.7
	Water Quantity (ℓ/min)	2.31	2.82	3.30	3.88	3.57	4.34	4.92	5.78	5.62	6.83	7.93	9.30	8.19	9.98	12.85	14.19	11.88	14.50	16.84	19.94

Listed values are not guaranteed values but representative values.



Spray Shape: Annular Shape



Material: Body: Strainer 80 Mesh 1.4301/X5CrNi18-10

Part Number Type	No.	d (Hole Ø)	T	Mass (g)	€ Unit Price Qty.1~4	Volume Discount Qty. 5~
NZRT	2	0.5	R1/4	33.0		
		0.7				
		1.0				

Features: As a fluid nozzle, when the particle is very fine with higher water pressure, the efficiency of air saturation becomes high.
Applications: Humidification and small amount of fluid application.

NZRT Specifications

Size	Hole Dia. (mm)	0.5				0.7				1.0			
1/4	Water Pressure (MPa)	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5	0.2	0.3	0.4	0.5
	Water Quantity (ℓ/min)	0.11	0.13	0.15	0.17	0.14	0.17	0.19	0.21	0.20	0.24	0.27	0.30
	Spray Angle (°)	60	60	65	70	65	65	70	75	65	70	75	80

Listed values are not guaranteed values but representative values.
No normal spraying with 0.2MPa or less.

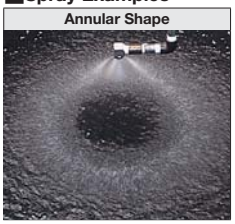
Order Example

Part Number	-	d
NZRS2	-	1.6

Days to Ship: 6 Days P.87

Spray Examples

Annular Shape

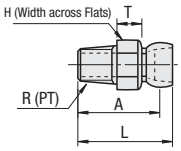


Adjusting Hoses · Installation Tools



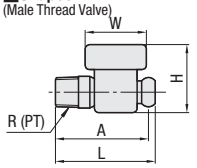
Attachment Part Selection

■Shapes AJ
(Male Thread)



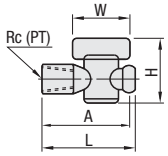
Hose Nominal	Thread Size (R (PT))	A	L	H	T
2	1 (R1/8)	23	26.3	14	7
	2 (R1/4)				
3	3 (R3/8)	27.3	32	19	8
	4 (R1/2)				
4	3 (R3/8)	28	38.3	18.8	7.5
	4 (R1/2)			20.8	

■Shapes VA
(Male Thread Valve)



Hose Nominal	R (PT)	A	L	H	W
2	R1/4	41	44	30	27
3	R3/8	45	49	34	25
4	R1/2	48.5	58	43	34

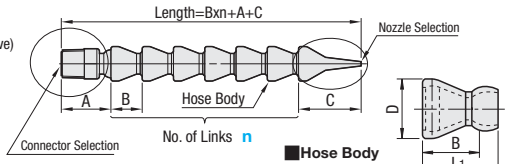
■(Female Threaded Valve) Compatible * Refer to the next page. **AVAFD**



Hose Nominal	Rc (PT)	A	L	H	W
2	Rc1/4	42	45	30	27
4	Rc1/2	58.2	64	63	34

Material: Hose Body : Polyacetal (Blue), (Gray), (Black)
Connector - Tip Nozzle : Polyacetal (Orange), (Gray), (Black)

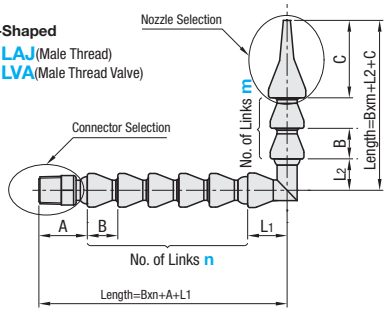
Standard
HOSAJ(Male Thread)
HOSVA(Male Thread Valve)



■Hose Body
(For all types)

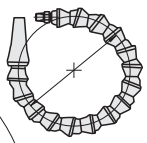
Hose Nominal	Hose Inner Ø	D	B	L1
2	6.3	16	14.5	20.7
3	8.5	21	17	25
4	12.7	24.5	20.3	30

L-Shaped
HLAJ(Male Thread)
HLVA(Male Thread Valve)



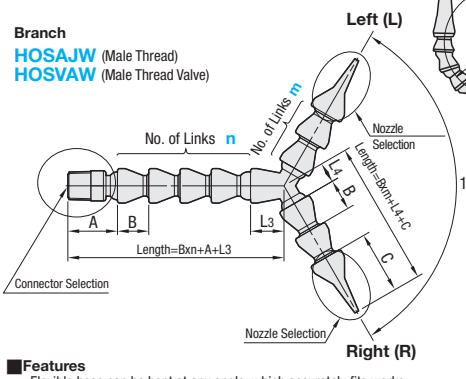
Hose Nominal	L-Shaped L1	L-Shaped L2
2	17	12
4	23.5	16.5

Hose Nominal	Branch L3	Branch L4
2	15.5	9.5
4	23.5	19



Min. Bending Radius
No.2 35mm
No.3 45mm
No.4 45mm

Branch
HOSAJW (Male Thread)
HOSVAW (Male Thread Valve)



■Specification

No.	Pressure Resistance Mpa Fluid	Air
2	0.2	0.5
3	0.2	0.5
4	0.2	0.5

Above data are for reference, not guaranteed. A small leakage may occur from the clearance in connection parts.

■Features
- Flexible hose can be bent at any angle, which accurately fits works.
- Lightweight, nonconductive, chemical resistant, shock resistant, and heat resistant resin material (Polyacetal).

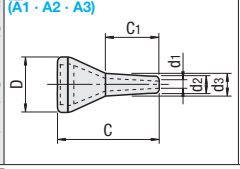
■Usage
- Best suitable hoses for coolant liquid for metal processing machines, lubricant and air blow.

■Chemical Resistance

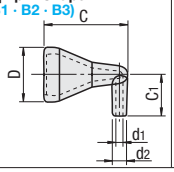
Chemical Name	A/NA
Solvents	0
Lubricant	0
Water	0
Acid	X
Alkali	X

Tip Shape Selection

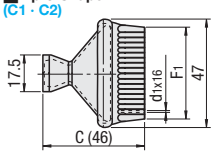
■Tip A Shape
(A1 · A2 · A3)



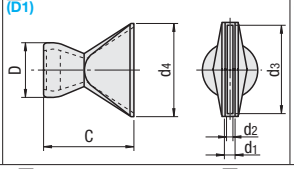
■Tip B Shape
(B1 · B2 · B3)



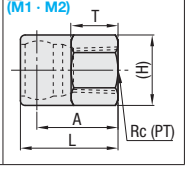
■Tip C Shape
(C1 · C2)



■Tip D Shape
(D1)



■Tip M Shape
(M1 · M2)



■Tip A Shape

Hose Nominal	A1 C	A1 C1	A1 D	A1 d1	A1 d2	A1 d3	A2 C	A2 C1	A2 D	A2 d1	A2 d2	A2 d3	A3 C	A3 C1	A3 D	A3 d1	A3 d2	A3 d3
2	30.0	16.0	16.0	1.6	4.9	7.0	30.0	19.0	16.0	3.2	6.3	9.6	35.0	25.5	16.0	6.3	9.6	11.0
3	33.0	19.0	21.0	6.3	9.5	13.0	39.0	28.0	21.0	9.5	13.0	15.0	33.0	22.0	21.0	12.7	15.0	16.0
4	37.5	24.5	24.5	6.6	10.5	12.5	37.5	24.5	24.5	9.5	12.5	15.5	37.5	24.5	24.5	12.5	17.0	19.0

■Tip C Shape

Hose Nominal	C1 d1	C1 F1	C2 d1	C2 F1
2	1.0	41.0	1.5	41.0

■Tip D Shape

Hose Nominal	D1 C	D1 D	D1 d1	D1 d2	D1 d3	D1 d4
2	26.4	16	3.2	1.7	25.4	26.8
3	39	21	5	3	32	34
4	50.5	25	6	4.5	44.5	48

■Tip B Shape

Hose Nominal	B1 C	B1 C1	B1 D	B1 d1	B1 d2	B2 C	B2 C1	B2 D	B2 d1	B2 d2	B3 C	B3 C1	B3 D	B3 d1	B3 d2
2	24.5	12.0	16.0	1.8	4.1	25.5	12.0	16.0	3.2	5.6	26.3	12.0	16.0	6.3	9.0
4	36.0	20.0	24.5	6.8	9.5	37.0	18.0	24.5	9.5	12.4	39.0	19.5	24.5	12.4	15.4

For prices and order example, refer to the right page.

■Tip M Shape

Hose Nominal	M1 A	M1 L	M1 (H)	M1 T	M1 Rc (PT)	M2 A	M2 L	M2 (H)	M2 T	M2 Rc (PT)
2	18.5	21	14	14	Rc1/8	22.5	25	17	10	Rc1/4

Shape of M2 is changed.

■Special Mounting Tools for Adjusting Hoses

Part Number Type	No.	€ Unit Price
HOSAJT	2	
	3	
	4	

Hose body is fragile. Be careful when handling.

Order Example — Part Number: HOSAJT2

Days to Ship: 8 Days — Express A — 5,00 EUR/ piece — P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount
(Round down to one Cent.) P87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Standard Hose Color: Selectable (Blue (Tip Nozzle: Orange) · Gray · Black)

Part Number			Hose Inner Dia.	Hose Color 0.5mm Increment	No. of Links N Configurable	Connector Thread Size (PT)		Tip Shape Selection (For dimension details, refer to the right page.)
Type	Connectors Selection	Hose Nominal				AJ (Selectable)	VA (Fixed)	
HOS	AJ (Male Thread) VA (Male Thread Valve)	2	6.3	Not specified (Blue) G (Gray) B (Black)	0~30	1 (R1/8) 2 (R1/4)	2 (R/Rc1/4)	(Hose: Blue) A1 · A2 · A3 · B1 · B2 · B3 · C1 · C2 · D1 · M1 · M2 (Hose: Gray) A1 · A2 · A3 · D1 (Hose: Black) A1 · A2 · A3 · C1 · C2 · D1
		*3	8.5	Not specified (Blue) G (Gray)		3 (R3/8) 4 (R1/2)	3 (R/Rc3/8)	(Hose: Blue) A1 · A2 · A3 · D1 (Hose: Gray) A1 · A2 · A3 · D1
		4	12.7			3 (R3/8) 4 (R1/2)	4 (R/Rc1/2)	(Hose: Blue) A1 · A2 · A3 · B1 · B2 · B3 · D1 (Hose: Gray) A1 · A2 · A3 · D1

* No.3 is not available for HOSVAF - Branch Type.

■L-Shaped Hose Color: Blue Nozzle: Orange

Part Number			Hose Inner Dia.	No. of Links N Configurable	Connector Thread Size (PT)		No. of Links m Configurable	Tip Shape Selection (For dimension details, refer to the right page.)
Type	Connectors Selection	Hose Nominal			AJ (Selectable)	VA (Fixed)		
HL	AJ (Male Thread) VA (Male Thread Valve)	2	6.3	0~30	1 (R1/8) 2 (R1/4)	2 (R/Rc1/4)	0~20	A1 · A2 · A3 · B1 · B2 · B3 · C1 · C2 · D1 · M1 · M2
		4	12.7		3 (R3/8) 4 (R1/2)	4 (R/Rc1/2)		A1 · A2 · A3 · B1 · B2 · B3 · D1

■Branch Hose Color: Blue Nozzle: Orange

Part Number				Hose Inner Dia.	No. of Links N Configurable	Connector Thread Size (PT)		No. of Links m Configurable		Tip Shape Selection (For dimension details, refer to the right page.)
Type	Connectors Selection	Branch Type Identification (Fixed)	Hose Nominal			AJ (Selectable)	VA (Fixed)	Right (R)	Left (L)	
HOS	AJ (Male Thread) VA (Male Thread Valve)	W	2	6.3	0~30	1 (R1/8) 2 (R1/4)	2 (R/Rc1/4)	0~20	0~20	A1 · A2 · A3 · B1 · B2 · B3 · C1 · C2 · D1 · M1 · M2
			4	12.7		3 (R3/8) 4 (R1/2)	4 (R/Rc1/2)			A1 · A2 · A3 · B1 · B2 · B3 · D1

Order Example

-Standard

Part Number		Hose Color		No. of Links n		Connectors Thread Size		Nozzle
HOSAJ2	-		-	30	-	1	-	A1
HOSVA2	-	B	-	20	-	2	-	D1

-L-Shaped

Part Number		No. of Links n		Connectors Thread Size		No. of Links m		Nozzle
HLVA2	-	10	-	2	-	5	-	B1

-Branch

Part Number		No. of Links n		Connectors Thread Size		No. of Links m Right (R)		No. of Links m Left (L)		Nozzle
HOSVAW2	-	5	-	2	-	R10	-	L7	-	D1

Days to Ship: 8 Days — Express A 5,00 EUR/piece — P.88

(?)A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~19	20~34	35~49
Rate	€ Unit Price	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

(?)Volume discount rate is applicable to € Unit Price for Link of Standard Type only. Not applicable to Branch Type. Not applicable to L-Shaped Type and Branch Type.

Hose Nominal	Link € Unit Price	Connector € Unit Price		Tip Shape € Unit Price					L-Shaped / Branch Additional Price
		Shapes AJ	Shapes VA	A1 A2 A3	B1 B2 B3	C1 C2	D1	M1 M2	
2									
3									
4									

Price Calculation Example

- For HOSAJ2–30–1–A1

0,70 EUR x 30 + 2,30 EUR + 2,30 EUR =25,60 EUR

(Link Price)x(No. of Links)+(Connector € Unit Price)+(Tip Shape € Unit Price)

- For HLVA2-10-2-5-B1

0,70 EUR x (10 + 5) + 11,60 EUR + 6,50 EUR + 7,00 EUR =35,60

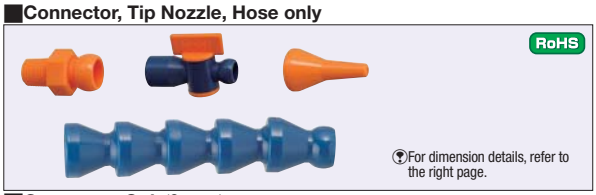
(Link Price)x(No. of Links n+No. of Links m)+(Connector € Unit Price)+(Tip Shape € Unit Price)+(L-Shaped Type Additional Price)

- For HOSVAW2–5–2–R10–L7–D1

0,70 EUR x (5 + 10 + 7) + 11,60 EUR + 7,00 EURx2 + 7,00 EUR =48,00 EUR

(Link Price)x(No. of Links + No. of Links on the Right+No. of Links on the Left) +(Valve € Unit Price)+(Tip Shape Price for 2 pcs.)+(Branch Type Additional Price)

■Connector, Tip Nozzle, Hose only



RoHS

(?)For dimension details, refer to the right page.

■Connector Only(Orange)

Part Number		Connector Thread Size (PT)		€ Unit Price		
Type	Hose Nominal	AAJD (Selectable)	AVAD · AVAFD (Fixed)	AAJD	AVAD	AVAFD
AAJD (Male Thread) AVAD (Male Thread Valve) AVAFD (Female Thread Valve)	2	1 (R1/8) 2 (R1/4)	2 (R/Rc1/4)			
	3	3 (R3/8) 4 (R1/2)	3 (R/Rc3/8)			
	4	3 (R3/8) 4 (R1/2)	4 (R/Rc1/2)			

Order Example

Part Number	-	Connector Thread Size
AAJD2	-	1

Part Number	-	Nozzle
HAKD2	-	A1

Part Number	-	No. of Links
HJD2	-	5

Days to Ship: 6 Days — P.87

■Tip Nozzle Only (Orange)

Part Number		Nozzle		Tip Shape € Unit Price				
Type	Hose Nominal	Shapes	No.	A Shapes	B Shapes	C Shapes	D Shapes	M Shapes
HAKD	2	A	1					
			2					
		B	3					
	3	C	1					
			2					
		D	3					
	4		1					
		M	2					
			3					

■Hose Only (Blue)

Part Number		No. of Links (Fixed)	€ Unit Price
Type	Hose Nominal		
HJD	2	5	
	3		
	4		

Grippers · Cylinders · Connecting Components

Grippers · Cylinders · Connecting Components



Product Name	Air Grippers -Parallel-	Sensors for Air Grippers	Attachments for Air Grippers	Fingers for Air Grippers
Page	1355~1357	1355	1358	1359~1361·1365~1367



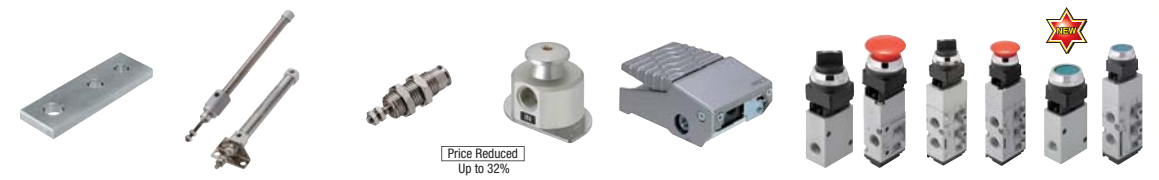
Fingered Arms for Air Grippers	Finger Tips for Air Grippers	Mounting Brackets for Stroke Limiting / Work Holding	Brackets for Air Grippers	Compact Cylinders	Cylinder Sensor
1362	1363·1364	1367	1368	1371	1372·1380



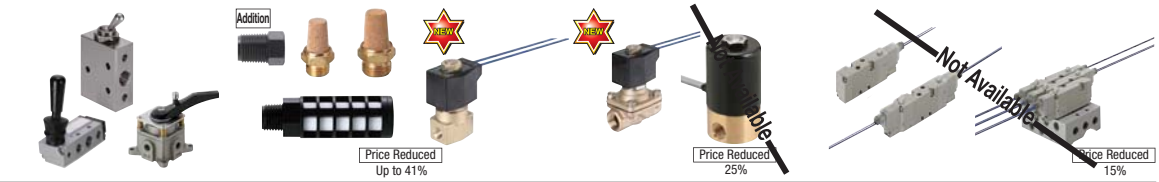
Brackets for Compact Cylinders	Cylinder Trunnion Plates	Small Cylinder	Cylinder with Guide	Guides for Rotary Clamp Cylinders	Auto Switches	Arms for Rotary Clamp Cylinders
1373·1374	1374	1375·1376	1379	1383	1383	1384



Guides for Rotary Clamp Cylinders	Brackets for Rotary Clamp Cylinders	Clamp Cylinder	Tie Rod for Auto-Switch Mounting	Mounting Bracket Kit	Arms for Clamp Cylinders	Bracket Plates for Clamp Cylinders
1385	1386	1388	1388	1388	1389·1390	1391



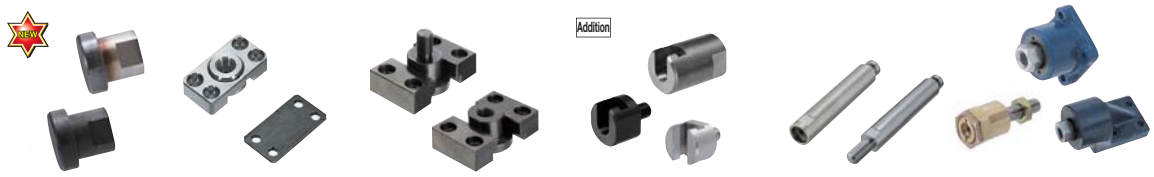
Hinge Plates	Air Cylinders -Pen-Shaped-	–Panel Mount Single-Acting–	Step Switch Valve	Manual Switching Valve -Panel Mount Type-
1392	1393	1393	1394	1395·1396



-Grip / Miniature / Lever Types-	Silencer	Multilex Valve	Electromagnetic Valves-2 Port Type-	Electromagnetic Valves -5 Port Direct Plumbing-	–5 Port Base Plumbing–
1397·1398	1398	1399	1399·1400	1401	1402



Floating Connectors	Floating Joint Sets	Backing Plates	Mount Flange	–Cylinder Connectors–
1403~1405	1406·1407·1411·1412	1408·1413·1414	1409	1410·1413



-Flat Connectors-	-Low Hardness / Low Hardness Thin-	-Slide Type-	-T Groove Type-	Tip Connection Joints	Floating Joint Connectors
1411	1414	1415	1416	1417·1418	1419



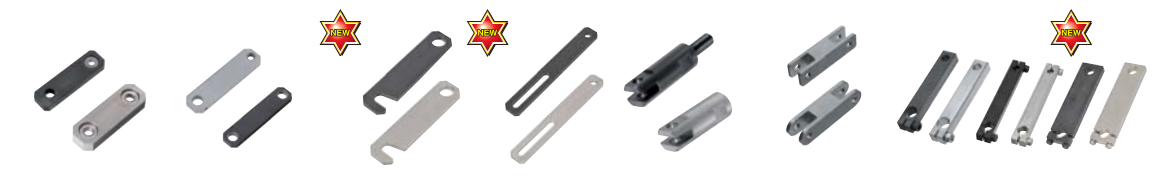
Floating Joints -Hexagon / Circular-	Holder	Knuckle Joints –Extra Short–	-Tool-less-	–Fixed–	Knuckle Joints -Male Thread / Female Thread-
1421~1427	1428~1430	1431	1431	1432	1433~1436



Pushers -Urethane / Silicone / Fluoro-Rubber / Resin-	Resin Pushers -Fixed / Configurable-	Metal Pushers	Urethane Caps	Pushers for Air Leak Inspection	Thread Conversion Adapters
1437~1441	1442	1443	1443	1444	1445



Spherical Bearings	Spherical Bearing Holder	Sets Rod End Bearings /	Link BallsRod Coupling Rods	Links
1446	1446	1447·1448	1449	1451~1454



–Bearing Embedded–	-Oil Free Bushings Press-Fit-	-Notched Type-	-Slot Type-	Link Bars	-General Purpose Type-	Clamp Links
1455	1456	1457	1457	1458	1459	1460·1461



Joint Plate	Hinge Bases	Hinge Bases -A Dimension Compact Type-	Hinge Bases -Center Mounting Hole Type-	-Center Mounting Hole Narrow Type-	Thick Hinge Bases -L-Shaped / Center Fulcrum-
1461	1462	1463	1464	1465	1466~1469



Hinge Bases -L-Shaped / Center Fulcrum-	Thick Hinge Bases -With Oil Free Bushings-	Hinge Bases -Dimension Fixed / Prong / Notched-	-Side Mounting Side-	Hinge Bolt
1470·1471	1472	1473~1477	1478·1479	1480

Compact Lateral Grippers Overview

■Compact Lateral Grippers Overview

- Best for work piece handling applications such as automated assembly machines and inspection machines.
- With strong grip forces and high-rigidity, smaller machine designs are possible.
- Strong gripping force and high gripping repeatability lead to less gripping errors, contributing to higher machine speeds.

■Compact Lateral Gripper Features

-MISUMI's compact parallel grippers can be used with the original fingers, which are easy-to-select depending on column, cylindrical or square work sizes.
-Different with the guide-integrated type Air Grippers, these grippers use cam-rollers for guiding the pistons. These are lightweight and compact, as well as achieving the high-rigidity and high grip forces.
-Different from the guide-integrated type Air Grippers, the fingers can be mounted to the main body directly, having more freedom for designing.
-By installing attachments (optional), it can be mounted with the same mounting method with the guide-integrated type Air Grippers.

■Selection Guide

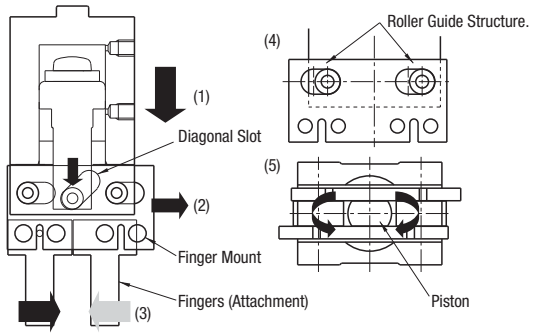
- Selection Procedure

(1)Confirmation of Work
Confirm the necessary stroke and weight calculated by the size of work.
(2)Calculation of Required Grip Force.
The required grip force is 10 to 20 times of the weight of work. (Varies depending on the friction coefficient of the fingers and works or work shape.)
(3)Selection of Types
Depending on types, the grip forces are different by gripping methods (Outer Dia. grip / Inner Dia. grip), Gripping point distance and operating pressure. Select the appropriate model from the Grip Force Chart.

- Precautions for Selection

Design the Finger Attachments to be lightweight and short.
Set the overhang under the limit of specified value of each product type.
Lateral overhang loads will apply torsional moments on the sliding components and it may cause premature wear.

■Product Structure

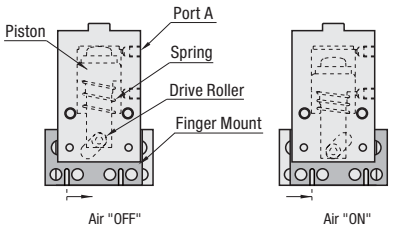


(1) Piston descends.
(2) The diagonal slot moves to the arrow direction.
(3) Fingers (Attachment) close.
(4) 2 rollers guide the cylinder movement.
(5) The piston rotates when moving forward and back and presses the finger mount onto the inner wall of the cylinder. The clearance will be locked up by this mechanism.

■Open/Close Operation

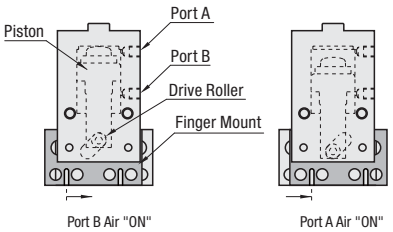
Single Acting Type

When the air enters the Port, it presses the piston and the drive roller presses the finger mount to slide.



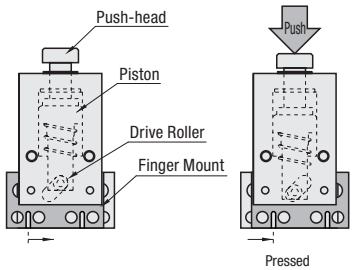
Double Acting Type

When the air enters the Port A, it presses the piston and then the drive roller presses the finger mount to slide.

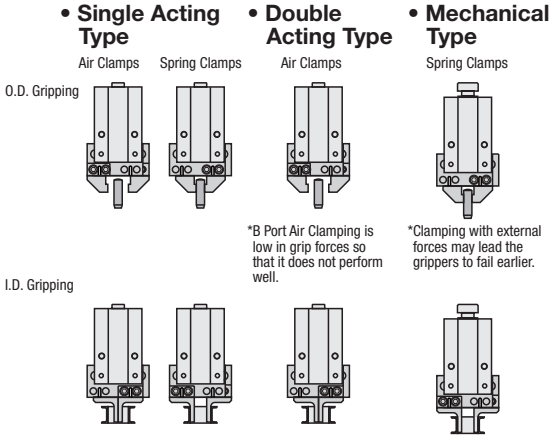


Mechanical Type (External · Unclamp)

When the push-head is pressed externally, the piston is depressed and the drive roller presses the finger mount to unclamp the gripper.



■Method of Grip



*B Port Air Clamping is low in grip forces so that it does not perform well.

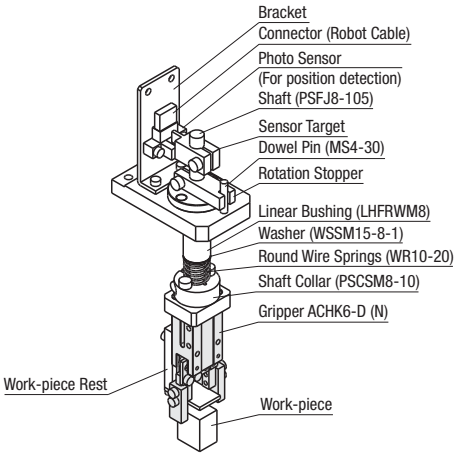
*Clamping with external forces may lead the grippers to fail earlier.

•Performance

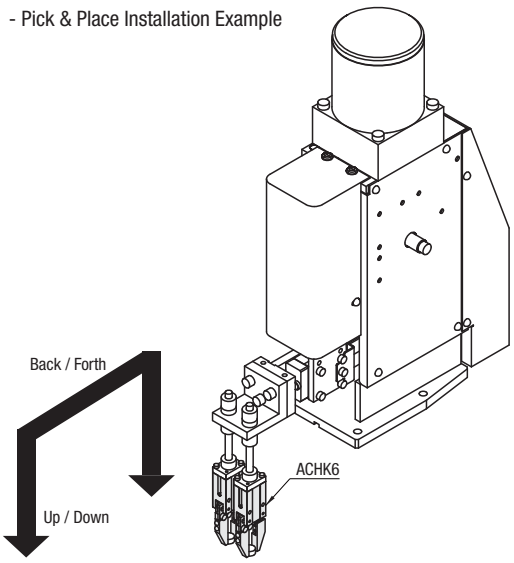
Repeatability	±0.01mm
Non-load Durability Test	No play after 100 million Open/Close cycles
Stroke Accuracy	0~0.3mm
Gripping Forces	Comparing to the same size products from other manufacturers: Approx. 2 times ~ * Comparison between other manufacturer's cylinder with 6mm dia. And ACHK4 (Research by MISUMI)

Example of Use

- Up and Down Floating Function



- Pick & Place Installation Example



Safety Precautions

Danger

- Do not use the cylinder for the following purposes:
  1. Medical equipment for sustaining human life or maintaining the human body
  2. Systems or machine equipment for moving or transporting humans.
  3. Vital parts of machinery
  These products are not designed to be used for purposes requiring high levels of safety. Loss of human life may result.
- Do not use in locations with dangerous combustible or flammable objects. The objects may ignite or catch fire.
- Never modify the products. It may cause injury, electric shock or fire by abnormal operations.
- Avoid inappropriate dismantling or re-assembling of the products which affect the basic structure, performance or functions.
- Do not splash water on the products. If the products are made wet, washed or used in the water, they may cause injury, electric shock or fire by abnormal operations.

Warning

- Do not throw the products into the fire. The products may be broken or poisonous gas may be generated.

Note

- Do not apply forces to grippers for press-fitting or pulling.
- Avoid high-speed rotation of the grippers. The gripping force is negated by the centrifugal force, causing the object to be let go and may cause injuries.
- Do not apply sudden impacts. The grippers may be damaged or the gripped object may fall due to temporarily lost holding forces, and may cause injuries.
- When installing the grippers, ensure secure mounting. The products may fall off or operate abnormally, and may cause injuries.
- Avoid using in the following atmospheres or locations: Direct sunlight (ultraviolet); locations with dusts, iron and iron powders; atmospheres including organic solvents, phosphoric acid ester-type hydraulic oil, sulfur dioxides, chlorine gas and acid.
- When supplying air to the products or operating the products, be sure to conduct safety checks within the device's operating range. Carelessly supplying the air may cause injury by moving parts.
- When the products are in operation or in operable conditions, avoid entering in the operational area of the machines. The products may move unexpectedly and may cause injuries.
- When conducting maintenance, inspection, overhaul or alteration of the products, ensure that the air supply has been completely blocked beforehand.

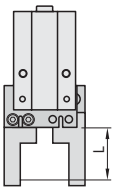
Specifications of ACHK4 and ACHE4

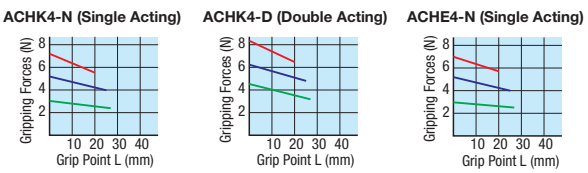
Specifications

Operating Method	Single and Double Acting / Parallel Open/Close
Permissible Fluid	Clean Air (Filtered, Compressed Air)
Operating Pressure Range	0.3~0.5MPa
Ambient Temperature	5~50°C
Lubrication	Non-lubrication (Lithium Grease Applied)
Pneumatic Fitting	M3x0.5
Operation Speed (max)	Single Acting 120CPM / Double Acting 180CPM
Repeatability	±0.01mm
Stroke Tolerance	0~+0.3mm

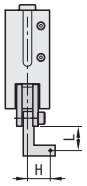
* For ACHE Type, only Single Acting is available.
*The Pneumatic Fitting of ACHE Type is M5x0.8.
* The operation speed of ACHE Type is Max.180CPM.

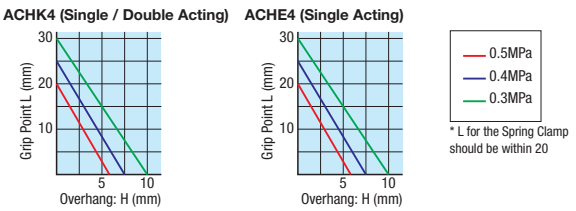
Grip Point - Grip Forces Data





Grip Point - Overhang Data





* L for the Spring Clamp should be within 20

NEW

Air Grippers -Parallel- / -Sensors-

-Stroke 4mm Type-

Price Reduction
Up to 34%

CAD Data



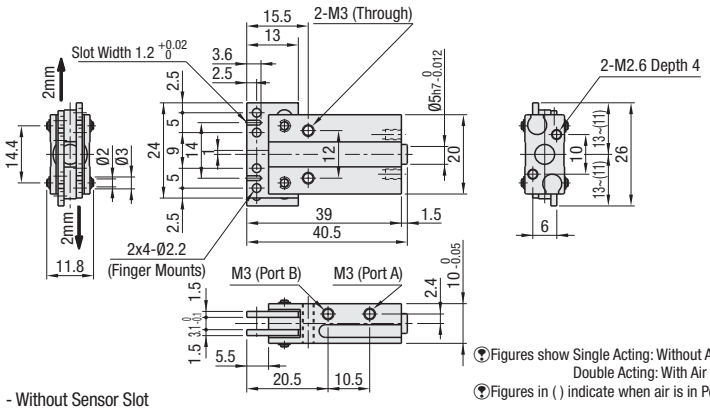




RoHS

- Sensor Mounting Type

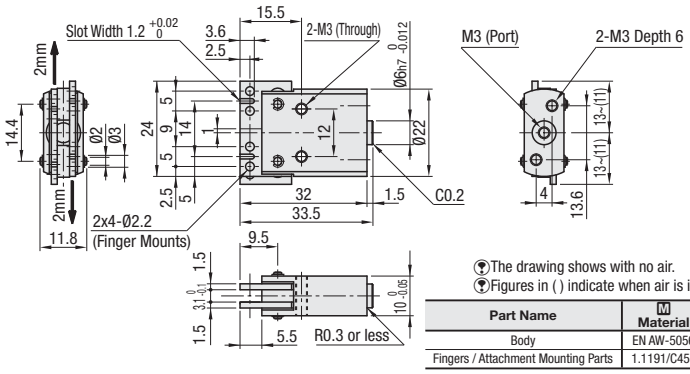
ACHK4-N (Single Acting)
ACHK4-D (Double Acting)



Figures show Single Acting: Without Air
Double Acting: With Air in Port B
Figures in ( ) indicate when air is in Port A.

- Without Sensor Slot

ACHE4-N (Single Acting)



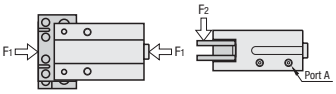
The drawing shows with no air.
Figures in ( ) indicate when air is in the port.

Part Name	M Material	S Surface Treatment
Body	EN AW-5056	Clear Anodize
Fingers / Attachment Mounting Parts	1.1191/C45E	Nitride Treatment

Part Number Type	Stroke	Single Acting · Double Acting Selection	Cylinder Inner Ø	Effective Holding Forces (N) Single Acting · Air	Single Acting · Spring	Double Acting · Air	* Allowable Static Load (N) Single Acting · Double Acting in Common F1	F2	Mass (g)	Sensor Slot	€ Unit Price Qty. 1~9
ACHK	4	N (Single Acting)	8	4.2	1	-	5	2.5	19	Yes	
		D (Double Acting)		-	-	4.9					
ACHE		N (Single Acting)		4.2	1	-			17	No	

Effective Holding Forces shown with air pressure: 0.4MPa and Holding Point: L=20mm. For the specifications and Holding Point data, refer to Overview Page on **P.1354** For orders larger than indicated quantity, please request a quotation.

Order Example | Part Number: ACHK4 - N (Single · Double Acting Selection)



Effective Holding Force data of Double Acting Type indicated with Port A supplied with air.
* The Allowable Static Load values are for reference only, not guaranteed.
The directions of the Allowable Static Load are shown in F1 and F2 on left.

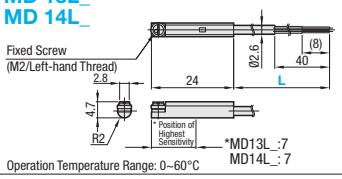
Days to Ship: 8 Days

■Sensors for Air-grippers



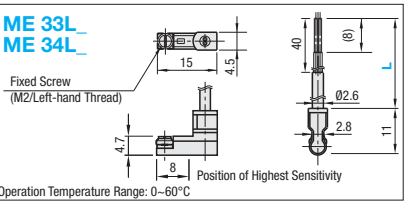
RoHS

MD 13L_
MD 14L_



Operation Temperature Range: 0~60°C

ME 33L_
ME 34L_



Operation Temperature Range: 0~60°C

Part Number Type	L	Load Voltage	Load Current	Indicator Light	Sensor Type	Line	Wire Exit	€ Unit Price L1(1m)	L3(3m)
MD13	L1(1m) L3 (3m)	28VDC or Less	0.1~40mA	LED (Lights when ON)	No Contact	3-Line	Rear		
MD14	L1(1m) L3 (3m)	DC10~28V	5~20mA		No Contact	2-Line			
ME33	L1(1m) L3 (3m)	28VDC or Less	0.1~40mA		No Contact	3-Line	Top		
ME34	L1(1m) L3 (3m)	DC10~28V	5~20mA		No Contact	2-Line			

For detailed specifications of the Sensors, see **P.1370**

Order Example | Part Number: MD14L1

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Air Grippers -Parallel-

-Stroke 6mm Type-

CAD Data





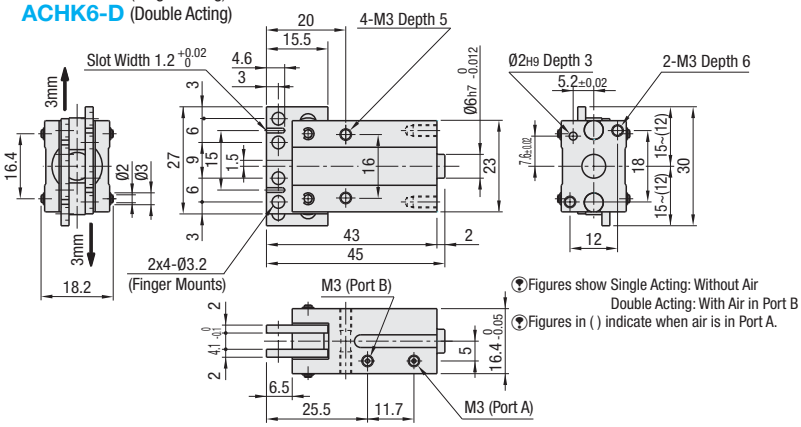


RoHS

- Sensor Mounting Type

ACHK6-N (Single Acting)

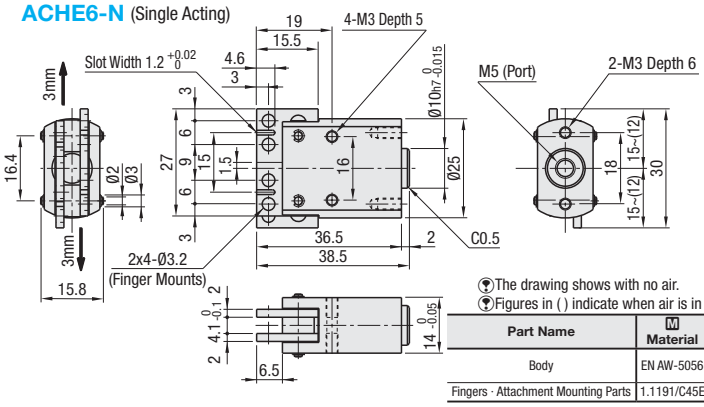
ACHK6-D (Double Acting)



Figures show Single Acting: Without Air
Double Acting: With Air in Port B
Figures in ( ) indicate when air is in Port A.

- Without Sensor Slot

ACHE6-N (Single Acting)



The drawing shows with no air.
Figures in ( ) indicate when air is in the port.

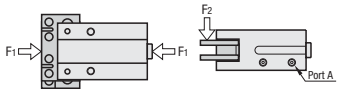
Part Name	M Material	S Surface Treatment
Body	EN AW-5056	Clear Anodize
Fingers · Attachment Mounting Parts	1.1191/C45E	Nitride Treatment

Part Number		Single Acting · Double Acting Selection	Cylinder Inner Ø	Effective Holding Forces (N)			* Allowable Static Load (N) Single Acting · Double Acting in Common		Mass (g)	Sensor Slot	€ Unit Price
Type	Stroke			Single Acting - Air	Single Acting - Spring	Double Acting - Air	F_1	F_2			Qty. 1~9
ACHK	6	N (Single Acting)	12	10.4	1.9	-	10	5	37	Yes	
		D (Double Acting)		-	-	12.2					
ACHE		N (Single Acting)	10	7.2	1.3	-			31	No	

Effective Holding Forces shown with air pressure: 0.4MPa and Holding Point: L=20mm.

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number ACHK6 - Single · Double Acting Selection N



Effective Holding Force data of Double Acting Type indicated with Port A supplied with air.

* The Allowable Static Load values are for reference only, not guaranteed.

The directions of the Allowable Static Load are shown in F_1 and F_2 on left.

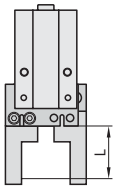
Days to Ship: 8 Days

Specifications

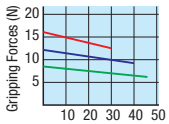
Operating Methodw	Single and Double Acting / Parallel Open/Close
Permissible Fluid	Clean Air (Filtered, Compressed Air)
Operating Pressure Range	0.3~0.5MPa
Ambient Temperature	5~50°C
Lubrication	Non-lubrication (Lithium Grease Applied)
Pneumatic Fitting	M3x0.5 (ACHE: M5x0.8)
Operation Speed (max)	Single Acting 120CPM / Double Acting 180CPM
Repeatability	±0.01mm
Stroke Tolerance	0~+0.3mm

* For ACHE Type, only Single Acting is available.
* The operation speed of ACHE Type is Max.180CPM.

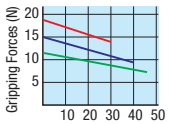
Grip Point - Grip Forces Data



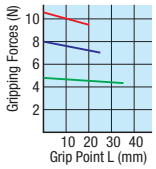
ACHK6-N (Single Acting)



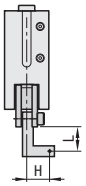
ACHK6-D (Double Acting)



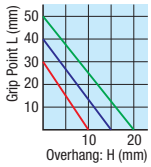
ACHE6-N (Single Acting)



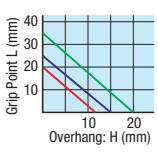
Grip Point - Overhang Data

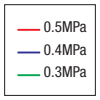


ACHK6 (Single Acting / Double Acting)



ACHE6 (Single Acting)





Mechanical Grippers -Parallel Type-

-Stroke 3 · 4 mm Mechanical Type-

CAD Data

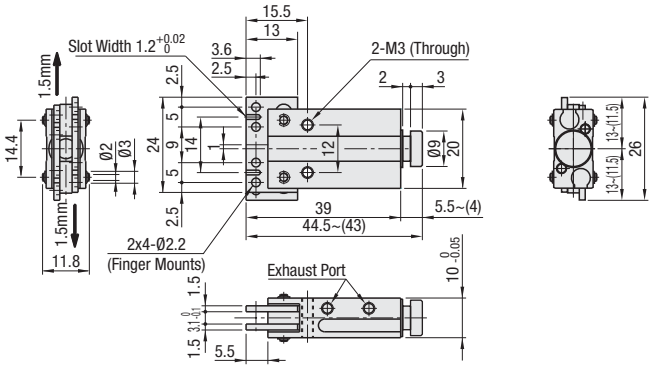




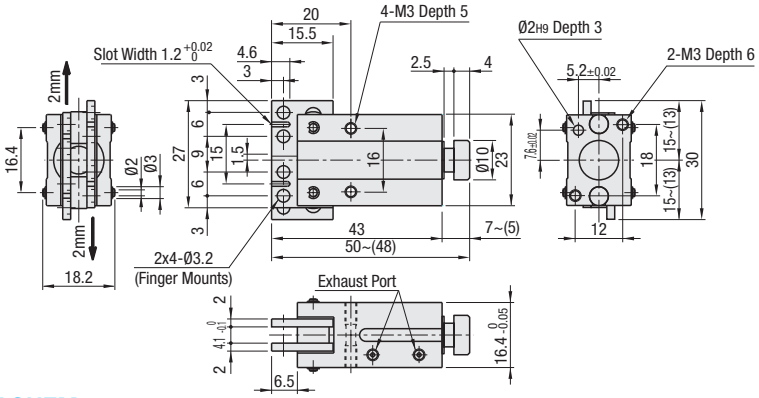


RoHS

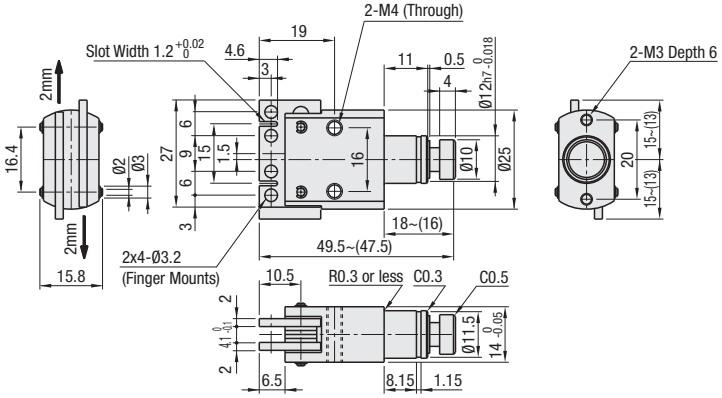
ACHKM3



ACHKM4



ACHEM4



(P)Values in ( ) indicate when the push-head is pressed.

Part Name	M Material	S Surface Treatment
Body	EN AW-5056/AlMg5	Clear Anodize
Fingers · Attachment Mounting Parts	1.1191/C45E	Nitride Treatment

Part Number		Effective Holding Forces (N)	Open/Close Release Forces (N)	Max. Grip Point L (mm)	* Allowable Static Load (N)		Mass (g)	€ Unit Price
Type	Stroke				F1	F2		Qty. 1~9
ACHKM	3	2.0	13	20	5	2.5	21	
	4	4.0	16	30	10	5	41	
ACHEM	4	3.2	16	25	10	5	34	

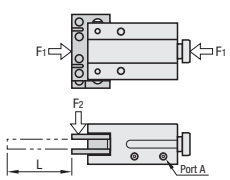
(P)For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number
ACHKM3

Days to Ship

8 Days



(P)* The Allowable Static Load values are for reference only, not guaranteed.
(P)The directions of the Allowable Static Load are shown in F1 and F2 on left.

Specifications

Stroke Ratio	Piston: Finger Mount; 1:2
Operation Speed (max)	120CPM

Attachments for Air-grippers

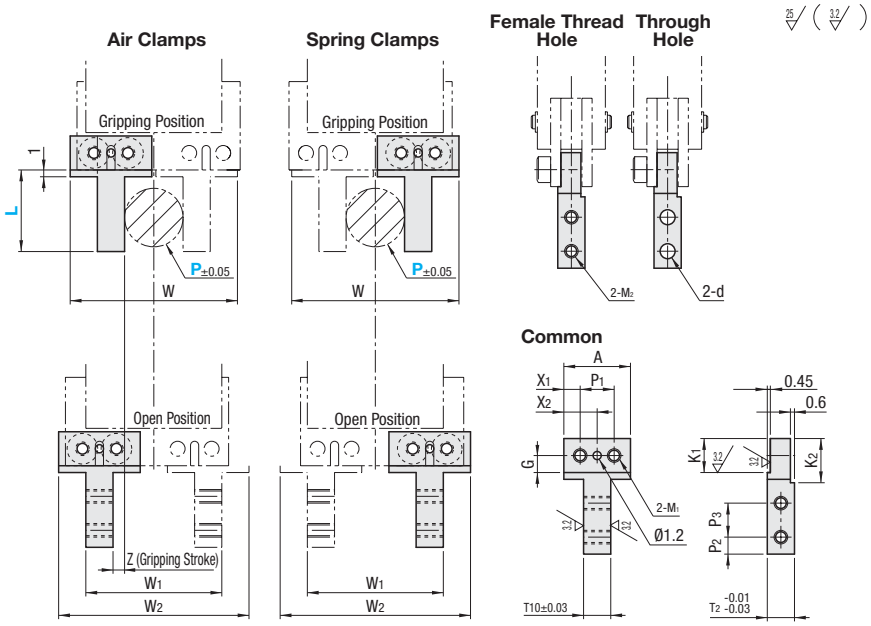
CAD Data

Attachments for Air-grippers



	Type		M Material	S Surface Treatment	A Accessory
	Female Thread Hole Type	Through Hole Type			
Selectable	ACHAT	-	1.1191/ C45E	Tufftride®	Hexagon Socket Head Cap Screw: 2 pcs.
Configurable	ACHATW	ACHATN		Electroless Nickel Plating	Locating pin: 1 pc.

The locating pin is press-fit into the pin hole before shipping.



P indicates points where the work is gripped.
Port A is supplied with air for Single Acting Type, while the push-head is pressed for Mechanical Type.
The closing allowance is 0.3mm on each side.
For Air Clamps and Spring Clamps, see the lower section of **P.1353**
The Configurable Type may have a centering hole on end faces.

RoHS

Common Dimensions

Gripper (Nominal)	T1	T2	P1	P2	P3	G	K1	K2	M1	M2	d
4 (M)	4	4	5	2.5	5	2.5	5	6.5	M2	M2	2.4
6 (M)	5.2	5	6	3	5.7	3	5.5	6.7	M3	M2.5	2.9

Selectable

Part Number Type	Part Number Gripper (Nominal)	L	P	W	W1	W2	Z	A	X1	X2	Applicable Grippers	€ Unit Price Set of 1~4 pcs. (2 pcs. per set)
Female Thread Hole Type ACHAT	4	12	8.6	22.4	20	25.8	1.7	9.8	2.4	4.9	ACHK4-_	
					19	24.8	1.2				ACHKM3	
	6	14	7.4	24.4	23.2	29.8	2.7	11.8	2.9	5.9	ACHK6-_	
					21.2	27.8	1.7				ACHKM4 ACHEM4	

€ Unit Price is the price per set (both sides).
For orders larger than indicated quantity, please request a quotation.

Configurable

Part Number Type	Part Number Gripper (Nominal)	L 1mm Increment	P Selection	W	W1	W2	Z	A	X1	X2	Applicable Grippers	€ Unit Price Set of 1~4 pcs. (2 pcs. per set)
Female Thread Hole Type ACHATW	4	12~18	0.6 8.6 16.6	24.6	P+11.4	28	1.7	12	3.5	6	ACHK4-_ ACHE4-N	
	4M				P+10.4	27	1.2				ACHKM3	
Through Hole Type ACHATN	6	14~25	0.6 7.4 14.2	24.6	P+15.8	30	2.7	12	3	6	ACHK6-_ ACHE6-N	
	6M				P+13.8	28	1.7				ACHKM4 ACHEM4	

€ Unit Price is the price per set (both sides). 4M and 6M are for Spring Clamp Type.
For orders larger than indicated quantity, please request a quotation.

Order Example

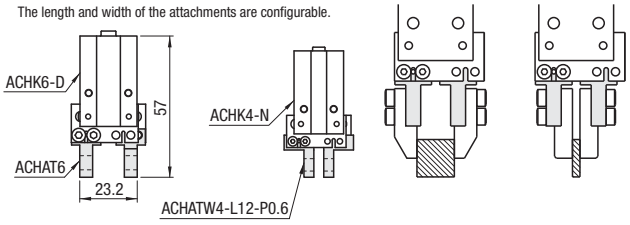
Part Number	-	L	-	P
ACHAT4 ACHATN4	-	L13	-	P8.6

Days to Ship

Selectable: 8 Days
Configurable: 10 Days

Example

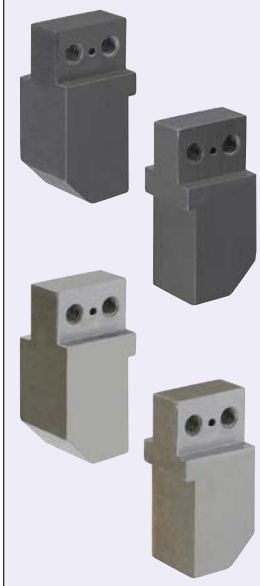
The length and width of the attachments are configurable.



Fingers for Air Grippers (Direct Mounting Type)
-Flat Shape-

CAD Data

■Flat-shaped fingers with a 0.3mm fastening allowance on each side.

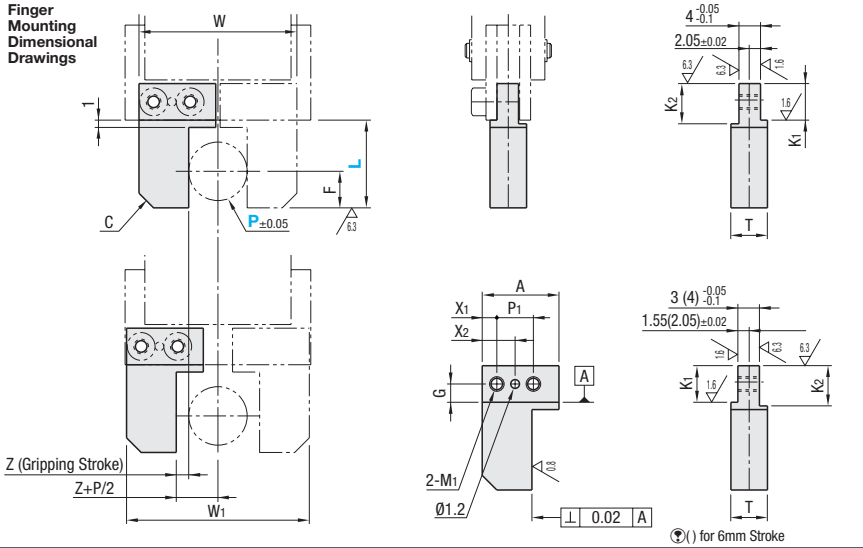


Type	Material	Surface Treatment	Hardness	Accessory
YFTB	1.1191/C45E	Black Oxide	-	Hexagon Socket Head Cap Screw: 2 pcs. Locating Pin
YFTM		Electroless Nickel Plating		
YFTBH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~45HRC	
YFTMH		Electroless Nickel Plating		

The locating pin is press-fit into the pin hole before shipping.

For Mechanical Gripper

Finger Mounting Dimensional Drawings



( ) for 6mm Stroke

■Common Dimensions

Gripper (Nominal)	P1	A	X1	X2	G	K1	K2	M1
4	5	10.5	2	4.5	2.5	5	5.5	M2
6 (M)	6	11.5	2.5	5.5	3	5.5	6.7	M3

■Gripper Body: 4mm Stroke (One-sided Stroke: 2mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	F	C	T	Z	W	W1	Applicable Gripper Body
YFTB YFTM YFTBH YFTMH	4	3.0~4.0	8~29	2	3	5	1.7	21.6	25	ACHK4-N ACHK4-D ACHE4-N
		4.1~5.0	8~30	2.5						
		5.1~6.0	9~30	3						
		6.1~7.0	9~31	3.5						
		7.1~8.0	10~31	4						
		8.1~9.0	11~32	4.5	2					
		9.1~10.0	12~32	5						

■Gripper Body: 6mm Stroke (One-sided Stroke: 3mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	F	C	T	Z	W	W1	Applicable Gripper Body
YFTB YFTM YFTBH YFTMH	6	3.0~4.0	8~44	2	3	6	2.7	23.6	29	ACHK6-N ACHK6-D ACHE6-N
		4.1~5.0	8~45	2.5						
		5.1~6.0	9~45	3						
		6.1~7.0	9~46	3.5						
		7.1~8.0	10~46	4						
		8.1~9.0	11~47	4.5	2					
		9.1~10.0	12~47	5						

■Mechanical Gripper: 4mm Stroke (One-sided Stroke: 2mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	F	C	T	Z	W	W1	Applicable Gripper Body
YFTB YFTM YFTBH YFTMH	6M	3.0~4.0	8~29	2	3	6	1.7	23.6	27	ACHKM4 ACHEM4
		4.1~5.0	8~30	2.5						
		5.1~6.0	9~30	3						
		6.1~7.0	9~31	3.5						
		7.1~8.0	10~31	4						
		8.1~9.0	11~32	4.5	2					
		9.1~10.0	12~32	5						

Order Example

Part Number	-	P	-	L
YFTB4	-	P5.5	-	L11

Price

Nominal	€ Unit Price Qty. 1~4			
	YFTB	YFTM	YFTBH	YFTMH
4				
6- 6M				

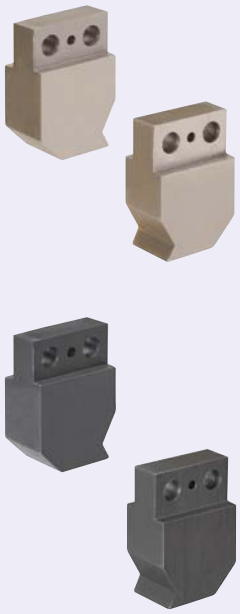
For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days

Fingers for Air Grippers (Direct Mounting Type)
-V-shaped · Side Grip-

CAD Data

■V-shaped fingers with a 0.3mm fastening allowance on each side.

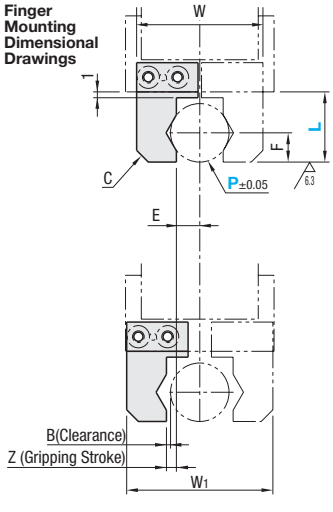


Type	M Material	S Surface Treatment	H Hardness	A Accessory
YVYB	1.1191/C45E	Black Oxide	-	Hexagon Socket Head Cap Screw: 2 pcs. Locating Pin
YVYM		Electroless Nickel Plating		
YVYBH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~45HRC	
YVYMH		Electroless Nickel Plating		

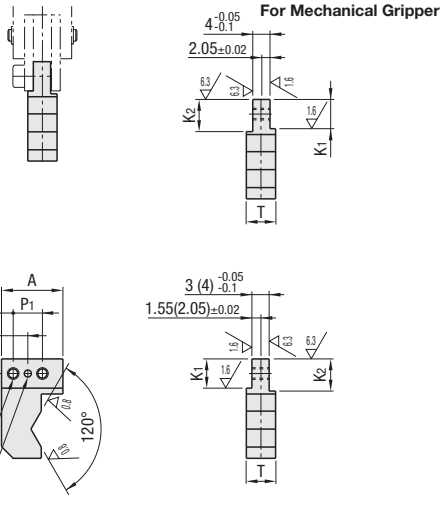
25 (6.3 1.6 0.8)

The locating pin is press-fit into the pin hole before shipping.

Finger Mounting Dimensional Drawings



For Mechanical Gripper



( ) for 6mm Stroke

■Common Dimensions

Gripper (Nominal)	P1	A	X1	X2	G	K1	K2	M1
4	5	10.5	2	4.5	2.5	5	5.5	M2
6 (M)	6	11.5	2.5	5.5	3	5.5	6.7	M3

■Gripper Body: 4mm Stroke (One-sided Stroke: 2mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	B	F	C	E	T	Z	W	W1	Applicable Gripper Body
YVYB YVYM YVYBH YVYMH	4	3.0~4.0	8~29	1	2	3	P/2-0.7	5	1.7	21.6	25	ACHK4-N ACHK4-D ACHE4-N
		4.1~5.0	8~30		2.5							
		5.1~6.0	9~30	0.9	3		P/2-0.8					
		6.1~7.0	9~31		3.5							
		7.1~8.0	10~31	0.8	4		P/2-0.9					
		8.1~9.0	11~32		4.5	2						
		9.1~10.0	12~32	0.7	5		P/2-1					

■Gripper Body: 6mm Stroke (One-sided Stroke: 3mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	B	F	C	E	T	Z	W	W1	Applicable Gripper Body
YVYB YVYM YVYBH YVYMH	6	3.0~4.0	8~44	2	2	3	P/2-0.7	6	2.7	23.6	29	ACHK6-N ACHK6-D ACHE6-N
		4.1~5.0	8~45		2.5							
		5.1~6.0	9~45	1.9	3		P/2-0.8					
		6.1~7.0	9~46		3.5							
		7.1~8.0	10~46	1.8	4		P/2-0.9					
		8.1~9.0	11~47		4.5	2						
		9.1~10.0	12~47	1.7	5		P/2-1					

■Mechanical Gripper: 4mm Stroke (One-sided Stroke: 2mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	B	F	C	E	T	Z	W	W1	Applicable Gripper Body
YVYB YVYM YVYBH YVYMH	6M	3.0~4.0	8~29	1	2	3	P/2-0.7	6	1.7	23.6	27	ACHKM4 ACHEM4
		4.1~5.0	8~30		2.5							
		5.1~6.0	9~30	0.9	3		P/2-0.8					
		6.1~7.0	9~31		3.5							
		7.1~8.0	10~31	0.8	4		P/2-0.9					
		8.1~9.0	11~32		4.5	2						
		9.1~10.0	12~32	0.7	5		P/2-1					

Order Example

Part Number	-	P	-	L
YVYB4	-	P8.0	-	L15

Price

Nominal	€ Unit Price Qty. 1~4			
	YVYB	YVYM	YVYBH	YVYMH
4				
6- 6M				

Days to Ship: 8 Days

For orders larger than indicated quantity, please request a quotation.

Fingers for Air Grippers (Direct Mounting Type)

-V-shaped · Vertical Grip-

CAD Data

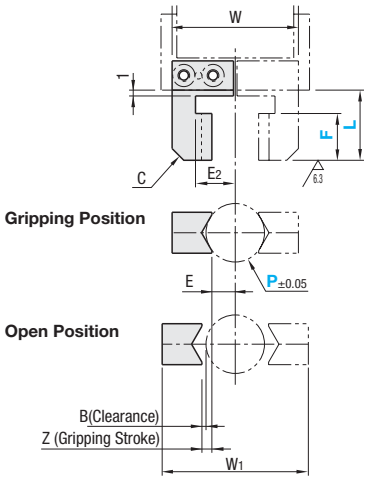
■V-shaped fingers with a 0.3mm fastening allowance on each side.



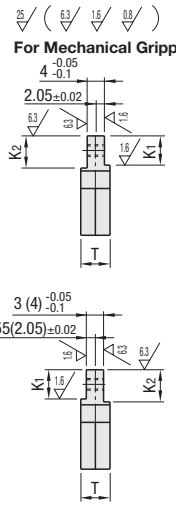
Type	Material	Surface Treatment	Hardness	Accessory
YVTB	1.1191/C45E	Black Oxide	-	Hexagon Socket Head Cap Screw: 2 pcs. Locating Pin
YVTM		Electroless Nickel Plating		
YVTBH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~45HRC	
YVTMH		Electroless Nickel Plating		

(?)The locating pin is press-fit into the pin hole before shipping.

Finger Mounting Dimensional Drawings



For Mechanical Gripper



(?)( ) for 6mm Stroke

■Common Dimensions

Gripper (Nominal)	P1	A	X1	X2	G	K1	K2	M1
4	5	10.5	2	4.5	2.5	5	5.5	M2
6 (M)	6	11.5	2.5	5.5	3	5.5	6.7	M3

■Gripper Body: 4mm Stroke (One-sided Stroke: 2mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	F 1mm Increment	B	E	E2	T	C	Z	W	W1	Applicable Gripper Body
YVTB YVTM YVTBH YVTMH	4	3.0~4.0	8~29	2~26	1	P/2-0.7	E+2	5	3	1.7	21.6	25	ACHK4-N ACHK4-D ACHE4-N
		4.1~5.0	8~30	2~27									
		5.1~6.0	9~30	2~27	0.9	P/2-0.8	E+2.5	6					
		6.1~7.0	9~31	2~28									
		7.1~8.0	10~31	2~28	0.8	P/2-0.9							
		8.1~9.0	11~32	2~29					2				
		9.1~10.0	12~32	2~29	0.7	P/2-1		7					

(?)F≤L-3

■Gripper Body: 6mm Stroke (One-sided Stroke: 3mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	F 1mm Increment	B	E	E2	T	C	Z	W	W1	Applicable Gripper Body
YVTB YVTM YVTBH YVTMH	6	3.0~4.0	8~44	2~26	2	P/2-0.7	E+2	6	3	2.7	23.6	29	ACHK6-N ACHK6-D ACHE6-N
		4.1~5.0	8~45	2~27									
		5.1~6.0	9~45	2~27	1.9	P/2-0.8	E+2.5	7					
		6.1~7.0	9~46	2~28									
		7.1~8.0	10~46	2~28	1.8	P/2-0.9							
		8.1~9.0	11~47	2~29					2				
		9.1~10.0	12~48	2~29	1.7	P/2-1							

(?)F≤L-3

■Mechanical Gripper: 4mm Stroke (One-sided Stroke: 2mm)

Part Number Type	Part Number Gripper (Nominal)	P Reference Pin 0.1mm Increment	L 1mm Increment	F 1mm Increment	B	E	E2	T	C	Z	W	W1	Applicable Gripper Body
YVTB YVTM YVTBH YVTMH	6M	3.0~4.0	8~29	2~26	1	P/2-0.7	E+2	6	3	1.7	23.6	27	ACHKM4 ACHEM4
		4.1~5.0	8~30	2~27									
		5.1~6.0	9~30	2~27	0.9	P/2-0.8	E+2.5	7					
		6.1~7.0	9~31	2~28									
		7.1~8.0	10~31	2~28	0.8	P/2-0.9							
		8.1~9.0	11~32	2~29					2				
		9.1~10.0	12~32	2~29	0.7	P/2-1							

(?)F≤L-3

Order Example

Part Number	-	P	-	L	-	F
YVTB4	-	P8.5	-	L30	-	F20

Price

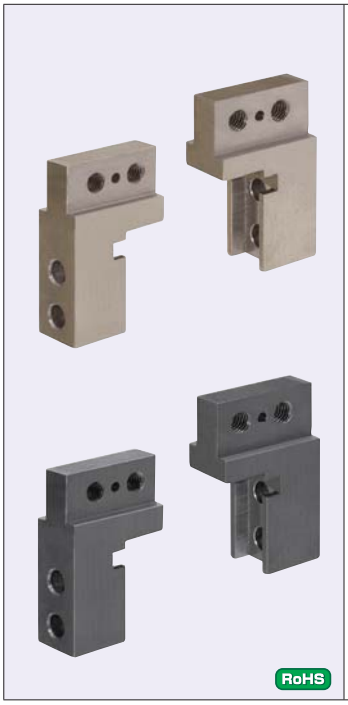
Nominal	€ Unit Price Qty. 1~4			
	YVTB	YVTM	YVTBH	YVTMH
4				
6-6M				

(?)For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days

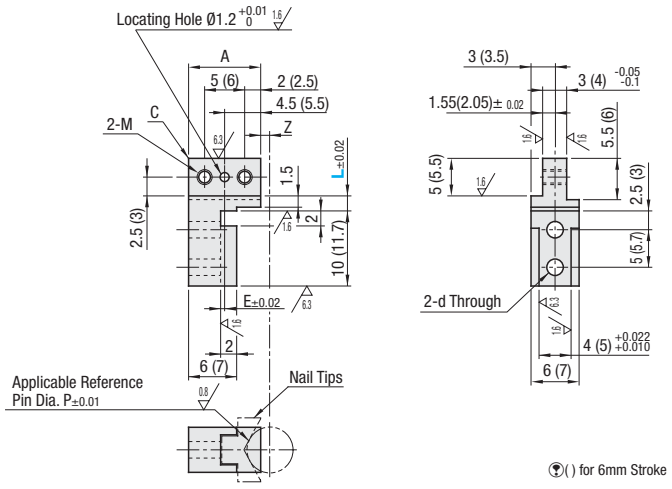
Fingered Arms for Air Grippers
-Direct Mounting Type-

CAD Data



Type	Material	Surface Treatment	Hardness	Accessory
DAMB	1.1191/C45E	Black Oxide	-	Hexagon Socket Head Cap Screw: 2 pcs. Locating Pin
DAMM		Electroless Nickel Plating		
DAMBH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~45HRC	
DAMMH		Electroless Nickel Plating		

Combined use of Finger Ends for Air Grippers (**P.1363**) is possible.
The locating pin is press-fit into the pin hole before shipping.



( ) for 6mm Stroke

Gripper Body: 4mm Stroke

Part Number Type	Part Number Nominal	L 1mm Increment	A	M	E	C	Z	d	Applicable Gripper Body	Finger Ends Applicable Reference Pin Dia. P
DAMB DAMM DAMBH DAMMH	4-3	2~25	9	2	0.5	-	1.8	2.2	ACHK4-N ACHK4-D ACHE4-N	3.00~4.00
	4-4		10		1.5	1				4.05~5.00
	4-5		11		2.5	2				5.05~6.00
	4-6		12		3.5	3				6.05~7.00
	4-7		13		4.5	4				7.05~8.00
	4-8		14		5.5	5				8.05~9.00
	4-9		15		6.5					9.05~10.00

Gripper Body: 6mm Stroke

Part Number Type	Part Number Nominal	L 1mm Increment	A	M	E	C	Z	d	Applicable Gripper Body	Finger Ends Applicable Reference Pin Dia. P
DAMB DAMM DAMBH DAMMH	6-3	2~44	11	3	0.5	-	0.8	2.9	ACHK6-N ACHK6-D ACHE6-N	3.00~4.00
	6-4		12		1.5	1				4.05~5.00
	6-5		13		2.5	2				5.05~6.00
	6-6		14		3.5	3				6.05~7.00
	6-7		15		4.5	4				7.05~8.00
	6-8		16		5.5	5				8.05~9.00
	6-9		17		6.5					9.05~10.00

Order Example

Part Number	-	L
DAMB4-8	-	L15

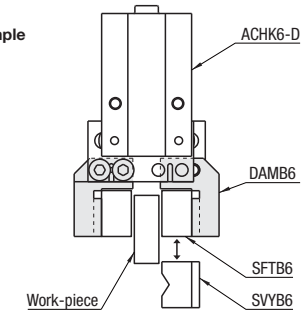
Days to Ship: 8 Days

Price

Nominal	€ Unit Price Qty. 1~4			
	DAMB	DAMM	DAMBH	DAMMH
4-_				
6-_				

For orders larger than indicated quantity, please request a quotation.

Example

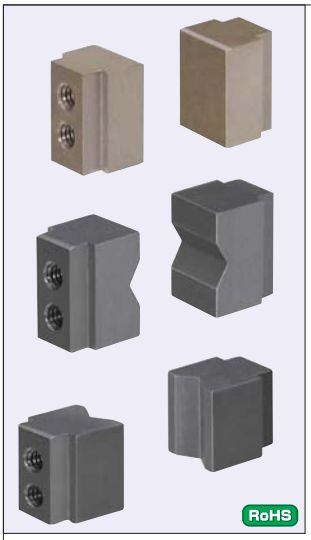


Finger Tips are replaceable according to the grip and work piece.

Finger Tips for Air-grippers

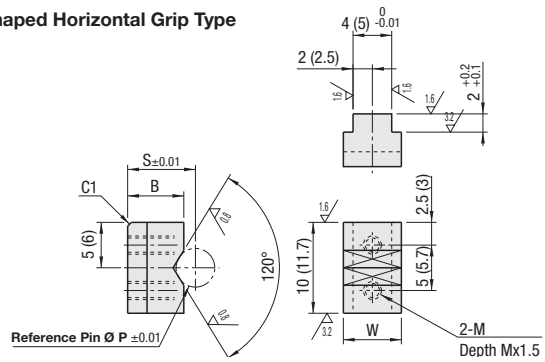
-Flat Shape · V Shape (Horizontal Grip / Vertical Grip)-

CAD Data

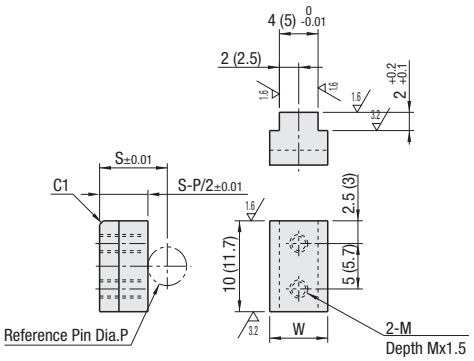


Type			M Material	S Surface Treatment	H Hardness
Flat Shape	V Shape				
	Horizontal Grip	Vertical Grip			
SFYB	SVYB	SVTB	1.1191/C45E	Black Oxide	-
SFYM	SVYM	SVTM		Electroless Nickel Plating	
SFYBH	SVYBH	SVTBH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~50HRC
SFYMH	SVYMH	SVTMH		Electroless Nickel Plating	

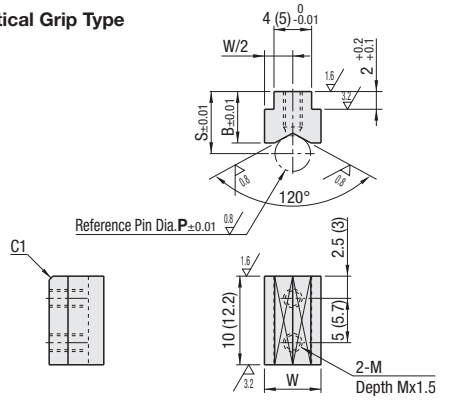
V-shaped Horizontal Grip Type



Flat Shape



V-shaped Vertical Grip Type



Depending on size, some pilot holes and through holes may go through.

( ) for 6mm Stroke

Gripper Body: 4mm Stroke

Part Number Type			Nominal	Applicable Reference Pin Dia. P Flat Shape	Applicable Reference Pin Dia. P V Shape: P 0.1 mm Increment	B	S	W	M
	V Shape		4-3	3.00~4.00	3.0~4.0	5.8	6.8	7	M2
Flat Shape	Horizontal Grip	Vertical Grip	4-4	4.05~5.00	4.1~5.0	6.5	7.8		
SFYB	SVYB	SVTB	4-5	5.05~6.00	5.1~6.0	7.1	8.8		
SFYM	SVYM	SVTM	4-6	6.05~7.00	6.1~7.0	7.6	9.8		
SFYBH	SVYBH	SVTBH	4-7	7.05~8.00	7.1~8.0	8.6	10.8	10	
SFYMH	SVYMH	SVTMH	4-8	8.05~9.00	8.1~9.0	9.3	11.8		
			4-9	9.05~10.00	9.1~10.0	9.7	12.8		

Specifying P dimensions is not required for the Flat Shape. Select nominal designation based on the size of the reference pin.

Gripper Body: 6mm Stroke

Part Number Type			Nominal	Applicable Reference Pin Dia. P Flat Shape	Applicable Reference Pin Dia. P V Shape: P 0.1 mm Increment	B	S	W	M
	V Shape		6-3	3.00~4.00	3.0~4.0	5.8	6.8	7	M2.5
Flat Shape	Horizontal Grip	Vertical Grip	6-4	4.05~5.00	4.1~5.0	6.5	7.8		
SFYB	SVYB	SVTB	6-5	5.05~6.00	5.1~6.0	7.1	8.8		
SFYM	SVYM	SVTM	6-6	6.05~7.00	6.1~7.0	7.6	9.8		
SFYBH	SVYBH	SVTBH	6-7	7.05~8.00	7.1~8.0	8.6	10.8	10	
SFYMH	SVYMH	SVTMH	6-8	8.05~9.00	8.1~9.0	9.3	11.8		
			6-9	9.05~10.00	9.1~10.0	9.7	12.8		

Specifying P dimensions is not required for the Flat Shape. Select nominal designation based on the size of the reference pin.

Order Example

Part Number	-	P
SVYB4-3	-	P3.1
SFYB6-4		

Days to Ship: 8 Days

Applicable Fingered Arm

Nominal	Part Number
4-_	DAM__4
6-_	DAM__6

Price

Nominal	€ Unit Price, 1~4 pcs. Flat Shape				V Shape Horizontal Grip				V Shape Vertical Grip			
	SFYB	SFYM	SFYBH	SFYMH	SVYB	SVYM	SVYBH	SVYMH	SVTB	SVTM	SVTBH	SVTMH
4-_												
6-_												

Fingers for Air Grippers - Internal Ø Grip Type

-Finger Tips / Direct Mounting-

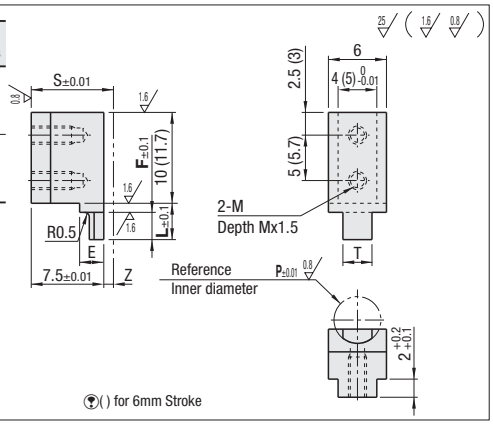
CAD Data

■Top: Fingers designed for DAM_4(6)-4-2.



Type	M Material	S Surface Treatment	H Hardness
SNKB	1.1191/C45E	Black Oxide	-
SNKM		Electroless Nickel Plating	
SNKBH	JIS G04OF (Pre-Hardening Steel)	Black Oxide	40~45HRC
SNKMH		Electroless Nickel Plating	

Arms for Air Grippers (P.1362)



RoHS

Double Acting Grippers for (Port B Air "ON")

( ) for 6mm Stroke

■Gripper Body: 4mm Stroke

Part Number Type	Nominal	P 0.1mm Increment	L 1mm Increment	F 1mm Increment	E	S	Z	T	M
SNKB SNKM SNKBH SNKMH	4	4.1~5.0	7~15 L-3≥F	3~8	2.5	8.5	1	3	2
		5.1~6.0			3	8.5	1	3.5	
		6.1~7.0			3.5	9	1.5	4	
		7.1~8.0		3~14	4	9	1.5	4.5	
		8.1~9.0			4.5	9	1.5	5	
		9.1~10.0			5	9	1.5	5.5	

Order Example: Part Number - P - L - F → SNKB6 - P10.0 - L17 - F3

Days to Ship: 10 Days

Price

Nominal	€ Unit Price Qty. 1~4 SNKB	SNKM	SNKBH	SNKMH
4				
6				

For orders larger than indicated quantity, please request a quotation.

■Applicable Fingered Arm

Nominal	Part Number
4	DAM_4-4-2
6	DAM_6-4-2

■Gripper Body: 6mm Stroke

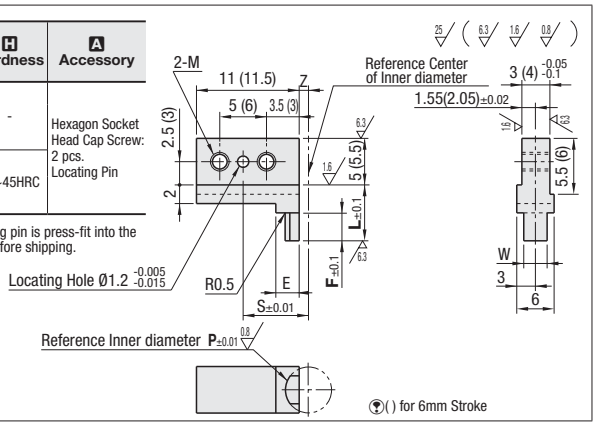
Part Number Type	Nominal	P 0.1mm Increment	L 1mm Increment	F 1mm Increment	E	S	Z	T	M
SNKB SNKM SNKBH SNKMH	6	4.1~5.0	7~33 L-3≥F	3~8	2.5	8.5	1	3	2.5
		5.1~6.0			3	8.5	1	3.5	
		6.1~7.0			3.5	9	1.5	4	
		7.1~8.0		3~14	4	9	1.5	4.5	
		8.1~9.0			4.5	9.5	2	5	
		9.1~10.0			5	9.5	2	5.5	



RoHS

Type	M Material	S Surface Treatment	H Hardness	A Accessory
FNAB	1.1191/C45E	Black Oxide	-	Hexagon Socket Head Cap Screw: 2 pcs. Locating Pin
FNAM		Electroless Nickel Plating		
FNABH	JIS G04OF (Pre-Hardening Steel)	Black Oxide	40~45HRC	
FNAMH		Electroless Nickel Plating		

*The locating pin is press-fit into the pin hole before shipping.



Double Acting Grippers for (Port B Air "ON")

( ) for 6mm Stroke

■Gripper Body: 4mm Stroke

Part Number Type	Nominal	P 0.1mm Increment	L 1mm Increment	F 1mm Increment	W	S	E	Z	M	Applicable Gripper Body
FNAB FNAM FNABH FNAMH	4	4.1~5.0	7~15 L-3≥F	3~8	3	7	3	1	2	ACHK4-N ACHK4-D ACHE4-N
		5.1~6.0			3		3.5	1		
		6.1~7.0		3~14	3.5	7.5	4	1.5		
		7.1~8.0			4		4.5	1.5		
		8.1~9.0			4.5		5	1.5		
		9.1~10.0			5		5.5	1.5		

Order Example: Part Number - P - L - F → FNAB6 - P8.1 - L30 - F16

Days to Ship: 10 Days

Price

Nominal	€ Unit Price Qty. 1~4 FNAB	FNAM	FNABH	FNAMH
4				
6				

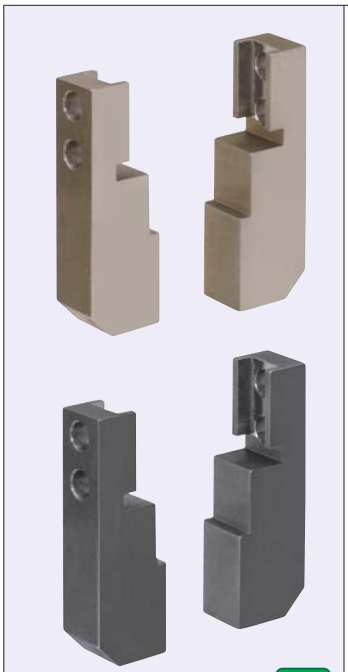
For orders larger than indicated quantity, please request a quotation.

■Gripper Body: 6mm Stroke

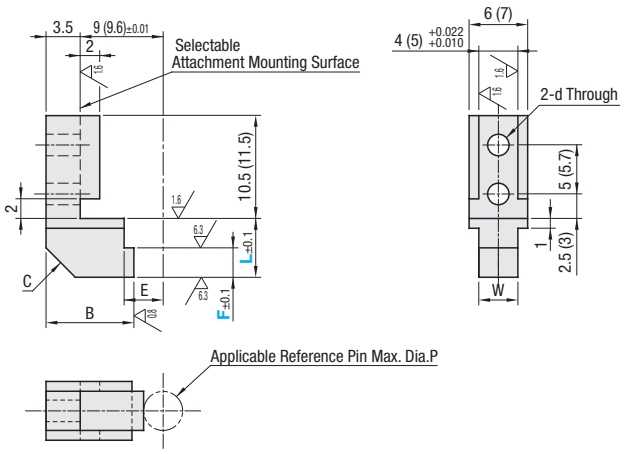
Part Number Type	Nominal	P 0.1mm Increment	L 1mm Increment	F 1mm Increment	W	S	E	Z	M	Applicable Gripper Body
FNAB FNAM FNABH FNAMH	6	4.1~5.0	7~33 L-3≥F	3~8	3	7	3	1	2.5	ACHK6-N ACHK6-D ACHE6-N ACHKM4
		5.1~6.0			3		3.5	1		
		6.1~7.0		3~12	3.5	7.5	4	1.5		
		7.1~8.0			4		4.5	1.5		
		8.1~9.0		3~16	4.5	8	5	2		
		9.1~10.0			5		5.5	2		

Fingers for Air Grippers (Attachment Mounting Type) -Flat Type-

CAD Data



Type	M Material	S Surface Treatment	H Hardness
AFYB	1.1191/C45E	Black Oxide	-
AFYM		Electroless Nickel Plating	
AFYBH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~45HRC
AFYMH		Electroless Nickel Plating	



RoHS

Flat Type fingers should be combined with each other.

( ) for 6mm Stroke

Gripper Body: 4mm Stroke

Part Number Type	Part Number Nominal	L 1mm Increment	F 1mm Increment	B	E	C	W	d	Applicable Gripper Body	Applicable Reference Pin Diameter P
AFYB AFYM AFYBH AFYMH	4-3	7~15 L-3≥F	4	10.5	3	3	5	2.2	ACHK4-N ACHK4-D ACHE4-N	3.00~4.00
	4-4		4~5	10	3.5					4.05~5.00
	4-5		4~6	9.5	4		7			5.05~6.00
	4-6		4~7	9	4.5					6.05~7.00
	4-7		4~8	8.5	5		10			7.05~8.00
	4-8		4~9	8	5.5	2				8.05~9.00
	4-9		4~10	7.5	6					9.05~10.00

Gripper Body: 6mm Stroke

Part Number Type	Part Number Nominal	L 1mm Increment	F 1mm Increment	B	E	C	W	d	Applicable Gripper Body	Applicable Reference Pin Diameter P
AFYB AFYM AFYBH AFYMH	6-3	7~33 L-3≥F	4	11.1	3	3	5	2.9	ACHK6-N ACHK6-D ACHE6-N	3.00~4.00
	6-4		4~5	10.6	3.5					4.05~5.00
	6-5		4~6	10.1	4		7			5.05~6.00
	6-6		4~7	9.6	4.5					6.05~7.00
	6-7		4~8	9.1	5		10			7.05~8.00
	6-8		4~9	8.6	5.5	2				8.05~9.00
	6-9		4~10	8.1	6					9.05~10.00

Order Example

Part Number	-	L	-	F
AFYM4-8	-	L13	-	F8

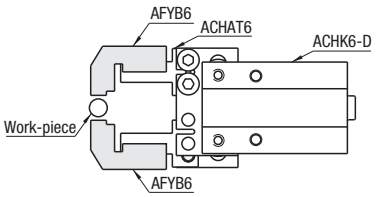
Days to Ship: 8 Days

Price

Nominal	€ Unit Price Qty. 1~4			
	AFYB	AFYM	AFYBH	AFYMH
4-_				
6-_				

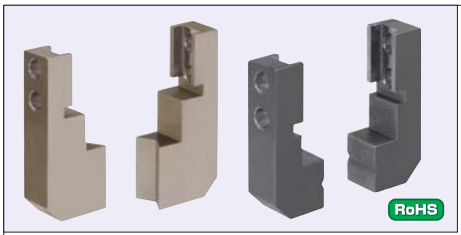
For orders larger than indicated quantity, please request a quotation.

Example



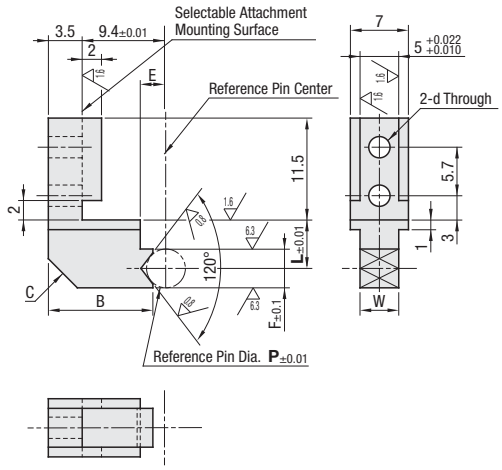
Fingers for Air Grippers (Attachment Mounting Type) -V Shape(Horizontal Grip · Vertical Grip)-

CAD Data

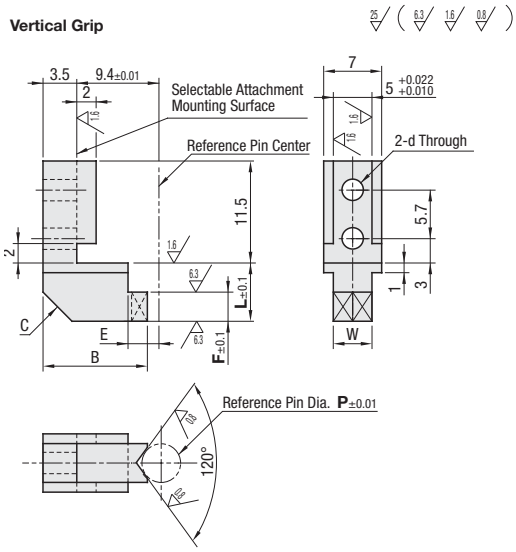


Type		M Material	S Surface Treatment	H Hardness	A Accessory
Horizontal Grip	Vertical Grip				
AVYB	AVTB	1.1191/C45E	Black Oxide	-	Hexagon Socket Head Cap Screw: 2 pcs. Locating Pin
AVYM	AVTM		Electroless Nickel Plating		
AVYBH	AVTBH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~50HRC	
AVYMH	AVTMH		Electroless Nickel Plating		

Horizontal Grip



Vertical Grip



■Horizontal Grip Gripper Body: 6mm Stroke

Part Number Type	Part Number Nominal	P 0.1mm Increment	L 1mm Increment	F	B	E	C	W	d
AVYB, AVYM, AVYBH, AVYMH	6	3.0~4.0	5~33	4	11.7	2.5	3	5	2.9
		4.1~5.0		5	11.4	3			
		5.1~6.0		6	11	3.5		7	
		6.1~7.0		7	10.7	4			
		7.1~8.0		8	10.5	4.5		10	
		8.1~9.0	6~33	9	9.7	5	2		
		9.1~10.0		10	9.4	-			

■Vertical Grip Gripper Body: 6mm Stroke

Part Number Type	Part Number Nominal	P 0.1mm Increment	1mm Increment L	1mm Increment F	B	E	C	W	d
AVTB, AVTM, AVTBH, AVTMH	6	3.0~4.0	6~33	3~33 ※F≤L-3	11.7	3.2	3	5	2.9
		4.1~5.0			11.4	4			
		5.1~6.0			11	4.8		7	
		6.1~7.0			10.7	5.6			
		7.1~8.0			10.5	6.4		10	
		8.1~9.0			10.3	7.2	2		
		9.1~10.0			9.9	8			

Order Example

Part Number	-	P	-	L	-	F
AVYB6	-	P8.0	-	L12		
AVTB6	-	P7.0	-	L12	-	F8

Days to Ship: 8 Days

Price

■Horizontal Grip Type

Nominal	€ Unit Price Qty. 1~4			
	AVYB	AVYM	AVYBH	AVYMH
6				

※For orders larger than indicated quantity, please request a quotation.

■Vertical Grip Type

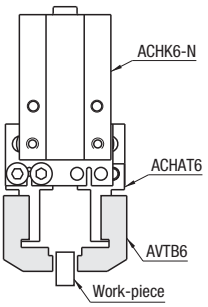
Nominal	€ Unit Price Qty. 1~4			
	AVTB	AVTM	AVTBH	AVTMH
6				

※For orders larger than indicated quantity, please request a quotation.

■Applicable Fingered Arm

Nominal	Type
6	DAMB6-_ · DAMM6-_ · DAMBH6-_ · DAMMH6-_

Example



Fingers for Air Grippers (Attachment Mounting Type) · Mounting Brackets

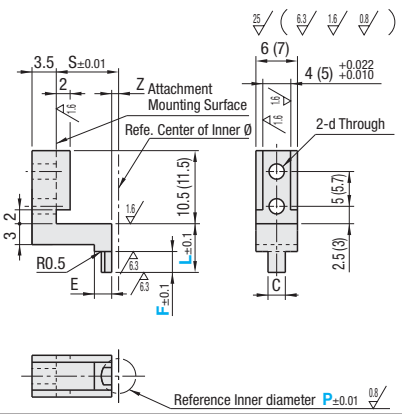
-Internal Dia. Grip- -Stroke Limits · Work piece Holding-

CAD Data

■Fingers for Air Grippers



Type	M Material	S Surface Treatment	H Hardness
ANAB	1.1191/C45E	Black Oxide	-
ANAM		Electroless Nickel Plating	
ANABH	JIS G040F (Pre-Hardening Steel)	Black Oxide	40~45HRC
ANAMH		Electroless Nickel Plating	



( ) for 6mm Stroke for Main Body

■Gripper Body: 4mm Stroke

Part Number Type	Part Number Nominal	P 0.1mm Increment	L 1mm Increment	F 1mm Increment	S	E	C	d	Z	Applicable Gripper Body
ANAB ANAM ANABH ANAMH	4	4.1~5.0	7~15 L-3≥F	3~8	9	2.5	3	2.2	1	ACHK4-N ACHK4-D ACHE4-N
		5.1~6.0				3	3.5		1	
		6.1~7.0			9.5	3.5	4		1.5	
		7.1~8.0		3~12		4	4.5		1.5	
		8.1~9.0				4.5	5		1.5	
		9.1~10.0				5	5.5		1.5	

Order Example: Part Number - P - L - F → ANAB4 - P8.1 - L10 - F7

Days to Ship: 10 Days

Price

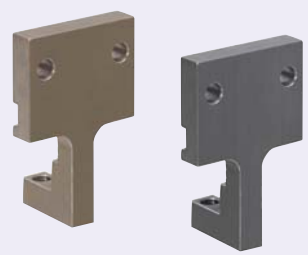
■Gripper Body: 6mm Stroke

Part Number Type	Part Number Nominal	P 0.1mm Increment	L 1mm Increment	F 1mm Increment	S	E	C	d	Z	Applicable Gripper Body
ANAB ANAM ANABH ANAMH	6	4.1~5.0	7~33 L-3≥F	3~8	9.6	2.5	3	2.9	1	ACHK6-N ACHK6-D ACHE6-N ACHKM4
		5.1~6.0				3	3.5		1	
		6.1~7.0			10.1	3.5	4		1.5	
		7.1~8.0		3~14		4	4.5		1.5	
		8.1~9.0			10.6	4.5	5		2	
		9.1~10.0				5	5.5		2	

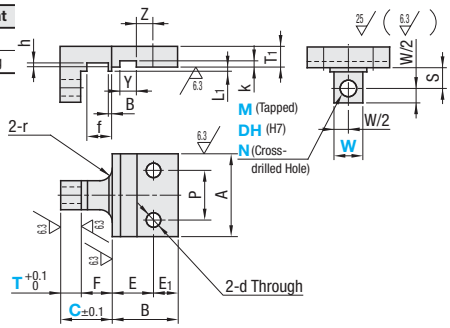
Nominal	€ Unit Price Qty. 1~4			
	ANAB	ANAM	ANABH	ANAMH
4				
6				

For orders larger than indicated quantity, please request a quotation.

■Mounting Brackets



Part Number	M Material	S Surface Treatment
ACFUB	1.0038/ S235JR	Black Oxide
ACFUM		Electroless Nickel Plating



Part Number	Nominal	C 1mm Increment	Selection T	Selection M (Female Thread) DH (H7) N (Through Hole)	W 1mm Increment	A	B	S	T1	E	E1	L1	P Pitch Center Divided	d	Z	Y	k	b	h	f	r	Machining Conditions Fmin≤(F=C-T)≤Fmax Fmin	Machining Conditions Fmin≤(F=C-T)≤Fmax Fmax	Applicable Gripper Body
ACFUB ACFUM	4-EK	10~30	3 5 8 10	3 4 5 6	6~10	20	16	5	5	10	6	1	12	3.4	4	4	1.5	0.8	0.8	5.2	3	7	22	ACHK4-ACHE4 *For Attachments Mounting
	6-E	13~35	5 8 10 12		6~10	25	18.5	7	5	12.5	6	1	16	3.4	6.5	4	1.5	0.7	0.8	6.3	3	8	25	ACHE6 *For Attachments Mounting
	6-K	13~35			6~10	23	19.5	8.2	5	13.5	6	1		3.4	7.5	4	1.5	0.7	0.8	6.3	3	8	25	ACHK6 *For Attachments Mounting

M≤T, DH≤T, N≤T

For M, DH and N holes, specify at least 1.5mm or more for W dimension and hole thickness on one side.

Order Example: Part Number - Nominal - C - T - Hole Type - W → ACFUB - 6-E - C13 - T8 - M5 - W9

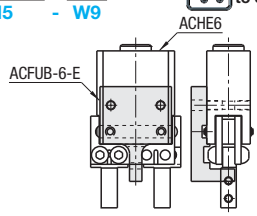
Days to Ship: 8 Days

Price

Nominal	€ Unit Price. 1~9pc(s).	
	ACFUB	ACFUM
4-EK		
6-E		
6-K		

For orders larger than indicated quantity, please request a quotation.

Example



Mounting onto one side of an Air Gripper.
Usable as a stroke stopper or a work piece presser.

Brackets for Air-grippers

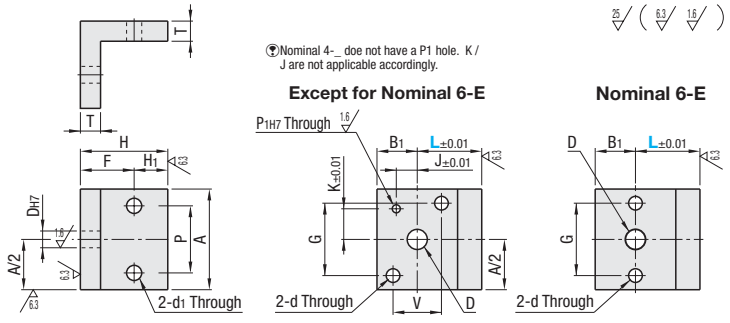
-L-Shaped Type · Plate Type-

CAD Data



RoHS

Part Number	Material	Surface Treatment
ACHLB	1.0038/S235JR	Black Oxide
ACHLM		Electroless Nickel Plating



Part Number	Nominal	L 1mm Increment	A	B1	P	F	H	H1	d1	D Hole	T	G	V	d	P1	K	J	Applicable Gripper Main Body
ACHLB ACHLM	4-E	12~48	20	6	14	15	24	9	4.5	6	6	13.6	4	3.4	-	-	-	ACHE4-N
	4-K	12~48	21	6	14	15	24	9	4.5	5	6	10	6	2.9	-	-	-	ACHK4-D ACHK4-N
	6-E	13~52	25	7	17	15	24	9	4.5	10	6	18	-	3.4	-	-	-	ACHE6-N
	6-K	16~64	25	10	17	15	24	9	4.5	6	5	18	12	3.4	2	7.6	5.2	ACHK6-D ACHK6-N

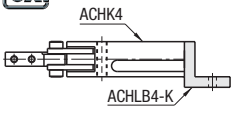
Nominal	€ Unit Price. 1~9pcs.					
	ACHLB			ACHLM		
	L12~30	L31~45	L46~64	L12~30	L31~45	L46~64
4-E						
4-K						
6-E						
6-K						

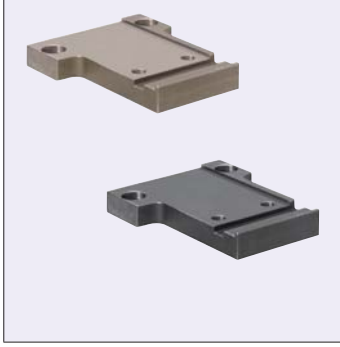
For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number ACHLB - Nominal 4-K - L L25

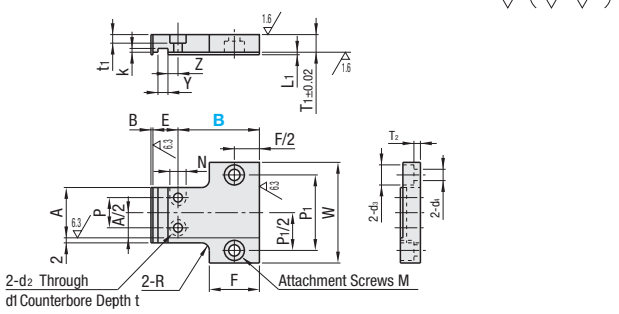
Days to Ship: 8 Days

Example





Part Number	Material	Surface Treatment
ACHPB	1.0038/S235JR	Black Oxide
ACHPM		Electroless Nickel Plating



Part Number	Nominal	B	P1	W	T1	E	L1	F	R	M	d4	d3	t2	P Pitch Center Divided	A	d2	d1	t1	N	Z	Y	k	b	Applicable Gripper Main Body
ACHPB ACHPM	4-E	16.5 26.5 33	28	36	6	10	1	15	3	3	3.4	6.5	2.5	12	21	3.4	6.5	3.5	6.5	4	4	1.5	0.8	ACHE4-N
	4-K	23.5 33.5 47	26	34	6	10	1	15	3	3	3.4	6.5	2.5	12	20	3.4	6.5	3.5	6.5	4	4	1.5	0.8	ACHK4-D ACHK4-N
	6-E	17.5 27.5 35	31	39	6	12.5	1	15	3	3	3.4	6.5	2.5	16	25	3.4	6.5	3.5	6.5	6.5	4	1.5	0.7	ACHE6-N
	6-K	23 33 46	29	37	6	13.5	1	15	3	3	3.4	6.5	2.5	16	23	3.4	6.5	3.5	6.5	7.5	4	1.5	0.7	ACHK6-D ACHK6-N

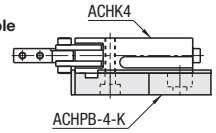
Nominal	€ Unit Price. 1~9pc(s).	
	ACHPB	ACHPM
4-E		
4-K		
6-E		
6-K		

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number ACHPB - Nominal 4-E - B 23.5

Days to Ship: 8 Days

Example



Compact Air Cylinders Overview

■Compact Air Cylinders Overview

MISUMI compact air cylinders are designed to be compact to save space.
The general-purpose thin-type cylinders have been standardized.
Fixed-stroke compact air cylinders can be shipped immediately, while those of selected shape (with specified stroke) can be dispatched on the 10th day after receiving an order.
Each of the MISUMI standard thin-type cylinders is equipped with a magnet rubber cushion.

■Features of Compact Air Cylinder Body

For the inner diameter of the cylinder tube, eight types are offered.
For selected shapes (with specified stroke), the stroke can be specified in 1mm increments, and the rod tip type can be selected.
The cylinder body can be fixed directly through four through holes.
In addition, connecting parts can be selected among four shapes: foot, rod end flange,
Sensors can be installed at eight locations (Ø12:3 locations; Ø16:6 locations).

■Selection of Cylinders

(1) Define the requirements for the load.

1) Load (N) - - - - - - - - - - - - - - - - Refer to "Load Calculation".
2) Operating Pressure (MPa)
3) Stroke (mm)
4) Operating Time (s)

(2) Calculate the cylinder output. (For Double Acting cylinder)

1) Determine the cylinder output. (for outstroke)
F1 ηxA1xp
F1 =Thrust for pushing (N)
A_1 =Outstroke Pressure area (mm^2) - - - Refer to "Cylinder Pressure Area Table".
η =Load Factor Meeting the Purpose (%) - - -Refer to "Load Factor Coefficient Table".
P =Operating Pressure (MPa)
2) Determine the cylinder output. (Instroke)
F2 =ηxA2xP
F2 =Thrust of instroke (N)
A_2 =Instroke pressure area (mm^2) - - - Refer to "Cylinder Pressure Area Table".
η =Load Factor Meeting the Purpose (%) - - - Refer to "Load Factor Coefficient Table".
P =Operating Pressure (MPa)

(3) Determine inner diameter of the tube.

- Determine the inner diameter of the tube based on the cylinder output (N) and load (N). Select a cylinder for required load to be within a (▭) range in the table.
- - - - - Refer to "Tube Inner Diameter Selection Table" and "Theoretical Output Table". For example, if the operating pressure is 0.5MPa and the 105N cylinder is required, the cylinder diameter is selectable from following 3 sizes: Ø20 (load factor: approx. 70%), Ø25 (load factor: approx. 45%), and Ø32 (load factor: approx. 25%).

$$\text{Load Factor} = \frac{\text{Load}}{\text{Theoretical Output}}$$

Theoretical Output (N)= Pressure Area (mm^2) x Operating Pressure (MPa)

(4) Determine the theoretical reference speed.

- Determine the theoretical reference speed based on the stroke (mm) and operating time (s).
- - - - - Refer to "Theoretical Reference Speed Selection Table".

(5) Verify the cylinder cushion mechanism.

- Check allowable kinetic energy (J) when the load is to be stopped near the end of the cylinder stroke.
E=m/2x Refer toefer to the "Allowable Kinetic Energy Table."
E=Kinetic Energy (J) m=Mass (kg) V=Velocity (m/s)
1) Review the inner diameter of the cylinder tube.
2) Install an external stopper.
The measures above are required.

(6) Verify the lateral load to be applied to the cylinder.

- If the lateral load is applied to the tip of the cylinder piston rod, check the allowable lateral load (N). Verify the load based on the following three conditions.
- - - - Refer to the "Allowable Tip Lateral Load Table".
1) Inner diameter of cylinder tube
2) Cylinder Stroke (mm)
3) Lateral load applied to the tip of the rod (N)
CAUTION: If load beyond the allowable lateral load (N) is applied to the tip of the cylinder piston rod, check the allowable lateral load (N).
1) Review the inner diameter of the cylinder tube.
2) Install a guiding mechanism on the piston rod to contain the applied load under the allowable lateral load. The measures above are required.

■Theoretical Output

Unit: N

Tube Inner Ø mm	Operating Direction	Operating Pressure (MPa) 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Ø12	Push	11	23	34	45	57	68	79	90	102	113
	Pull	8	17	25	34	42	51	59	68	76	85
Ø16	Push	20	40	60	80	101	121	141	161	181	201
	Pull	15	30	45	60	75	90	106	121	136	151
Ø20	Push	31	63	94	126	157	188	220	251	283	314
	Pull	24	47	71	94	118	141	165	188	212	236
Ø25	Push	49	98	147	196	245	295	344	393	442	491
	Pull	38	76	113	151	189	227	264	302	340	378
Ø32	Push	80	161	241	322	402	483	563	643	724	804
	Pull	60	121	181	241	302	362	422	483	543	603
Ø40	Push	126	251	377	503	628	754	880	1005	1131	1257
	Pull	106	211	317	422	528	633	739	844	950	1056
Ø50	Push	196	393	589	785	982	1178	1374	1571	1767	1963
	Pull	165	330	495	660	825	990	1155	1319	1484	1649
Ø63	Push	312	623	935	1247	1559	1870	2182	2494	2806	3117
	Pull	280	561	841	1121	1402	1682	1962	2242	2523	2803

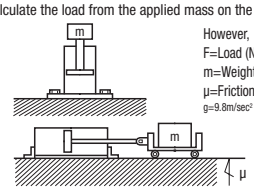
Load Calculation Calculate the load from the applied mass on the cylinder and its direction.

For vertical direction

F= mxg

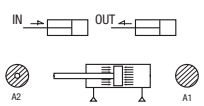
For lateral direction

F=mxgxμ



However,
F=Load (N)
m=Weight of Object (kg)
μ=Friction Coefficient (Standard μ=0.3)
g=9.8m/sec²

Cylinder Pressure Area Table



Cylinder Pressure Area

Tube Inner Dia. (mm)	Rod Dia. (mm)	A2 Pressure Area (mm^2) IN (Pull)	A1 Pressure Area (mm^2) OUT (Push)
12	6	85	113
16	8	151	201
20	10	236	314
25	12	378	491
32	16	603	804
40	16	1056	1257
50	20	1649	1963
63	20	2803	3117

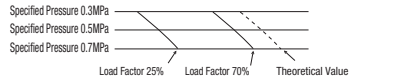
Load Factor Coefficient Table

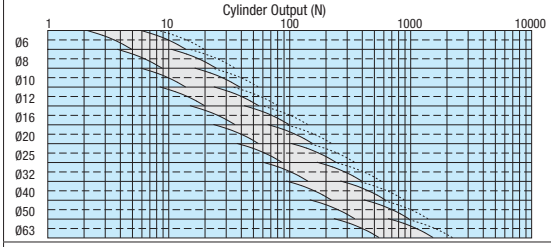


Load Factor Constant

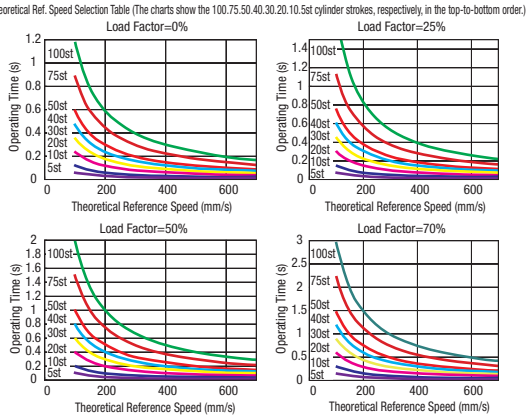
Purpose of Work		Load Factor η
Static Work (clamping, low speed vise tightening, etc.)		0.7 or Less
Dynamic Work	Lateral direction of the load placed on the guide.	1 or Less
	Vertical to horizontal operation of load	0.5 or Less

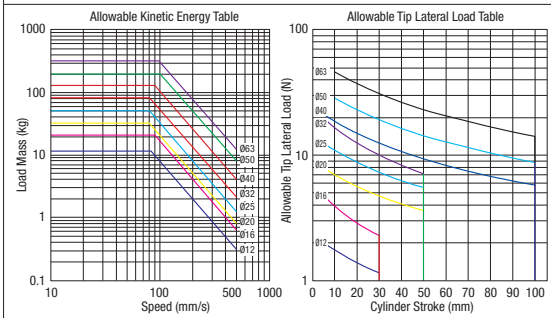
Tube Inner Diameter Selection Table





Theoretical Ref. Speed Selection Table (The charts show the 100.75.50.40.30.20.10.5st cylinder strokes, respectively, in the top-to-bottom order.)





Above two tables (Allowable Kinetic Energy Table and Allowable Tip Lateral Load Table) are for Compact Type Cylinders (☞ **P.1371**).
Refer to **P.1375** / **1376** for Small Cylinders, and **P.1393** for Air Cylinders (Pen-shaped Type).

■Air Consumption and Required Air Amounts

- Air Consumption (per Reciprocating Motion of Double Acting Cylinder)

(1) Amount of the air consumed by the reciprocating motion of the air cylinder, in the cylinder or between the cylinder and the changeover valve. It is required to select an air compressor or to calculate the running costs.

(Formulas)

$Qcc=(A1+A2)xLx\frac{P+0.1013}{0.1013}x10^{-6}$

$Qcp=2naxℓx\frac{P}{0.1013}x10^{-6}$

Qc =Qcc+Qcp

Qcc=Air Consumption of Air Cylinder [ℓ(ANR)]

Qcp=Air Consumption of Tube or Hollow [r(ANR)]

A1 =Extruding End Pressure Area [mm²] ---------- Refer to "Cylinder Pressure Area Table".

A2 =Retreating End Pressure Area [mm²] ---------- Refer to "Cylinder Pressure Area Table".

L =Cylinder Stroke [mm]

P =Operating Pressure [MPa]

ℓ =Hollow Length [mm]

a =Inner Cross-sectional Area of Hollow [mm²]

Qc =Air consumption required for one reciprocating motion of air cylinder [ℓ (ANR)]

(2)Select a compressor that has enough capacity for the total amount of air consumed downstream by the air actuator. Air is consumed due to leakages in the pips, or in the drain valve or pilot valve. In addition, air volume decreases with the temperature decrease.

(Formulas)

Qc´ =Qc x n x Number of Cylinders Used x Margin Ratio

Qc´ =Compressor Discharged Flow Rate [ℓ/min(ANR)]

n =Cylinder Reciprocating Motions Per Minute

Margin Ratio=1.5~ (To be set by the user)

- Required Air Amounts(per minute)

Amount of the air necessary for actuating the air cylinder at a predetermined speed. This is required for selecting a diameter of any pipe upstream of the changeover valve, or selecting the F, R and L equipment (filter, regulator and lubricator.). ☞P.1294

(Formulas)

$Qr1=60xA1xVx\frac{P+0.1013}{0.1013}x10^{-6}$

$Qr2=60xA2xVx\frac{P+0.1013}{0.1013}x10^{-6}$

Qr1=Extruding End Air Requirement [ℓ/min(ANR)]

Qr2=Retreating End Air Requirement [ℓ/min(ANR)]

A1 =Extruding End Pressure Area [mm²] ---------- Refer to "Cylinder Pressure Area Table".

A2 =Retreating End Pressure Area [mm²] ---------- Refer to "Cylinder Pressure Area Table".

V V =Maximum Piston Speed [mm/s]

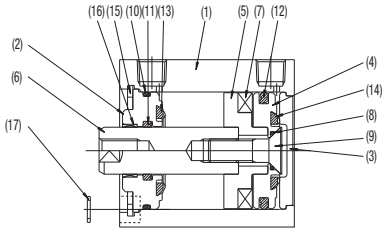
P =Operating Pressure [MPa]

* For Double Acting cylinders, use one with larger Qr1 and Qr2.
When there are multiple air cylinders downstream in selecting the plumbing or equipment, apply the maximum amount among all cylinders in simultaneous operation.

■Compact Cylinder Basic Specifications

Tube Inner Diameter (mm)	12~25	32~40	50	63
Operating Type	Double Acting			
Permissible Fluid	Air			
Min. Operating Pressure (MPa)	0.1			
Max. Operating Pressure (MPa)	1.0			
Pressure Resistance (MPa)	1.5			
Operating Temp. Range (°C)	5~60			
Piston Speed (mm/s)	50~500			
Cushion Mechanism	NBR			
Stroke Tolerance (mm)	0~+1.0			0~+2.0
Lubrication	Lube-Maintenance Free			
Pipe Connection Bore Diameter	M5x0.8	Rc1/8	Rc1/4	

■Compact Cylinders Basic Structure Diagram



■Compact Cylinders Parts Details

Number	Part Name	Material Ø12~32	Material Ø40~63	Surface Treatment
1	Body	EN AW 6063-T5		Clear Anodize
2	Rod Cover	EN AW-4032	EN AW 6061-T6	Clear Anodize
3	Head Cover	EN AW 6061/ EN AW-AlMg1SiCu-T6		Clear Anodize
4	Piston			Clear Anodize
5	Piston R			Clear Anodize
6	Piston Rod	1.4301	1.1191/C45E	Hard Chrome Plating
7	Magnet			
8	Piston Gasket	NBR	NBR	
9	Hexagon Socket Flat Head Cap Screws	1.4301/ X5CrNi18-10	1.7220/ 34CrMo4	
10	Body Gasket	NBR	NBR	
11	Rod Gasket	NBR	NBR	
12	Piston Gasket	NBR	NBR	
13	Rod Cushion	NBR	NBR	
14	Head Cushion	NBR	NBR	
15	Stop Ring	1.4301	1.3243	Nickel Plating (Ø40~63)
16	Rod Bushing		Oil Free Bushing	
17	Washer	1.0330/DC01	1.0330/DC01	Nickel Plating

■Cylinder Sensor Specifications

Part Number	MD11L_	MD13L_	ME33L_	MD14L_	ME34L_
Cable Exit Direction	Rear	Rear	Top	Rear	Top
Contact Type	Contact	No Contact			
Power Supply Voltage Range	DC5~28V				
Load Voltage Range	DC24V,AC110V	28VDC or Less		DC10~28V	
Load Current Range	DC24V:5~40mA AC110V:5~20mA	0.1~40mA		5~20mA	
Internal Voltage Drop	3V or less	0.5V or less		5V or less	
Leakage Current	0μA	50μA or Less		1mA or Less (24VDC, 25°C)	
Current Consumption	10mA or less				
Response Time	1ms or less				
Reset Time	1ms or less				
Insulation Resistance	100mΩ or more with 500 VDC (between case and code)				
Withstand Voltage	1 min. with 1500VAC (between case and code)				
Impact Resistance	294m/s²				
Vibration Resistance	Lateral amplitude 1.5mm, 10~55Hz (1 sweep/min, 2 hours in each of X, Y, Z directions)				
Ambient Temperature	0~+60°C (Not to be frozen)				
Connection Method	PVC 0.2mm² 2-conductors Outer dia. Ø2.6mm	PVC 0.15mm² 3 Conductors, Outer dia. Ø2.6mm		PVC 0.2mm² 2-conductors Outer dia. Ø2.6mm	
Lead Wire Length	1m / 3m				
Protection Structure	IP67 (IEC Standard), JIS0920 (Water Resistant Type)				
Protection Circuit	No	Yes			
Indicator Light	LED (Lights when power is ON)				
Applicable Load	Small Relay – PLC				
Electrical Circuit	Brown [+] Blue [-]	Brown [+] Black [OUT] Blue [-]		Brown [+] Blue [-]	

[IMPORTANT!] Precautions

DANGER: A clearly dangerous state. Unless avoided, death or serious injuries might be caused.
CAUTION: A potentially dangerous state depending on usage. Unless avoided, death or injuries might be caused .
NOTE: A potentially dangerous state depending on usage. Unless avoided, low-grade to moderate injuries might be caused, or property might be damaged .

(Cylinder)▲CAUTION

(1) Check the air cylinder specifications and use the cylinder within the allowed specification range. If the cylinder is used under pressure or temperature exceeding the specifications, or any fluid other than compressed air is used, there is a danger of personal injury or damage to the machine by broken or malfunctioning cylinders. Be sure to use the cylinder in accordance with the specifications.

(2) Please note that there are potential damages to the machine or human body, e.g., hands and/or legs being caught in the moving mechanisms.
If there are potential hazards to human body, install a protective cover as a safety measure.

(3) Provide safety measures against possible injuries and equipment damages by air cylinder malfunctions due to power and air supply troubles.

(4) The air cylinder and the coupling with other equipment must be fixed securely to avoid loosening.

(Cylinder)▲NOTE

(1) Use a filter and a dryer in order to supply clean and dry compressed air to the air cylinder. Impurities in the compressed air may cause malfunctions.

(2) Use a speed controller to operate the air cylinder at a predetermined speed.

(3)A lateral load beyond the allowable range must not be applied to the piston rod.
Otherwise, the air cylinder may operate improperly, or the gaskets may be damaged.

(4) The air cylinder can be operated without re-lubrication.
For lubricating the cylinder, supply Category-1 turbine oil (ISO VG232). Once lubricated, continue to use the same lubricant. If lubrication is stopped, the initial lubricant may be lost, thus causing the cylinder to malfunction.

(Cylinder Sensor)▲DANGER

(1) Never use the cylinder in an atmosphere containing explosion gas.
Otherwise, the sensor may cause an explosion because it does not have an explosion-proof structure.

(Cylinder Sensor)▲CAUTION

(1) After reviewing the cylinder sensor specifications, use the sensor within the specifications. If the sensor is used with a load current, voltage, temperature, impact, or any other condition outside the range of the specifications, the sensor may break or operate improperly.

(2) Do not use the sensor under conditions such as: a magnetized area; an atmosphere containing an explosive gas; water or oil may be splashed to the cylinder; the temperature may change in an extremely wide range; an impact may occur; a dusty area. Otherwise, the sensor may operate improperly or break.

(3) Perform wiring correctly according to the color-coded labels of the sensor lead wires.
‹Lead type sensor›
- If the wiring is reversed, the lamp will not light, although the sensor operates (24 VDC only).
‹Two-wire non-contact sensor›
- If the wiring is reversed, the lamp will continually stay on.
‹Three-wire non-contact sensor›
- If the power and output lines are wired incorrectly, the sensor will break.

(4) To connect a load that generates a surge voltage (e.g. relay), use a switch that contains a contact protection circuit, or use a protection circuit.

(5) If power is turned on without connecting a load such as relay, PLC (programmable controller), or a similar load to the two-wire sensor, the sensor will fail. Be sure to connect a load before turning the power on.

(6) Do not bundle sensor wires with power lines or high voltage circuits.
Otherwise, noise may be generated, resulting in malfunction of the sensor.

(7) If the wire contains insulation faults, an over-current may flow through the sensor, causing the sensor to fail.. Confirm that there is no insulation fault.

(8) If the sensor wire is too long, turning power on may generate a in-rush current, resulting in breakage of the contacts. If the wire length exceeds 5m, be sure to connect a contact protection circuit.

(9) Do not drop or bump the sensor, as the internal mechanism of the sensor may break.

(10) Fix the sensor in accordance with the tightening torque specifications (0.1~0.2Nm).

Compact Cylinders



RoHS

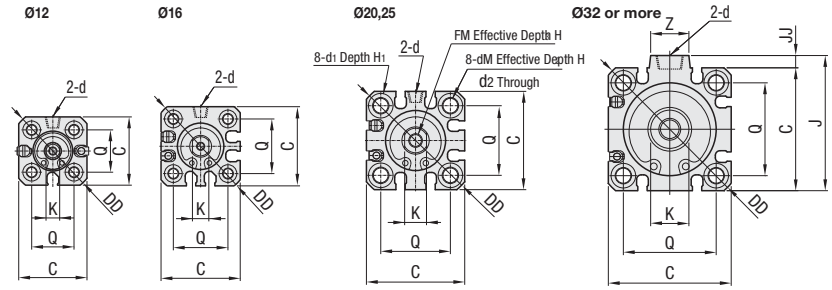
Stroke	Rod Tip	Type	Features
Selectable	Female Thread	MSCCN	Fixed Stroke type is also available.
	Male Thread	MSCCA	(Cylinder Sensor, No Bracket)
Configurable	Shape Selectable	MSCCS	Stroke and end shape are selectable in 1mm increments.

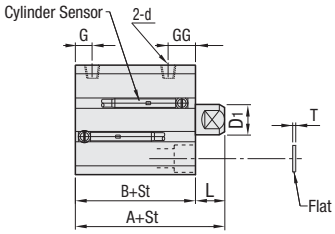
For Cylinder Brackets for the Fixed Stroke Type, refer to **P.1373•1374**

Operation Temperature Range: 5~60°C

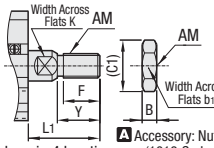
Cylinder Body End

Standard Type (Terminal A)
Rod Tip Female Thread



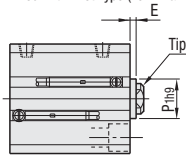


Rod Tip Male Thread

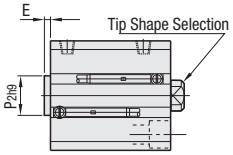


A Accessory: Nut 1 pc. (1018 Carbon Steel Nickel Chrome Plating)

Rod With Pilot Type (Terminal B)

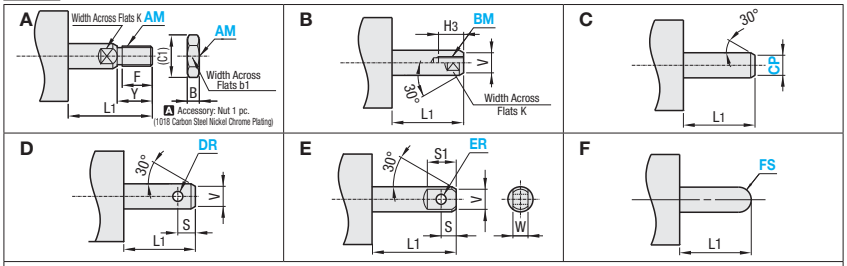


Head With Pilot Type (Terminal C)



For material and surface treatment, refer to the "Compact Cylinders Overview" on **P.1370**
A Accessory: Flat Washer 4 pcs. (1.0330/DC01 Nickel Plating)

Table 1 Compact Cylinder, Piston Rod Tip Shape



Tube Inner Dia. (mm)	F	H3	K	* L1	S	S1	V	W	Y
12	9	6	5	14 (24)	4	8	5	4	10.5
16	10	8	6	15.5 (25.5)	6	12	7	5	12
20	12	7	8	18.5 (28.5)	8	16	8	6	14
25	15	12	10	22.5 (32.5)	10	20	10	8	17.5
32	20.5	13	14	28.5 (38.5)	12	24	14	10	23.5
40	20.5	13	14	28.5 (38.5)	12	24	14	10	23.5
50	26	15	17	33.5 (43.5)	14	28	18	12	28.5

* When foot and rod flanged type are selected, dimension will be indicated in ( ).

AM	b	b1	(C1)
M3x0.5	2.4	5.5	6.4
M4x0.7	3.2	7	8.1
M5x0.8	4	8	9.2
M6x1.0	5	10	11.5
M8x1.25	5	13	15
M10x1.25	6	17	19.6
M12x1.5	7	19	21.9
M14x1.5	8	22	25.4
M16x1.5	10	24	27.7
M18x1.5	11	27	31.2

Nominal Thread Dia.	Male Thread	Female Thread
M3	M3x0.5	M3x0.5
M4	M4x0.7	M4x0.7
M5	M5x0.8	M5x0.8
M6	M6x1.0	M6x1.0
M8	M8x1.25	M8x1.25
M10	M10x1.25	M10x1.5
M12	M12x1.5	-
M14	M14x1.5	-
M16	M16x1.5	-
M18	M18x1.5	-

Table 2 Bracket Selection List

(refer to the part numbers on **P.1373**)

Cylinder Brackets (Foot Type)	
Type	Applicable Part Number
KFB	CFKPB
KFM	CFKPM

Cylinder Brackets (Crevice Type)	
Type	Applicable Part Number
TKB	CTKB
TKM	CTKM

For material, surface treatment and dimensions, refer to **P.1373**

External Dimensions for Compact Air Cylinders

Tube Inner Dia. (mm)	A	B	C	D1	DD	d	d1	d2	H1	H2	dM	E	H3	G	GG	J	JJ	K	L	P1	P2	Q	T	Z	b	b1	C1	F	L1	Y
12	25.5	22	25	6	32	M5x0.8	6.5	3.5	4	7	M4x0.7	1.5	6	5	7.5	-	-	5	3.5	15	6	15.5	0.5	-	4	8	9.2	9	14	10.5
16			29	8	38								8					6		20	10	20			5	10	11.5	10	15.5	12
20	34	29.5	36	10	47		9	5.5	7	10	M6x1.0	2	7	5.5	9			8	4.5	13	13	25.5	1		5	13	15	12	18.5	14
25	37.5	32.5	40	12	52								12		11			10	5	15	15	28			6	17	19.6	15	22.5	17.5
32	40	33	45	16	60	Rc1/8							13	7.5	10.5	49.5	4.5	14	7	21	21	34		14	8	22	25.4	20.5	28.5	23.5
40	46.5	39.5	52		70									8	11	57	5			28	28	40								
50	48.5	40.5	64	20	86	Rc1/4	11	6.6	8	14	M8x1.25	-	15	10.5	10.5	71	7	17	8	35	35	50		19	11	27	31.2	26	33.5	28.5
63	54	46	77		103		14	9	10.5	18	M10x1.5				15	84				-	-	60								

Fixed Stroke Type

Part Number Type	Tube Inner Ø (mm)	St Stroke (mm) Selection (Refer to the price list.)	L	Cylinder Body End Shape	Rod Tip MSCCN (Female Thread) FM	Rod Tip MSCCA (Male Thread) AM	Gasket
Rod Tip Female Thread MSCCN	12	5~30	3.5	A (Standard)	M3x0.5	M5x0.8	NB (Nitrile Rubber)
	16				M4x0.7	M6x1.0	
	20	5~50	4.5		M5x0.8	M8x1.25	
	25		5		M6x1.0	M10x1.25	
	32		7		M8x1.25	M14x1.5	
Rod Tip Male Thread MSCCA	40	5~100					
	50	10~100	8		M10x1.5	M18x1.5	
	63	30~100					

€ Unit Price

MSCCN St Stroke (mm)													MSCCA St Stroke (mm)					
5	10	15	20	25	30	35	40	45	50	75	100		10	20	30	50	75	100

Price Reduction
Up to 34%

CAD Data

Configurable Stroke Type

Part Number Type	Tube Inner Ø(mm)	St Stroke (mm) 1mm Increment	Cylinder Body End Shape Selection	Piston Rod Tip Shape Table 1 — Shape A BM (Thread Ø) Selection	Shape B BM (Thread Ø) Selection	Shape C CP 1mm Increment	Shape D DR Selection	Shape E ER Selection	Shape F FS (Arc Tip) Selection	Gasket Selection	Cylinder Bracket Table 2 Type	Cylinder Bracket Qty
MSCCS	12	5~30	A (Standard Type)	3 4 5	3	3~5	2 3	2 3	3	NB (Nitrile Rubber)	(No Bracket)	0 (Without TK bracket, specify 0.)
	16			4 5 6	3 4	3~7	2 3 4	2 3 4	4		TK (Foot Type)	
	20		B (Rod Side Piloted Type)	5 6 8	3 4 5	4~8	3 4 5	3 4 5	5		KFB	1
	25	5~50		5 6 8 10	4 5 6	4~10	4 5 6	4 5 6	6	VT (Fluorine Rubber)	KFM (Crevice)	
	32		C (Head Side Piloted Type)	6 8 10 12 14	5 6 8	5~14	5 6 8	5 6 8	8		TKB	2
	40	5~100		6 8 10 12 14	5 6 8	5~14	5 6 8	5 6 8	8		TKM	
	50	10~100		8 10 12 14 16 18	6 8 10	8~18	6 8 10	6 8 10	10			

Cylinder brackets cannot be installed on the pilot side for the types with cylinder end Shapes B and C. Please purchase sensors separately (See below).

Order Example

Part Number Type	Tube Ø	St Stroke	Cylinder Body End Shape	Piston Rod Tip Shape	Gasket	Cylinder Bracket Type	Cylinder Bracket Quantity
MSCCN	20	35					
MSCCS	20	38	B	BM4	VT	KFB	1

Alterations

Part Number Type	Tube Ø	St Stroke	Cylinder Body End Shape	Piston Rod End Shape	Gasket	Cylinder Bracket Type	Cylinder Bracket Quantity	(TC / TH)
MSCCS	20	50	B	DR5	NB	TK	0	TH

Order Example - Fixed Stroke Type: 6 Days P.87

- Configurable Stroke Type: 10 Days

Alterations	Cold Weather Resistance Specification	Heat Resistance Specification
Code	TC	TH
Spec.	Usable in the ambient temperature range from -40~60 °C. Changes to cold resistant grease and low nitrile rubber gasket. Cold resistance specification is not available for the sensors.	Usable in the ambient temperature range from 5°C~120°C. Changes to heat resisting grease and fluoro rubber gasket. Heat resistant sensors are not available.
Price Adder	Tube Inner Dia. Ø12~32: 20,00EUR Ø40~50: 30,00EUR	Tube Inner Diameter Ø12~32: 20,00EUR, Ø40~50: 30,00EUR

Applicable to Configurable Stroke Type only.
When specifying TC or TH alterations, select NB (Nitrile Rubber) for gaskets.

<Example of Price Calculation> MSCCS20-38-A-AM5-VT-KFB1
Cylinder Body Price+Surcharge for Cylinder Body End Shape+Surcharge for Piston Rod Tip Shape
70,00 + 0 + 10,00
+Gasket Surcharge + (Bracket € Unit Price x Quantity)
+ 16,00 + 14,50 = 110,50 EUR

Price

Volume Discount (Round down to one Cent.) P.87

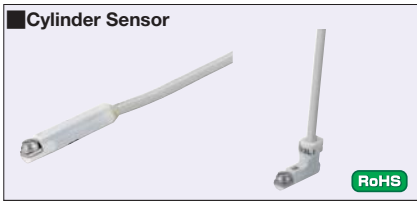
Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

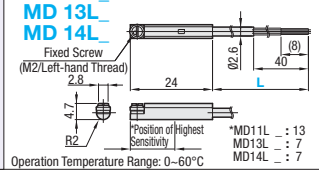
Tube Inner Dia. (mm)	MSCCS € Body Price — St Stroke (mm) 5~10	11~20	21~30	31~40	41~50	51~75	76~100	€ Surcharge for Piston Rod Tip Shape (Body +) AM	BM	CP	DR	ER	FS
12													
16													
20													
25													
32													
40													
50													

Tube Inner Dia. (mm)	€ Cylinder Body Surcharge for Cylinder Body End Shape (Body +) A	B	C	€ Gasket Surcharge (Body +) NB	VT	Bracket € Unit Price (Body +) * The bracket unit price is the price per piece. TK	KFB	KFM	TKB	TKM
12										
16										
20										
25										
32										
40										
50										

Cylinder Sensor

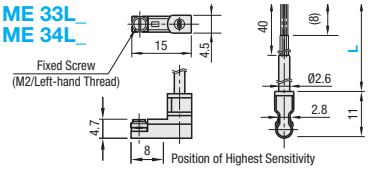


MD 11L_ MD 13L_ MD 14L_



Operation Temperature Range: 0~60°C

ME 33L_ ME 34L_



Operation Temperature Range:0~60°C

Part Number Type	L	Load Voltage	Load Current	Indicator Light	Sensor Type	Line	Wire Exit	€ Unit Price L1 (1m)	L3 (3m)
MD11	L1(1m) L3(3m)	DC24V AC110V	DC24V 5~40mA AC110V 5~20mA	LED (Lights when ON)	Contact	2-Line	Rear		
MD13	L1(1m) L3(3m)	28VDC or Less	0.1~40mA		No Contact	3-Line			
MD14	L1(1m) L3(3m)	DC10~28V	5~20mA		No Contact	2-Line			
ME33	L1(1m) L3(3m)	28VDC or Less	0.1~40mA		No Contact	3-Line	Top		
ME34	L1(1m) L3(3m)	DC10~28V	5~20mA		No Contact	2-Line			

For detailed specifications of the Sensors, see P.1370

Order Example Part Number: MD14L1

Order Example 6 Days P.88

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

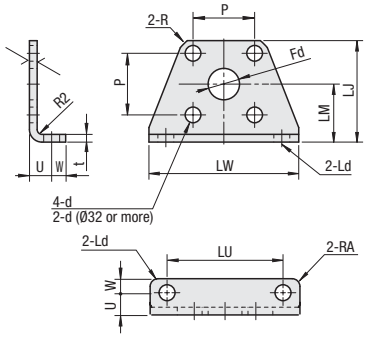
Brackets for Compact Cylinders

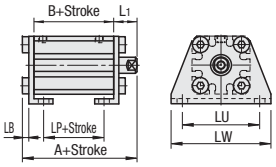
CAD Data

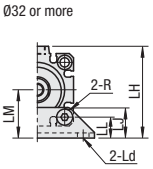
Foot Brackets

Type	Material	Surface Treatment
CFKPB	1.0330/DC01	Black Oxide
CFKPM		Electroless Nickel Plating









RoHS

LB refers to dimensions with hexagon socket low head cap screws.

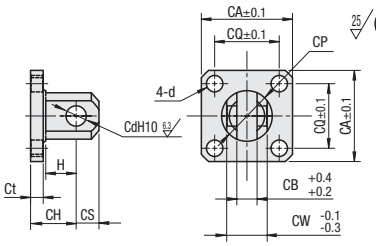
Part Number Type	Tube Inner Ø (mm)	*A	B	d	Fd	*L1	Ld	LB	LP	t	LU	LJ	LM	LW	P	R	RA	U	W	LH	LL	€ Unit Price CFKPB	€ Unit Price CFKPM
CFKPB CFKPM	12	50.8 (30.3)	22	4.5	10	24 (3.5)	4.5	2.8	10	2	34	29.5	17	44	15.5	16	2	8	4.5	-	-		
	16	52.3 (30.3)	22	4.5	12	25.5 (3.5)	4.5	2.8	10	2	38	33.5	19	48	20	19	2	8	5	-	-		
	20	65.2 (41.2)	29.5	6.5	14	28.5 (4.5)	6.6	4	17.5	3.2	48	42	24	62	25.5	23.5	3.2	9.2	5.8	-	-		
	25	72.2 (44.7)	32.5	6.5	16	32.5 (5)	6.6	4	17.5	3.2	52	46	26	66	28	26	3.2	10.7	5.8	-	-		
	32	78.7 (47.2)	33	6.5	-	38.5 (7)	6.6	4	17	3.2	57	19	30	71	34	3.2	3.2	11.2	5.8	57	13		
	40	85.2 (53.7)	39.5	6.6	-	38.5 (7)	6.6	4	23.5	3.2	64	18.5	33	78	40	3.2	3.2	11.2	7	64	13		
	50	92.2 (56.7)	40.5	9	-	43.5 (8)	9	5	17.5	3.2	79	21	39	95	50	3.2	3.2	14.7	8	78	14		

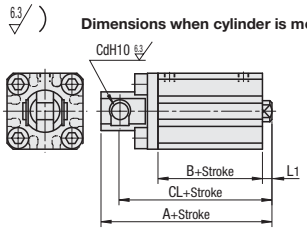
* ( ) dimensions are for bracket mounted MSCCN (Fixed Stroke).

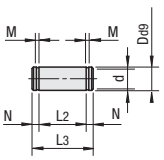
Clevis Mount Brackets

Type	Material	Surface Treatment	Accessory
CTKB	1.1191/C45E	Black Oxide	Pin 1 pc. (1.1191/C45E JIS STKM Electroless Nickel Plating 40~45HRC)Stopper Shafts 2 pcs. (Spring Steel)
CTKM		Electroless Nickel Plating	









RoHS

Part Number Type	Tube Inner Ø (mm)	*A	B	Cd	Ct	CA	CB	CH	*CL	CP	CQ	CS	CW	d	H	*L1	€ Unit Price CTKB	€ Unit Price CTKM
CTKB CTKM	12	56 (45.5)	22	5	4	25	5	14	50.0 (39.5)	12	15.5	6	10	4.5	7	14 (3.5)		
	16	58.5 (46.5)	22	5	4	29	6.5	15	52.5 (40.5)	14	20	6	12	4.5	10	15.5 (3.5)		
	20	75 (61)	29.5	8	5	36	8	18	66.0 (52.0)	20	25.5	9	16	6.5	12	18.5 (4.5)		
	25	85 (67.5)	32.5	10	5	40	10	20	75.0 (57.5)	24	28	10	20	6.5	14	22.5 (5)		
	32	91.5 (70)	33	10	5	45	18	20	81.5 (60.0)	-	34	10	36	6.5	14	28.5 (7)		
	40	100 (78.5)	39.5	10	6	52	18	22	90 (68.5_)	-	40	10	36	6.5	14	28.5 (7)		
	50	116 (90.5)	40.5	14	7	64	22	28	102 (76.5_)	-	50	14	44	9	20	33.5 (8)		

* ( ) dimensions are for bracket mounted MSCCN (Fixed Stroke).

Order Example

Part Number
CFKPB32
CTKB20

Days to Ship

6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Accessory of Crevice Brackets

No.	Dd9	d	L2	L3	N	M	Retaining Ring
12	5 -0.030 -0.060	4.8 0 -0.04	10.2	14.6	2.2	0.7 +0.10 0	C Type for Shaft 5
16			12.2	16.6			
20	8 -0.040 -0.076	7.6 0 -0.06	16.2	21	2.4	0.9 +0.10 0	C Type for Shaft 8
25	10 -0.040 -0.076	9.6 0 -0.09	20.2	25.6	2.7	1.15 +0.14 0	C Type for Shaft 10
32			36.2	41.6			
40							
50	14 -0.050 -0.093	13.4 0 -0.11	44.2	50.6	3.2		C Type for Shaft 14

Compact Cylinder Brackets · Cylinder Trunnion Plates

-L-Shaped Type · T-shaped Type- -Selectable Type · Configurable Type-

CAD Data

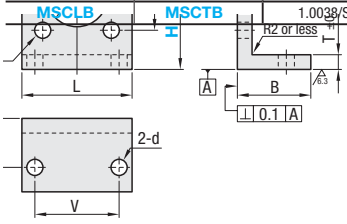
■Bottom: The Through Hole Type has been added.

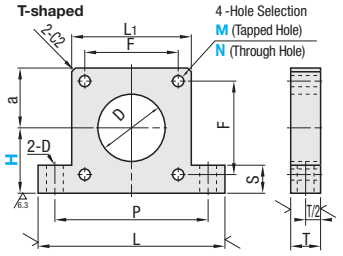
■Brackets for Compact Cylinders RoHS



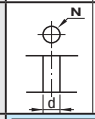
Type	
L-shaped	T-shaped
MSCLB	MSCTB

M Material	S Surface Treatment
1.0038/S235JR	Black Oxide





Hole Selection

Hole Type	Through Hole	Female Thread Hole (Coarse Thread)
Code	N	M
Shape		

Machining Specifications	Dimension	Nominal Diameter		
		3	5	6
	d	4.5	6.5	9

■L-shaped Type

Part Number		H	Hole Selection		a	B	L	T	F	D	S	V	d	€ Unit Price
Type	Tube Inner Dia. (mm)	1mm Increment	Selection	Nominal Diameter										
MSCLB	12	25~40	M (Female Thread Hole)	3	13	18	27	6	15.5	15.5	12	15	5.5	
	16	26~40			15		31		20	21		20		
	20	33~50	N (Through Hole)	5	18	22	38	8	25.5	14	15	25	6.5	
	25	35~50			20		42		28	16		30		
	32	42~55			23	25	47	10	34	22	18	32	9	
	40	45~60			26		54		40	29		40		
	50	51~65		6	32		66		50	36		50		

■T-shaped Type

Part Number		H	Hole Selection		a	L	P	F	L1	D	T	S	d	€ Unit Price
Type	Tube Inner Dia. (mm)	1mm Increment	Selection	Nominal Diameter										
MSCTB	12	20~50	M (Female Thread Hole)	3	13	50	38	15.5	26	15.5	10	10	5.5	
	16				15		40	20	30	21				
	20	25~60	N (Through Hole)	5	18	65	50	25.5	36	14	12	15	6.5	
	25				20	75	60	28	40	16				
	32				23			34	46	22				
	40	30~70			26		65	40	52	29				
	50	35~80		6	32	100	82	50	64	36	16		9	

Part Number - H - Hole Selection
MSCLB16 - H30 - N3
MSCTB40 - H60 - M5

10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

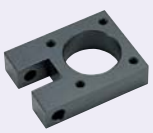
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Cylinder Trunnion Plates

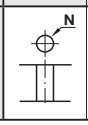
-For Compact Cylinders-

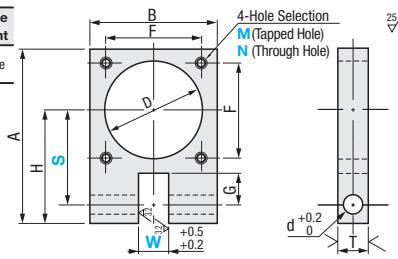


RoHS

Type			M Material	S Surface Treatment
Mounting Hole	Selectable	Configurable		
Female Thread Hole	CYPN	CYPF	1.0038	Black Oxide
Through Hole	CYPT	CYPTF		

Hole Selection

Hole Type	Through Hole	Female Thread Hole (Coarse Thread)
Shape		



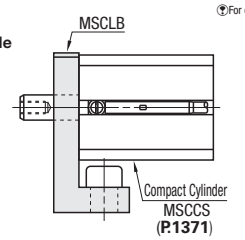
Part Number		S		W		D	A		H		B	F	Mounting Hole		G	T	D	Applicable Cylinders Tube Inner Dia.	€ Female Thread Hole Type				€ Through Hole Type			
Type	No.	Selectable	Config. 1mm Incr.	Selectable	Config. 1mm Incr.		Selectable	Configurable	Selectable	Configurable			M (Coarse Thread)	N (Through Hole)					CYPN		CYPF		CYPT		CYPTF	
																			€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
																			Qty. 1~4	Qty. 5~9	Qty. 1~4	Qty. 5~9	Qty. 1~4	Qty. 5~9	Qty. 1~4	Qty. 5~9
(Selectable) CYPN CYPT	12	19	19~29	10	8~10	16	40	H+15	25	S+6	30	15.5	M3		6	9	5	Ø12								
	16	21	21~31			21	42		27			20						Ø16								
	20	27	27~37	12	10~12	25	52	H+18	34	S+7	38	25.5	M5	6.5	8	12	6	Ø20								
	25	29	29~39			28	57	H+21	36		44	28						Ø25								
(Configurable) CYPF CYPTF	32	35	35~45	16	10~16	32	66	H+23	43	S+8	50	34			12	16	8	Ø32								
	40	40	40~50			42	75	H+26	49	S+9	55	40			14		10	Ø40								
	50	50	50~60	19	12~19	54	95	H+33	62	S+12	65	50	M6	9	17	19	12	Ø50								
	63	60	60~70			62	111	H+39	72		80	60	M8		20			Ø63								

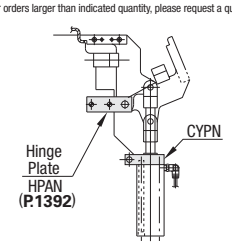
For orders larger than indicated quantity, please request a quotation.

Order Example
Part Number - S - W
CYPN32
CYPF50 - S55 - W19

Days to Ship
■Selectable
6 Days P.87
■Configurable
10 Days

Example





Small Cylinder

Price Reduction
Average 15%

CAD Data

RoHS

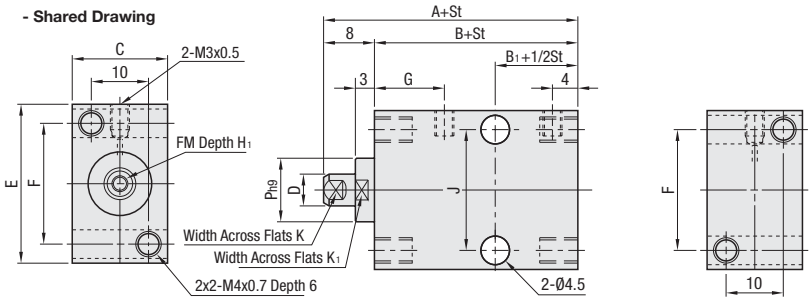


Type	Features
MSMCS	Tip shape of cylinder rod is selectable.

Small Cylinder: Basic Specifications

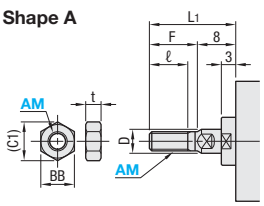
Tube Inner Diameter (mm)	6~10
Operating Type	Double Acting
Permissible Fluid	Air
Min. Operating Pressure (MPa)	0.2
Max. Operating Pressure (MPa)	0.7
Pressure Resistance (MPa)	1.0
Operating Temp. Range (°C)	5~60
Piston Speed (mm/s)	50~500
Cushion Mechanism	No
Stroke Tolerance (mm)	0~+0.5
Lubrication	Lube-Maintenance Free
Pipe Connection Bore Diameter	M3x0.5

- Shared Drawing



Select Tip Shape for Selectable Type.

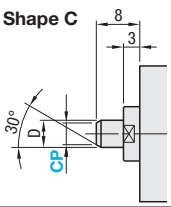
Shape A



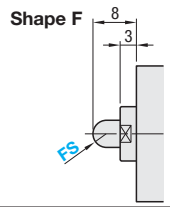
A Accessory:
Nut 1 pc.
(1.4301/X5CrNi18-10)

AM	BB	(C1)	t
3	5.5	6.4	1.8
4	7	8.1	2.4
5	8	9.2	3.2

Shape C



Shape F



Dimensions of Shape A Selection

Tube Inner Dia. (mm)	ℓ	L1	F
6	6	16	8
8	8	18	10
10	10	21	13

Tube Inner Dia. (mm)	A	B	B1	E	C	D	F	FM	G	H1	J	K	K1	Ph9
6	28	20	6.5	20	15	4	15	M2.5x0.45	11	5	14	3.5	9	10
8	30	22	8	25		5	19		10		19	4	9.5	
10						6		M3x0.5		6		5	11	12

Part Number Type	Part Number Tube Inner Dia. (mm)	St Stroke (mm) Selection	Piston Rod Tip Shape: Shape A AM (Thread Dia.) Selection	Shape C CP (mm)	Shape F FS (mm)	€ Body Price: St Stroke (mm) 5	10	15	20	25	30	€ Piston Rod Tip Shape Surcharge (+ Body): AM	CP	FS
MSMCS	6	5 10 15 20	3	3	2									
	8	5 10 15 20 25 30	3 4	4	2.5									
	10		4 5	5	3									

Order Example: Part Number MSMCS8 - St Stroke 10 - Piston Rod Tip Shape AM4

Days to Ship: 10 Days

Small Cylinder: Theoretical Output

Unit: (N)

Tube Inner Dia. (mm)	Operating Direction	Operating Pressure (MPa) 0.2	0.3	0.4	0.5	0.6	0.7
6	Push	5.7	8.5	11.3	14.1	17.0	19.8
	Pull	3.1	4.7	6.3	7.9	9.4	11.0
8	Push	10.1	15.1	20.1	25.1	30.2	35.2
	Pull	6.1	9.2	12.3	15.3	18.4	21.4
10	Push	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	10.1	15.1	20.1	25.1	30.2	35.2

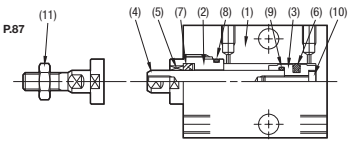
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Small Cylinder Structure Diagram



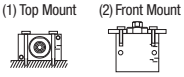
Small Cylinder: Part List

Number	Part Name		Material	Surface Treatment - Others
1	Body		Aluminum	Clear Anodize
2	Rod Cover		Aluminum	Clear Anodize
3	Piston	Ø6	Stainless Steel	
		Ø8,10	Aluminum	Clear Anodize
4	Piston Rod		Stainless Steel	Hard Chrome Plating
5	Bearing		PTFE Type	
6	Piston Gasket		NBR	
7	Rod Gasket		NBR	
8	Body Gasket		NBR	
9	Piston Gasket		NBR	Ø8, Ø10 only
10	Mounting Bolt		Stainless Steel	Ø8, Ø10 only
11	Nut		Stainless Steel	For Male Thread only

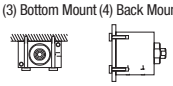
Example

It can be installed in four directions.

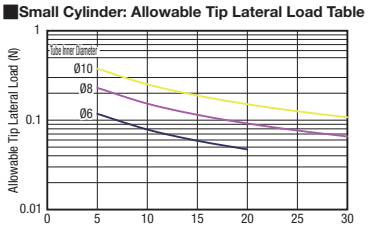
(1) Top Mount (2) Front Mount



(3) Bottom Mount (4) Back Mount

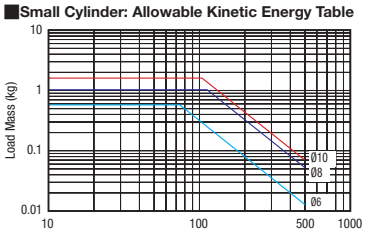


Small Cylinder: Allowable Tip Lateral Load Table



For theoretical reference speed, P1369

Small Cylinder: Allowable Kinetic Energy Table



Small Cylinder
-Sensor Slot Type-

Price Reduction
Up to 34%

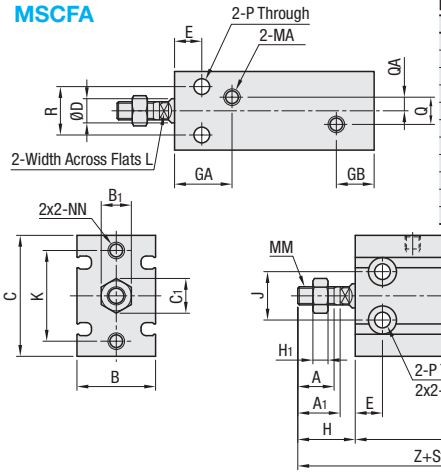
CAD Data

■Small Cylinder -Sensor Slot Type-



RoHS

MSCFA



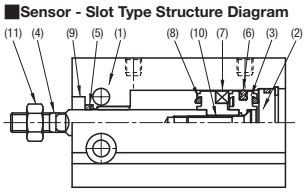
■MSCFA: Basic Specifications

Tube Inner Dia. (mm)	6	10 / 16	20 / 25	32
Operating Type	Double Acting			
Permissible Fluid	Air			
Min. Operating Pressure (MPa)	0.12	0.06	0.05	
Max. Operating Pressure (MPa)	0.7			
Pressure Resistance (MPa)	1.0			
Operating Temp. Range (°C)	5~60			
Piston Speed (mm/s)	50~500			
Cushion Mechanism	NBR			
Stroke Tolerance (mm)	0~+2.0			
Lubrication	Lube-Maintenance Free			
Pipe Connection Bore Diameter	M5x0.8		Rc1/8	

Tube Inner Ø (mm)	A	A1	B	B1	C	C1	D	E	GA	GB	H	H1	J	K	L	MA	MM	NN	P	Q	QA	R	S	T	Z
6	7	-	13	5.5	22	6.4	3	7	15	10	13	1.8	10	17	-	M5x0.8	M3x0.5	M3x0.5 Depth 5	3.2	-	-	7	33	Ø6 Counterbore Depth 4.8	46
10	10	-	15	7	24	8.1	4	7	16.5	10	16	2.4	11	18	-	M5x0.8	M4x0.7	M3x0.5 Depth 5	3.2	-	-	9	36	Ø6 Counterbore Depth 5	52
16	11	12.5	20	8	32	9.2	6	7	16.5	11.5	16	4	14	25	5	M5x0.8	M5x0.8	M4x0.7 Depth 6	4.5	4	2	12	40	Ø7.6 Counterbore Depth 6.5	56
20	12	14	26	10	40	11.5	8	9	19	12.5	19	5	16	30	6	M5x0.8	M6x1.0	M5x0.8 Depth 8	5.2	9	4.5	16	46	Ø9.3 Counterbore Depth 8	65
25	15.5	18	32	13	50	15	10	10	21.5	13	23	5	20	38	8	M5x0.8	M8x1.25	M5x0.8 Depth 8	5.5	9	4.5	20	50	Ø9.3 Counterbore Depth 9	73
32	19.5	22	40	17	62	19.6	12	11	23	12.5	27	6	24	48	10	Rc1/8	M10x1.25	M6x1.0 Depth 9	6.6	13.5	4.5	24	52	Ø11 Counterbore Depth 11.5	79

Part Number		St Stroke (mm) Selection	€ Body Price			
Type	Tube Inner Ø (mm)		Stroke (mm)			
			10	20	30	50
MSCFA	6	10 20 30				
	10					
	16					
	20	10 20 30 50				
	25					
	32					

■Sensor - Slot Type Structure Diagram

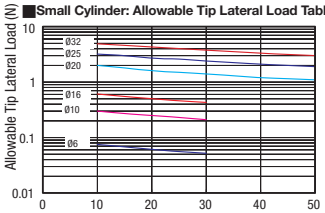


■MSCFA: Part List

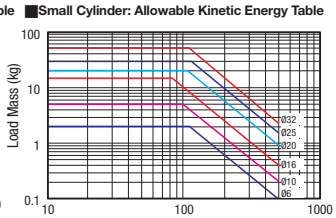
Number	Part Name	Ø6	Ø10	Ø16	Ø20	Ø25	Ø32
1	Body	EN AW-6061/EN AW-AlMg1SiCu					
2	End Cover	EN AW-6061			EN AW-5052		EN AW-6061
3	Piston(*)	EN AW-6061x2 pcs.					
4	Piston Rod	1.4305/X10CrNiS18-9					1.1191
5	Rod Gasket	NBR					
6	Piston Gasket	NBR					
7	Magnet	-					
8	Cushion	NBR		NBR			
9	Rod Cover	EN AW-6061					
10	Piston Bolt	1.4305/X10CrNiS18-9					1.7220
11	Rod Nut	1.0038/S235JR					

(*) One piece of EN AW-6061 and CW614N-CD each are applied for Ø16 rod piston.

■Small Cylinder: Allowable Tip Lateral Load Table



■Small Cylinder: Allowable Kinetic Energy Table



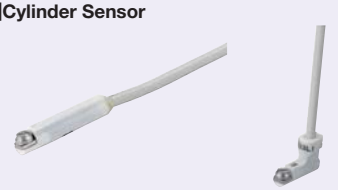
For theoretical reference speed, P.1369

■MSCFA: Theoretical Output

Unit: (N)

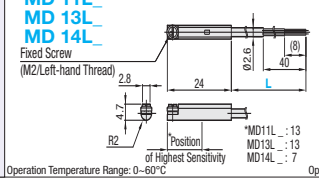
Tube Inner Dia. (mm)	Operating Direction	Operating Pressure (MPa) 0.2	0.3	0.4	0.5	0.6	0.7
6	Push	5.7	8.5	11.3	14.1	17.0	19.8
	Pull	4.2	6.4	8.5	10.6	12.7	14.8
10	Push	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	13.2	19.8	26.4	33.0	39.6	46.2
16	Push	40	60	80	101	121	141
	Pull	35	52	69	86	104	121
20	Push	63	94	126	157	188	220
	Pull	53	79	106	132	158	185
25	Push	98	147	196	245	295	344
	Pull	82	124	165	206	247	289
32	Push	161	241	322	402	483	563
	Pull	138	207	276	346	415	484

■Cylinder Sensor



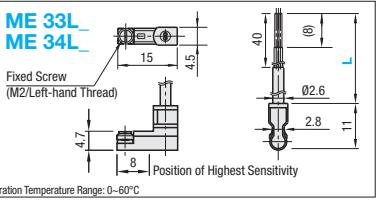
RoHS

MD 11L_
MD 13L_
MD 14L_



Operation Temperature Range: 0~60°C

ME 33L_
ME 34L_



Operation Temperature Range: 0~60°C

Part Number Type	L	Load Voltage	Load Current	Indicator Light	Sensor Type	Line	Wire Exit	€ Unit Price L1 (1m)	L3 (3m)
MD11	L1(1m) L3(3m)	DC24V AC110V	DC24V5~40mA AC110V5~20mA	LED (Lights when ON)	Contact	2-Line	Rear		
MD13	L1(1m) L3(3m)	28VDC or Less	0.1~40mA		No Contact	3-Line			
MD14	L1(1m) L3(3m)	DC10~28V	5~20mA		No Contact	2-Line			
ME33	L1(1m) L3(3m)	28VDC or Less	0.1~40mA		No Contact	3-Line	Top		
ME34	L1(1m) L3(3m)	DC10~28V	5~20mA		No Contact	2-Line			

For detailed specifications of the Sensors, P.1370

Order Example

- Small Cylinder (Sensor Slot Type): Part Number MSCFA6 - St Stroke 10
- Cylinder Sensor: Part Number MD14L1

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

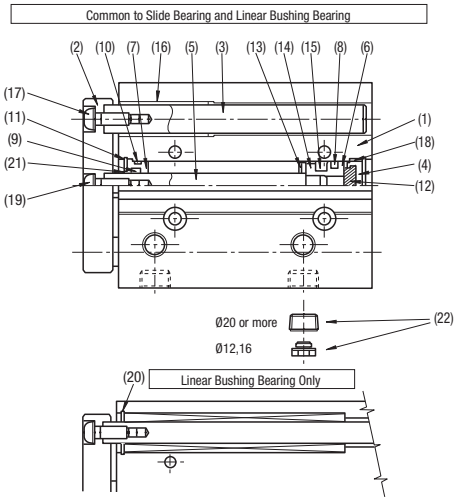
Overview of Cylinders with Guides

Overview of Cylinders with Guides

The MISUMI cylinders with guides provide more enhanced lateral load capacity, rigidity and accuracy compared to the compact type cylinders.

- High rigidity
  The integrated two robust guide rods and one cylinder assures high rigidity.
- High accuracy
  The twin guide mechanism ensures excellent non-rotating and locating accuracy.
- Easy installation
  There are three ways of mounting the cylinder body.
- A magnet is provided as standard equipment.
  One piece of magnet is included as a standard equipment as shown in the "Basic Structure of Cylinders with Guides: No. (15)."

Basic Specifications of Cylinders with Guides



Cylinders with Twin Guides: Component List

Number	Name		Material	Surface Treatment	Quantity
1	Body	Ø12~32	EN AW-6063-T5	Clear Anodize	1
		Ø50	EN AW-6061	Clear Anodize	
2	Link Bars	Ø12~32	1.0038/S235JR	Electroless Nickel Plating	1
		Ø50		Electroless Nickel Plating	
3	Guide Rod	Sliding Bearing	1.1191/C45E	Hard Chrome Plating	2
		Linear Bushing	1.3505/100Cr6	Hard Chrome Plating	
4	End Cover	Ø12, 50	EN AW-6061/EN AW-AlMg1SiCu	Clear Anodize	1
		Ø16~32	1.0038/S235JR	Nickel Plating	
5	Piston Rod	Ø12~20	1.4305	Hard Chrome Plating	1
		Ø25~50	1.1191/C45E	Hard Chrome Plating	
6	Piston		EN AW-6061/EN AW-AlMg1SiCu	Clear Anodize	1
7	Rod Cover	Ø12~32	EN AW-4032/AlSi12.5MgCuNi	Clear Anodize	1
		Ø50	EN AW-6061/EN AW-AlMg1SiCu	Clear Anodize	
8	Piston Gasket		NBR		1
9	Rod Gasket		NBR		1
10	Body Gasket #1		NBR		1
11	Stop Ring		1.3242/HS 6-5-2-5	Black Oxide	1/2
12	Head Cushion		NBR		1
13	Rod Cushion		NBR		1
14	Magnet Holder	Ø12~32	1.4301		1
		Ø50	EN AW-6061/EN AW-AlMg1SiCu		
15	Magnet				1
16	Bushing	Sliding Bearing	Oil Free Bushing		4
		Linear Bushing	Linear Bushing		2/4
17	Hexagon Socket Head Cap Screw	Linear Bushing Bearing Ø12	1.7220/34CrMo4	Black Oxide	2
	Hexagon Socket Low Head Cap Screws	Ø50	1.7220/34CrMo4	Nickel Plating	
		All other than above	1.7220/34CrMo4	Black Oxide	
18	Body Gasket #2		NBR		1
19	Hexagon Socket Head Cap Screw	Ø12	1.7220/34CrMo4	Black Oxide	1
	Hexagon Socket Low Head Cap Screws	Ø16~32	1.7220/34CrMo4	Black Oxide	
	Hexagon Socket Low Head Cap Screws	Ø50	1.7220/34CrMo4	Nickel Plating	
20	Stop Ring	Linear Bushing	1.3242/HS 6-5-2-5	Black Oxide	2
21	Bushing	Ø50 only	Oil Free Bushing		1
22	Plugs	Ø12, 16	CW614N-CD	Electroless Nickel Plating	2
		Ø20~50	1.0038/S235JR	Nickel Plating	

Features of Cylinders with Guides

Two types of bearings: sliding type and linear bushing type are available as guide rod bearings.
There are three ways of mounting the cylinder body: mounting it from the front, back, or bottom faces.
The sensors can be installed in four locations: 2 locations on the front face and 2 locations on the bottom face.
Plumbing is possible from two directions: the front and the sides.



Basic Specifications for Cylinders with Twin Guide

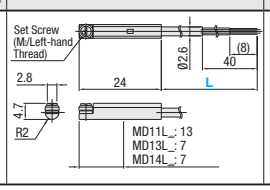
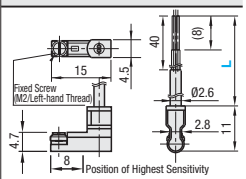
Tube Inner Diameter (mm)		12	16	20	25	32	50
Operating Type		Double Acting					
Permissible Fluid		Air					
Min. Operating Pressure (MPa)		0.1					
Max. Operating Pressure (MPa)		1.0					
Pressure Resistance (MPa)		1.5					
Operating Temp. Range (°C)		5~60					
Piston Speed (mm/s)		50~500					
Cushion Mechanism		NBR					
Stroke Tolerance (mm)		0~+1.5				0~+2.0	
Lubrication		Lube-Maintenance Free					
Pipe Connection Bore Diameter		M5x0.8		Rc1/8			Rc1/4
Mounting Part	Screw on Body Bottom Face Thread	M4x0.7 Depth 9	M5x0.8 Depth 11	M5x0.8 Depth 13	M6x1.0 Depth 15	M8x1.25 Depth 18	M10x1.5 Depth 22
	Body Side Screws (Outside)	M4x0.7 Depth 7	M5x0.8 Depth 7		M6x1.0 Depth 9	M8x1.25 Depth 11	
	Body Side Screws (Inside)	M5x0.8 Depth 10		M6x1.0 Depth 12		M8x1.25 Depth 16	M10x1.5 Depth 20
	Bolt Through Hole	For M4		For M5		For M6	For M8

Cylinder Sensor Specifications

Part Number	MD11L_	MD13L_	ME33L_	MD14L_	ME34L_
Cable Exit Direction	Rear	Rear	Top	Rear	Top
Contact Type	Contact	No Contact			
Power Supply Voltage Range		DC5~28V			
Load Voltage Range	DC24V,AC110V	28VDC or Less		DC10~28V	
Load Current Range	DC24V:5~40mA AC110V:5~20mA	0.1~40mA		5~20mA	
Internal Voltage Drop	3V or less	0.5V or less		5V or less	
Leakage Current	0μA	50μA or Less (24VDC, 25°C)		1mA or Less (24VDC, 25°C)	
Current Consumption	10mA or less				
Response Time	1ms or less				
Reset Time	1ms or less				
Insulation Resistance	100mΩ or more with 500 VDC (between case and code)				
Withstand Voltage	1 min. with 1500VAC (between case and code)				
Impact Resistance	294m/s²				
Vibration Resistance	Lateral amplitude 1.5mm, 10~55Hz (1 sweep/min, 2 hours in each of X, Y, Z directions)				
Ambient Temperature	0~+60°C (Not to be frozen)				
Connection Method	PVC 0.2mm² 2-conductors Outer dia. Ø2.6mm	PVC 0.15mm² 3 Conductors, Outer dia. Ø2.6mm		PVC 0.2mm² 2-conductors Outer dia. Ø2.6mm	
Lead Wire Length	1m / 3m				
Protection Structure	IP67 (IEC Standard), JIS0920 (Water Resistant Type)				
Protection Circuit	No	Yes			
Indicator Light	LED (Lights when power is ON)				
Applicable Load	Small Relay – PLC				
Electrical Circuit	Brown [+] Blue [-]	Brown [+] Black [OUT] Blue [-]		Brown [+] Blue [-]	

(Note) If an inductive load (e.g., small relay) is used, be sure to install a protection circuit to the load.

External Dimensions of Cylinder Sensors

Part Number	MD11L_ MD13L_ MD14L_	ME33L_ ME34L_
External Dimensions		

[IMPORTANT!] Notes on Cylinder with Guides

*Be sure to read the precautions in [IMPORTANT!] in the "Compact Air Cylinders - Overview" on P.1370

(Cylinders with Guides) ▲CAUTION

Never touch any moving part while the cylinder is in operation.
It is extremely dangerous because fingers may be caught between moving parts.

(Cylinders with Guides) ▲NOTE

(1) Protect the sliding sections of the piston rods and piston guide rods from being scratched and dented.

(2) Mounting position
Load should be applied in the direction of the piston rod axis or at 90°.

(3) Installing the speed controller
Install the speed controller (meter out: throttle on the exhaust side) to the air pressure outlet side.
The performance of the speed controller affects the operation of the cylinder.
Use a speed controller with low cracking pressure.

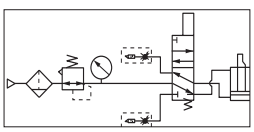
(4) Installing conditioning equipment
Cylinder failures are mostly caused by foreign materials in the atmosphere or drains.
Protect the cylinder from trouble by installing an air dryer or air filter upstream.

Recommended System Plumbing Drawing

(5) Space
Provide sufficient space around the equipment to ensure easy handling.

(6) Flushing
Before plumbing, flush the pipe thoroughly to protect it from solids or seal tape fragments.

(7) Ambient Environment
Do not use the cylinder in the following environments:
X An area filled with oil or grease It may cause dust to adhere to the sliding section.
X An area where intense vibrations may occur.
X An area where the equipment may be affected by chemicals.



■Selecting a Cylinder for Each Purpose of Use

- As a stopper (without a stopper plate).

(1) Obtain the intersection point of the amount of conveyed material and the conveyance speed from the [Allowed Stopper Capability Chart.]
Ex.): If the amount of conveyed material is 50 kg and the conveyance speed is 10 m/min, the intersection point is at 1.

(2) Select a desired cylinder with an inner diameter above the intersection point in the chart.
Ex.) For Intersection Point 1, cylinders with Ø20 or larger can stop conveyed objects.
Note that the "Allowable Stopper Capability Chart" below refers to 30mm and 25mm strokes for Ø12~Ø25 and Ø32~Ø50, respectively. Conversion is required to use the cylinder with more than the above strokes.
Note that the "Allowable Stopper Capability Chart" below refers to 30mm and 25mm strokes for Ø12~Ø25 and Ø32~Ø50, respectively. Conversion is required to use the cylinder with more than the above strokes.
L: Distance from the top face of the cylinder body to the top of the link bar used in upward motion of the cylinder
= Conversion coefficient+Stroke used (mÇcm)–Stroke in the "Allowable Stopper Capability Chart" (mm)
Ex.) F32–100 mm, conveyance speed=10 m/min. Converted value of maximum amount of conveyed material = 230 (kg)×44/(44+100 (mm)–25 (mm))=85 (kg). Any conveyed material up to 85 (kg) can be stopped.

- As a stopper (with a stopper plate).

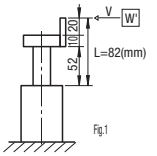
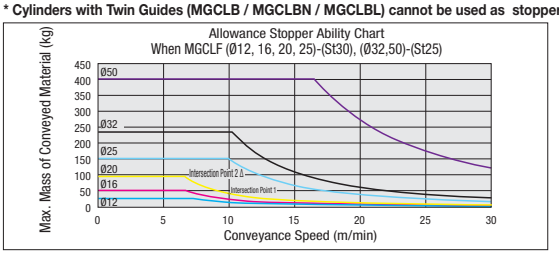


Fig.1

<Conditions>
Mass of Conveyed Material: 50kg
Conveyance Speed: 10m/min
Inner Diameter of Cylinder: Ø25
Stopper Plate: 30mm
L=82mm

(1) Conversion is required if the cylinder is used with more than the strokes in the "Allowable Stopper Capability Chart" below.
Conversion Formula: Converted value of maximum amount of conveyed material = Maximum amount of conveyed material in "Allowable Stopper Capability Chart" x conversion coefficient (K) /L
L: Distance from the top face of the cylinder body to the tip of the stopper plate used in upward motion of the cylinder
=Outer dimension of the plate from the link bar (mm)+Conversion coefficient+Stroke used (mm)
-Stroke in Allowed Stopper Capability Chart (mm)
Ex.) If the outer dimension of the plate is 30 (mm) relative to the link bar in the conditions of Ø32-100 mm and the conveyance speed 10 m/min,
Maximum amount of conveyed material = 230 (kg)×44/(30+44+100 (mm)–25 (mm))=68 (kg)
Any conveyed material up to 68 (kg) can be stopped.

*** Cylinders with Twin Guides (MGCLB / MGCLBN / MGCLBL) cannot be used as stoppers.**



- Factor Table for Conversion (k: Factor)

Tube Inner Dia. (mm)	Ø12	Ø16	Ø20	Ø25	Ø32	Ø50
k	40	42	42	42	44	53

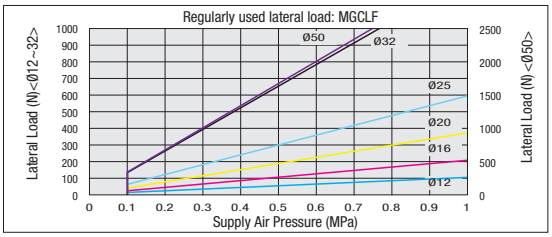
- As a stopper (Verification of allowable lateral load)

To use the cylinder as a stopper, make sure that the cylinder can be lowered with conveyed objects on.

<Calculating the lateral load>
(Example of calculation conditions)
- Supply air pressure: 0.4 MPa - Mass of work: 50 kg - Gravitational acceleration: 9.8 m/sec2
- Friction coefficient of conveyor μ = 0.2

(1) Obtain the lateral load (N).
Lateral load (N) = Mass of work (kg) × Gravitational acceleration (9.8 m/sec2) × Friction coefficient of conveyor (μ)
Ex.) Lateral load (N) = 50(kg) × 9.8 (m/sec^2) × 0.2 = 98 (N)

(2) Obtain the intersection point between "air supply pressure (MPa)" and "lateral load (N)" in the "Normal Lateral Load" chart below.
Tube inner diameter above the intersection point can be used.
(Ex.) The intersection point between the lateral load 98 (N) and supply air pressure 0.4 (MPa) shows that the
applicable tube diameters are Ø20, Ø25, Ø32 and Ø50.



- As a lifter

(1) Obtain the total mass (kg) of the work to be lifted.
(2) If the center of gravity of the work is placed in the center of the cylinder, select a tube inner diameter with the mass of work (kg) approximately 60% or lower of the theoretical thrust (N).
(3) If the center of gravity of the work is eccentrically located from the center of the cylinder (Fig. 2), obtain the intersection point between the eccentric distance (mm) and the allowable eccentric load (N) from the "Allowable Eccentric Load" chart.
Note that the upper limit in the chart accounts for approximately 60% of the theoretical output under a supply pressure of 0.5MPa.
The upper limit in the chart changes with supply pressure.
If the cylinder is to be used with a supply pressure other than 0.5 MPa, the load factor must be within 60% of the theoretical output.
(4) The cylinder ability is 50% if it is used in the direction of eccentricity of the work as shown in Figure 3.
Double the mass of work for selection.

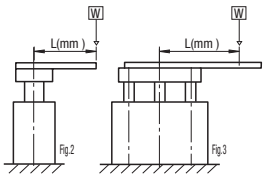
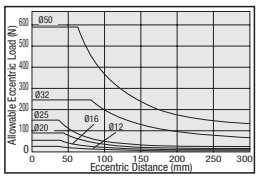
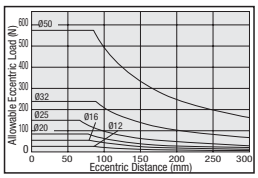


Fig.2 Fig.3

- Allowable Eccentric Load MGCLF (Slide Bearing)

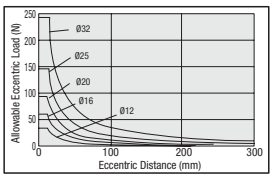


MGCLF12,16-10~50
MGCLF20,25-20~50
MGCLF32,50-25~50

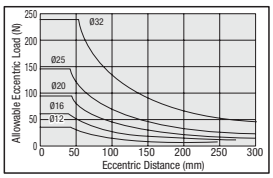


MGCLF12~50-51~100

- Allowable Eccentric Load MGCLB (Linear Bushing)



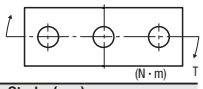
MGCLB12,16-10~30
MGCLB20,25-20~30
MGCLB32-25~50



MGCLB12,16-31~100
MGCLB20,25-31~100
MGCLB32-51~100

■Allowable Rotational Torque

The followings show dynamic allowable values with rotational torque T applied to the tips of the guide rod.



Tube Inner Dia. (mm)	Bearing Type	Stroke (mm) 10	20	25	30	40	50	75	100
Ø12	Sliding Bearing	0.50	0.40	-	0.33	0.28	0.25	0.77	0.65
	Linear Bushing	0.41	0.31	-	0.25	0.69	0.59	0.40	0.32
Ø16	Sliding Bearing	0.91	0.75	-	0.64	0.56	0.49	1.25	1.06
	Linear Bushing	0.76	0.60	-	0.49	1.14	1.02	0.79	0.65
Ø20	Sliding Bearing	-	1.43	-	1.23	1.08	0.96	1.51	1.27
	Linear Bushing	-	1.12	-	0.93	2.12	1.90	1.50	1.24
Ø25	Sliding Bearing	-	2.26	-	1.94	1.71	1.52	2.38	2.00
	Linear Bushing	-	1.98	-	1.65	3.75	3.37	2.68	2.22
Ø32	Sliding Bearing	-	-	6.71	-	-	5.24	4.30	3.64
	Linear Bushing	-	-	3.61	-	-	2.55	6.48	5.41
Ø50	Sliding Bearing	-	-	13.0	-	-	10.8	-	10.6

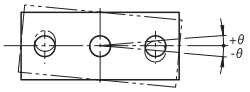
■Theoretical Output

(N)

Tube Dia. (mm)	Operating Direction	Operating Pressure (MPa) 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Ø12	Push	11	23	34	45	57	68	79	90	102	113
	Pull	8	17	25	34	42	51	59	68	76	85
Ø16	Push	20	40	60	80	101	121	141	161	181	201
	Pull	15	30	45	60	75	90	106	121	136	151
Ø20	Push	31	63	94	126	157	188	220	251	283	314
	Pull	24	47	71	94	118	141	165	188	212	236
Ø25	Push	49	98	147	196	245	295	344	393	442	491
	Pull	38	76	113	151	189	227	264	302	340	378
Ø32	Push	80	161	241	322	402	483	563	643	724	804
	Pull	60	121	181	241	302	362	422	483	543	603
Ø50	Push	196	393	589	785	982	1178	1374	1571	1767	1963
	Pull	165	330	495	660	825	990	1155	1319	1484	1649

■Non-rotational Accuracy

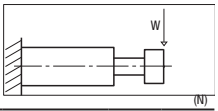
A deviation angle centered on the piston rod, expressing the backlash caused by the clearance between the guide rod and the bearing.



Tube Inner Dia. (mm)	Non-rotating Accuracy of Link Bar Tip: Sliding Bearing	Linear Bushing
Ø12	±0.12°	±0.06°
Ø16	±0.10°	±0.06°
Ø20	±0.09°	±0.05°
Ø25	±0.08°	±0.05°
Ø32	±0.06°	±0.04°
Ø50	±0.05°	-

■Allowable Lateral Load

The followings show dynamic allowable values with lateral load W (load perpendicular to the guide rod) applied to the tips of the guide rod.



(N)

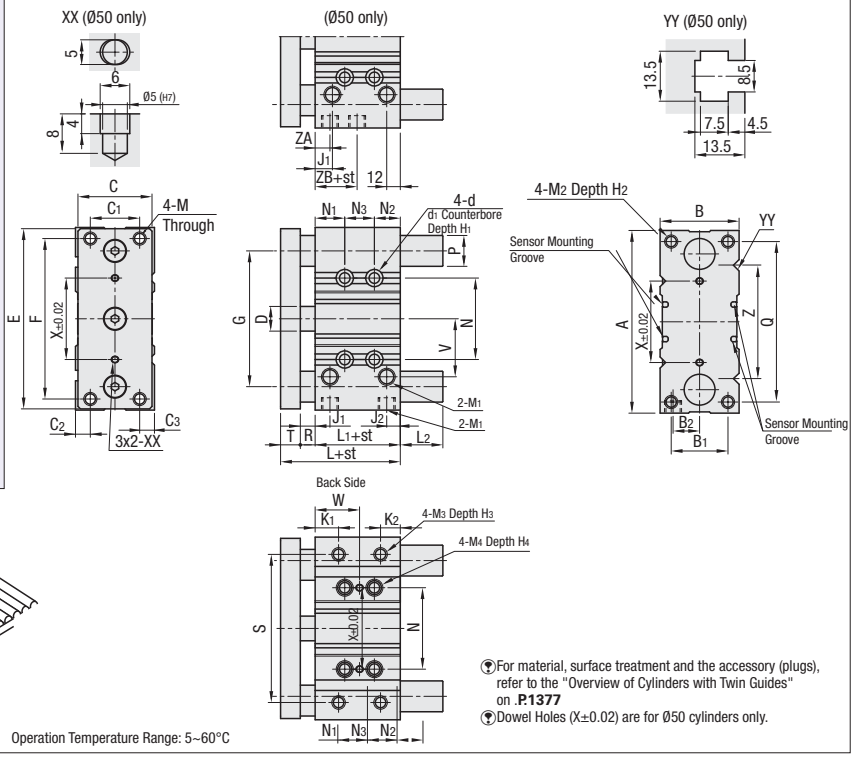
Part Number	Tube Dia. (mm)	Stroke (mm) 10	20	25	30	40	50	75	100
MGCLF (Slide Bearing)	Ø12	24	19		16	14	12	37	31
	Ø16	40	33		28	24	21	55	46
	Ø20		52		45	39	35	55	46
	Ø25		69		60	52	47	73	62
	Ø32			166			131	107	91
	Ø50			296			245		241
MGCLB (Linear Bushing Bearing)	Ø12	20	15		12	33	29	19	16
	Ø16	33	26		21	50	44	34	28
	Ø20		41		34	77	69	54	45
	Ø25		61		51	115	104	82	68
	Ø32			90			34	162	135

■Cylinder with Twin Guides

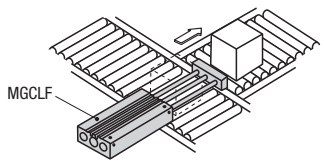


Type	Sliding Bearing	Linear Bushing	Features
Fixed Stroke Type	MGCLF	MGCLB	Fixed type is selectable.
Spacer Fitted Type	MGCLFN	MGCLBN	Intermediate strokes can be selected in 1mm increments. (Spacer Fitted)

No cylinder sensor is included in any of these types. If purchase is required, refer to **P.1380**



Example



For material, surface treatment and the accessory (plugs), refer to the "Overview of Cylinders with Twin Guides" on **P.1377**

Dowel Holes (X±0.02) are for Ø50 cylinders only.

Operation Temperature Range: 5~60°C

Tube Inner Dia. (mm)	A	B	B1	B2	C	C1	C2	C3	d	d1	D	E	F	G	H1	H2	H3	H4	J1	J2	K1	K2	L	L1
12	58	26	18	8.5	22	14	6	6	4.3	8	6	56	48	41.5	4.5	9	7	10	11	15	12	12	39	29
16	64	30	22	10	25	16	7	7	4.3	8	8	62	52	46	4.5	11	7	10	11	17	11	13	43	31
20	85	36	26	11.5	30	18	8	10	5.2	9.5	10	72	60	55	5.5	13	7	12	12	23	11	14	47	35
25	96	42	32	13.5	38	26	8	8	5.2	9.5	12	86	70	65	5.5	15	9	12	11	23.5	12	13.5	47.5	35.5
32	116	51	38	16	48	30	11	10	6.8	11	16	112	96	80	6.5	18	11	16	11.5	25	12	16.5	47.5	33.5
50	148	64	46	21.5	60	40	12	12	8.6	14	20	146	130	110	9	22	-	20	14	11	-	-	72	44

Tube Inner Dia. (mm)		M	M1	M2	M3	M4	N	N1	N2	N3	P		Q	R	S	T	V	W
											Sliding Bearing	Linear Bushing						
12		M4x0.7	M5x0.8	M4x0.7	M4x0.7	M5x0.8	23	5	20	4+St	8	6	40	2	50	8	19.5	-
16		M5x0.8	M5x0.8	M5x0.8	M5x0.8	M5x0.8	24	5	22	4+St	10	8	42	2	54	10	23	-
20		M5x0.8	Rc1/8	M5x0.8	M5x0.8	M6x1.0	28	19	16	St	12	10	52	2	64	10	24.5	-
25		M6x1.0	Rc1/8	M6x1.0	M6x1.0	M6x1.0	34	22	12.5	1+St	16	13	62	2	76	10	24	-
32		M8x1.25	Rc1/8	M8x1.25	M8x1.25	M8x1.25	42	22	14.5	St-3	20	16	80	2	100	12	31	-
50	St=25	M10x1.5	Rc1/4	M10x1.5	-	M10x1.5	66	24	21	24	25	-	130	12	-	16	47	36
	St=50								22	48								48
	St=100								72	48								48

Tube Inner Dia. (mm)	X	Z	ZA	ZB	L2 Dimensions St Stroke (mm)															
					Sliding Bearing Type								Linear Bushing Type							
					10	20	25	30	40	50	75	100	10	20	25	30	40	50	75	100
12	-	-	-	-	0	0	-	0	0	0	18	18	0	0	-	0	14	14	14	14
16	-	-	-	-	0	0	-	0	0	0	21	21	0	0	-	0	21	21	21	21
20	-	-	-	-	-	0	-	0	0	0	14	14	-	0	-	0	27	27	27	27
25	-	-	-	-	-	0	-	0	0	0	14	14	-	2	-	2	35	35	35	35
32	-	-	-	-	-	-	20	-	-	20	20	20	-	-	8	-	-	8	42	42
50	66	92	12	9	-	-	34.5	-	-	34.5	-	46	-	-	-	-	-	-	-	-

<L2 Dimension of Intermediate Stroke with Spacer Attached>
Ex. For the MGCLFN12-70,
A 5mm spacer is mounted into a Sliding Bearing Type cylinder with a 12mm inner diameter and a 75mm stroke.
L2=18mm.

Price Reduction
Up to 34%

CAD Data

Fixed Stroke Type

Part Number		St Stroke (mm) Selection	€ Unit Price St Stroke (mm)															
Type	Tube Inner Dia. (mm)		MGCLF								MGCLB							
			10	20	25	30	40	50	75	100	10	20	25	30	40	50	75	100
(Slide Bearing) MGCLF (Linear Bushing Bearing) MGCLB	12	10 20 30 40 50 75 100																
	16																	
	20	20 30 40 50 75 100																
	25																	
	32	25 50 75 100																
	50	25 50 100																

* Tube Inner Diameter 50 is applicable to MGCLF only.

Spacer Fitted Type

Part Number		St Stroke (mm) Spacer Fitted 1mm Increment
Type	Tube Inner Dia. (mm)	
(Slide Bearing) MGCLFN (Linear Bushing Bearing) MGCLBN	12	10~100
	16	
	20	20~100
	25	
	32	25~100

Spacers are made of resin (POM).

Order Example

Part Number	-	St Stroke
MGCLB16	-	50
MGCLFN12	-	70

Days to Ship — Fixed Stroke Type: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Spacer Fitted (Low Speed) Type: 10 Days

<Example of Price Calculation>
For the MGCLFN12–70, € Unit Price (MGCLFN12–75) + the price of intermediate stroke with spacer (51~74mm) 125,20 + 12,00 = 137,20 EUR

Part Number		€ Unit Price (Body Price) Stroke (mm)								€ Spacer Price (+Body Price) Intermediate Stroke with Spacer (mm)						
Type	Tube Inner Dia. (mm)	10	20	25	30	40	50	75	100	11~19	26~49	21~29	31~39	41~49	51~74	76~99
MGCLFN	12															
	16															
	20															
	25															
	32															
MGCLBN	12															
	16															
	20															
	25															
	32															

Alterations

Part Number	-	St Stroke	-	(TC · TH)
MGCLBN25	-	73	-	TH

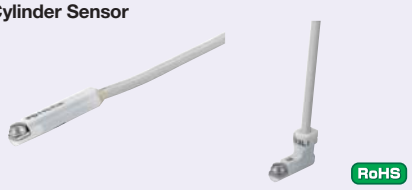
Available for MGCLFN and MGCLBN only.

Alterations	Cold Weather Resistance Specification	Heat Resistance Specification
Code	TC	TH
Spec.	Usable in the ambient temperature range from -40°C to 60°C. Changes to low temp. resistant grease, low nitrile rubber gaskets, and low temp. resistant cylinder sensors are not available.	Usable in the ambient temperature range from 5°C to 120°C. Changes to low temp. resistant grease, low fluoro-rubber gaskets, and low temp. resistant cylinder sensors are not available Change the spacer material to EN AW-6063/ AlMg0,7Si.
Price Adder	20,00	20,00

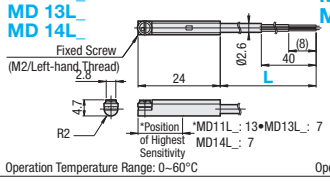
Tube Inner Dia. (mm)	Standard Stroke Table St Stroke (mm)							
	10	20	25	30	40	50	75	100
12	•	•	-	•	•	•	•	•
16	•	•	-	•	•	•	•	•
20	-	•	-	•	•	•	•	•
25	-	•	-	•	•	•	•	•
32	-	-	•	-	-	•	•	•

No spacer is provided when a standard stroke is specified.

Cylinder Sensor

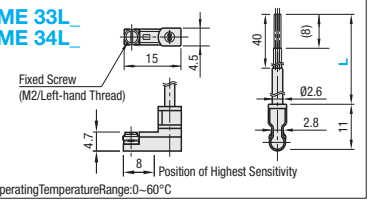


MD 11L_
MD 13L_
MD 14L_



Operation Temperature Range: 0~60°C

ME 33L_
ME 34L_



Operating Temperature Range: 0~60°C

Part Number Type	L	Load Voltage	Load Current	Indicator Light	Sensor Type	Line	Lead Wire Removal	€ Unit Price L1(1m)	€ Unit Price L3(3m)
MD11	L1(1m)L3(3m)	DC24V AC110V	DC24V5~40mA AC110V5~20mA	LED (Lights when ON)	Contact	2-Line	Rear		
MD13	L1(1m)L3(3m)	28VDC or Less	0.1~40mA		No Contact	3-Line			
MD14	L1(1m)L3(3m)	DC10~28V	5~20mA		No Contact	2-Line			
ME33	L1(1m)L3(3m)	28VDC or Less	0.1~40mA		No Contact	3-Line	Top		
ME34	L1(1m)L3(3m)	DC10~28V	5~20mA		No Contact	2-Line			

For detailed specifications of the Sensors, see P.1377

Order Example — Part Number: MD14L1

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Overview of Rotary Clamp Cylinders

■General Information

The square and space-saving cylinders have built-in rotary (swing) clamping mechanisms.
They are suited for clamping small workpieces such as electronic parts in space-savings.

■Features

- Space-saving / Square Type

Sensors of all diameters (Contact / No Contact) are mountable to the cylinders.

- High Rigidity

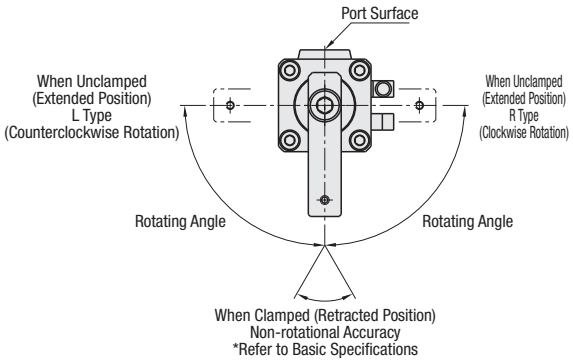
For enhanced wear resistance, the cylinders are equipped with two guide grooves compatible with all diameters.
In addition, each of the guide pins is outfitted with a roller(Ø32~Ø50).

■Basic Specifications of Clamp Cylinders

Tube Inner Diameter (mm)		25	32	40	50
Operating Type		Double Acting			
Permissible Fluid		Compressed Air			
Max. Operating Pressure (MPa)		1.0			
Min. Operating Pressure (MPa)		0.2			
Guaranteed Withstand Pressure		1.6			
Operating Temp. Range (°C)		-10 ~ 60 (No Freezing)			
Connection Diameter		M5	Rc1/8		Rc1/4
Piston Speed (mm/s)		50~200			
Cushion Mechanism		With Cushion Rubber			
Lubrication		N/A			
Rotating Angle		90°±10°			
Rotating Direction		Right / Left			
Rod Non-rotating Accuracy (When Clamped): Initial Value		±1°	±0.9°		±0.7°
Pressure Area (mm2)	Instroke Side	377	603	1055	1649
	Outstroke Side	490	804	1256	1963
Service Life		1 Million Times			

■Stroke

Tube Inner Dia. (mm)	Stroke	Stroke on Rotating Section (mm)	Stroke on Clamping Section (mm)	Rotating Direction
Ø25	31	11	20	Counter-clockwise Rotation Clockwise Rotation
Ø32	35	15	20	
Ø40	35	15	20	
Ø50	70	20	50	



■For Design · Selection

▲NOTE

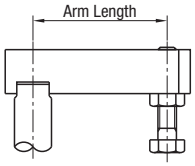
■In operation, the piston rod of this cylinder strokes while rotates (at 90°).
Be sure that the arm mounted onto the tip of the piston rod does not interfere with any external objects while rotating.
Take precautions such as installing a protective cover if the pivoting arm mounted onto the tip of the piston rod poses a hazard to human body.

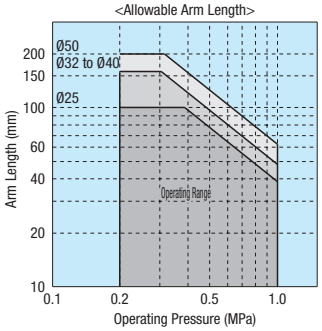
■Clamping Position

Do not clamp while the arm is rotating.
For clamping, allow 3mm or more before the stroke end.

■Arm Length & Operating Pressure

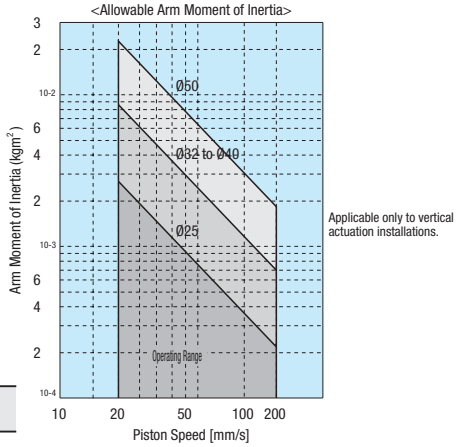
Set the arm length and the operating pressure to be within the ranges below.





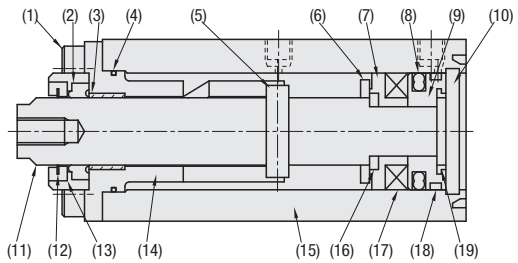
■Arm Inertia Moment & Piston Speed

Set the arm inertia moment and the piston speed to be within the operating range as shown in the applicable Figure.

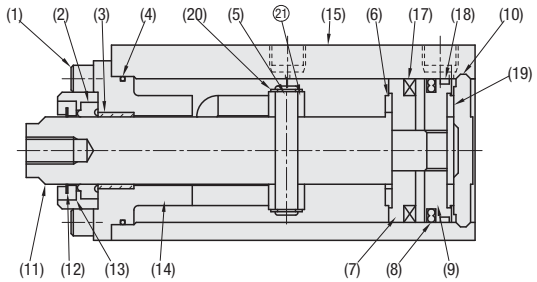


(Note) The Arm Allowable Inertia Moment Chart applies only to vertical actuation installations.

MKRCA25



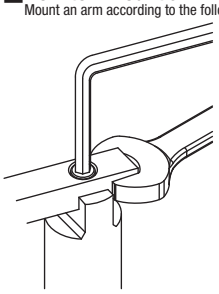
MKRCA32 · 40 · 50



Number	Product Name	Material	Number	Product Name	Material
1	Hexagon Socket Head Cap Screw	Stainless Steel	11	Piston Rod	Steel
2	Rod Gasket	Nitrile Rubber	12	Coil Scraper	Copper Alloy
3	Bushing	Coppers	13	Holder	Aluminum Alloy
4	Cylinder Gasket	Nitrile Rubber	14	Rod Cover	Steel
5	Pin	Steel	15	Cylinder Body	Aluminum Alloy
6	Cushion Rubber	Urethane Rubber	16	Spacer Washer	Stainless Steel
7	Spacer	Ø25: Special Resin Ø32~Ø50: Aluminum Alloy	17	Magnet	Plastic
			18	Wearing	Acetal Resin
8	Piston Gasket	Nitrile Rubber	19	Cushion Rubber	Urethane Rubber
9	Piston	Aluminum Alloy	20	E Type Retaining Ring	Steel
10	Cover	Ø25: Stainless Steel Ø32~Ø50: Aluminum Alloy	21	Roller	Steel

How to Amount an Arm.

Mount an arm according to the following steps as shown below.



Tighten the screw with a hex wrench.

Fix the arm with a vise/spanner.

Draw the rotating portion out of the piston rod. Make sure that the piston rod rotates before fixing the arm. If the arm is fixed at any other location, overload might damage the internal components.

Piston Speed

Adjust the speed to make sure that the arm inertia moment and the piston speed are with in the operating ranges as shown in the applicable Figure.

Specifications

Item	Contact Point 2 wire Type		No Contact 2 wire Type	No Contact 3 wire Type
	MT10 • MTV10		MT12 • MTV12	MT13
Purpose	For PLC and Relays		For PLC (dedicated)	For PLC and Relays
Output Method				NPNOutput Method
Power supply voltage				DC10~28V
Load Voltage	DC12/24V	AC110V	DC10~30V	DC30V or Low
Load Voltage	5~50mA	7~20MA	* 5~20mA	100mA or Low
Current consumption				DC24V 10mA or Low
Internal Voltage Drop	3V or Low		4V or Low	0.5V or Low
Lamp	LED (Lights when ON)			
Leakage Current	0mA		1mA or Low	10μA or Low
Lead Wire Length	1m(Oil Resistant Vynil Cab Tyer Cord 2 Conductors 0.2mm^2)			
Maximum Impact	294m/s^2		980m/s^2	
Insulation Resistance	20MΩ or more at 500V, with a High Resistance Value Meter			
Dielectric Strength Voltage	No anomaly to be recognized after AC1000V applied for 1 minute.			
Ambient Temperature	-10~+60°C			
Protective Structure	IEC Standards IP67 JIS C0920(Water-resistant) Oil-proof			
Mass	1m:20g 3m:50g			
Circuit	Brown line [+] Blue line [-]		Brown line [+] Blue line [-]	Brown Wire [Power Supply+] Black line [Output] Blue line [Power Supply -]

* The values of the maximum load current 20mA is for 25°C 20mA less when used in ambient temp. 25°C or higher. (5~10mA when 60°C)

Selection Example A

<Requirements>
- Required Clamping Force: 500N
- Operating Pressure: 0.5Mpa
- Piston Speed: 100mm/s
- Arm Length: 80mm
- Arm Inertia Moment: 2.0x10-3kg/m

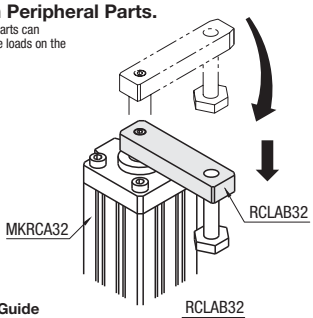
1. Calculate a required pressure area.
   Required Pressure Area (mm^2)= Required Clamping Force (N) / Operating Pressure (MPa)= 500/0.5=1000 (mm^2).
2. Select a cylinder size based on the list and the pressure area (instroke side).
   Ø40 Pressure Area: 1055 (mm^2) > Required Pressure Area 1000(mm^2)
3. Make sure that the arm length and the operating pressure are within the operating ranges as shown in the applicable Figure.
   Operating Pressure 0.5MPa-Arm Length 80mm: Within the Operating Range
4. Make scue that the arm inertia moment and the piston speed are within the operating ranges as shown in the applicable Figure.
   Lever Inertia Moment 2.0x10-3kg/m-Piston Speed 100mm/s: Within the Operating Ranges

How to Combine with Peripheral Parts.

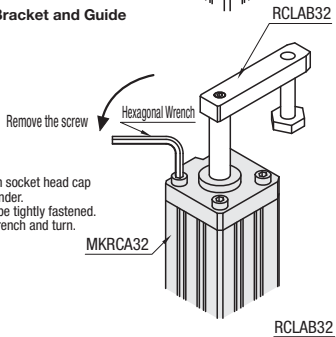
Combined use of MISUMI's peripheral parts can stabilize a clamping position and reduce loads on the rod.

- Basic Actions

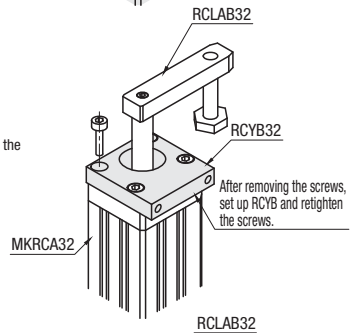
The rod strokes down while rotating. After the rotational stroke, the arm clamp strokes downward.



- Assembling Bracket and Guide



Remove the hexagon socket head cap screws from the cylinder.
Ⓨ The screws may be tightly fastened. Firmly insert a wrench and turn.

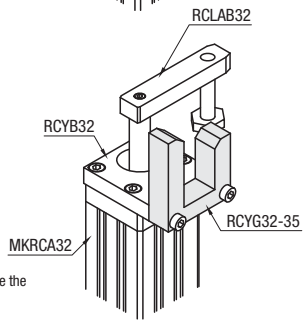


After removing the screws, set up the guide and retighten the screws.
Ⓨ Be careful not to disassemble the cylinder.

Comply with the following tightening torques.

Tightening Torque

Tube Dia.	Tightening Torque
25~40	4.3~5.3Nm
50	10.8~13.2 Nm



Mount the guide onto the side of the bracket.
Ⓨ Note the rotating direction.

Clamping position stabilizes because the guide draws the arm in.

[IMPORTANT!]Precautions for Handling Rotary Clamp Cylinders

*Be sure to read the precautions in [IMPORTANT!] in the "Compact Air Cylinders - Overview" on **P.1370**

(Rotary Clamp Cylinders)▲CAUTION

Never touch any moving part while the cylinder is in operation.
It is extremely dangerous because fingers may be caught between moving parts.

(Rotary Clamp Cylinders)▲NOTE

(1) Protect the sliding sections of the piston rods and piston guide rods from being scratched and dented.
(2) Mounting position
Use the cylinders in vertical.
(3) Installing the speed controller
Install the speed controller (meter out: throttle on the exhaust side) to the air pressure outlet side).
The performance of the speed controller affects the operation of the cylinder.
Use a speed controller with low cracking pressure.
(4) Installing conditioning equipment
Cylinder failures are mostly caused by foreign materials in the atmosphere or drains.
Protect the cylinder from trouble by installing an air dryer or air filter upstream.
(5) Space
Provide sufficient space around the equipment to ensure easy handling.
(6) Flushing
Before plumbing, flush the pipe thoroughly to protect it from solids or seal tape fragments.
(7) Ambient Environment
Do not use the cylinder in the following environments:
An area filled with oil or grease It may cause dust to adhere to the sliding section.
An area where intense vibrations may occur.
An area where the equipment may be affected by chemicals.

Rotary Clamp Cylinders · Auto Switches

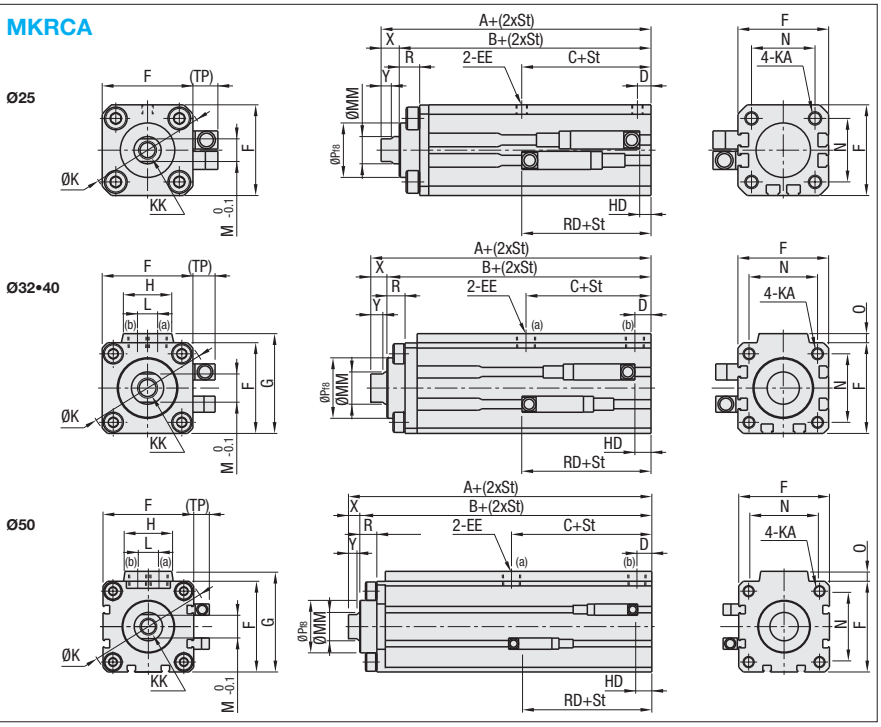
CAD Data

Rotary Clamp Cylinders



RoHS

MKRCA



Rotary Clamp Cylinders · External Dimensions

Tube Inner Dia.(mm)	A	B	C	D	EE	F	G	H	K	KA	KK	L	M	MM	N	O	P	R	X	Y
25	57	49	26	6	M5x0.8	40	-	-	51	M6 Depth 11	M8 Depth 15	-	10	12	28	-	24	9	8	4.5
32	69	61	27	8	Rc1/8	45	49.5	24	60	M6 Depth 11	M10 Depth 15	10	14	16	34	4.5	30	9	8	6
40	70	62	29	8.5	Rc1/8	52	57	24	69	M6 Depth 11	M10 Depth 15	10	14	16	40	5	35	9	8	6
50	74	66	29	10.5	Rc1/4	64	71	33	86	M8 Depth 13	M12 Depth 15	15	17	20	50	7	37	12	8	6

Be sure to check the "Specifications" and "Precautions" for selections. on **P.1382**

Part Number		St Stroke	Rotating Direction	€ Unit Price
Type	Tube Inner Dia. (mm)			Qty. 1~4
MKRCA	25	31	L (Counterclockwise Rotation)	
	32	35		
	40	35	R (Clockwise Rotation)	
	50	70		

For orders larger than indicated quantity, please request a quotation.

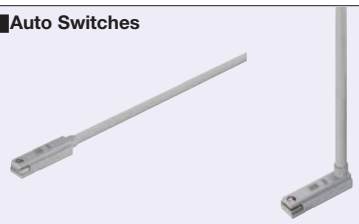
Rotary Clamp Cylinders · External Dimensions

Tube Inner Dia. (mm)	MT12, 13 · MTV12			MT10 · MTV10		
	HD	RD	(TP)	HD	RD	(TP)
25	6	25	0	5	26	0
32	9	28	0	8	29	0
40	10	29	0	9	30	0
50	11	30	0	10	31	0

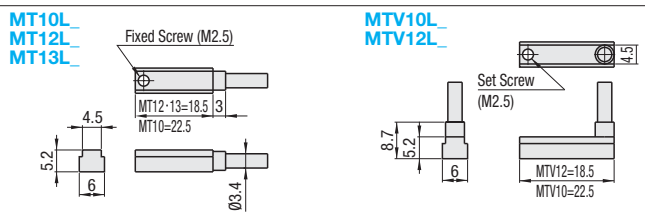
Order Example: Part Number **MKRCA25** - St Stroke **31** - Rotating Direction **L**

Days to Ship: **6 Days** P.88

Auto Switches



RoHS



Part Number			Load Voltage	Load Current	Indicator Light	Sensor Type	Line	Lead Wire Removal	€ Unit Price	
Type	L								L1(1m)	L3(3m)
MT10	L1(1m)	L3(3m)	DC12/24V AC110V	5~50mA(DC) 7~20mA(AC)	LED (Lights when ON)	Contact	2	Rear		
MT12	L1(1m)	L3(3m)	DC10~30V	* 5~20mA		No Contact	2			
MT13	L1(1m)	L3(3m)	DC30V0r Low	100AmOr Low		No Contact	3			
MTV10	L1(1m)	L3(3m)	DC12/24V AC110V	5~50mA(DC) 7~20mA(AC)		Contact	2	Top		
mTV12	L1(1m)	L3(3m)	DC10~30V	* 5~20mA		No Contact	2			

* The values of the maximum load current 20mA is for 25°C 20mA less when used in ambient temp. 25°C or higher. (5~10mA when 60°C)

Order Example: Part Number **MT10L1**

Days to Ship: **6 Days** P.88

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

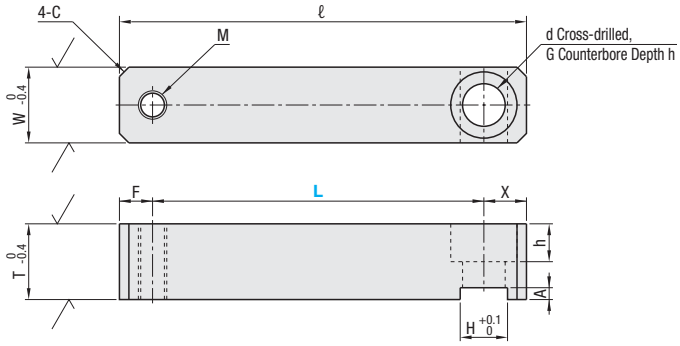
Arms for Rotary Clamp Cylinders

CAD Data



RoHS

Type	Material	Surface Treatment
RCLA	1.0038/S235JR	-
RCLAB	1.1191/C45E	Black Oxide
RCLAM		Electroless Nickel Plating
RCLAS	1.4301/X5CrNi18-10	-



Part Number Type	No.	L 1mm Increment	W	T	H	G	d	h	A	X	M	F	C	ℓ
RCLA RCLAB RCLAM RCLAS	20	15~100	16	16	10	14	9	9	3	9	6	7	2	L+16
	25	15~100	16	16	10	14	9	9	3	9	6	7	2	L+16
	32	20~160	20	20	14	17.5	11	11	4	12	8	10	2	L+22
	40	20~160	20	20	14	17.5	11	11	4	12	8	10	2	L+22
	50	25~200	22	22	17	20	14	13	4	13	10	10	3	L+23

Order Example

Part Number	-	L
RCLA32	-	100
RCLAS50	-	200

Order Example

8 Days | Express A | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

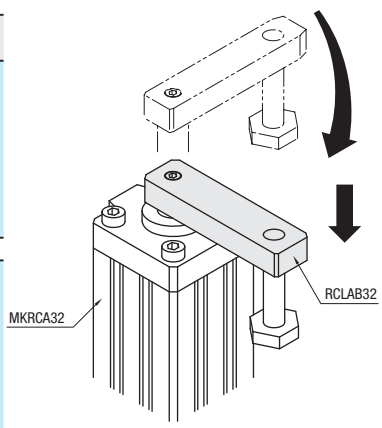
Part Number Type	No.	€ Unit Price RCLA	RCLAB	RCLAM	RCLAS
RCLA RCLAB RCLAM RCLAS	20				
	25				
	32				
	40				
	50				

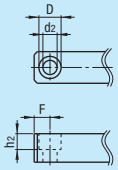
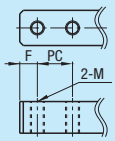
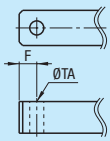
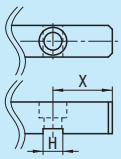
Alterations

Part Number - L - (ZA / PC / TA / XA)

RCLA32 - 100 - ZA6
RCLAS50 - 150 - XA

Example



	Counterbored Hole Change	Mounting Hole Addition	Through Hole Change	X Length Change
Alterations				
Code	ZA	PC	TA	XA
Spec.	Change from a tapped hole to a counterbored hole.	A tapped hole to be added. Mx2≤PC≤L-Gx2 Specify in 1mm Increment	Change from a tapped hole to a through hole. 0.5mm Increment	L dimension to be changed.
	M / ZA / d2 / D / h2: 6 / 6 / 6.6 / 11 / 6.6; 8 / 8 / 9 / 13 / 9; 10 / 10 / 11 / 16 / 11	Ordering Code PC20	No. / TA: 20 / 25: 4.0~12.0; 32 / 40 / 50: 4.0~14.0	No. / X: 20 / 25; 25 / 30; 32 / 35; 40 / 40; 50 / 45
	⊗Not available together with Through Hole Change (TA).	Cannot be combined with Counterbored Hole Change (ZA). If combined with ZA / TA, a mounting hole will be added after the change.	⊗Cannot be combined with Counterbored Hole Change (ZA).	
	Ordering Code ZA8		Ordering Code TA4.5	Ordering Code XA
Price Adder	3,00	3,00	2,00	3,00

Overview of Rotary Clamp Cylinders

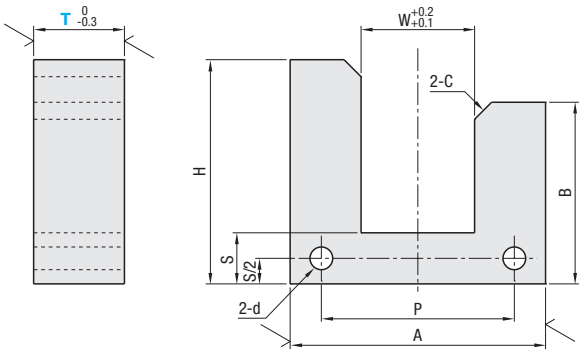
CAD Data





RoHS

Type	Material	Surface Treatment
RCYG	1.0038/S235JR	-
RCYGB	1.1191/C45E	Black Oxide
RCYGM		Electroless Nickel Plating
RCYGS	1.4301/X5CrNi18-10	-



Part Number		T Selection	W	S	H	B	A	P	C	d	€ Unit Price			
Type	No. (Applicable Cylinder Tube Dia. · Stroke)										RCYG	RCYGB	RCYGM	RCYGS
RCYG RCYGB RCYGM RCYGS	20-21	9 12 16	16	9	30	22	38	25.5	3	4.5				
	20-31	9 12 16			40	32								
	25-21	9 12 16	16	9	30	22	44	28						
	25-31	9 12 16			40	32								
	32-25	9 12 16	20	9	33	22	50	34						
	32-35	9 12 16			43	32								
	40-25	9 12 16	20	9	33	21	60	40						
	40-35	9 12 16			43	31								
	50-40	9 12 16	22	12	50	34	65	50	4	6.5				
	50-70	9 12 16			80	64								

Order Example

Part Number	-	T
RCYG40-25	-	12
RCYGM50-40	-	16

Days to Ship: 8 Days

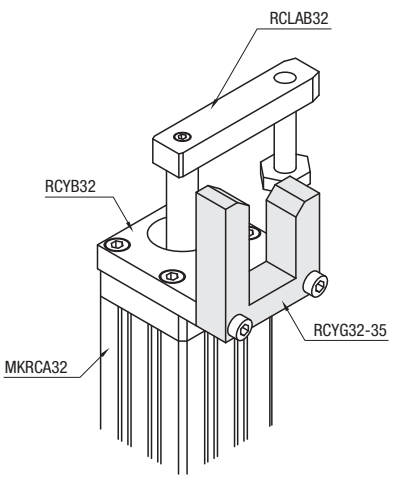
Price

Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example



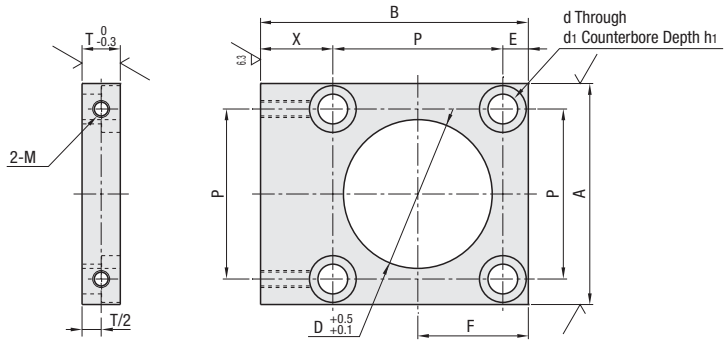
Brackets for Rotary Clamp Cylinders

CAD Data



RoHS

Type	Material	Surface Treatment
RCYB	1.0038/S235JR	-
RCYBB	1.1191/C45E	Black Oxide
RCYBM		Electroless Nickel Plating
RCYBS	1.4301/X5CrNi18-10	-



Part Number														€ Unit Price			
Type	No. (Applicable Cylinder Tube Dia.)	T	d	A	P	X	B	E	F	M	d	d1	h1	RCYB	RCYBB	RCYBM	RCYBS
RCYB RCYBB RCYBM RCYBS	20	9	24	38	25.5	18.25	P+E+X	6.25	19	M4	6.5	11	6.5				
	25	9	24	44	28	19	P+E+X	6	20	M4	6.5	11	6.5				
	32	9	30	50	34	18	P+E+X	8	25	M4	6.5	11	6.5				
	40	9	35	60	40	19	P+E+X	10	30	M4	6.5	11	6.5				
	50	12	37	65	50	26.5	P+E+X	7.5	32.5	M6	9	14	9				

Order Example

Part Number
RCYB32

Days to Ship 8 Days

Price

■Volume Discount (Round down to one Cent) P.88

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	- (MT)
RCYB32	- MT4

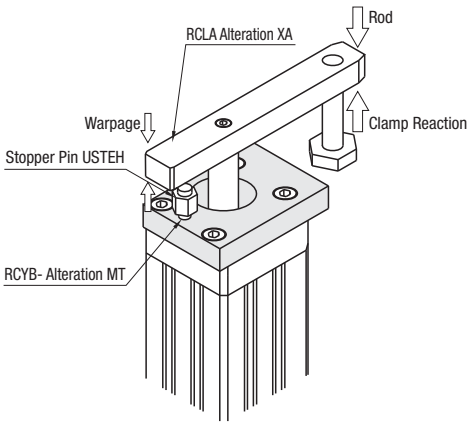
Example ■ Arm warpage is prevented when clamping a work piece, thus reducing loads on the rod.

Alteration	Female Thread Holes for Stopper
Code	MT
Spec.	A tapped hole for the stopper is added.

No.	E2	MT			
20	3	M3	M4		
25	4	M3	M4	M5	
32	5	M3	M4	M5	
40	6	M3	M4	M5	M6
50	7	M4	M5	M6	M8

Ordering Code MT4

Price Adder	3,00



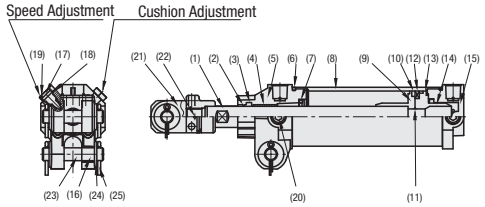
Overview of Clamp Cylinders

Overview of Clamp Cylinders

MISUMI's clamp cylinders are equipped with crevices having concaved knuckles. They are specialized clamping cylinders.

- **Quick Delivery**
  Quick delivery is available for the three off-the-shelf strokes.
- **Light Weight**
  The optimized shape of the cover has trimmed and streamlined the products.
- **Safety**
  The compact cylinders each houses a speed controller, a cushion and a needle. They materialize both easy adjustments and increased safety thanks to the needle projecting in the shortest possible length.

Basic Structure of Clamp Cylinder



Number	Name	Material	Surface Treatment	Number	Name	Material	Surface Treatment
1	Piston Rod	Steel	Chrome Plating	14	Piston*	Aluminum Alloy Die Casting	
2	Metal Scraper	Copper Alloy		15	Head Cover	Aluminum Alloy Die Casting	Chromate
3	Rod Gasket	Nitrile Rubber		16	Bushing for Crevice	Steel, Copper	
4	Bushing	Copper Alloy		17	Needle	Copper Alloy	
5	Rod Cover	Aluminum Alloy Die Casting	Chromate	18	Body Gasket	Nitrile Rubber	
6	Cylinder Gasket	Nitrile Rubber		19	Hexagon Nut	Steel	Chromate
7	Cushion Gascket	Urethane Rubber, Copper	Chromate	20	Hexagon Socket Plug	Steel	Black Oxide
8	Cylinder Tube	Aluminum Alloy	Hard Anodize Treatment	21	Concaved Knuckle	Cast Iron	Manganese Phosphate
9	Piston*	Aluminum Alloy Die Casting		22	Spring Pin	Steel	Black Oxide
10	Piston Gasket	Nitrile Rubber		23	Clevice Pin	Steel	Black Oxide
11	Piston Gasket	Nitrile Rubber		24	Flat Washer	Steel	Chromate
12	Magnet	Plastic		25	Split Pin	Steel	Chromate
13	Wear ring	Polyacetal					

* Material: Aluminum Alloy for Ø40 only.

Basic Specifications of Clamp Cylinders

Tube Inner Diameter (mm)	40	50	63
Operating Type	Double Acting		
Permissible Fluid	Compressed Air		
Max. Operating Pressure (MPa)	1.0		
Min. Operating Pressure (MPa)	0.1		
Guaranteed Withstand Pressure	1.6		
Operating Temp. Range (°C)	5~60		
Connection Diameter	Rc1/4		
Standard Stroke	75 / 100 / 125		
Piston Speed (mm/s)	50~500	50~400	50~300
Cushion Mechanism	Air Cushion on Head Side		
Effective Cushion Length(mm)	13.5		
Lubrication	N/A		
Support Type	Concaved Crevices		

* Use the clamp cylinders within absorbed energy (Refer to the Cushion Characteristic Chart below).

Stroke

Tube Inner Dia. (mm)	St Stroke	Max. Stroke (mm)	Min. Stroke (mm)	Min. Stroke with Sensor (mm)
Ø40	75 100 125	125	75	75
Ø50				
Ø63				

Cushion Characteristic Chart

Tube Inner Dia. (mm)	Effective Cushion Length(mm)	Allowable Energy (J)	
		w/ Cushion	w/o Cushion
Ø40	13.5	5.14	0.137
Ø50		6.41	0.137
Ø63		11.37	0.205

- Cushion

The cushion mechanism is provided in order to prevent the piston from hitting the cover at the stroke end, by absorbing kinetic energy owned by the piston through air compressibility.Thus the cushion does not actuate the piston at low velocity near the stroke end. The above chart refers to kinetic energy that can be absorbed by the cushion. Consider using separate buffer equipment if the kinetic energy exceeds these values, or if bounces from air compressibility should be avoided.

Kinetic Energy (J)= 1/2xMass (kg) x={Velocity (m/s)}^{2}

Cylinder Mass

(Unit: kg)

Tube Inner Dia. (mm)	Stroke=0mm Product Mass	Stroke=100mm Added Mass	Concaved Knuckle Joints
Ø40	0.75	0.34	0.37
Ø50	0.82	0.36	
Ø63	1.03	0.39	

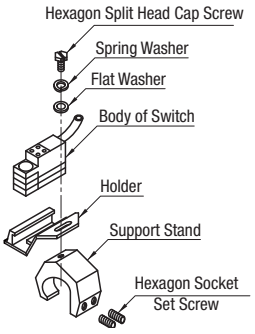
(Ex.)
MCCLA40-75 Product Mass
- Stroke=Product Mass at 0mm/h ・・・・・・・・・・・・ 0.75kg
- Stroke=Added Mass at 75mm/h ・・・・・・・・・・・・ 0.34x75/100=0.255kg
- Included Accessories' Mass (Concaved Knuckle Joints) ・・ 0.37kg

- Product Mass ・・・・・・・・・・・・・・・・・・・・ 0.75+0.255+0.37=1.375kg

Specifications

Item	Contact Point 2 Wire Type MT10 MTV10		No Contact 2 Wire Type MT12 MTV12	Contact 3 Wire Type MT13
Purpose	For PLC and Relays		For PLC (dedicated)	For PLC and Relays
Output Method				NPNOutput
Power supply voltage				DC10~28V
Load Voltage	DC12/24V	AC110V	DC10~30V	DC30V or less
Load Current	5~50mA	7~20mA	* 5~20mA	100mA or less
Current consumption				DC24V 10mA or less
Internal Voltage Drop	3V or less		4V or less	0.5V or less
Lamp	LED (Lights when ON)			
Leakage Current	0mA		1mA or less	10μA or less
	1m(Oil Resistant Vynil Cab Tyer Cord 2 Conductors 0.2mm^2)			
Maximum Impact	294m/s^2		980m/s^2	
Insulation Resistance	20MΩ or more at 500V, with a High Resistance Value Meter			
Dielectric Strength Voltage	No anomaly to be recognized after AC1000V applied for 1 minute.			
Ambient Temperature	-10~+60°C			
Protective Structure	IECStandards IP67/JIS C0920(Water-resistant)/Oil-proof			
Mass	1m:20g 3m:50g			
Circuit	Brown line [+] Blue line [-]		Brown line [+] Blue line [-]	Brown Wire [Power Supply+] Black line [Output] Blue line [Power Supply -]

* The values of the maximum load current 20mA is for 25°C 20mA less when used in ambient temp. 25°C or higher. (5~10mA when 60°C)



How to Mount

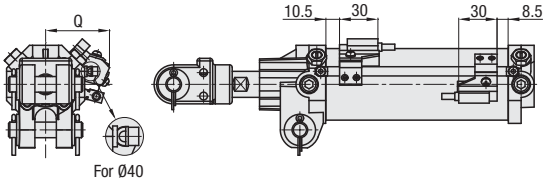
(1)Pass a hexagon split head cap screw through a spring washer and a flat washer before setting up a holder.
(2)Fit a mounting bracket in the tie rod of a cylinder, and then tightenthe hexagon split head cap screw with a tightening torque of 0.5~0.7N・m.
(3)Finally, tighten the hexagon socket head cap screws with a tightening torque of 1.7~2.0N・m.

Tuning

(1)Fine-tuning
Loosen the hexagon split head cap screw and move only the sensor body before tightening at torque of 0.5~0.7N・m.
(2)Coarse-tuning
Loosen the hexagon split head cap screw and the set screws, and move the cylinder to a predetermined position before tightening at torque of 0.5~0.7N・m. Finally, tighten the set screws at torque of 1.7~2.0N・m.

Dimensions for Auto Switch Mounting

For details of auto switches, refer to **P.1383**



Tube Inner Dia.	Q
Ø40	46
Ø50	50
Ø63	56

Note the rotating direction in mounting a tie rod.

[IMPORTANT!] Precautions

Danger: A clearly dangerous state. Unless avoided, death or serious injuries might be caused.
CAUTION: A potentially dangerous state depending on usage. Unless avoided, death or injuries might be caused .
NOTE: A potentially dangerous state depending on usage. Unless avoided, low-grade to moderate injuries might be caused, or property might be damaged .

*Be sure to read the precautions in [IMPORTANT!] in the "Compact Air Cylinders - Overview" on **P.1370**

Clamp Cylinders · Tie Rod Kits for Auto Switch Mounting · Mounting Bracket Kits

CAD Data

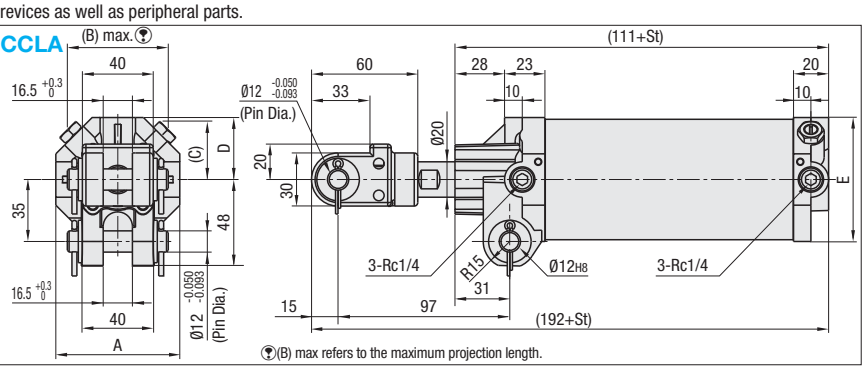
■We have added clamp cylinders with crevices as well as peripheral parts.

■Clamp Cylinder



RoHS

MCCLA



(B) max refers to the maximum projection length.

Part Number		St Stroke (Selection)			A	(B)	(C)	D	E	€ Unit Price St Stroke		
Type	Tube Inner Dia. (mm)									75	100	125
MCCLA	40	75	100	125	60	63	27	30	60			
	50	75	100	125	60	63	27	30	60			
	63	75	100	125	70	57	33	35	70			

Be sure to check the "Specifications" and "Precautions" for selections. P.1387

Order Example: Part Number MCCLA63 - St Stroke 125

Days to Ship: 6 Days P.88

Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

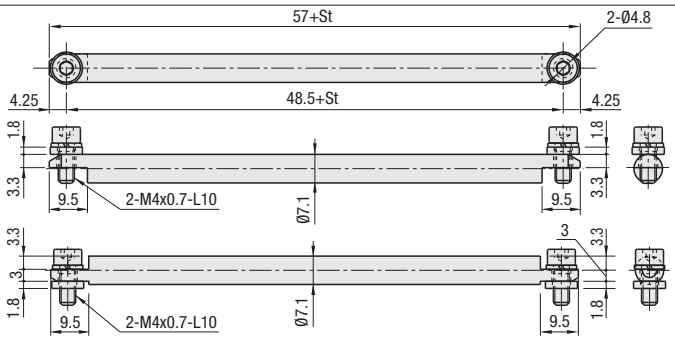
■Tie Rod Kits for Auto-Switch Mounting



RoHS

MCCLT

- Tube Inner Diameter 40
- Tube Inner Diameter 50 · 63



Part Number		St Stroke (Selection)			€ Unit Price. 1~4pcs. St Stroke		
Type	Applicable Tube Dia.				75	100	125
MCCLT	40	75	100	125			
	50	75	100	125			
	63	75	100	125			

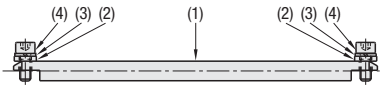
For Auto Switches, refer to P.138

For mounting method, see the Overview page on refer to P.1387

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number MCCLT40 - St Stroke 100

Days to Ship: 6 Days P.88



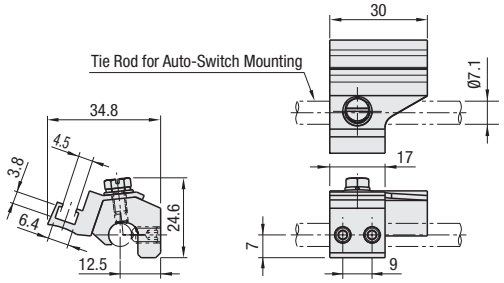
Part No.	Part Name	Quantity	M Material	S Surface Treatment
(1)	Switch Mounting Rod	1	Steel	Trivalent Carbon Steel Bright Chromate
(2)	Spacer	2	Steel	Trivalent Carbon Steel Bright Chromate
(3)	Spring Washer	2	Steel	Black Oxide
(4)	Hexagon Socket Head Cap Screw	2	Steel	Black Oxide

■Mounting Bracket Kit

MCCLK



RoHS



Part Number	€ Unit Price Qty. 1~4
MCCLK	

For orders larger than indicated quantity, please request a quotation.

A Accessory	M Material	Quantity	Note
Hexagon Socket Head Cap Screw - Cup Point	Steel	2	M5x8
Hexagon Split Head Cap Screw	Stainless Steel	1	M4x8
Switch Holder	Aluminum Alloy	1	-
Switch Mounting Base	Aluminum Alloy	1	-

Order Example: Part Number MCCLK

Days to Ship: 6 Days P.88

Arms for Clamp Cylinders
-T-Shaped-

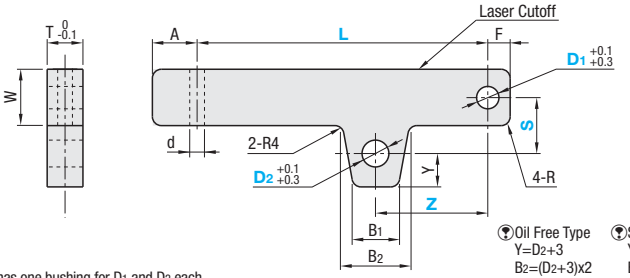
CAD Data



RoHS

Type		M	S	A
Standard Type	Oil Free Type	Material	Surface Treatment	Accessory
MCART	MCARTM	1.0038/S235JR	-	Oil Free Bushing (Oil Free Type Only)
MCARTB	MCARTBM		Black Oxide	

25 ( )



Oil Free Type: Y=D2+3, B2=(D2+3)x2, B1=B2-4

Standard Type: Y=D2, B2=D2x2, B1=B2-4

The Oil Free Type has one bushing for D1 and D2 each.

The press fit sections have a housing diameter of H7 tolerance for housing the oil free bushings.

Part Number		1mm Increment									
Type		D1	L	D2	Z	S	W	T	A	F	R	d
Standard Type	Oil Free Type	6	100~300	6~20	50~150	20~60	19	12	10	8	3	6.5
		8										
MCART	MCARTM	10	100~400		50~200	30~80	25	16	20	9	5	9
MCARTB	MCARTBM	12								10		
		14								12		
		16										
		18				40~100	36	19		14	8	
		20								15		

Z≤L-B2

Order Example

Part Number	-	L	-	D2	-	Z	-	S
MCART12	-	100	-	16	-	50	-	40
MCARTM12	-	250	-	16	-	100	-	60

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent) P.88

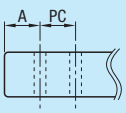
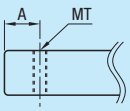
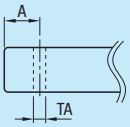
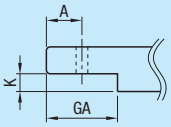
Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	L	-	D2	-	Z	-	S	-	(PC · MT · TA · GA)
MCART12	-	100	-	16	-	50	-	40	-	PC30

D	Z	€ Unit Price							
		Standard Type				Oil Free Type			
		MCART		MCARTB		MCARTM		MCARTBM	
		Min. L~250	251~Max.L	Min. L~250	251~Max.L	Min. L~250	251~Max.L	Min. L~250	251~Max.L
6	50~100								
	101~150								
8	50~100								
	101~150								
10	50~100								
	101~200								
12	50~100								
	101~200								
14	50~100								
	101~200								
16	50~100								
	101~200								
18	50~100								
	101~200								
20	50~100								
	101~200								

Alterations	Code	Spec.	Price Adder
Through Hole Addition 	PC	A through hole to be added. d+6≤PC≤L-Z-B2x2 Specify in 1mm Increment Ordering Code PC20 If combined with MT / TA, a mounting hole will be added after the change.	3,00
Female Thread Hole Change 	MT	Change from a counterbored hole to a tapped hole. d: 6.5 → M6 M8; 9 → M6 M8 M10. Not available together with Through Hole Change (TA). Ordering Code MT8	3,00
Through Hole Dia. Change 	TA	Through hole dia. to be changed. 0.5mm Increment. d: 6.5 → 4.0~9.0; 9 → 4.0~12.0. Not available together with Female Thread Hole Change (MT). Ordering Code TA4.5	3,00
Pilot Machining 	GA	Pilot machining to be added. A+d≤GA≤L-Z-D2x2 1≤K≤W/2 Specify in 1mm Increment Ordering Code GA20-K8	5,00

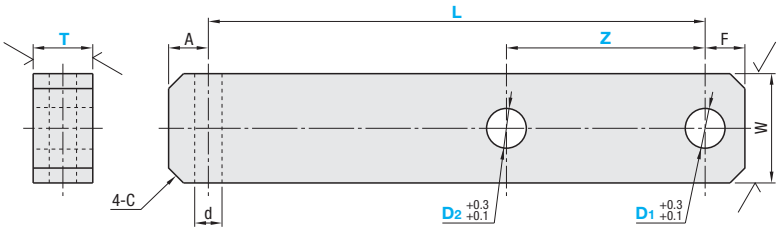
Arms for Clamp Cylinders
-Straight-

CAD Data



Type		M	S	A
Standard Type	Oil Free Type	Material	Surface Treatment	Accessory
MCAR	MCARM	1.0038/S235JR	-	Oil Free Bushing (Oil Free Type Only)
MCARB	MCARBM		Black Oxide	

25 √(√)



- T Dimension Tolerance

T	12 , 16	19
	-0.3~0	-0.33~0

RoHS

(?)The press fit sections have a housing diameter of H7 tolerance for housing the oil free bushings.

Part Number Type	D1	L Specify in 1mm Increment	D2 Selection	Z Specify in 1mm Increment	T Selection	W	F	d	A	C
Standard Type / Oil Free Type	8	100~250	0 8 10	40~200	12 16 19	22	8	5.5	8	3
MCAR / MCARM	10	100~300	0 8 10 12	40~200	12 16 19	22	9	5.5	9	5
MCARB / MCARBM	12	100~300	0 8 10 12	40~250	12 16 19	25	10	6.5	10	5
	16	120~300	0 8 10 12 16	50~250	12 16 19	32	12	6.5	12	8
	20	120~300	0 8 10 12 16 20	50~250	16 19	38	15	9	15	8

(?)If 0 is selected for D2, there will be no hole. (?)If 0 is selected for D2, Z does not have to be selected (See order examples). (?)Z≤L-(D1+D2+d)

Order Example

Part Number	-	L	-	D2	-	Z	-	T
MCAR12	-	100	-	12	-	40	-	12
MCARM16	-	250	-	0			-	16

(No D2 Hole)

Days to Ship

8 Days | Express A | 5,00 EUR/ piece | P.88

(?)A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (?)Round down to one Cent) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

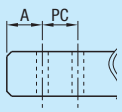
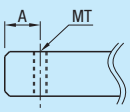
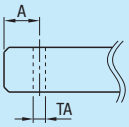
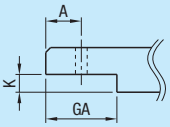
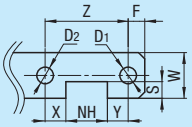
(?)For orders larger than indicated quantity, please request a quotation.

D1or D2	T	Oil Free Bushing Bushing Type d (Inner Dia.)	Oil Free Bushing Bushing Type L (Full Length)	Qty.
8	12	8	10	1 pc each
	16 · 19	8	15	
10	12	10	10	
	16 · 19	10	15	
12	12	12	10	
	16 · 19	12	15	
16	12	16	10	
	16 · 19	16	15	
20	16 · 19	20	15	

D1	€ Unit Price Standard Type MCAR Min. L~200	MCAR 201~Max.L	MCARB Min. L~200	MCARB 201~Max.L	Oil Free Type MCARM Min. L~200	MCARM 201~Max.L	MCARBM Min. L~200	MCARBM 201~Max.L
8								
10								
12								
16								
20								

Alterations

Part Number	-	L	-	D2	-	Z	-	T	-	(PC · MT · TA · NH)
MCAR12	-	100	-	12	-	40	-	12	-	TA8.5

Alterations	Through Hole Addition	Female Thread Hole Change	Through Hole Dia. Change	Pilot Machining	Relief machining
					
Code	PC	MT	TA	GA	NH
Spec.	A through hole to be added. (?)d+6≤PC≤L-Z-D2x2 (?)For D2=0, d+6≤PC≤L-D1 Specify in 1mm Increment Ordering Code PC20 (?)If combined with MT · TA, a mounting hole will be added after the change.	Change from a counterbored hole to a tapped hole. d: 5.5 / 6.5 / 9 — MT: M6 / M6 M8 / M6 M8 M10 ⊗Not available together with Through Hole Change (TA). Ordering Code MT8	Through hole dia. to be changed. 0.5mm Increment T: 12 / 16 / 19 — TA: 4.0~9.0 / 4.0~12.0 / 4.0~14.0 ⊗Not available together with Female Thread Hole Change (MT). Ordering Code TA4.5	Pilot machining to be added. (?)A+d≤GA≤L-Z-D2x2 1≤K≤W/2 Specify in 1mm Increment Ordering Code GA20-K8	Relief to be added between D1 and D2. (?)NH≥5NH=Z-X-Y D1/2+3≤Y D2/2+3≤X S≤W/2 ⊗Not applicable if 0 is selected for D2. Specify in 1mm Increment Ordering Code NH20-Y10-S10
Price Adder	3,00	3,00	3,00	5,00	5,00

Bracket Plates for Clamp Cylinders

CAD Data

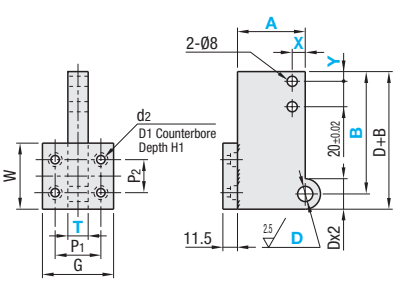


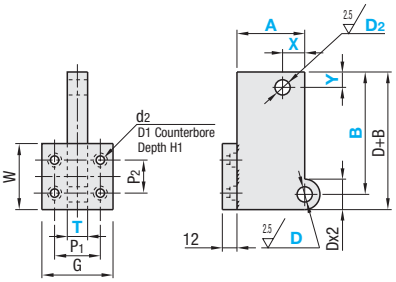
Part Number			Material	Surface Treatment
2 Holes	1 Hole	No Hole		
MCYBW	MCYB	MCYN	1.0038/S235JR	-
MCYBWB	MCYBB	MCYNB		Black Oxide

2-Hole (Ø8) Type
MCYBW
MCYBWB

No Hole
MCYN
MCYNB

1-Hole (ØD2) Type
MCYB
MCYBB





RoHS

No-Hole Type does not require X and Y dimensions.

Part Number Type	D	T	1mm Increment A	1mm Increment B	MCYBW_1mm Increment X	MCYBW_1mm Increment Y	W	G	P1	P2	d2	d1	h1
2 Holes / No Hole: MCYBW MCYBWB / MCYN MCYNB	5	10	30~60	30~130	15~50 X≤A-8	6~20 Y≤D+B+26	20	40	25	-	4.5	8	4.5
	6	10 12					20	40	25	-			
	8	10 12 16	30~80	40~150			40	40	25	25			
	10						40	40	25	25			
	12						50	50	30	30	6.5	11	6.5
	18	10 12 16 19	40~100	50~200			70	60	40	30			

Part Number Type	D	D2	T	1mm Increment A	B	X	Y	W	G	P1	P2	d2	d1	h1
1 Hole: MCYB MCYBB	5	8 10 12	10	30~60	30~130	15~50 X≤A-8	8~20	20	40	25	-	4.5	8	4.5
	6	8 10 12	10 12					20	40	25	-			
	8	8 10 12	10 12 16	30~80	40~150			40	40	25	25			
	10	8 10 12 16						40	40	25	25			
	12	8 10 12 16 20						50	50	30	30	6.5	11	6.5
	18	8 10 12 16 20	10 12 16 19	40~100	50~200			70	60	40	30			

D2/2+4≤Y≤B-D2+4

Order Example

Part Number	- D2	- T	- A	- B	- X	- Y
MCYBW10		- T12	- A40	- B80	- X15	- Y15
MCYN12		- T16	- A60	- B100		
MCYB8	- 10	- T10	- A30	- B40	- X15	- Y15

Days to Ship

8 Days

Price

Volume Discount (Round down to one Cent) P.88

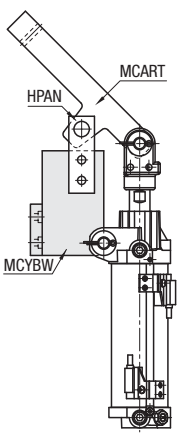
Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

Please request a quotation for quantity more than listed.

D	€ Unit Price					
	2 Holes		1 Hole		No Hole	
	MCYBW	MCYBWB	MCYB	MCYBB	MCYN	MCYNB
5						
6						
8						
10						
12						
18						

Example

Combination with 2-Hole Type (MCYBW)

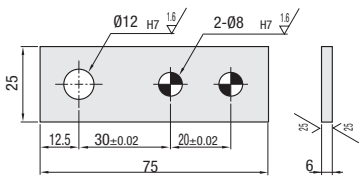


Hinge Plates

CAD Data



HPAN



Material: 1.0038/S235JR

Part Number	€ Unit Price
HPAN	

Order Example Part Number: HPAN

Days to Ship 8 Days — Express A: 5,00 EUR/piece — P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.88

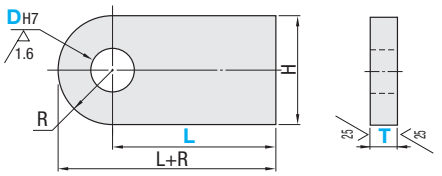
Quantity	1~19	20~29	30~49	50~99
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Economy Type



HPE



Material: 1.0038/S235JR

Part Number Type	D	L 10mm Increment	T Selection	R	H	€ Unit Price
HPE	8	40~100	9 12 15 16	11	22	
	10			12.5	25	
	12			16	32	
	16			19	38	
	20			25	50	

Order Example Part Number - L - T

HPE12 - 100 - 16

Days to Ship 8 Days — Express A: 3,00 EUR/piece — P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.88

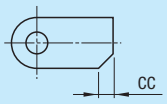
Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

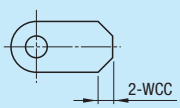
For orders larger than indicated quantity, please request a quotation.

Alterations

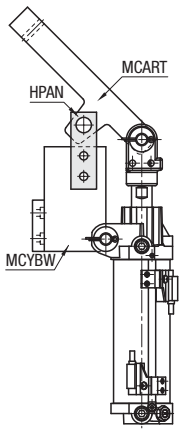
Part Number - L - T - (CC / WCC)

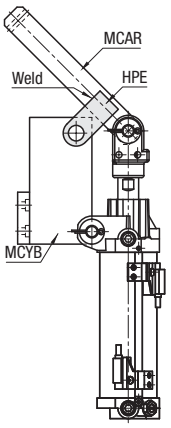
HPE12 - 100 - 16 - CC10

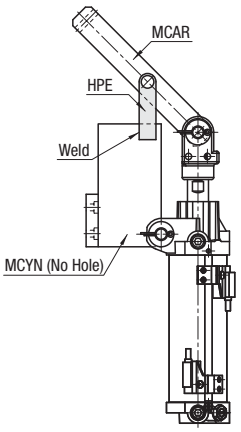
Alterations	Code	Spec.	Price Adder
	CC	The corner on one side can be cut in any given length. CC=1mm Increment 1≤CC<H/2	2,00

Alterations	Code	Spec.	Price Adder
	WCC	The corners on both sides can be cut in any given length. WCC=1mm Increment 1≤WCC<H/2	4,00

Example







Air Cylinders

-Pen Double Acting Type · Panel Mount Single Acting Type-

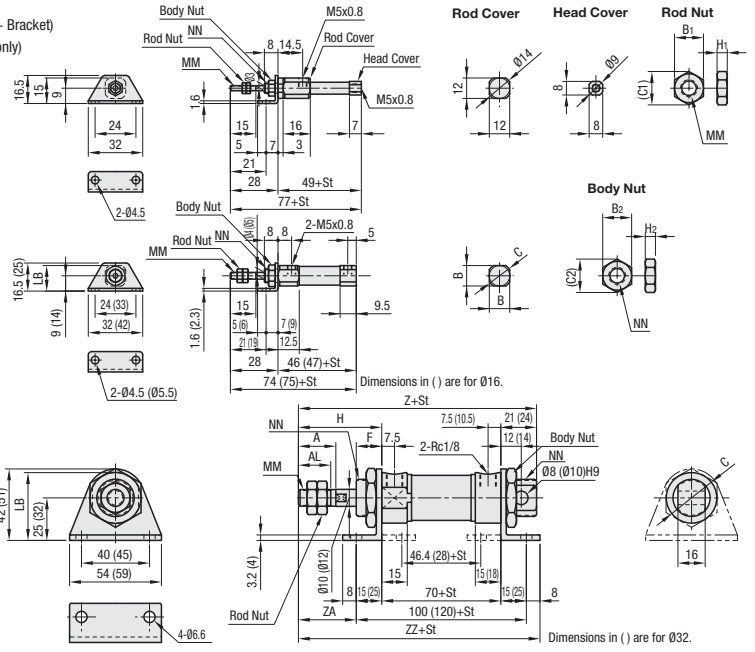
Price Reduction
Up to 32%

CAD Data

■Pen Double Acting Type

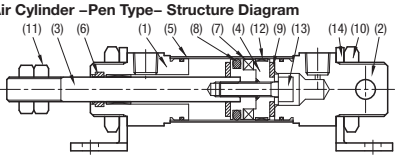


MSPCB (Cylinder + Bracket)
MSPCN (Cylinder only)



Tube Inner Ø (mm)	A	AL	B	B1	B2	C	C1	C2	F	H	H1	H2	LB	MM	NN	Z	ZA	ZZ
6	-	-	-	5.5	8	-	6.4	9.2	-	-	2.4	4	-	M3x0.5	M6x1.0	-	-	-
10	-	-	12	7	11	14	8.1	12.7	-	-	3.2	4	15	M4x0.7	M8x1.0	-	-	-
16	-	-	18	8	14	20	9.2	16.2	-	-	4	4	23	M5x0.8	M10x1.0	-	-	-
20	20	18	-	13	30	26.7	15	34.6	12	38	5	6	38.4	M8x1.25	M22x1.5	129	23	131
25	22	20	-	17	30	29.7	19.6	34.6	15	49	6	6	39.9	M10x1.25	M22x1.5	140	34	142
32	22	20	-	17	32	36	19.6	37	18	52	6	8	50	M10x1.25	M24x2.0	146	27	155

■Air Cylinder –Pen Type– Structure Diagram



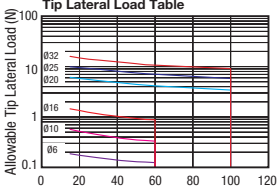
Part Number Type	Tube Inner Dia. (mm)	St Stroke (mm) Selection	MSPCB € Unit Price St Stroke (mm) 15	25	30	45	50	60	100	MSPCN € Unit Price St Stroke (mm) 15	25	30	45	50	60	100
(Cylinder + Bracket) MSPCB	6	15 30 45 60														
	10	15 30 45 60														
	16	15 30 45 60														
(Cylinder only) MSPCN	20	15 25 50 100														
	25	15 25 50 100														
	32	15 25 50 100														

■Pen Type: Parts List

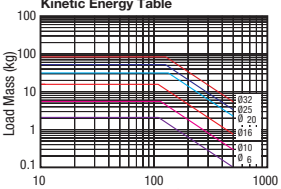
Number	Part Name	Ø6	Ø10	Ø16	Ø20	Ø25	Ø32
1	Rod Cover	EN AW-6061/EN AW-AlMg1SiCu					
2	Head Cover	EN AW-6061/EN AW-AlMg1SiCu					
3	Piston Rod	1.4305		1.1191/C45E			
4	Piston	EN AW-6061(Note)					
5	Tube	1.4301/X5CrNi18-10					
6	Rod Gasket	NBR					
7	Magnet	-					
8	Piston Gasket	NBR					
9	Cushion	NBR					
10	Body Nut	CW614N-CD		1.0038/S235JR			
11	Rod Nut	CW614N-CD		1.0038/S235JR			
12	Wearing	Teflon					
13	Piston Bolt	1.7220/34CrMo4					
14	Foot	1.0038/S235JR					

(Note) CW614N-CD is for Ø10 and Ø16, POM is for Ø25.

■Pen-Shaped Type Allowable Tip Lateral Load Table



■Pen-Shaped Type Allowable Kinetic Energy Table



For theoretical reference speed, refer to

■Pen Type: Theoretical Output

Unit (N)

Tube Inner Ø (mm)	Operating Direction	Operating Pressure (MPa) 0.2	0.3	0.4	0.5	0.6	0.7
6	Push	5.7	8.5	11.3	14.1	17	19.8
	Pull	4.2	6.4	8.5	10.6	12.7	14.8
10	Push	15.7	23.6	31.4	39.3	47.1	55
	Pull	13.2	19.8	26.4	33	39.6	46.2
16	Push	40	60	80	101	121	141
	Pull	36	54	73	91	109	127
20	Push	63	94	126	157	189	220
	Pull	47	71	94	118	141	165
25	Push	98	147	196	245	295	344
	Pull	83	124	165	206	247	289
32	Push	161	241	322	402	483	563
	Pull	138	207	277	346	415	484

■Basic Specification for Pen Type

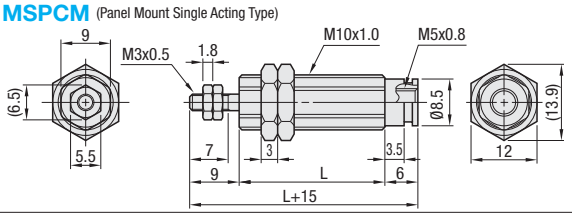
Tube Inner Diameter (mm)	6	10 · 16 · 20~32
Operating Type	Double Acting	
Permissible Fluid	Air	
Min. Operating Pressure (MPa)	0.12	0.06
Max. Operating Pressure (MPa)	0.7	
Pressure Resistance (MPa)	1.0	
Operating Temp. Range (°C)	5~60	
Piston Speed (mm/s)	50~500	
Cushion Mechanism	NBR	
Stroke Tolerance (mm)	0~+1.5	0~+2.0
Lubrication	Lube-Maintenance Free	
Pipe Connection Bore Ø	M5x0.8	Rc1/8

For theoretical reference speed, refer to

■Panel Mount Single Acting Type



MSPCM (Panel Mount Single Acting Type)

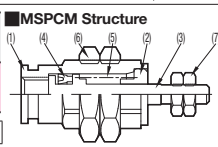


■MSPCM Basic Specifications

Tube Inner Diameter (mm)	6
Operating Type	Single Acting Push Type
Permissible Fluid	Air
Min. Operating Pressure (MpPa)	0.2
Max. Operating Pressure (MPa)	0.7
Pressure Resistance (MPa)	1.0
Operating Temp. Range (°C)	5~60
Piston Speed (mm/s)	50~500
Cushion Mechanism	No
Stroke Tolerance (mm)	0~+1.0
Lubrication	Lube-Maintenance Free
Pipe Connection Bore Ø	M5x0.8

Part Number Type	Tube Inner Dia.(mm)	St Stroke (mm) Selection	L	€ Unit Price
MSPCM	6	5	12.5	
		10	19.5	
		15	26.5	

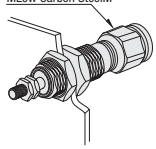
■MSPCM Structure



- MSPCM: Parts List

Number	Part Name	M Material	S Surface Treatment
1	Body	CW614N-CD	Electroless Nickel Plating
2	Cover	JIS C5441B	
3	Piston Rod	1.4305	
4	Piston Gasket	NBR	
5	Spring	JIS SWP	
6	Body Nut	CW614N-CD	Electroless Nickel Plating
7	Rod Nut	CW614N-CD	Electroless Nickel Plating

Example



Order Example

Part Number	-	St Stroke
MSPCB6	-	30
MSPCM6	-	5

Days to Ship: 6 Days P87

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Step Switch Valve

-2-Port Type · 3-Port, 4-Port Type-

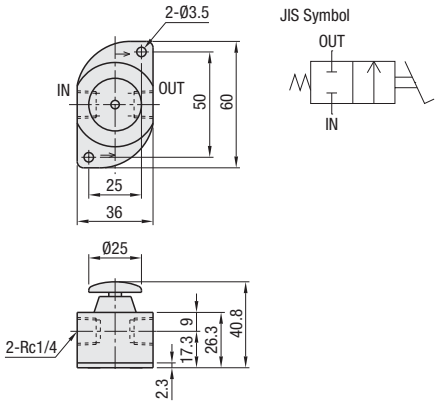
CAD Data

■2-Port Type



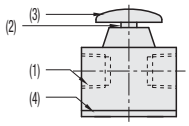
RoHS

MSFF (No Lock Mechanism)



■Features

-Switching valve to switch a flow of compressed air on and off. Air starts flowing by pressing the pedal, and the flow stops by releasing the pedal.
-Mountable either vertically or horizontally. Manual operation is also possible.



■Parts List

Part No.	Name	M Material	S Surface Treatment
1	Body	EN AW-2017-B	Clear Anodize
2	Rod	CW614N-B	-
3	Pedal	EN AW-5052B	Clear Anodize
4	Plate	1.0330/DC01	Chrome Plating

Part Number Type	Part Number No.	Direction	No. of Ports	Pipe Connection Bore Dia. IN · OUT	Number of Positions	Effective Sectional Area (mm²)	Operating Pressure Range (MPa)	Max. Actuating Force (N)	Operating Temp. Range(°C)	Used Fluid	Mass (g)	€ Unit Price
MSFF	2	2	2	Rc1/4	2	6	0~0.7	40	5~60	Air	130	

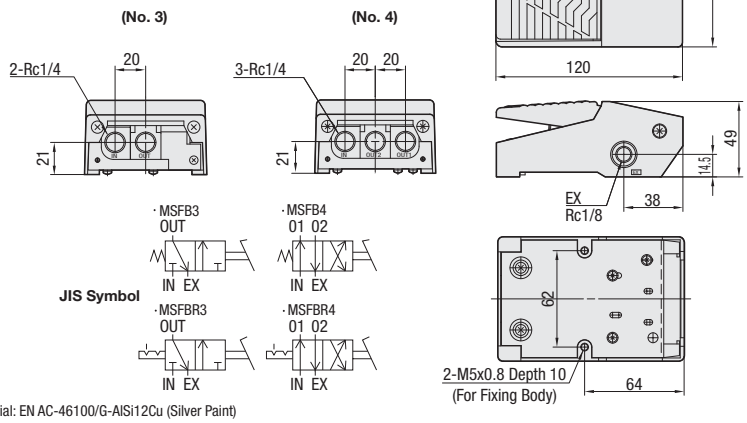
■3-Port, 4-Port Type



RoHS

MSFB (No Lock Mechanism)
MSFBR (With Lock Mechanism)

[Features]
- For the Lock Mechanism Type, the pedal is locked when stamped.
- The lock is released when the locked pedal is stamped again.



M Material: EN AC-46100/G-AlSi12Cu (Silver Paint)

Part Number Type	Part Number No.	Direction	No. of Ports	Pipe Connection Bore Dia. IN · OUT	Pipe Connection Bore Dia. EX	Number of Positions	Effective Sectional Area (mm²)	Operating Pressure Range (MPa)	Max. Actuating Force (N)	Operating Temp. Range (°C)	Used Fluid	Mass (g)	€ Unit Price MSFB	€ Unit Price MSFBR
MSFB MSFBR	3	3	3	Rc1/4	Rc1/8	2	8	0~0.7	29	5~60	Air	560		
	4	4	4									680		

Order Example — Part Number: MSFF2, MSFBR4

Days to Ship: 6 Days P.87

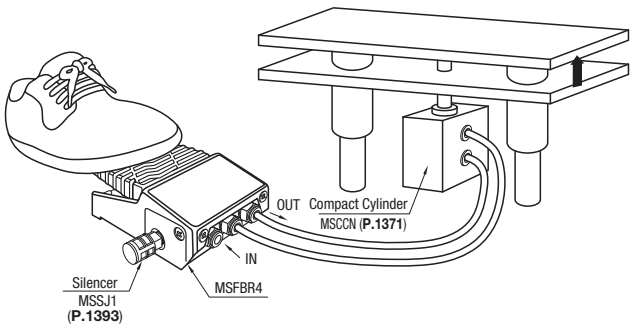
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Example



Manual Switching Valves

Panel Mount 2-Port, 3-Port Type

CAD Data

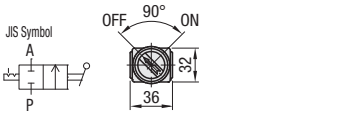
■We have added the Push Button Type that can prevent malfunctions or human errors.

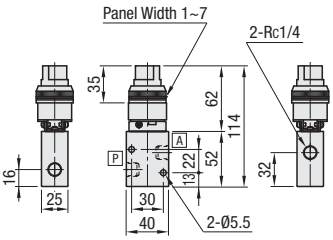
■2-Port · 3-Port Type



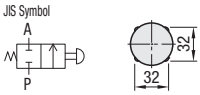
RoHS

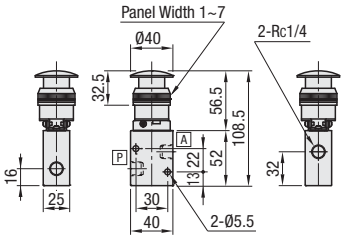
NCHS2
(2-Port Selector Type)



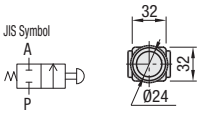


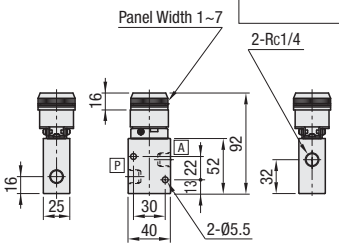
NCHB2
(2-Port Button Type)

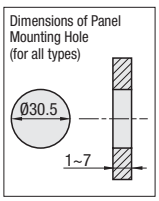




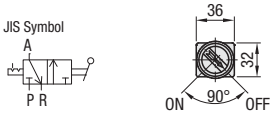
NCHP2
(2-Port Push Button Type)

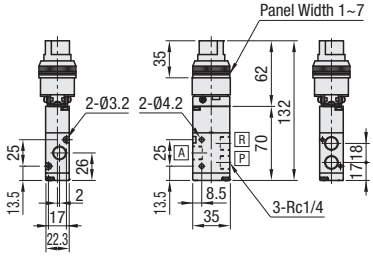






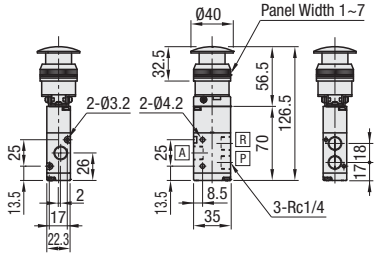
NCHS3
(3-Port Selector Type)



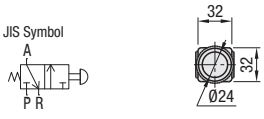


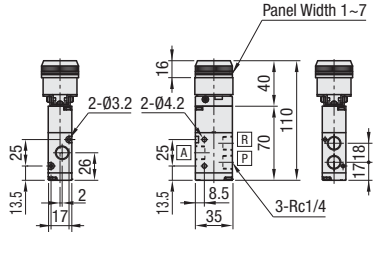
NCHB3
(3-Port Button Type)





NCHP3
(3-Port Push Button Type)

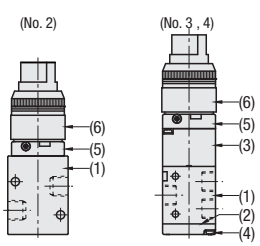




Part Number		Nominal	Direction	No. of Ports	Pipe Connection Bore Dia.		Number of Positions	Effective Sectional Area (mm^2)	Operating Pressure Range (MPa)	Operating Temp. Range (°C)	Used Fluid	Mass (g)	€ Unit Price		
Type	No.				IN · OUT	EX							NCHS	NCHB	NCHP
(Selector Type) NCHS (Button Type) NCHB (Push Button Type) NCHP	2	8A	2	2	Rc1/4	-	2	18	0~0.9	5~60	Air	200			
	3		3	3	Rc1/4	Rc1/4			0.15~0.8			210			

The NCHP buttons are green.

■Components



■Parts List

Part No.	Name	Material
1	Body	(No. 2) EN AW-6061/ EN AW-AlMg1SiCu (No. 3 , 4) ACD10
2	End Cover	Resin
3	Pilot Body	EN AW-6061/ EN AW-AlMg1SiCu
4	Philips Head Small Screw	1.0038/S235JR
5	Bracket	1.0330/DC01
6	Selector / Push-Button	-

■Features

- Small manual-switching valves with large capacity
- Spring-loaded push button
- 1~7mm sheet thickness for panel mounting

Order Example

Part Number	-	Nominal
NCHS2	-	8A
NCHB3	-	8A

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Manual Switching Valves
Panel Mount 5-Port Type

CAD Data

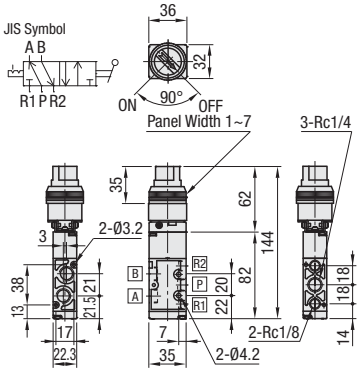
■We have added the Push Button Type that can prevent malfunctions or human errors.

■5-Port Type

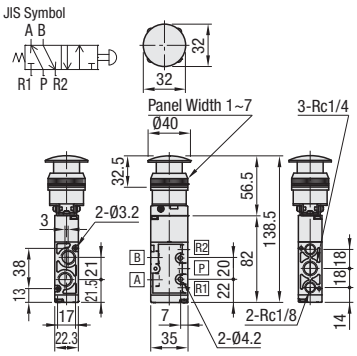


RoHS

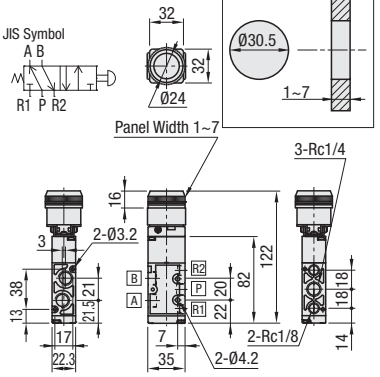
NCHS4 (Name: 8A)
(5-Port Selectable Type)



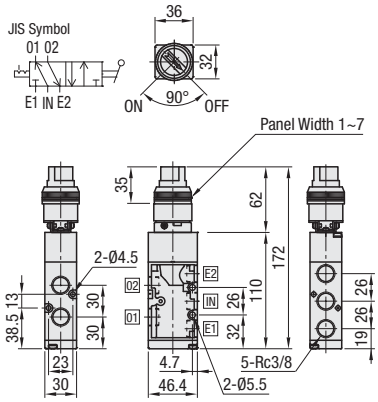
NCHB4 (Name: 8A)
(5-Port Button Type)



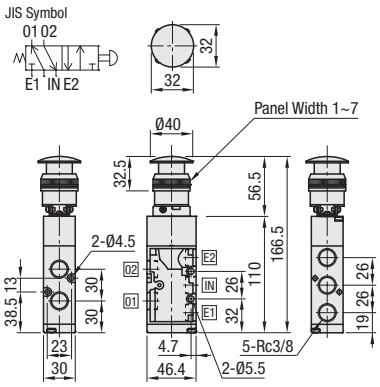
NCHP4 (Name: 8A)
(5-Port Push Button Type)



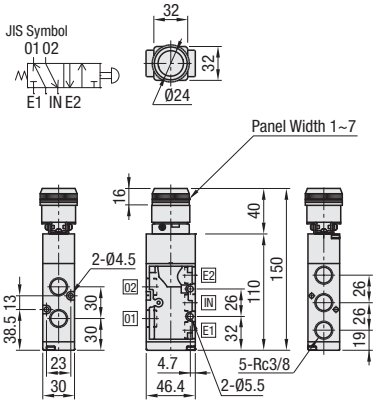
NCHS4 (Nominal: 10A)
(5-Port Selectable Type)



NCHB4 (Nominal: 10A)
(5-Port Button Type)



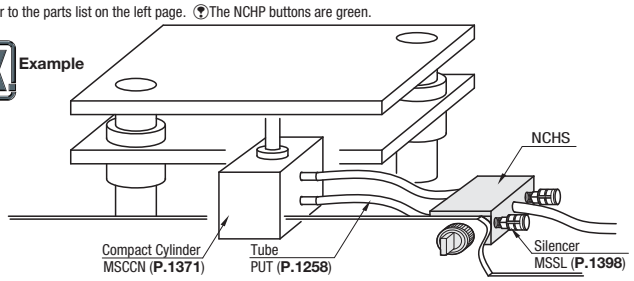
NCHP4 (Nominal: 10A)
(5-Port Push Button Type)



Part Number		Nominal	Direction	No. of Ports	Pipe Connection Bore Dia.		Number of Positions	Effective Sectional Area (mm²)	Operating Pressure Range (MPa)	Operating Temp. Range (°C)	Used Fluid	Mass (g)	€ Unit Price		
Type	No.				IN · OUT	EX							NCHS	NCHB	NCHP
(Selector Type) NCHS (Button Type) NCHB (Push Button Type) NCHP	4	8A	4	5	Rc1/4	Rc1/8	2	18	0.15~0.8	5~60	Air	180			
		10A			Rc3/8	Rc3/8		30				320			

Refer to the parts list on the left page. The NCHP buttons are green.

Example



Order Example

Part Number	-	Nominal
NCHS4	-	8A
NCHB4	-	10A

Days to Ship 6 Days P.87

Price

■Volume Discount (Round down to one Cent) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Manual Switching Valves

-Grip Type · Miniature Type-

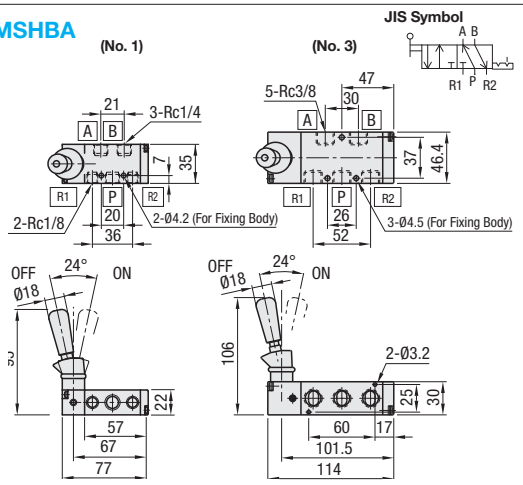
CAD Data

■Grip Type



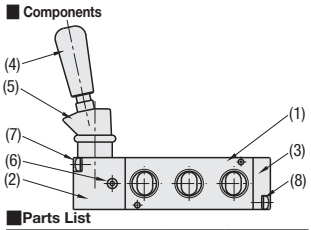
RoHS

MSHBA



■ Features
- Compact spool-type manual-switching valves
- Ensured switching with a lever irrespective of pressure. The lever is maintained after switching.

■ Components



■Parts List

Part No.	Name	Quantity	Meatrial
1	Body	1	EN AW-6061
2	Pilot Body	1	EN AW-6061
3	End Cover	1	(No. 1) EN AW-6061
4	Hand Lever	1	POM
5	Dust Cover	1	NBR
6	Set Screw	2	JIS STKM
7	Screw for Pilot Body	2	JIS STKM
8	End Cover Screw	2	JIS STKM

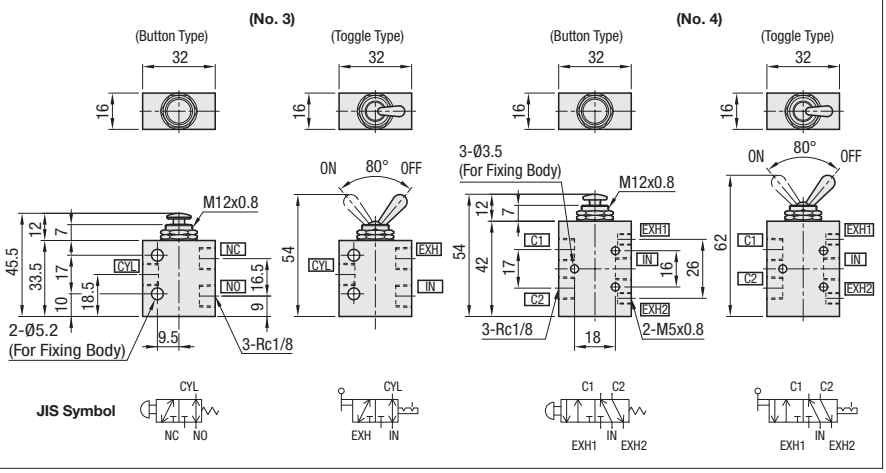
Part Number Type	Part Number No.	Direction	No. of Ports	Pipe Connection Bore Dia. IN · OUT	Pipe Connection Bore Dia. EX	Number of Positions	Effective Sectional Area (mm²)	Operating Pressure Range (MPa)	Operating Temp. Range (°C)	Used Fluid	Mass (g)	€ Unit Price
MSHBA	1	4	5	Rc1/4	Rc1/8	2	18	0~0.9	5~60	Air	200	
	3			Rc3/8	Rc3/8		34				440	

■Miniature Type



RoHS

MSHBP (Button Type)
MSHBT (Toggle Type)



Part Number Type	Part Number No.	Direction	No. of Ports	Nominal	Pipe Connection Bore Dia. IN · OUT	Pipe Connection Bore Dia. EX	Number of Positions	Effective Sectional Area (mm²)	Operating Pressure Range (MPa)	Operating Temp. Range (°C)	Used Fluid	Mass (g)	€ Unit Price MSHBP	€ Unit Price MSHBT
MSHBP	3	3	3	6A	Rc1·8		2	4.5	0~0.9	5~60 (No freezing)	Air	130		
MSHBT	4	4	5		Rc1/8	M5		5.5				160		

Order Example

Part Number
MSHBA1
MSHBP3

Days to Ship 6 Days P.87

Price

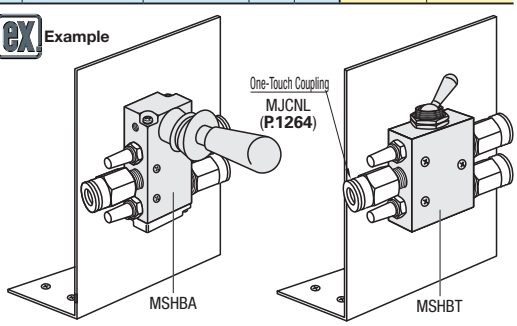
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■ Features
- Button type is a spring return type.

Example



Manual-switching Valves · Silencers
-Lever Type-

Price Reduction
Up to 41%

CAD Data

■We have added compact plastic silencers.

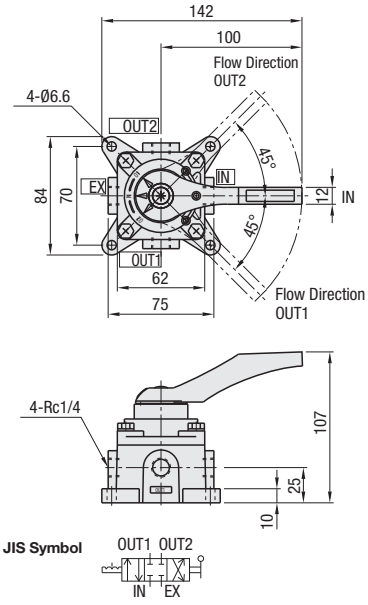
■Lever Type



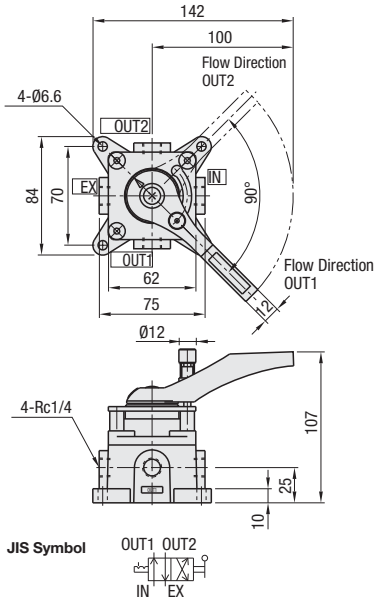


RoHS

MHAN (No Lock Mechanism)



MHANR (With Lock Mechanism)

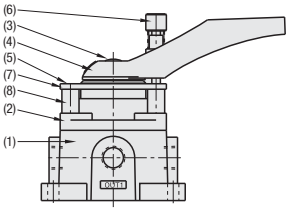


Part Number		Direction	No. of Ports	Pipe Connection Bore Dia.		Number of Positions		Effective Sectional Area (mm²)	Operating Pressure Range (MPa)	Operating Temp. Range (°C)	Used Fluid	Mass (g)		€ Unit Price	
Type	No.			IN · OUT	EX	MHAN	MHANR					MHAN	MHANR	MHAN	MHANR
MHAN MHANR	4	4	4	Rc1/4	Rc1/4	3	2	20	0~0.7	5~60	Air	800	850		

■Features

- MHAN: 3-position type of closed center.
- MHANR: 2 Position Type; Lever is locked at the OUT1 and OUT2 positions. Move the lever by pressing the knob for switching.

■Parts



■Parts List

Part No.		Name	Quantity	Material
1	Common	Base	1	JIS ADC
2		Cover	1	JIS ADC
3		Small Flat Head Screw	1	1.0038
4		Lever	1	JIS ADC
5	MHAN	Bolts	4	1.0038
	MHANR	Hexagon Socket Flat Head Cap Screws	4	1.7220
6	MHANR only	Knob	1	1.0038
7		Stoppers Plate	1	1.0330
8		Collar	4	CW614N/CuZn39Pb

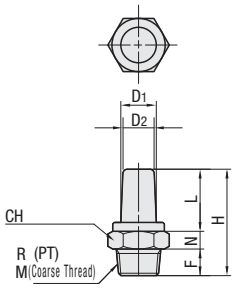
■Silencer



RoHS

MSSL (Metal)

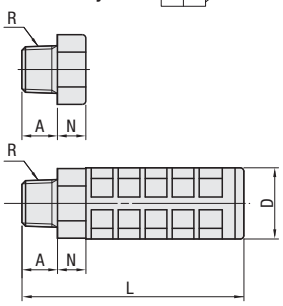
JIS Symbol



Material: Brass

MSSJ (Plastic)

JIS Symbol



Material: ABS Resin

■Metal Silencers

Part Number		R (PT) M (Coarse)	D1	D2	N	F	L	H	CH (Width Across Flats)	Effective Sectional Area (mm²)	€ Unit Price
Type	No.										
MSSL	1	R1/8	8	7	4	6	14	24	12	20	
	2	R1/4	12	10	4	8	18	30	17	45	
	3	R3/8	14	11	5	9	21	35	19	86	
	5	M5	5	4	3	5	12	20	8	2	

■Plastic Silencers

Part Number		R	A	B	(C)	D	L	N	Effective Sectional Area (mm²)	€ Unit Price
Type	No.									
MSSJ	1	R1/8	7	14	16.3	16.1	33	7	12	
	1S	R1/8	10	10	11.5	-	-	6	12	
	2	R1/4	10	17	19.6	20.1	62.5	8	40	
	2S	R1/4	10	14	16.2	16	36	7	20	
	3	R3/8	12	24	26	26.3	68	11	63	

Order Example — Part Number: MHAN4, MSSJ2

Days to Ship — 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

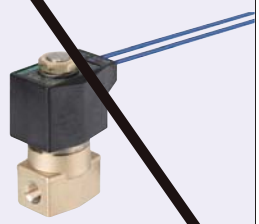
For orders larger than indicated quantity, please request a quotation.

Multilex Valves · 2-Port Solenoid Valves

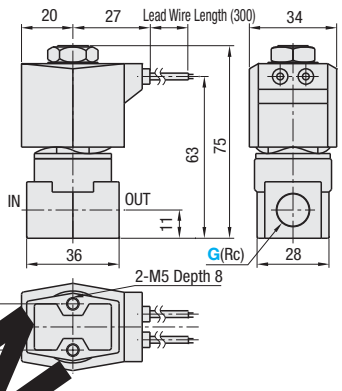
-Pilot-kick Type · Direct Operation Type-

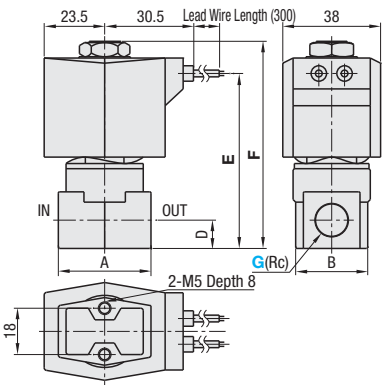
■We have included versatile Multilex Valves and pilot kick type Solenoid Valves in stock.

■Multilex Valve



RoHS



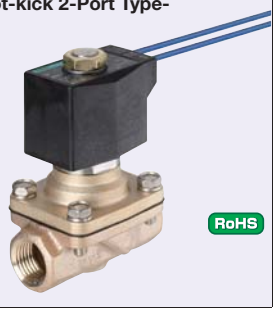


No.	G(Rc)	A	B	D	E	F
4	2	36	28	11	68	80
	3	40	28	12	71	83.5

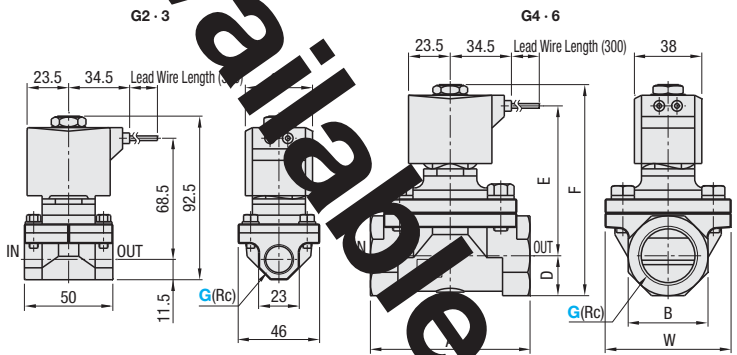
Part Number Type	No.	G (Rc)	Rated Voltage (V)	Orifice Diameter (mm)	Max. Operating Pressure Differential (MPa) Air	Water• Kerosene	Oil (50mm²/S)	Max. Operating Pressure (MPa)	Flow Rate Characteristics C*	b	Cv	Power Consumption(W) AC 50/60Hz	Apparent Power Holding 50Hz	Holding 60Hz	Starting 50Hz	Starting 60Hz	Mass (kg)	€ Unit Price
	3	1(Rc1/8)	B (100VAC)	3.0	1.0	0.7	0.5		1.1	0.52	0.31	5.2/3.8	12	10	17	14	0.35	
		2(Rc1/4)																
	4	2(Rc1/4)	C (200VAC)	4.0	1.0	0.7			2.10	0.48	0.54	6.7/5.7	18	15	29	24	0.43	
		3(Rc3/8)															0.45	

*C=[dm³/(s·bar)]

■Solenoid Valves -Pilot-kick 2-Port Type-



RoHS



G(Rc)	A	B	D	E	F	W
Rc1/2	71	29	14.5	75.5	102	50
Rc3/4	80	35	17.5	79	108.5	60

Part Number Type	No.	G (Rc)	Rated Voltage (V)	Orifice Diameter (mm)	Min. Operating Pressure Differential (MPa)	Max. Operating Pressure Differential (MPa) Air	Water• Kerosene	Oil (50mm²/S)	Flow Rate Characteristics C	b	Cv	S (mm³)	Power Consumption (W) AC 50/60Hz	Apparent Holding 50Hz	Holding 60Hz	Starting 50Hz	Starting 60Hz	Mass (kg)	€ Unit Price Rated Voltage(V) B	C
	1	2(Rc1/4)	B (100VAC)	12	0	1	1	0.7	9.2	0.36	2.0	-	10/8	24	19	61	54	0.65		
		3(Rc3/8)		12					11	0.46	2.4	-						0.65		
		4(Rc1/2)	C (200VAC)	16				0.6	20	0.31	4.5	-	10/8.5	25	21	84	75	0.90		
		6(Rc3/4)		23					-	-	8.6	162						1.0		

C=[dm³/(s·bar)]

Order Example

Part Number	-	G(Rc)	-	Rated Voltage (V)
	-	2	-	B
	-	4	-	B

Days to Ship 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

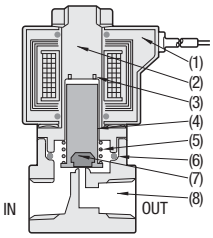
Not Available

NEW

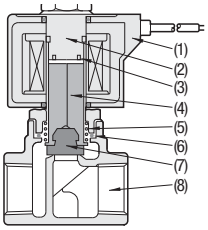
Price Reduction
25%

CAD Data

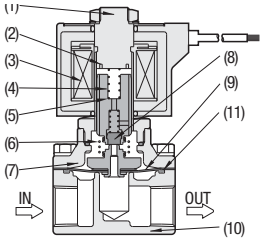
MMRBC3



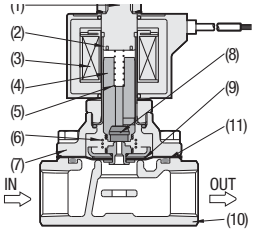
MMRBC4



MDPN (G2 · 3)



MDPN (G4 · 6 · 1)



Parts List

Part No.	Name	Material	Part No.	Name	Material
1	Coil	-	5	Plunger Spring	1.4301/X5CrNi18-10
2	Core Assembly	1.4002/X6CrAl13	6	O-Ring	NBR
3	Shading Coil	Cu	7	Seal	NBR
4	Plunger	1.4002/X6CrAl13	8	Body	CW617N/CuZn40Pb2

Parts List

Part No.	Name	Material	Part No.	Name	Material
1	Core Assembly	1.4002/X6CrAl13 · 1.4404/X2CrNiMo17-12-2 · 1.4000/X6Cr13	7	Stuffing	CW617N/CuZn40Pb2
2	Shading Coil	Cu	8	Seal	NBR
3	Coil	-	9	Diaphragm Assembly	1.4305/X10CrNiS18-9 · 1.4305/X5CrNiS18-10 · NBR
4	Plunger Assembly	1.4002/X6CrAl13	10	Body	CuSn6Zn4Pb2 (CC498K)
5	Plunger Spring	1.4301/X5CrNi18-10	11	O-Ring	NBR
6	Kick Spring	1.4301/X5CrNi18-10			

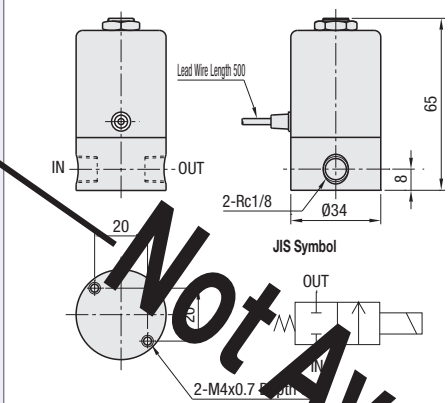
Specifications

Part Number	MMRBC	MDPN
Applicable Fluid	Air · Vacuum[(1.33X10^{3}Pa(abs)] · Water · Kerosene · Oil (50mm^2/S or Low)	
Operating Pressure Differential Range (MPa)	0~5 (size dependent)	0~1.0 (size dependent)
Max. Operating Pressure (MPa)	-	
Pressure Resistance (MPa)	25 (w/Water)	4 (w/Water)
Fluid Medium Temp. (°C)	-10~60°C (Not to be frozen)	
Ambient Temperature(°C)	-20~60	-10~60
Heat Resistance Class	B	
Environment	No corrosive or explosive gases in surroundings	
Valve Structure	Direct Poppet Design	Pilot Type Poppet Design Diaphragm Driven
Valve Seat Leakage (cm^3/min) (AIR)	0.2 or less (w/Air)	1 or less (w/Air)
Mounting Orientation	Flexible	
Body · Seal - Materials	Brass · Nitrile Rubber	

Solenoid Valves Direct Operation 2-Port Type-



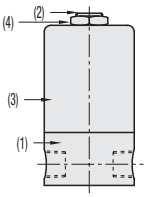
RoHS



Basic Specifications of Solenoid Valves

Direction	2 ports
Number of Positions	2
Permissible Fluid	Air · Clear Water
Operating Pressure (MPa)	0~1.5
Effective Sectional Area (mm^2)	1.54
Operating Temp. Range (°C)	5~40
Allowable Voltage Range	±10%
Pipe Connection Bore Dia.	Rc1/8

Components



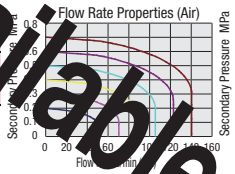
Parts List

Part No.	Name	M Material	S Surface Treatment
1	Body	CW614N/CuZn39Pb3	-
2	Fixed Core	Magnetic Stainless Steel	-
3	Coil Case	1.0330/DC01	Black Resin Coating
4	Nut	1.1141/C15E	Nickel Plating

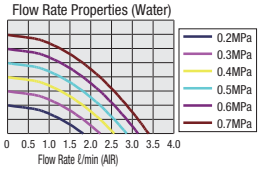
Not Available

Part Number	Valve Voltage (V)	Rated Current 50/60 Hz (mA)	Valve Type	Mass (g)	€ Unit Price
	B(100VAC)	88/73	2-Port Valve	310	
	C(200VAC)	43/37			

Flow Rate Properties (Air)



Flow Rate Properties (Water)



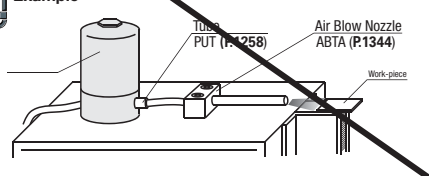
Features

-Compact 2-port solenoid valves for both air and water.
-Direct operation enables use under low pressure as well.

Precautions for Use

- Operating Environment
  - Use the solenoid valves at temperatures between 5 and 40 °C. Avoid any use and storage in a corrosive atmosphere.
  - Keep the solenoid valves away from strong impacts and vibrations. They may be closed from being open, and vice versa.
- Fluid Quality
  - When compressed air is used as a fluid, removes drainage and dust through an air filter.
  - When the fluid is water, remove grit and rust inside a pipe through a filter. Do not run poor quality water.
- Installation
  - Install the Solenoid Valves horizontally with the coil part upward.
  - The body might be damaged if the M4 screws are excessively tightened up.
- Plumbing
  - Before plumbing, cleanse and flush thoroughly the valves to remove cutting chips, dust and cutting oil.
  - Mate sure that plumbing will not cause a strong turbulence on the IN side.
- Maintenance
  - Do not disassemble the solenoid valves.

Example



Order Example: Part Number - Valve Voltage (V) - B

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

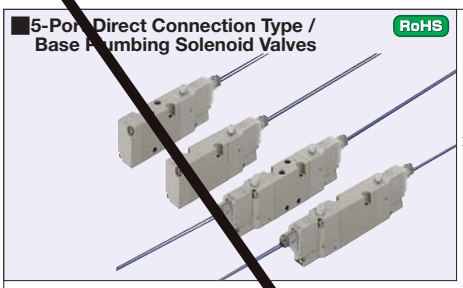
Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Solenoid Valves
-5-Port Type-

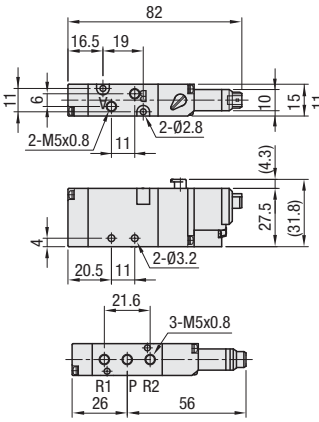
■5-Port Direct Connection Type / Base Plumbing Solenoid Valves

RoHS

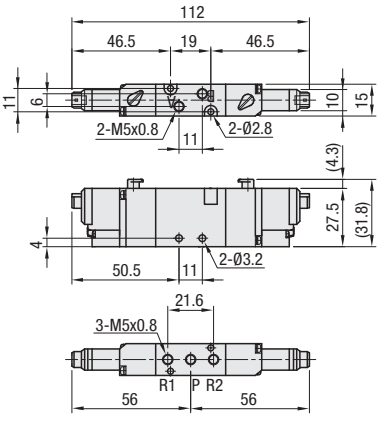


Valve Type	Solenoid Valves	Type	
		Direct Plumbing Type	Base Plumbing Type
5 Port Valves	Single Solenoid		
	Double Solenoid		

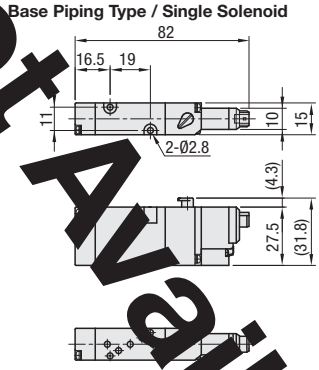
Direct Piping Type / Single Solenoid



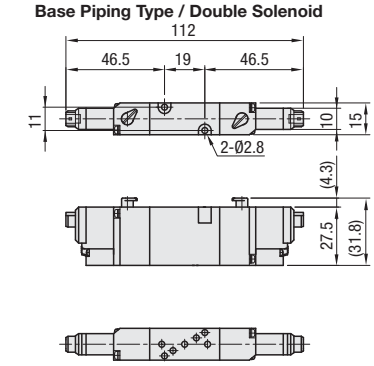
Direct Piping Type / Double Solenoid



Base Piping Type / Single Solenoid



Base Piping Type / Double Solenoid



■Electromagnetic Valve Precautions for Use

•Operating Environment
- Do not use this product when it is exposed to any corrosive gases, chemicals, water or water vapor.
- Note that drain sludge will freeze when operating under temperature of 5°C or lower.
- Protect it with covers when it is used in water-dropping or oil-dropping or dusty places.
- Install silencers etc. on the exhaust port to protect from powder dust intrusions.

•Air Quality
- Use air as fluid.
- Attach air filter to circuit for compressed air in order to remove moisture and dusts from circuit.
  Drain the air filter regularly.

•Installation
- The valve must be installed by mounting the body and must not be supported by the plumbing.
- Provide space for attaching, detaching, wiring, plumbing around the electromagnetic valve.
- Although this can be used without lubrication maintenance, use turbine oil "ISO VG32" if any lubricant is to be added.
- After installation, do not wash with water or solvents, or paint it.

•Plumbing
- Before plumbing, make sure to clean the inside of the pipes. Brush and remove saw chips, scrap, and oil, etc.
- Note that when twisting pipes and joints together, do not let cutting chips or sealing tape inside.
  When using sealing tape, please leave 1.5~2 threads unwrapped from the tip.

•Maintenance
- Before the maintenance, be sure that you have turned off the power, stopped the compressed air supply, and no residual pressure left.
- Be sure to unlock the manual button of electromagnetic valve before trial operation.
- Do not disassemble the electromagnetic valve when trouble occurs.

A Accessory: Base Plumbing Type (VFS3000/S235/MDSYDM) only: Gaskets (NBR) / Mounting Screws (1.0038/S235JR Nickel Plating)
Lead Wire: 500mm

Solenoid Valves	Part Number		Valve Voltage (V)	€ Unit Price
	Direct Plumbing Type	Base Plumbing Type		
Single Solenoid			A(DC24V)	
Double Solenoid			B(100VAC)	
			C(200VAC)	

Order Example: Part Number - Valve Voltage (V) → - A

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Basic Specifications of Solenoid Valves

Type	Direct Plumbing Type	Base Plumbing Type
Valve Type	Pilot Type, 5 Port Valves	
Number of Position	4	
Number of Ports	2	
Media Fluid	Air	
Operating Pressure (MPa)	0.15~0.7	
Pressure Resistance (MPa)	1	
Effective Sectional Area (mm²)	3.8	
Response Time (ms)	30	
Operating Temperature Range (°C)	5~50	
Rated Voltage	DC24V,AC100V,AC200V	
Power Consumption	1.6/2.5VA (AC100V/AC200V), 1.2W (DC)	
Allowable Voltage Range	±10%	
Insulation Class	B Type	
Pipe Connection Bore Dia.	M5x0.8	

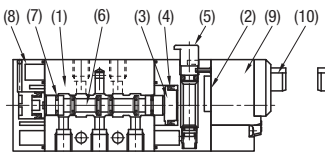
Check for the following when operating condition is poor..
- If the operating pressure is 0.1~0.7MPa.
  (Not operational at less than 0.1MPa.)
- If operated within the range of rated voltage.

■Features
- Direct plumbing type can be directly connected to the pipes.
- Base plumbing type must be attached on the base unit MSSYB for connection.
  Refer to the base unit MSSYB on the right page if purchase is required.

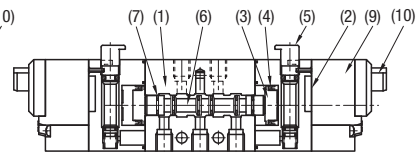
■Cross Section Structure Diagram

* The figures below are for Direct Plumbing Type, but the components are in common with the Base Plumbing Type.

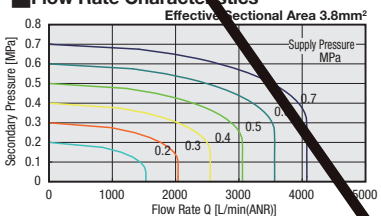
Single Solenoid



Double Solenoid



■Flow Rate Characteristics



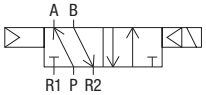
■Parts List

Part No.	Name	Material
1	Body	EN AW-6061/EN AW-AlMg1SiCu
2	Pilot Body	PBT
3	Piston	POM
4	Piston Gasket	NBR
5	Push Button	POM

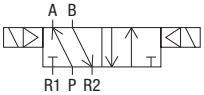
Part No.	Name	Material
6	Spool Valve	EN AW-6061/EN AW-AlMg1SiCu
7	Spool Valve Gasket	NBR
8	End Cover	PBT
9	Coil	
10	Connector Cord	

■JIS Symbol

Single Solenoid



Double Solenoid



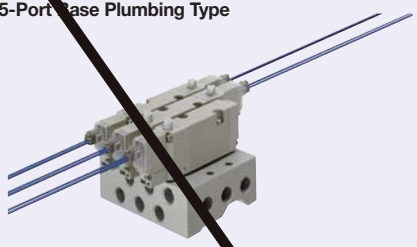
Not Available

Price Reduction
15%

CAD Data

■5-Port Base Plumbing Type

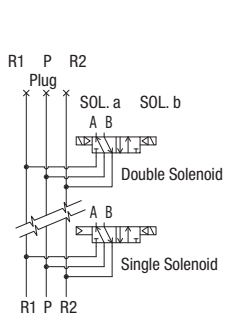
RoHS

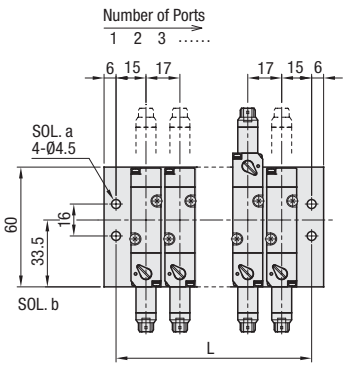


(Base + Electromagnetic Valve)

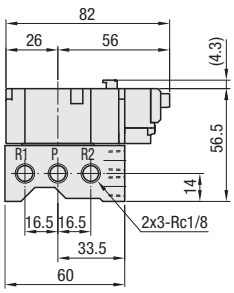
(Base Only)

-Arrangement and Selecting Order of Electromagnetic Valve Installation

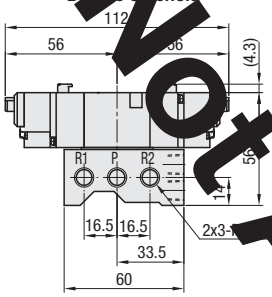


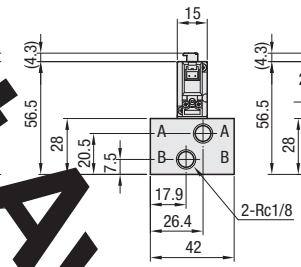


Single Solenoid

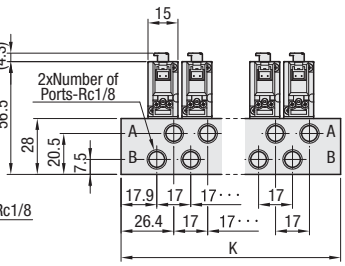


Double Solenoid





For 1 Port



For 2 Ports or more

Part Number		only 1~12 Positions		L	K	Mass			Electromagnetic Valve Additional Price		Base € Unit Price
Type	No. of Positions	Solenoid Valves Type	Solenoid Valves Voltage (V)			Base	Solenoid Valve Single	Solenoid Valve Double	Base € Unit Price	S(Single)	D(Double)	
(Base + Electromagnetic Valve)		S(Single) D(Double)	A(DC24V) B(100VAC) C(200VAC)	30	42	140	68 Unit Mass	80 Unit Mass				
				47	59	203						
				64	76	266						
				81	93	329						
				98	110	392						
				115	127	455						
				132	144	518						
				149	161	581						
				166	178	644						
				183	195	707						
				200	212	770						
				217	229	833						
(Base only)												

The price of MSSY is (base unit price [MSSYB]) + (additional price for the electromagnetic valves) x the number of positions.

Order Example

Part Number	1 Position	2 Positions	3 Positions	4 Positions	...	12 Positions
-	- SA	- DA	- DC	- SB	- ...	- DB
	- SA	- DA	- DC			

Days to Ship 10 Days

6 Days P87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

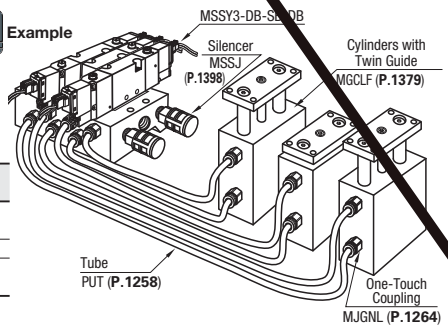
For orders larger than indicated quantity, please request a quotation.

(Price Calculation Example) –SA–DA–DC

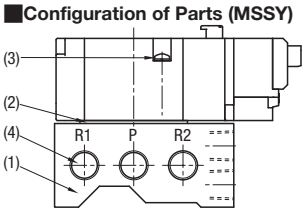
Base € Unit Price 35,60 + SA 59,60 + DA 89,60 + DC 89,60 = 274,40 EUR

- For MSSY, the base and the electromagnetic valve (solenoid valve) will be assembled before shipping.
- MSSYB is the base only, which is designed to be combined with the Base Plumbing Type of the electromagnetic valve on the left page. (Assembly is required by the customer.)
- For the basic specifications, the Flow Rate Properties and the Cross Section Structure Diagram, please refer to the left page.

Example



■Configuration of Parts (MSSY)



■Parts Material Table

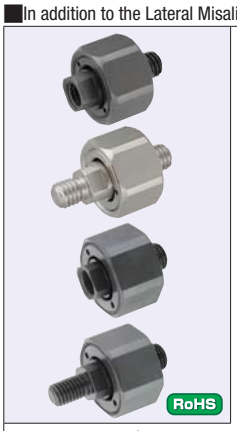
Part No.	Name	Material
1	Base	EN AW-6061/ EN AW-AlMg1SiCu
2	Gasket	NBR
3	Set Screw	1.0038/S235JR Nickel Plating
4	Plugs	Nickel Plating

Not Available

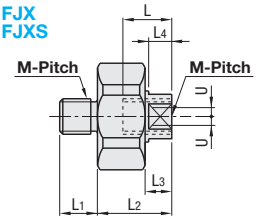
Floating Connectors
-Extra Short Male Thread Stud Mount Type-

CAD Data

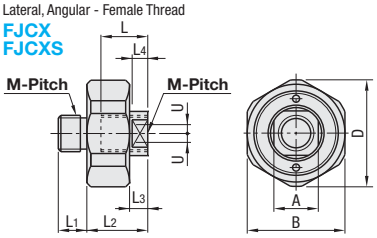
■In addition to the Lateral Misalignment Type, Angular Misalignment Compensation Type has been added to our lineup of connectors.



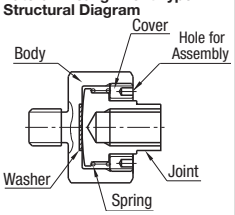
Lateral - Female Thread
FJX
FJXS



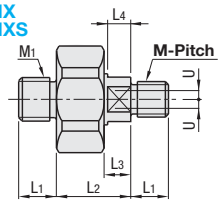
Lateral, Angular - Female Thread
FJCX
FJCXS



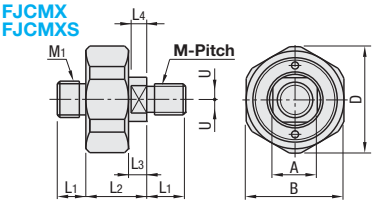
Lateral Misalignment Type Structural Diagram



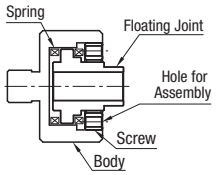
Lateral - Male Thread
FJMX
FJMXS

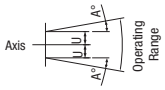


Lateral, Angular - Male Thread
FJCMX
FJCMXS



Lateral, Angular Type Structural Diagram





* Male Thread Type has the same structure.

Type				Body - Cover		Joint			Spring	Washer		
Lateral Misalignment Type		Lateral, Angular Type										
Female Thread	Male Thread	Female Thread	Male Thread	M Material	S Surface Treatment	M Material	S Surface Treatment	H Hardness	M Material	M Material	S Surface Treatment	H Hardness
FJX	FJMX	FJCX	FJCMX	1.1191/C45E	Black Oxide	1.1191/C45E	Black Oxide	35~45HRC	1.4301/X5CrNi18-10-WPB	1.4301/X5CrNi18-10	Nitride Treatment	600HV~
FJXS	FJMXS	FJCXS	FJCMXS	1.4301/X5CrNi18-10	-	1.4031/X38Cr13	-					

■Floating Connector -Extra Short Male Thread Stud Mount Type - Tap (for threaded cylinder)

Part Number Type	M-Pitch	L	L1	L2	L3	L4	A	B	D	Allowable Misalignment U	Maximum Applied Tensile · Compression Force (N)	Mass (g)	€ Unit Price FJX	€ Unit Price FJXS
Female Thread Type FJX FJXS	5-0.8	9	6	16.5	5	4.1	7	17	18.5	0.5	150	20		
	6-1.0													
	8-1.25	11	8.5	21	6	5.2	10	22	24		1100	40		
	10-1.25	13.5	10	24.5	7	6	12	27	29.5		2500	85		
	14-1.5	18	11	30	8	7	17	36	39	0.75	6000	190		
	18-1.5	20	13	37	9.5	8.5	22	46	50	1	11000	390		

Floating Connectors for air cylinders

■Floating Connector -Extra Short Male Thread Stud Mount Type with Angular Misalignment Compensation- Tap (for threaded cylinder)

Part Number Type	M-Pitch	L	L1	L2	L3	L4	A	B	D	Allowable Lateral Misalignment U	Allowable Angular Deviation A°	Maximum Applied Tensile · Compression Force (N)	Mass (g)	€ Unit Price FJCX	€ Unit Price FJCXS
Female Thread Type FJCX FJCXS	5-0.8	14	6	18.5	4.5	4	7	24	26	2.5	4	150	46		
	6-1.0														
	8-1.25	17	8.5	21	5.5	5	10	27	29			1100	66		
	10-1.25	21	10	26	6.5	6	12	30	32			2500	99		
	14-1.5	23	11	29	7	7	17	38	40	1	5	6000	174		

Floating Connectors for air cylinders

■Floating Connector -Extra Short Male Thread Stud Mount Type - Thread (for tapped cylinder)

Part Number Type	M-Pitch	M1	L1	L2	L3	L4	A	B	D	Allowable Misalignment U	Max. Operating Force (N) Tensile	Max. Operating Force (N) Compression	Mass (g)	€ Unit Price FJMX	€ Unit Price FJMXS
Male Thread Stud Type FJMX FJMXS	5-0.8	M8-1.25	6	16.5	5	4.1	7	17	18.5	0.5	300	1100	25		
	6-1.0										500	2500			
	8-1.25	M10-1.5	8.5	21	6	5.2	10	22	24		1300	6000	50		
	10-1.5	M14-2.0	10	24.5	7	6	12	27	29.5		3100	11000	105		

Floating Connectors for air cylinders

■Floating Connector -Extra Short Male Thread Stud Mount Type with Angular Misalignment Compensation- Male Thread (for tapped cylinder)

Part Number Type	M-Pitch	M1	L1	L2	L3	L4	A	B	D	Allowable Lateral Misalignment U	Allowable Angular Deviation A°	Max. Operating Force (N) Tensile	Max. Operating Force (N) Compression	Mass (g)	€ Unit Price FJCMX	€ Unit Price FJCMXS
Male Thread Stud Type FJCMX FJCMXS	5-0.8	M8-1.25	6	18.5	4.5	4	7	24	26	0.5	4	300	1100	50		
	6-1.0											500	2500			
	8-1.25	M10-1.5	8.5	21	5.5	5	10	27	29			1300	6000	76		
	10-1.5	M14-2.0	10	26	6.5	6	12	30	32			3100	11000	121		

Floating Connectors for air cylinders

Order Example

Part Number
FJX8-1.25
FJMXS10-1.5

Example

Days to Ship

6 Days P.87

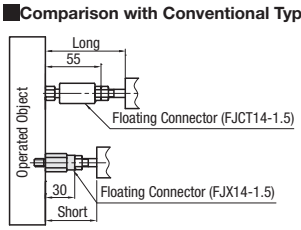
Price

■Volume Discount (Round down to one Cent) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders of 20 or more pieces of Lateral Misalignment Type or Angular Misalignment Compensation Type, please request a quotation.
For orders larger than indicated quantity, please request a quotation.

■Comparison with Conventional Type

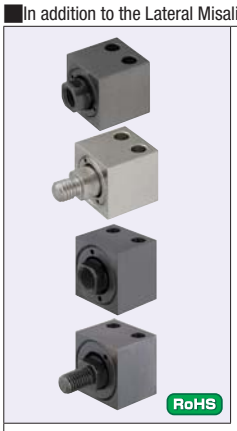


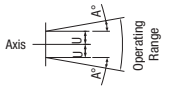
■Features
1. The distance between cylinder and operated object can be made short.
2. Large allowable eccentricity absorbs misalignment.
3. For threaded (for tapped cylinder), a thread on the operated object is larger than that on the cylinder to stabilize the strength. (N-Pitch part)

Floating Connectors
-Extra Short Foot Mount Type-

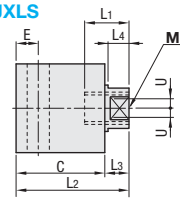
CAD Data

■In addition to the Lateral Misalignment Type, Angular Misalignment Compensation Type has been added to our lineup of connectors.

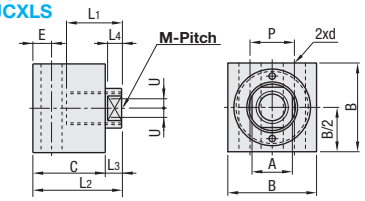




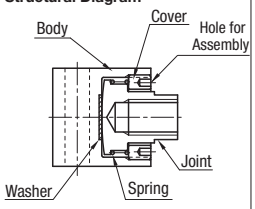
Lateral - Female Thread
FJXL
FJXLS



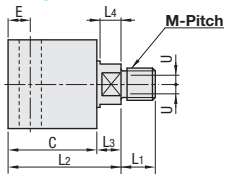
Lateral, Angular - Female Thread
FJCXL
FJCXLS



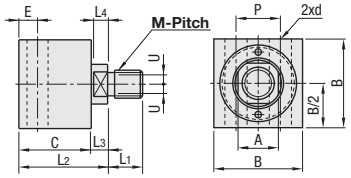
Lateral Misalignment Type Structural Diagram



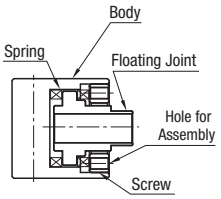
Lateral - Male Thread
FJMXL
FJMXLS



Lateral, Angular - Male Thread
FJCMXL



Lateral, Angular Type Structural Diagram



Type				Body - Cover		Joint			Spring	Washer		
Lateral Misalignment Type		Lateral, Angular Type										
Female Thread	Male Thread	Female Thread	Male Thread	M Material	S Surface Treatment	M Material	S Surface Treatment	H Hardness	M Material	M Material	S Surface Treatment	H Hardness
FJXL	FJMXL	FJCXL	FJCMXL	1.1191/C45E	Black Oxide	1.1191/C45E	Black Oxide	35~45HRC	1.4301/X5CrNi18-10-WPB	1.4301/X5CrNi18-10	Nitride Treatment	600HV~
FJXLS	FJMXLS	FJCXLS	-	1.4301/X5CrNi18-10	-	1.4031/X38Cr13	-					

■**Floating Connector - Extra Short Foot Mount Type - Tap (for threaded cylinder)**

Part Number Type	M-Pitch	L1	L2	L3	L4	A	B	C	P	E	d	Allowable Misalignment U	Maximum Applied Tensile · Compression Force (N)	Mass (g)	€ Unit Price FJXL	€ Unit Price FJXLS
Female Thread Type FJXL FJXLS	5-0.8	9	22	5	4.1	7	17 (19)	17	9	4	4.5	0.5	150	30 (40)		
	6-1.0															
	8-1.25	11	28	6	5.2	10	22	22	11	5.5	5.5		1100	65		
	10-1.25	13.5	32	7	6	12	26	25	14	6	6.6		2500	115		
	14-1.5	18	40	8	7	17	35 (36)	32	20	8	9	0.75	6000	260 (280)		
	18-1.5	20	50	9.5	8.5	22	44 (45)	40.5	26	10	11	1	11000	520 (555)		

Value in ( ) for JIS SUS. Floating Connectors for air cylinders

■**Floating Connector - Extra Short with Lateral and Angular Misalignment Compensation Type - Tap (for threaded cylinder)**

Part Number Type	M-Pitch	L1	L2	L3	L4	A	B	C	P	E	d	Allowable Misalignment U	Allowable Angular Misalignment A°	Maximum Applied Tensile · Compression Force (N)	Mass (g)	€ Unit Price FJCXL	€ Unit Price FJCXLS
Female Thread Type FJCXL FJCXLS	5-0.8	14	22.5	4.5	4	7	25	18	9	4	4.5	0.5	4	150	73		
	6-1.0																
	8-1.25	17	27.5	5.5	5	10	28	22	11	5	5.5			1100	112		
	10-1.25	21	33.5	6.5	6	12	32	27	14	6	6.6			2500	176		

Value in ( ) for JIS SUS. Floating Connectors for air cylinders

■**Floating Connector - Extra Short Foot Mount Type - Male Thread (for tapped cylinder)**

Part Number Type	M-Pitch	L1	L2	L3	L4	A	B	C	P	E	d	Allowable Misalignment U	Max. Operating Force (N) Tensile	Max. Operating Force (N) Compression	Mass (g)	€ Unit Price FJMXL	€ Unit Price FJMXLS
Male Thread Stud Type FJMXL FJMXLS	5-0.8	6	22	5	4.1	7	17 (19)	17	9	4	4.5	0.5	300	1100	35 (45)		
	6-1.0												500	2500			
	8-1.25	8.5	28	6	5.2	10	22	22	11	5.5	5.5		1300	6000	70		
	10-1.5	10	32	7	6	12	26	25	14	6	6.6		3100	11000	130		

Value in ( ) for JIS SUS. Floating Connectors for air cylinders

■**Floating Connector - Extra Short with Lateral and Angular Misalignment Compensation Type - Male Thread (for tapped cylinder)**

Part Number Type	M-Pitch	L1	L2	L3	L4	A	B	C	P	E	d	Allowable Misalignment U	Allowable Angular Misalignment A°	Max. Operating Force (N) Tensile	Max. Operating Force (N) Compression	Mass (g)	€ Unit Price
Male Thread Stud Type FJCMXL	5-0.8	6	22.5	4.5	4	7	25	18	9	4	4.5	0.5	4	300	1100	76	
	6-1.0													500	2500		
	8-1.25	8.5	27.5	5.5	5	10	28	22	11	5	5.5			1300	600	120	

Floating Connectors for air cylinders

Order Example

Part Number
FJXL5-0.8
FJMXL6-1.0

Example

Days to Ship

6 Days P.87

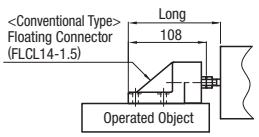
Price

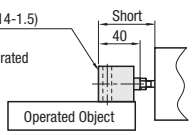
■**Volume Discount**(Round down to one Cent) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders of 20 or more pieces of Lateral Misalignment Type or Angular Misalignment Compensation Type, please request a quotation.
For orders larger than indicated quantity, please request a quotation.

■**Comparison with Conventional Type**





■**Features**
1. The distance between cylinder and operated object can be made short.
2. Large allowable eccentricity absorbs misalignment.

Floating Connectors
-Extra Short Type-

CAD Data

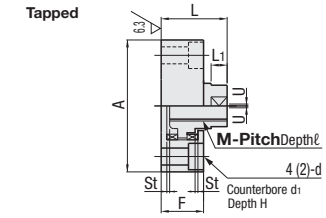


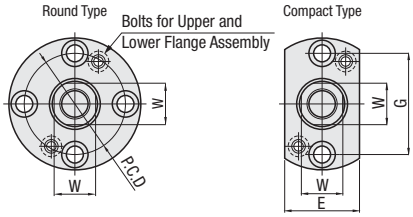
Thread	Type: Round Type	Type: Compact Type	M Material	S Surface Treatment	H Surface Hardness	Spring M Material
Female Thread	FJCR	FJCC	1.1191/C45E	Black Oxide	40~45HRC	Spring Steel
	FJCRT	FJCCT		Tufftride®	500HV~	Stainless Steel for Spring
	FJCRS	FJCCS	1.4125/X105CrMo17	-	40~45HRC	
Male Thread	FJMCR	FJMCC	1.1191/C45E	Black Oxide	40~45HRC	Spring Steel
	FJMCRT	FJMCCT		Tufftride®	500HV~	Stainless Steel for Spring
	FJMCRS	FJMCCS	1.4125/X105CrMo17	-	40~45HRC	

Tufftride® is a trademark of DURFERRIT GmbH.

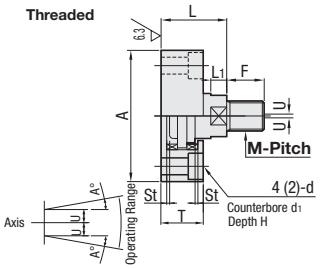
Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.

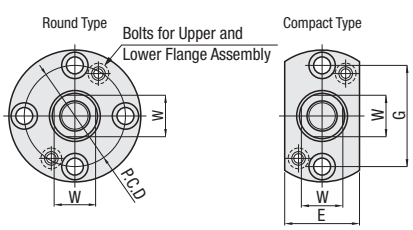
Tapped





Threaded





For details of Tufftride®, refer to **P.1799**

Do not insert screws deeper than the depth of tapped holes. Malfunction may occur.

■Floating Connectors-Extra Short Female Thread Type-

Part Number Type	M-Pitch	ℓ	W	L1	A	L	F	P.C.D.	d	d1	H	E	G	Allowable Eccentricity U	Allowable Angular Deviation A°	St (Reference)	Working Load kgf (N)	Mass (g) Round Type	Mass (g) Compact Type
Round Type FJCR FJCRT FJCRS	3-0.5	11	7	3	39	14	10	28.6	4.5	8	5	21	28.6	0.5	3	0.45	~2.8 (27.5)	78	51
	4-0.7																~7.8 (76.5)	77	50
	5-0.8	12.5		4	44	16	10.5	32.1	6	9.5	5.5	23	32.1		4	0.65	~20 (196.1)	106	69
	6-1.0																	105	68
	8-1.25	16	10	5	50	20	13	36.6	7	11	6	26	36.6		5	0.95	~80 (784.5)	166	109
	10-1.25	20	12	6	52	25	17	38.6				28	38.6			1.1		236	157
Compact Type FJCC FJCCT FJCCS	12-1.25	23	17	7	66	28	19.5	49.6	9	14	8	36	49.6	1.0		1.4	~440 (4315)	411	274
	14-1.5																	402	269
	16-1.5	30	22	9	70	35	24.5	53.6				40	53.6			1.5	~650 (6374)	553	372
	18-1.5																	538	363
	20-1.5	38	27	10	88	45	31.5	68.1	12	18	10	51	68.1	1.5		1.9	~900 (8826)	1078	735
	22-1.5																	1058	715

■Floating Connectors–Extra Short Male Thread Type–

Part Number Type	M-Pitch	F	W	L1	A	L	T	P.C.D.	d	d1	H	E	G	Allowable Eccentricity U	Allowable Angular Deviation A°	St (Reference)	Working Load kgf (N)	Mass (g) Round Type	Mass (g) Compact Type
Round Type FJMCR FJMCRT FJMCRS	5-0.8	10	7	4	44	16	10.5	32.1	6	9.5	5.5	23	32.1	0.5	4	0.65	~20 (196.1)	103	67
	6-1.0	12																105	69
	8-1.25	15	10	5	50	20	13	36.6	7	11	6	26	36.6		5	0.95	~80 (784.5)	173	113
	10-1.5	15	12	6	52	25	17	38.6				28	38.6			1.1		246	163
Compact Type FJMCC FJMCCT FJMCCS	12-1.75	18	17	7	66	28	19.5	49.6	9	14	8	36	49.6	1.0		1.4	~440 (4315)	445	298
	16-2.0	20	22	9	70	35	24.5	53.6				40	53.6			1.5	~650 (6374)	653	457
	20-2.5	25	27	10	88	45	31.5	68.1	12	18	10	51	68.1	1.5		1.9	~900 (8826)	1304	928

Order Example — Part Number: FJCR10-1.25

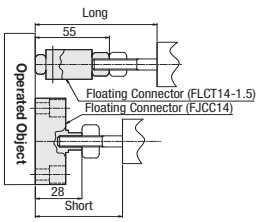
Days to Ship
-Products within Price List*: 6 Days P.87
-Others: 8 Days
Express A: 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

■Features

1. The distance between cylinder and operated object can be made short.
2. Large allowable eccentricity absorbs misalignment.
3. Deep tapped hole allows wide-ranging adjustment.
4. Compact type is designed for space-saving.

■Comparison with Conventional Type



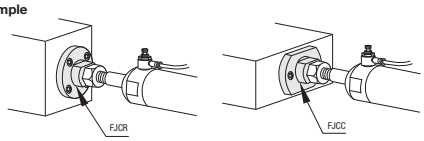
Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~15	16~20	21~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

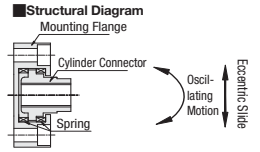
Example



M-Pitch	€ Unit Price FJCR	FJCC	FJCRT	FJCCT	FJCRS	FJCCS
3-0.5						
4-0.7						
5-0.8						
6-1.0						
8-1.25						
10-1.25						
12-1.25						
14-1.5						
16-1.5						
18-1.5						
20-1.5						
22-1.5						

M-Pitch	€ Unit Price FJMCR	FJMCC	FJMCRT	FJMCCT	FJMCRS	FJMCCS
5-0.8						
6-1.0						
8-1.25						
10-1.5						
12-1.75						
16-2.0						
20-2.5						

■Structural Diagram



* Threaded Type has the same structure.

Floating Joints

-Mount Flange, Cylinder Connector (Female Thread) Sets Standard Type · Space Saving Type-

CAD Data

■For mount flange and cylinder connector (tapped) only, refer to **P.1409** and **P.1410**

RoHS



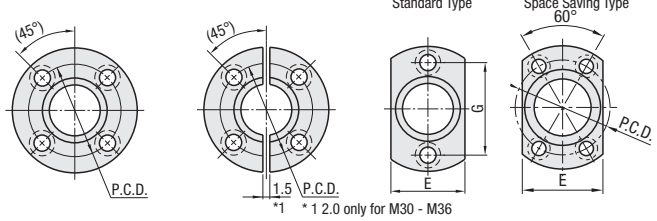
Shape	Type			Mount Flange			Cylinder Connector		
	Standard	Separate	Compact	M Material	H Hardness	S Surface Treatment	M Material	H Hardness	
Standard	FJA	FJB	FJC	1.1191/C45E	50~55HRC	Black Oxide	1.1191/C45E	Section 45~50HRC Induction Hardening Surface	
	FJAS	FJBS	FJCS	1.4125/X105CrMo17*		-	1.4125/X105CrMo17*		
Space Saving	FJUA	FJUB	FJUC	1.1191/C45E		Black Oxide	1.1191/C45E		
	-	-	FJUCS	1.4031/X38Cr13		-	1.4031/X38Cr13		

25 / (6.3 /)

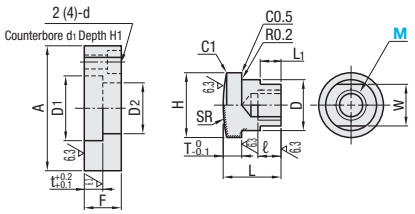
* M24~30 is 1.4031/X38Cr13

■ Mount Flange

Standard Type / Separate Type / Compact Type (Standard Type, Space Saving Type)



■ Cylinder Connector



■Standard Type

Part Number Type	M	Mount Flange A	D1	D2	t	F	P.C.D.	d	d1	H1	E	G	Cylinder Connector MxPitch	ℓ	L	d	H	T	W	L1	SR
Standard FJA FJAS*	3	42	18	13	5	10	30	4.5	8	5	24	30	3x0.5	6	15	12	17	5	10	6	40
	4												4x0.7	8							
	5	48	20	15	6	12	34	6	9.5	5.5	28	34	5x0.8	10	20	14	19	6	12	8	50
	6												6x1.0	12							
Separate FJB FJBS*	8	51	24	17	8	16	37	7	11	6	30	37	8x1.25	14	25	16	23	8	14	10	60
	10	54	28	21			40				32	40	10x1.25	15		20	27		17		
	12	70	36	27	10	20	52	10	14	8	42	52	12x1.25	18	35	25	34	10	22	12	100
	14												14x1.5	21							
Compact FJC FJCS*	16	90	46	35	12	24	68	12	17.5	10	54	68	16x1.5	24	45	32	43	12	27	15	
	18												18x1.5	27							
	20	106	56	44	15	30	80	14	20	12	66	80	20x1.5	30	55	40	52	15	32	18	200
	22												22x1.5	33							
* Stainless Steel (M3~30)	24	116	66	53	16	32	86				78	86	24x1.5	36	60	49	62	16	41	23	
	26												26x1.5	39							
	30	134	74	59	18	40	104	18	26	18	80	104	30x1.5	43	65	54	69	18	46	24	250
	36												36x1.5	45					48		

(P) 1.0038/1.4031/X38Cr13 and SUS420J2 Hardening Type may discolor due to Hardening.

■Space Saving Type

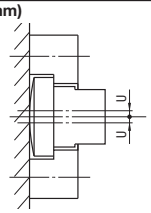
Part Number Type	M	Mount Flange A	D1	D2	t	F	P.C.D.	d	d1	H1	E	Cylinder Connector MxPitch	ℓ	L	D	H	T	W	L1	SR
Standard FJUA	5	34	17	13	5	11	24	4.5	8	5	22	5x0.8	10	17	12	16	5	10	6	50
	6											6x1.0	12	20						
	8	40	23	17			30				25	8x1.25	14	23	16	22		13	8	60
	10											10x1.25	15	25						
Separate Type FJUB	12	52	32	24	5.5	12	40	6	9.5	5.5	34	12x1.25	18	29	22	30	5.5	19	10	100
	14											14x1.5	21	33						
	16	62	39	31	8	16	48	7	11	6	41	16x1.5	24	37	28	36	8	21	12	
	18											18x1.5	27	41						
Compact FJUC FJUCS	20	74	46	36	10	20	58	10	14	8	48	20x1.5	30	46	32	42	10	26	15	200
	22											22x1.5	33	50						
	24	80	52	42	12	24	64				54	24x1.5	36	55	38	48	12	32	16	
	26											26x1.5	39	60						
	30	90	62	52	16	32	74				64	30x1.5	43	65	48	58	16	36	18	250

(P) 1.4031/X38Cr13 Hardening Type may be discolored due to Hardening. (P) Space saving type is a special floating joint for air cylinders.

M	€ Unit Price									
	Standard Type						Space Saving Type			
	FJA	FJB	FJC	FJAS	FJBS	FJCS	FJUA	FJUB	FJUC	FJUCS
3										
4										
5										
6										
8										
10										
12										
14										
16										
18										
20										
22										
24										
26										
30										
36										

■Allowable Misalignment (mm)

M	U
3~10	0.5
12 or 14	1
16 or 18	1.5
20~26	2
30 or 36	2.5 (2)



* Value in ( ) is for the Space Saving Type.

Order Example — Part Number: FJA10, FJUC18

Days to Ship — 6 Days P.87 / 2 Days

Price

■Volume Discount (P)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

(P)For orders larger than indicated quantity, please request a quotation.

(P)For alterations, refer to **P.1408**

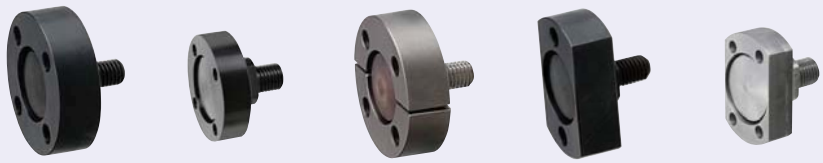
Floating Joints

-Mount Flange, Cylinder Connector (Male Thread) Sets Standard Type · Space Saving Type-

CAD Data

For mount flange and cylinder connector (threaded) only, refer to **P.1409** and **P.1410**

RoHS



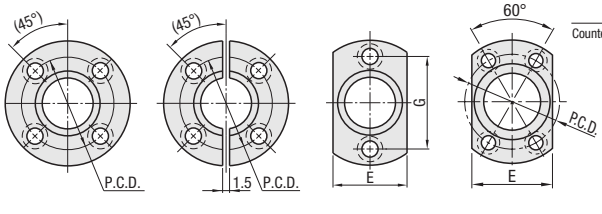
Shape	Type			Mount Flange			Cylinder Connector	
	Standard	Separate	Compact	M Material	H Hardness	S Surface Treatment	M Material	H Hardness
Standard	FJMA	FJMB	FJMC	1.1191/C45E	50~55HRC	Black Oxide	1.1191/C45E	Section 45~50HRC Induction Hardening Surface
	FJMAS	FJMBS	FJMCS	1.4125/X105CrMo17		-	1.4125/X105CrMo17*	
Space Saving	FJUMA	-	FJUMC	1.1191/C45E		Black Oxide	1.1191/C45E	
	FJUMAS	-	FJUMCS	1.4031/X38Cr13		-	1.4031/X38Cr13	

25 (6.3)

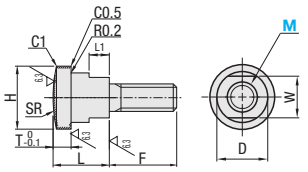
* Material for M22 is1.4301/X38CR13

Mount Flange

Standard Type / Separate Type / Compact Type (Standard Type / Space Saving Type)



Cylinder Connector



Standard Type

Part Number		Mount Flange											Cylinder Connector								
Type	M	A	D1	D2	t	F	P.C.D.	d	d1	H1	E	G	MxPitch	F	L	D	H	T	W	L1	SR
Standard FJMA FJMAS	3	42	18	13	5	10	30	4.5	8	5	24	30	3x0.5	5	14	12	17	5	10	6	40
	4												4x0.7	6							
	5	48	20	15	6	12	34	6	9.5	5.5	28	34	5x0.8	7	16	14	19	6	12	8	50
	6												6x1.0	10							
Separate FJMB FJMBS	8	51	24	17	8	16	37	7	11	6	30	37	8x1.25	12	20	16	23	8	14	10	60
	10	54	28	21			40				32	40	10x1.5	15		20	27		17		
	12	70	36	27	10	20	52	10	14	8	42	52	12x1.75	16	25	25	34	10	22	12	100
Compact FJMC FJMCS	16	90	46	35	12	24	68	12	17.5	10	54	68	16x2.0	18	30	32	43	12	27	15	100
	20	106	56	44	15	30	80	14	20	12	66	80	20x2.5	25	55	40	52	15	32	18	200
	22												22x2.5	28							

(P) 1.4125/X105CRM017 and 1.4301/X38CR13 Hardening Type may discolor due to Hardening.

Space Saving Type

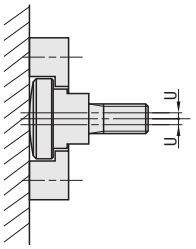
Part Number		Mount Flange										Cylinder Connector								
Type	M	A	D1	D2	t	F	P.C.D.	d	d1	H1	E	MxPitch	F	L	d	H	T	W	L1	SR
Standard FJUMA FJUMAS	5	34	17	13	5	11	24	4.5	8	5	22	5x0.8	10	14	12	16	5	10	3	50
	6											6x1.0	13							
	8	40	23	17			30				25	8x1.25	15	15	16	22		13	4	60
	10											10x1.5	18							
Compact FJUMC FJUMCS	12	52	32	24	5.5	12	40	6	9.5	5.5	34	12x1.75	22	16	22	30	5.5	19	4	100
	16	62	39	31	8	16	48	7	11	6	41	16x2.0	30	20	28	36	8	21		
	20	74	46	36	10	20	58	10	14	8	48	20x2.5	32	25	32	42	10	26	5	200
	22											22x2.5	35							

(P) 1.4031/X38Cr13 Hardening Type may discolor due to Hardening. (P) Space saving type is a special floating joint for air cylinders.

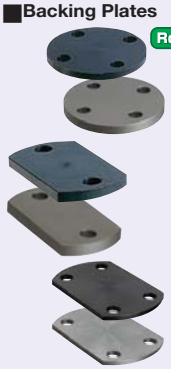
M	€ Unit Price									
	Standard Type						Space Saving Type			
	FJMA	FJMB	FJMC	FJMAS	FJMBS	FJMCS	FJUMA	FJUMC	FJUMAS	FJUMCS
3										
4										
5										
6										
8										
10										
12										
16										
20										
22										

Allowable Misalignment (mm)

M	U
3~10	0.5
12	1
16	1.5
20 or 22	2

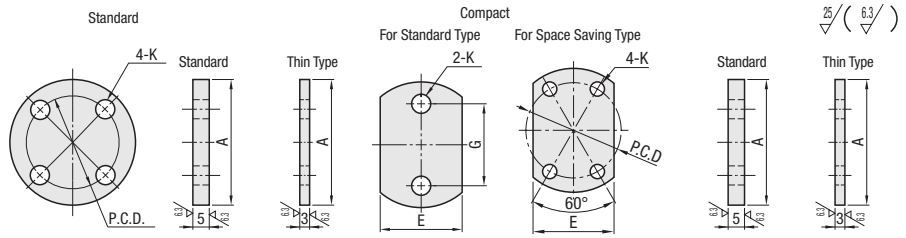


■Backing Plates



Shape	Type				Material	Hardness	Surface Treatment
	Standard		Compact				
	Standard	Thin Type	Standard	Thin Type			
For Standard Type	BPFA	BPFUA	BPFC	BPFUC	1.1191/C45E	45~50HRC	Black Oxide
	BPFAS	BPFUAS	BPFCS	BPFUCS	1.4125/X105CrMo17*		-
For Space Saving Type	BPUA	-	BPUC	BPUUC	1.1191/C45E		Black Oxide

* Material for BPFUAS and BPFUCS is 1.4031/X38Cr13



■Floating Joint (For Standard Type)Backing Plates

Part Number Type	No.	A	P.C.D.	E	G	K	€ Unit Price Standard BPFA	BPFC	BPFAS	BPFCS	Thin Type BPFUA	BPFUC	BPFUAS	BPFUCS
Standard Standard BPFA BPFAS	3	42	30	24	30	4.5								
	4													
Standard Thin Type BPFUA BPFUAS	5	48	34	28	34	6								
	6													
	8	51	37	30	37	7								
	10	54	40	32	40									
	12	70	52	42	52	10								
	14													
Compact Standard BPFC BPFCS	16	90	68	54	68	12								
	18													
Compact Thin Type BPFUC BPFUCS	20	106	80	66	80	14								
	22													
	24	116	86	78	86									
	26													
	30	134	104	80	104	18								

(?)1.4125/1.4031/X38Cr13rMo17 and 1.4031/X38Cr13 Hardening Type may discolor due to Hardening. (?)For floating joints M36, the applicable backing plate is M30.

■Floating Joints (For Space Saving Type)Backing Plates

Part Number Type	No.	A	P.C.D.	E	K	€ Unit Price Standard BPUA	BPUC	Thin Type BPUUC
Standard Standard BPUA	5	34	24	22	4.5			
	6							
	8	40	30	25				
	10							
	12	52	40	34	6			
	14							
Compact Standard Thin Type BPUC BPUUC	16	62	48	41	7			
	18							
	20	74	58	48	10			
	22							
	24	80	64	54				
	26							
	30	90	74	64				

Order Example: Part Number FJMA10 / BPFUC18 / BPFA14

Days to Ship: 6 Days / 2 Days P.87

Price

■Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

(?)For orders larger than indicated quantity, please request a quotation.

Alterations

Order Example: Part Number - (AWC) — FJMA10 - AWC / BPFA10 - AWC

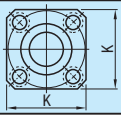
Days to Ship: 8 Days

Express A 2,00 EUR/piece P.88

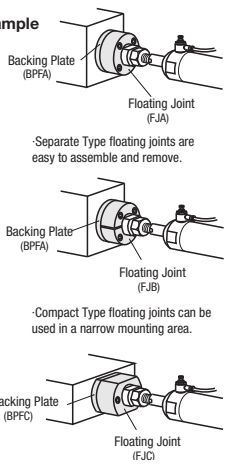
(?)A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alteration	Flange Cut
Code	AWC
Spec.	Cuts four sides of the flange. Ordering Code AWC ⊗Not available for FJA36, FJMA22, Separate Type, Space Saving Type and Thin Type.
Price Adder	FJA, FJAS, FJMA, FJMAS: 8,00 EUR BPFA, BPFAS: 4,00 EUR

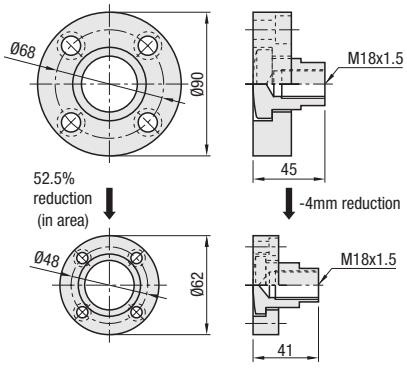
M	K
3 or 4	32
5 or 6	36
8	40
10	42
12 or 14	54
16 or 18	68
20 or 22	80
24 or 26	86
30	104



Example



Comparison between Standard Type and Space Saving Type (when M=18)

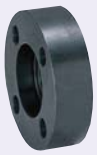


Floating Joints
-Mount Flanges-

CAD Data

■For a set of Mount Flange and Cylinder Connector, refer to **P.1406** and **P.1407**

RoHS



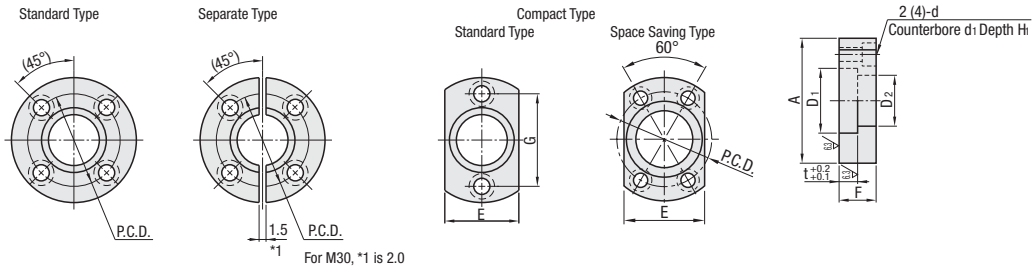


Shape	Type			Mount Flange		
	Standard	Separate	Compact	M Mateial	H Hardness	S Surface Treatment
Standard	FJA-H	FJB-H	FJC-H	1.1191/C45E	50~55HRC	Black Oxide
	FJAS-H	FJBS-H	FJCS-H	1.4125/X105CrMo17*		-
Space Saving	-	-	FJUC-H	1.1191/C45E		Black Oxide
	FJUAS-H	FJUBS-H	-	1.4031/X38Cr13		-

25 (6.3)

* Material for No.24~30 is 1.4031/X38Cr13

■Mount Flange



For M30, *1 is 2.0

■Standard Type

Part Number		Mount Flange											€ Unit Price					
Type	No.	A	D1	D2	t	F	P.C.D.	d	d1	H1	E	G	FJA-H	FJB-H	FJC-H	FJAS-H	FJBS-H	FJCS-H
Standard FJA-H FJAS-H	0304	42	18	13	5	10	30	4.5	8	5	24	30						
	0506	48	20	15	6	12	34	6	9.5	5.5	28	34						
	08	51	24	17	8	16	37	7	11	6	30	37						
	10	54	28	21			40				32	40						
Separate Type FJB-H FJBS-H	1214	70	36	27	10	20	52	10	14	8	42	52						
	1618	90	46	35	12	24	68	12	17.5	10	54	68						
Compact FJC-H FJCS-H	2022	106	56	44	15	30	80	14	20	12	66	80						
	24	116	66	53	16	32	86				78	86						
	26																	
	30	134	74	59	18	40	104	18	26	18	80	104						

? 1.4125/X105CrMo17 and 1.4031/X38Cr13rMo17 Hardening Type may discolor due to hardening. ? The mount flanges for FJA36, FJB36 and FJC36 are the same type as FJA-H30, FJB-H30 and FJC-H30.

■Space Saving Type

Part Number		Mount Flange										€ Unit Price		
Type	No.	A	D1	D2	t	F	P.C.D.	d	d1	H1	E	FJUC-H	FJUBS-H	FJUAS-H
Standard FJUAS-H	0506	34	17	13	5	11	24	4.5	8	5	22			
	0810	40	23	17			30				25			
Separate Type FJUBS-H	1214	52	32	24	5.5	12	40	6	9.5	5.5	34			
	1618	62	39	31	8	16	48	7	11	6	41			
Compact FJUC-H	2022	74	46	36	10	20	58	10	14	8	48			
	2426	80	52	42	12	24	64				54			
	30	90	62	52	16	32	74				64			

? 1.4031/X38Cr13 Hardening Type may be discolored due to Hardening. ? Space saving type is a special floating joint for air cylinders.

Order Example

Part Number
FJA-H10
FJAS-H1214
FJUC-H2022

Alterations

Part Number - (AWC)
FJA-H10 - AWC

Days to Ship

6 Days P.88

8 Days

Express A 2,00 EUR/piece P.88

? A Express Charge of 5,40 EUR for 3 or more identical pieces.

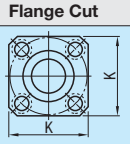
Price

■Volume Discount (?Round down to one Cent) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

? For orders larger than indicated quantity, please request a quotation.

Alteration	Flange Cut
Code	AWC
Spec.	Cuts four sides of the flange for JA-H and FJAS-H. Ordering Code AWC ⊗FJAS – H24~30 is not applicable to Space Saving Type.
Price Adder	8,00



No.	K
0304	32
0506	36
08	40
10	42
1214	54
1618	68
2022	80
24	86
26	
30	104

Floating Joints
-Cylinder Connectors-

CAD Data

For a set of Mount Flange and Cylinder Connector, refer to **P.1406** and **P.1407**

Female Thread Type

RoHS



Male Thread Type

RoHS

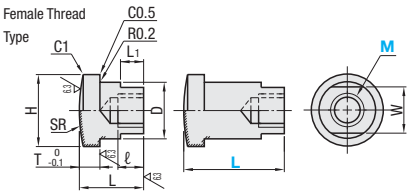


Thread	Shape	Type: L Fixed F Fixed	Type: L Configurable F Configurable	Material	Surface Treatment	Hardness
Female Thread	Standard	FJCN	FJCNL	1.1191/C45E	Black Oxide	Section 45~50HRC Induction Hardening Surface
		FJCNS	FJCNSL	1.4125/X105CrMo17*	-	
	For Space Saving	FJUN	-	1.1191/C45E	Black Oxide	
		FJUNS	-	1.4031/X38Cr13	-	
Male Thread	Standard	FJCNF	FJCNR	1.1191/C45E	Black Oxide	
		FJCNFS	FJCNRS	1.4125/X105CrMo17*	-	
	For Space Saving	FJUNF	-	1.1191/C45E	Black Oxide	
		FJUNFS	-	1.4031/X38Cr13	-	

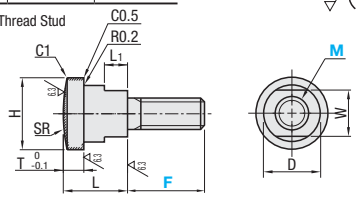
* Material for M24~30 is 1.4031/X38Cr13
* Material for FJCNFS M22 is 1.4031/X38Cr13

25 / (6.3)

Female Thread Type



Male Thread Stud Type



Female Thread Type

Part Number Type	M	L Selectable	L Configurable Type (1mm Increment)	MxPitch	ℓ	D	H	T	W	L1	SR	€ Unit Price FJCN	FJCNS	FJCNL	FJCNSL
Standard	3	15	-	3x0.5	6	12	17	5	10	6	40				
	4			4x0.7	8										
	5	20		5x0.8	10	14	19	6	12	8	50				
	6			6x1.0	12										
L Fixed	8	25	30~60	8x1.25	14	16	23	8	14	10	60				
FJCN FJCNS	10			10x1.25	15	20	27		17						
	12	35	40~80	12x1.25	18	25	34	10	22	12	100				
	14			14x1.5	21										
L Dimension Configurable	16	45	50~100	16x1.5	24	32	43	12	27	15					
	18			18x1.5	27										
FJCNL FJCNSL	20	55	60~100	20x1.5	30	40	52	15	32	18	200				
	22			22x1.5	33										
	24	60		24x1.5	36	49	62	16	41	23					
	26			26x1.5	39										
	30	65		30x1.5	43	54	69	18	46	24	250				
	36			36x1.5	45				48						

1.4125/X105CrMo17 and 1.4031/X38Cr13rMo17 Hardening Type may discolor due to hardening.

Part Number Type	M	L	MxPitch	ℓ	D	H	T	W	L1	SR	€ Unit Price FJUN	FJUNS
For Space Saving	5	17	5x0.8	10	12	16	5	10	6	50		
	6	20	6x1.0	12								
	8	23	8x1.25	14	16	22		13	8	60		
	10	25	10x1.25	15								
	12	29	12x1.25	18	22	30	5.5	19	10	100		
	14	33	14x1.5	21								
L Fixed	16	37	16x1.5	24	28	36	8	21	12			
FJUN FJUNS	18	41	18x1.5	27								
	20	46	20x1.5	30	32	42	10	26	15	200		
	22	50	22x1.5	33								
	24	55	24x1.5	36	38	48	12	32	16			
	26	60	26x1.5	39								
	30	65	30x1.5	43	48	58	16	36	18	250		

1.4031/X38Cr13rMo17 Hardening Type may discolor due to hardening. Space saving type is a special floating joint for air cylinders.

Male Thread Type

Part Number Type	M	F Selectable	F Configurable Type (1mm Increment)	MxPitch (Coarse Thread)	L	D	H	T	W	L1	SR	€ Unit Price FJCNF	FJCNFS	FJCNR	FJCNRS
Standard	3	5	5~8	3x0.5	14	12	17	5	10	6	40				
	4	6	5~10	4x0.7											
F Fixed	5	7	5~12	5x0.8	16	14	19	6	12	8	50				
FJCNF FJCNFS	6	10	6~18	6x1.0											
	8	12	10~25	8x1.25	20	16	23	8	14	10	60				
	10	15	10~25	10x1.5		20	27		17						
F Configurable	12	16	12~36	12x1.75	25	25	34	10	22	12	100				
FJCNR FJCNRS	16	18	15~40	16x2.0	30	32	43	12	27	15	100				
	20	25	20~60	20x2.5	55	40	52	15	32	18	200				
	22	28	-	22x2.5											

1.4125/X105CrMo17 and 1.4031/X38Cr13rMo17 Hardening Type may discolor due to hardening.

Part Number Type	M	F	MxPitch (Coarse Thread)	L	D	H	T	W	L1	SR	€ Unit Price FJUNF	FJUNFS
For Space Saving	5	10	5x0.8	14	12	16	5	10	3	50		
	6	13	6x1.0									
	8	15	8x1.25	15	16	22		13	4	60		
	10	18	10x1.5									
F Fixed	12	22	12x1.75	16	22	30	5.5	19		100		
FJUNF FJUNFS	16	30	16x2.0	20	28	36	8	21				
	20	32	20x2.5	25	32	42	10	26	5	200		
	22	35	22x2.5									

1.4125/X105CrMo17 and 1.4031/X38Cr13rMo17 Hardening Type may discolor due to hardening. Space saving type is a special floating joint for air cylinders.

Order Example

Part Number - L - F

FJUN10
FJCNL10 - 50
FJCNF10 - 15

Days to Ship

- L Dimension - F Dimension Fixed Type: 6 Days P.88
- L Dimension Configurable Type: 10 Days
  - Express B: 3,00 EUR/piece P.88
  - A Express Charge of 8,10 EUR for 3 or more identical pieces.
- F Dimension Configurable Type: 8 Days / 2 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number - F - (NC)
FJCNR8 - 12 - NC

Available for F Dimension Configurable Type

Alteration	Code	Spec.	Price Adder
	NC	Machines an undercut at the base of threads. (Ordering Code: NC)	2,00

Floating Joints

-Mount Flange · Flat Connector Sets / Flat Connector-

CAD Data

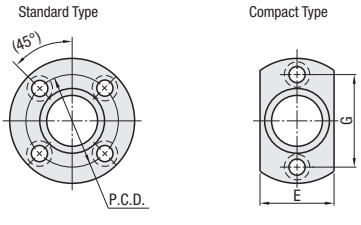
■Tip shape of cylinder connector is flat and effective for machine accuracy.

RoHS

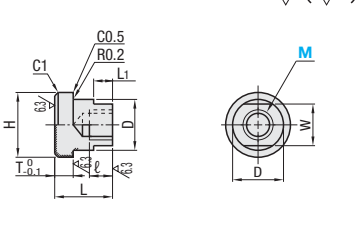


Type			Mount Flange			Cylinder Connector		
Set		Cylinder Connector Only	M Material	H Hardness	S Surface Treatment	M Material	S Surface Treatment	H Hardness
Standard	Compact							
FJAZ	FJCZ	FJZN	1.1191/C45E	50~55HRC	Black Oxide	1.1191/C45E	Black Oxide	Section 45~50HRC Induction Hardening Surface
FJAZS	FJCZS	FJZNS	1.4125/ X105CrMo17		-	1.4125/ X105CrMo17	-	

■Mount Flange



■Cylinder Connectors



Part Number		Mount Flange											Cylinder Connector							
Type	M	A	D_1	D_2	t	F	P.C.D.	d	d_1	H_1	E	G	MxPitch	ℓ	L	D	H	T	W	L_1
Set Standard FJAZ FJAZS	8	51	24	17	8	16	37	7	11	6	30	37	8x1.25	14	25	16	23	8	14	10
	10	54	28	21			40				32	40	10x1.25	15		20	27		17	
Compact FJCZ FJCZS	14	70	36	27	10	20	52	10	14	8	42	52	14x1.5	21	35	25	34	10	22	12
Cylinder Connector FJZN FJZNS	18	90	46	35	12	24	68	12	17.5	10	54	68	18x1.5	27	45	32	43	12	27	15
	22	106	56	44	15	30	80	14	20	12	66	80	22x1.5	33	55	40	52	15	32	18

1.4215/X105CrMo17 Hardening Type may be tarnished by hardening.

Order Example

Part Number

FJAZ10
FJZN14

Days to Ship

6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

M	€ Unit Price					
	Set				Cylinder Connector	
	FJAZ	FJAZS	FJCZ	FJCZS	FJZN	FJZNS
8						
10						
14						
18						
22						

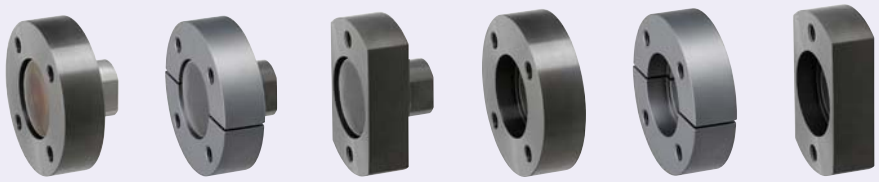
Floating Joints

-Both Sides Fixable Flange · Cylinder Connector Set, 2 Width Across Flats-

CAD Data

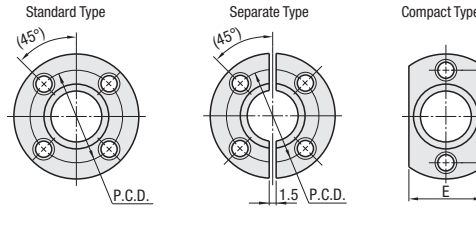
Features: Flange: Mounting holes are tapped, which enables the product to be fixed from both sides. Connector : Change from width across flats to two width across flats makes fine positioning possible.

RoHS

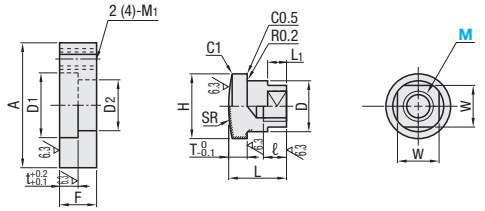


	Type			Mount Flange			Cylinder Connector	
	Standard	Separate Type	Compact	M Material	H Hardness	S Surface Treatment	M Material	H Hardness
Set	FJAT	FJBT	FJCT	1.1191/C45E	50~55HRC	Black Oxide	1.1191/C45E	Section 45~50HRC Induction Hardening Surface
	FJATS	-	FJCTS	1.4125/X105CrMo17		-	1.4125/X105CrMo17	
Mount Flange	FJAT-H	FJBT-H	FJCT-H	1.1191/C45E	50~55HRC	Black Oxide	-	
	FJATS-H	-	FJCTS-H	1.4125/X105CrMo17		-		

Mount Flange



Cylinder Connectors



Part Number Type		M	Mount Flange A	D1	D2	t	F	P.C.D.	M1	E	G	Cylinder Connector MxPitch	ℓ	L	D	H	T	W	L1	SR
Set Standard FJAT FJATS	Mount Flange Standard FJAT-H FJATS-H	8	51	24	17	8	16	37	M6	30	37	8x1.25	14	25	16	23	8	14	10	60
		10	54	28	21			40		32	40	10x1.25	15		20	27		17		
Separate Type FJBT	Separate Type FJBT-H	14	70	36	27	10	20	52	M8	42	52	14x1.5	21	35	25	34	10	22	12	100
Compact FJCT FJCTS	Compact FJCT-H FJCTS-H	18	90	46	35	12	24	68	M10	54	68	18x1.5	27	45	32	43	12	27	15	
		22	106	56	44	15	30	80	M12	66	80	22x1.5	33	55	40	52	15	32	18	200

1.4215/X105CrMo17 Hardening Type may be tarnished by hardening.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

M	€ Unit Price Set FJAT	FJBT	FJCT	FJATS	FJCTS	Mount Flange FJAT-H	FJBT-H	FJCT-H	FJATS-H	FJCTS-H
8										
10										
14										
18										
22										

Order Example

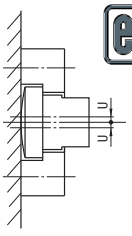
Part Number
FJAT10
FJCTS22
FJBT-H18

Days to Ship

6 Days P.87

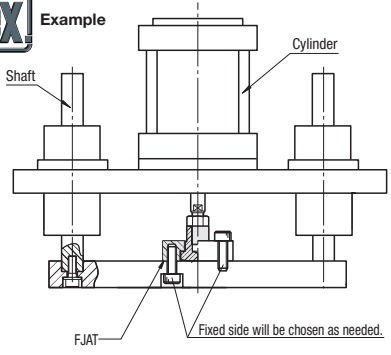
Allowable Misalignment (mm)

M	U
8 or 10	0.5
14	1
18	1.5
22	2



Example

- Features : Fixable from both sides



Floating Joints · Backing Plates

-Cylinder Connectors, Flange Type-

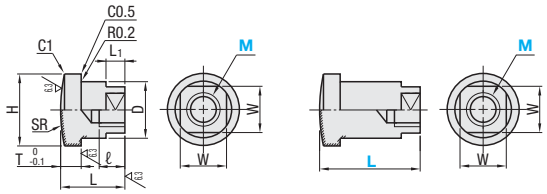
CAD Data

■Floating Joints

RoHS



Type		M Material	S Surface Treatment	H Hardness
L Fixed	L Configurable			
FJTN	FJTNL	1.1191/C45E	Black Oxide	Section 45~50HRC Induction Hardening Surface
FJTNS	FJTNSL	1.4125/X105CrMo17	-	



Part Number		L		Cylinder Connector								€ Unit Price			
Type	M	Selectable	Configurable Type (1mm Increment)	MxPitch	ℓ	D	H	T	W	L1	SR	FJTN	FJTNS	FJTNL	FJTNSL
L Fixed FJTN FJTNS	8	25	30~60	8x1.25	14	16	23	8	14	10	60				
	10			10x1.25	15	20	27		17						
L Configurable FJTNL FJTNSL	14	35	40~80	14x1.5	21	25	34	10	22	12	100				
	18	45	50~100	18x1.5	27	32	43	12	27	15					
	22	55	60~100	22x1.5	33	40	52	15	32	18	200				

1.4125/X105CrMo17 Hardening Type may be tarnished by hardening.

Order Example

Part Number	L
FJTN10	60
FJTNS22	
FJTNL18	

Days to Ship

· L Dimension Fixed Type: 6 Days P.87

· L Dimension Configurable Type: 10 Days

Price

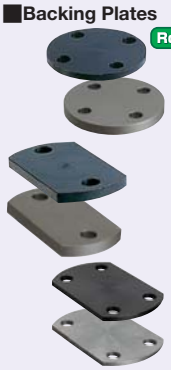
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

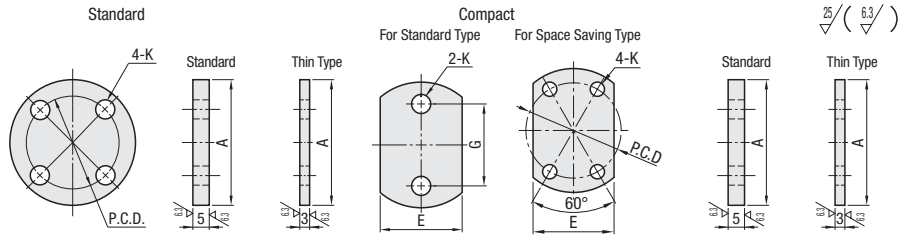
■Backing Plates

RoHS



Type				M Material	H Hardness	S Surface Treatment
Standard		Compact				
Standard	Thin Type	Standard	Thin Type			
BPFA	BPFUA	BPFC	BPFUC	1.1191/C45E	45~50HRC	Black Oxide
BPFAS	BPFUAS	BPFCS	BPFUCS	1.4125/X105CrMo17*		-

* Material for BPFUAS and BPFUCS is 1.4031/X38Cr13



Part Number			A	P.C.D.	E	G	K	€ Unit Price							
Type		No.						Standard				Thin Type			
								BPFA	BPFC	BPFAS	BPFCS	BPFUA	BPFUC	BPFUAS	BPFUCS
Standard Standard BPFA BPFAS	Thin Type BPFUA BPFUAS	8	51	37	30	37	7								
		10	54	40	32	40									
		14	70	52	42	52	10								
Compact Standard BPFC BPFCS	Thin Type BPFUC BPFUCS	18	90	68	54	68	12								
		22	106	80	66	80	14								

1.4125/X105CrMo17 · 1.4031/X38Cr13 Hardening Type may discolor due to Hardening.

Order Example

Part Number
BPFUC18
BPFA14

Days to Ship: 6 Days P.87 | 2 Days

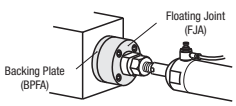
Price

■Volume Discount (Round down to one Cent.) P.87

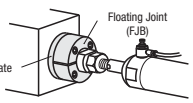
Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

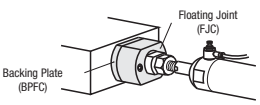
Example



·Separate Type floating joints are easy to assemble and remove.



·Compact Type floating joints can be used in a narrow mounting area.



Floating Joints

-Low Hardness Type · Low Hardness Thin Type-

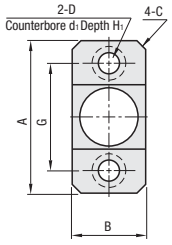
CAD Data

Features: Low hardness type for small load and low speed.

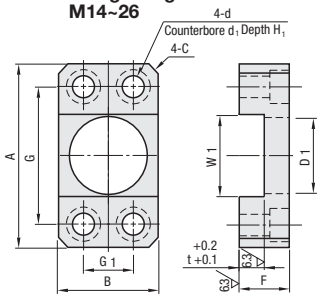


Type	Set	Cylinder Connector			Mount Flange	
		M Material	H Hardness	S Surface Treatment	M Material	S Surface Treatment
Low Hardness Type	FJCF	1.1191/C45E	28~33HRC	Black Oxide	1.1191/C45E	Black Oxide
	FJCFM			Electroless Nickel Plating		Electroless Nickel Plating
	FJCFS	1.4301/X5CrNi18-10	-	-	1.4301/X5CrNi18-10	-
Low Hardness Thin Type	FJCFT	1.1191/C45E	28~33HRC	Black Oxide	1.1191/C45E	Black Oxide
	FJCFST	1.4301/X5CrNi18-10	-	-	1.4301/X5CrNi18-10	-

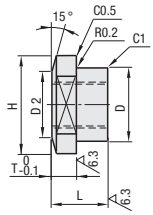
· Mounting Flange M6~10

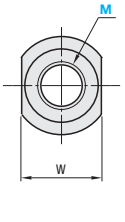


· Mounting Flange M14~26

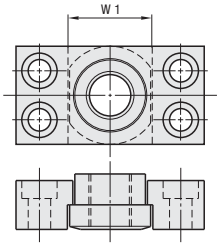


· Cylinder Connector





(Assembled)



25 (6.3)

Low Hardness Type

Part Number Type	M	Cylinder Connector MxPitch	L	D	D2	H	T	W	Mount Flange A	G	B	G1	W1	D1	t	F	d	d1	H1	C
Set FJCF FJCFM FJCFS	6	6x1.0	10	12	11	16	4	13	38	26	16	-	14	13	4	8	4.5	8	4	2
	8	8x1.25	12	14	13	20	5	16	43	30	20		17	15	5	10	5.5	9.5	5	
	10	10x1.25	16	18	15	24	7	20	50	35	24		21	19	7	14	7	11	6	3
	14	14x1.5	18	24	20	32	8	26	60	45	32	16	27	25	8	16				
	18	18x1.5	20	30	26	38	9	33	75	55	38	20	34.5	31.5	9	18	10	14	8	
	22	22x1.5	24	35	30	48	11	40	90	65	48	25	42	37	11	22	12	17.5	10	4
	26	26x1.5	28	40	32	54	13	45	100	75	54	30	47	42	13	26				

Low Hardness Thin Type

Part Number Type	M	Cylinder Connector MxPitch	L	D	D2	H	T	W	Mount Flange A	G	B	G1	W1	D1	t	F	d	d1	H1	C
Set FJCFT FJCFST	10	10x1.25	8	18	15	24	3.5	20	50	35	24	-	21	19	3.5	7	7	11	4	3
	14	14x1.5	9	24	20	32	4	26	60	45	32	16	27	25	4	8				
	18	18x1.5	10	30	26	38	4.5	33	75	55	38	20	34.5	31.5	4.5	9	10	14	5	

Order Example — Part Number: FJCF10

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

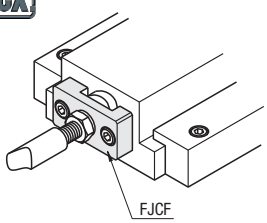
Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Price

M	€ Unit Price Low Hardness FJCF	FJCFM	FJCFS	Low Hardness Thin Type FJCFT	FJCFST
6					
8					
10					
14					
18					
22					
26					

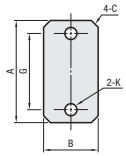
Example



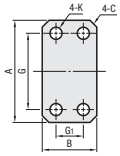
Backing Plates

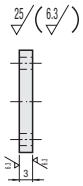
Type	M Material	H Hardness	S Surface Treatment
BPFJ	1.1191/C45E	28~33HRC	Black Oxide
BPFJM			Electroless Nickel Plating
BPFJS	1.4301/X5CrNi18-10	-	-

(No.6~10)



(No.14~22)





Part Number Type	No.	A	G	B	G1	K	C	€ Unit Price BPFJ	BPFJM	BPFJS
BPFJ BPFJM BPFJS	6	38	26	16	-	4.5	2			
	8	43	30	20		5.5				
	10	50	35	24		7	3			
	14	60	45	32	16					
	18	75	55	38	20	10				
	22	90	65	48	25	12	4			

Order Example — Part Number: BPFJ10

Days to Ship: 6 Days P.87 2 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

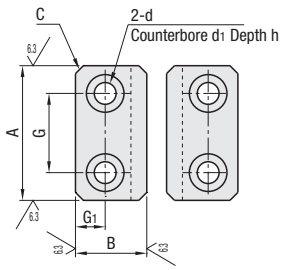
Floating Joints
-Slide-

CAD Data



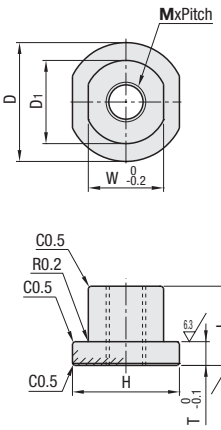
Thread	Components			Mount Flange			Cylinder Connector		
	Set	Cylinder Connector	Mount Flange	M Material	S Surface Treatment	H Hardness	M Material	S Surface Treatment	H Hardness
Female Thread	FJY	-	FJY-H	1.1191/ C45E	Black Oxide	40~45HRC	1.1191/ C45E	Black Oxide	Section 45~50HRC Induction Hardening Surface
Male Thread	FJMY	FJMYN							

- Mount Flange

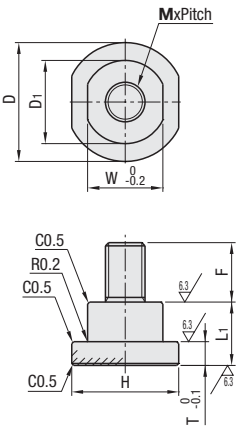


- Cylinder Connector

Female Thread



Male Thread



RoHS

■Mount Flange - Cylinder Connector Sets · Mount Flange

Part Number		Cylinder Connector										Mount Flange										
		Female Thread		Male Thread			D	D1	H	T	W	A	G	B	G1	E	t	T1	d	d1	h	C
Type	M	MxPitch	L	MxPitch	L1	F																
Set Connector Female Thread FJY	6	6x1.0	14	6x1.0	11	13	20	14	18	4	12	22	12	14	6	3	4	8	4.5	8	4.5	2
	8	8x1.25	17	8x1.25	14	15	23	16	20	5	14	25	14				5	11				
Connector Male Thread FJMY	10	10x1.25	21	10x1.5	16	18	30	21	27	6	19	34	20	19	8	4	6	13	5.5	9.5	5	
	14	14x1.5	25	-	-	-	38	27	34	7	24	42	26	22	9	5	7	15	6.5	11	6.5	3
Cylinder Connector Connector Male Thread FJMYN	16	-	-	16x2.0	19	30																
	18	18x1.5	28	-	-	-	45	32	40	8	30	48	30	25	10	5	8	15	10	14	8	
Mount Flange FJY-H	20	-	-	20x2.5	20	32																
	22	22x1.5	33	22x2.5	23	35	56	40	50	10	36	60	38	28	11	7	10	18				

Order Example — Part Number: FJY18

Days to Ship: 6 Days P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

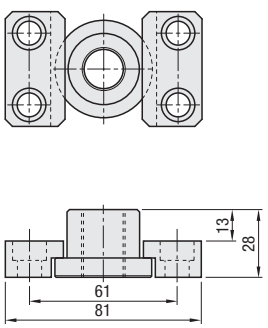
For orders larger than indicated quantity, please request a quotation.

M	€ Unit Price			
	Set		Cylinder Connector Unit	Mount Flange (Set of 2 pcs.)
	FJY	FJMY	FJMYN	FJY-H
6				
8				
10				
14				
16				
18				
20				
22				

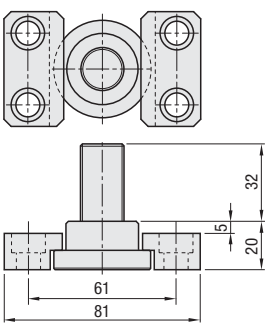
Example

Assembled
(When allowable misalignment is 0.5mm)

FJY18



FJMY20



■Features

1.Allowable lateral misalignment can be adjusted by adjusting the mounting pitch as desired.
2.Sliding removal design is also suitable for frequent maintenance scheme.

Floating Joints
-T Groove Type-

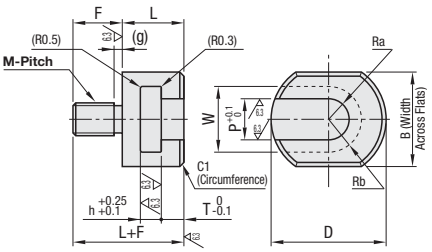
CAD Data

■Through Hole Type for easy maintenance has been added.

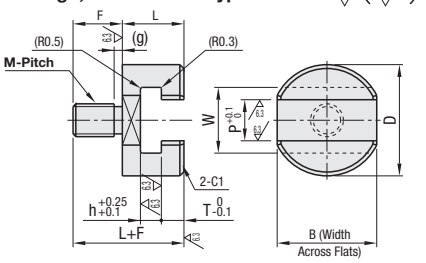


Type				M Material	H Hardness	S Surface Treatment
With Pilot Type		Through Hole Type				
Male Thread	Female Thread	Male Thread	Female Thread			
FJMH	FJH	FJMW	FJW	1.1191/C45E	-	Black Oxide
FJMHSA	FJHSA	-	-	1.2510/100MnCrW4	53~58HRC	-
FJMHS	FJHS	FJMWS	FJWS	1.4301/X5CrNi18-10	-	-

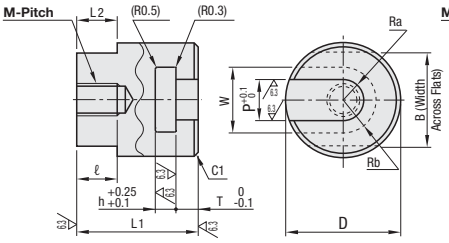
Pilot, Male Thread Type



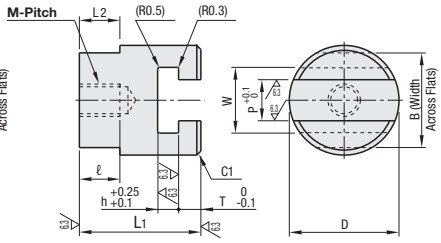
Through, Male Thread Type-



Pilot, Female Thread Type



Through, Female Thread Type



Part Number Type		M-Pitch	D	P	W	Ra (P/2)	Rb (W/2)	B	L	L1	L2	T	h	ℓ	F	(g)	Tip Connection Joint D
Male Thread with Pilot	Through, Male Thread	4-0.7	15	5	8	2.5	4	13	12	21	7	4	4	6	6	2	8
FJMH	FJMW	5-0.8	18	6	9	3	4.5	15		24	8			8	7		10
FJMHSA		6-1.0	20	7	11	3.5	5.5	17	15	29	9	5	5	10	10	2.5	12
FJMHS	FJMWS	8-1.25	22	9	13	4.5	6.5	19		32	10			12	12		16
Female Thread with Pilot	Through, Female Thread	10-1.25	28	12	17	6	8.5	25	-	38	11	6	6	15	-	-	20
FJH	FJW	10-1.5							18	-	-			-	14	3	
FJHSA		14-1.5	33	15	21	7.5	10.5	30	-	44	13			21	-	-	25
FJHS	FJWS	16-2.0							20	-	-			-	20	3	

Order Example

Part Number
FJMH8-1.25
FJH10-1.25

Days to Ship 8 Days

Alterations

Part Number - (MC)
FJMH8-1.25 - MC

Price

■Volume Discount (Round down to one Cent.) P.87

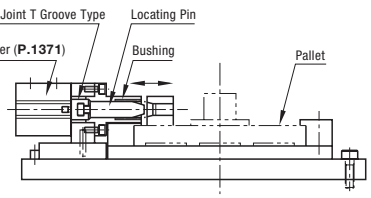
Quantity	1~9	10~15	16~20	21~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

M-Pitch	€ Unit Price									
	With Pilot Type						Through Hole Type			
	Male Thread			Female Thread			Male Thread		Female Thread	
	FJMH	FJMHSA	FJMHS	FJH	FJHSA	FJHS	FJMW	FJMWS	FJW	FJWS
4-0.7										
5-0.8										
6-1.0										
8-1.25										
10-1.25										
10-1.5										
14-1.5										
16-2.0										

Example

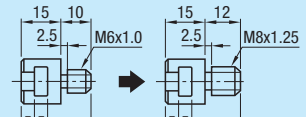
Cylinder (P.1371)



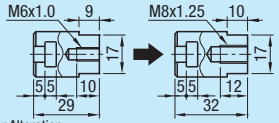
Alteration	Thread Size
Code	MC
Spec.	Changes the thread to the next larger size. (Applicable to With Pilot Type only)

(Ex.)

When FJMH6-1.0



When FJH6-1.0



Dimensions after Alteration

Before Change M-Pitch	After Change M-Pitch	D	L1	L2	ℓ	F	(g)	Tip Connection Joint D
4-0.7	5-0.8	15	24	8	8	7	2	8
5-0.8	6-1.0	18	29	9	10	10	2.5	10
6-1.0	8-1.25	20	32	10	12	12	2.5	12
8-1.25 Female Thread	10-1.25	22	38	11	15	-	-	16
8-1.25 Male Thread	10-1.5		-	-	-	14	3	
10-1.25	14-1.5	28	44	13	21	-	-	20
10-1.5	16-2.0		-	-	-	20	3	

⊗Not applicable for 14-1.5,16-2.0.

Price Adder	5,00

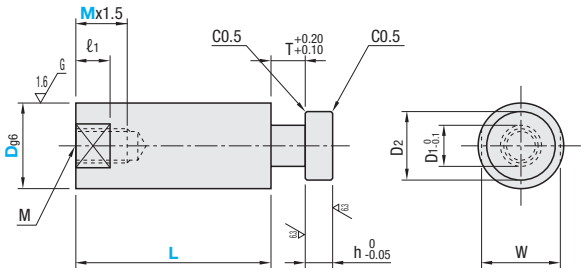
Tip Connection Joints
-Female Thread-

CAD Data



RoHS

Type	Material	Surface Treatment	Hardness
TCJ	1.1191/C45E	Hard Chrome Plating Plating Thickness 3μm or more	750HV~
TCJSA	1.2510/100MnCrW4	-	53~58HRC
TCJS	1.4301/X5CrNi18-10	-	-



Part Number Type	D	L Specify in 1mm Increment	M (Coarse)	h	D1	D2	T	W	ℓ1
TCJ TCJSA TCJS	8	10~100	3 4 5	4	4	7	4	7	5
	10	10~100	4 5 6		5	8		8	6
	12	15~150	5 6 8	5	6	10	5	10	7
	16	15~150	6 8 10		8	12		13	8
	20	20~200	8 10 12 14	6	11	16	6	18	10
	25	25~200	10 12 14 16		14	20		22	12

(P)L≥Mx2.5

Order Example

Part Number	-	L	-	M
TCJ10	-	80	-	M6
TCJSA16	-	150	-	M10

Days to Ship

•TCJ **10 Days**

•TCJSA · TCJS **8 Days**

Price

Volume Discount ((P)Round down to one Cent.) P.87

Quantity	1~9	10~15	16~20	21~29
Discount Rate	€ Unit Price	5%	10%	18%

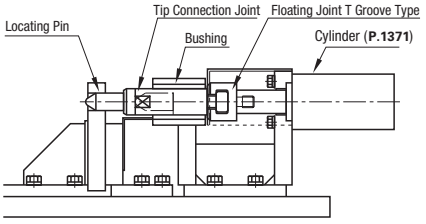
(P)For orders larger than indicated quantity, please request a quotation.

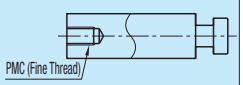
D	€ Unit Price					
	TCJ		TCJSA		TCJS	
	Min.L~100	L101~Max.	Min.L~100	L101~Max.	Min.L~100	L101~Max.
8						
10						
12						
16						
20						
25						

Alterations

Part Number	-	L	-	M	-	(PMC)
TCJ16	-	55	-	M10	-	PMC

Example



Alterations	Code	Spec.	Price Adder
 PMC (Fine Thread)	PMC	Changes the thread to fine thread. (P)Applicable to M10, 14 and 16 only. Ordering Code: PMC — M 10: Pitch 1.25; M 14, 16: Pitch 1.5	3,00

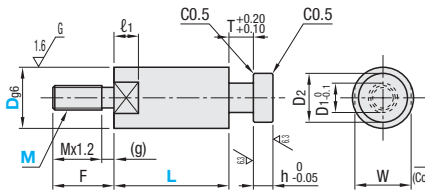
Tip Connection Joints
-Male Thread Type-

CAD Data

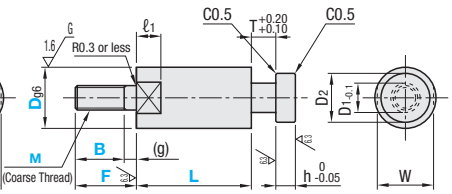


Type			M Material	S Surface Treatment	H Hardness
Standard Type	F Configurable Type	The Thread End R Type			
TCMJ	TCMJF	TCMJR	1.1191/C45E	Hard Chrome Plating Plating Thickness 3μm or more	750HV~
TCMSA	TCMSAF	-	1.2510/100MnCrW4	-	53~58HRC
TCMJS	TCMJSF	TCMJSR	1.4301/X5CrNi18-10	-	-

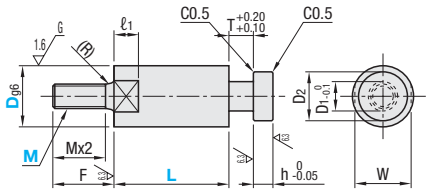
Standard Type



F Configurable Type



Thread End R Type



RoHS

Part Number		L Specify in 1mm Increment	M (Coarse) Selection	* Selection only for F Dimension Configurable Type Specify in 1mm Increment		h	D1	D2	T	W	ℓ1	(R)
Type	D			F	B							
Standard Type	8	10~100	3 4 5 6	4≤F≤Mx5	(When M≤6) B≤F-2	4	4	7	4	7	5	1
TCMJ TCMSA TCMJS	10	10~100	4 5 6 8				5	8		8	6	
F Configurable Type	12	15~150	5 6 8 10		(When M=8 and 10) B≤F-3	5	6	10	5	10	7	2
TCMJF TCMSAF TCMJSF	16	15~150	6 8 10 12		(When M≥12) B≤F-5		8	12		13	8	
Thread End R Type	20	20~200	8 10 12 14 16		B≥Pitchx3	6	11	16	6	18	10	
TCMJR TCMJSR	25	25~200	10 12 14 16 20				14	20		22	12	2.5

Thread Details

M (Coarse Thread)	F Standard	F Thread End R	(g) Standard
3	5.6	9	2
4	6.8	12	
5	8.5	14	2.5
6	9.7	16	
8	12.6	20	3
10	15	25	
12	17.4	29	
14	20.8	34	4
16	23.2	39	
20	28	49	

Order Example

Part Number	-	L	-	M	-	F	-	B
TCMJ10	-	80	-	M6				
TCMSAF20	-	200	-	M16	-	F45	-	B35

Days to Ship

•1.1191/C45E: 10 Days

•1.2510/100MnCrW4 · 1.4301/X5CrNi18-10: 8 Days

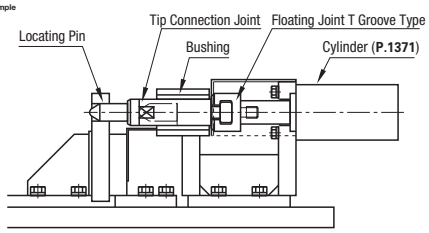
Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~15	16~20	21~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

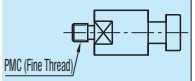
Example



D	€ Unit Price															
	Standard Type						F Configurable Type						Thread End R Type			
	TCMJ		TCMSA		TCMJS		TCMJF		TCMSAF		TCMJSF		TCMJR		TCMJSR	
	Min.L ~100	L101 ~Max.	Min.L ~100	L101 ~Max.	Min.L ~100	L101 ~Max.	Min.L ~100	L101 ~Max.	Min.L ~100	L101 ~Max.	Min.L ~100	L101 ~Max.	Min.L ~100	L101 ~Max.	Min.L ~100	L101 ~Max.
8																
10																
12																
16																
20																
25																

Alterations

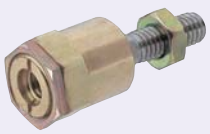
Part Number	-	L	-	M	-	F	-	B	-	(PMC)
TCMJS16	-	55	-	M10					-	PMC

Alterations	Code	Spec.	Price Adder
	PMC	Changes the thread to fine thread. Alteration is available for M10, 14, 16, 20 only. Ordering Code PMC	3,00

M	Pitch
10	1.25
14	1.5
16	
20	

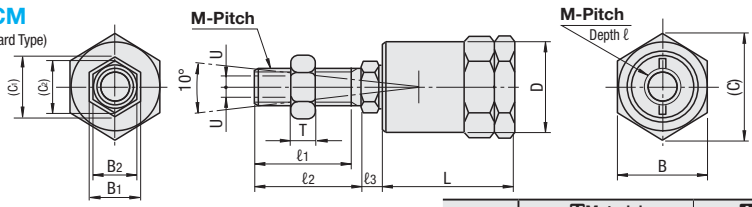
Floating Connectors

■Miniature Type



RoHS

FLCM
(Standard Type)



	Material	Accessory
Body	Refer to P.1420	Hexagon Nut (Trivalent Carbon Steel Bright Chromate)
Thread	1.4301/X5CrNi18-10	

Part Number Type	M-Pitch	ℓ	ℓ1	ℓ2	ℓ3	L	T	D	B	B1	B2	(C)	(C1)	(C2)	Allowable Misalignment U	Working Load kgf (N)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~20
FLCM	3-0.5	4.5	8	8	3	12	1.8	11	11	5.5	5.5	12.7	6.4	6.4	0.5	~1.9 (19)	8		
	4-0.7		10	10			2.4			7	7		8.1	8.1		~5.4 (53)	9		
	5-0.8	6	11	12.5	4	17	3.2	14	14	8	6	16.2	9.2	7		~12.3 (121)	21		
	6-1.0		14	15.5			3.6			10			11.5				22		

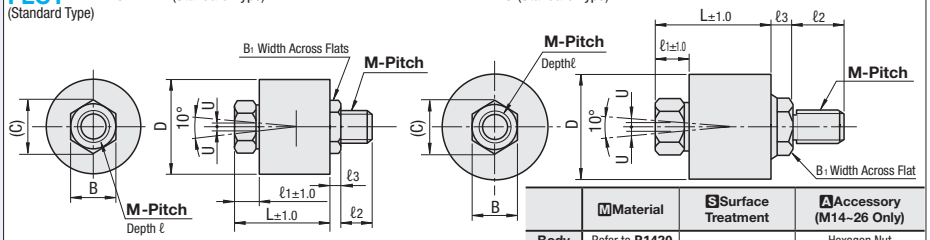
For orders larger than indicated quantity, please request a quotation.

■Screw-In Type



RoHS

FLCT - **M8~M12** (Standard Type) - **M14~M26** (Standard Type)
(Standard Type)



Thread for M8~M12 has no surface treatment.

	Material	Surface Treatment	Accessory (M14~26 Only)
Body	Refer to P.1420	Trivalent Carbon Steel Bright Chromate	Hexagon Nut (Trivalent Carbon Steel Bright Chromate)
Thread	1.0038		

Part Number Type	M-Pitch	ℓ	ℓ1	ℓ2	ℓ3	L	D	B	B1	(C)	Allowable Misalignment U	Working Load kgf (N) For Push and Pull	Mass (kg)	€ Unit Price Qty. 1~4	Volume Discount 5~10
FLCT (Standard Type)	8-1.0	8	6	12	3	30	30	14	13	16.2	0.5	~60 (588)	0.12		
	10-1.25	10	9			36	36	19	17	22	0.75	~120 (1177)	0.19		
	12-1.5								19				0.20		
	14-1.5	13	14	24	6	49	45	23	23	26.6	1	~540 (5296)	0.40		
	16-1.5														
	18-1.5	15	24			59		29		33.5			0.50		
	22-1.5	22	31	32	11.5	74.5	61	35	29	40.4	1.5	~780 (7644)	1.10		
	26-1.5		33	42	15	84	69	41	35	47.3		~1380 (13524)	1.80		

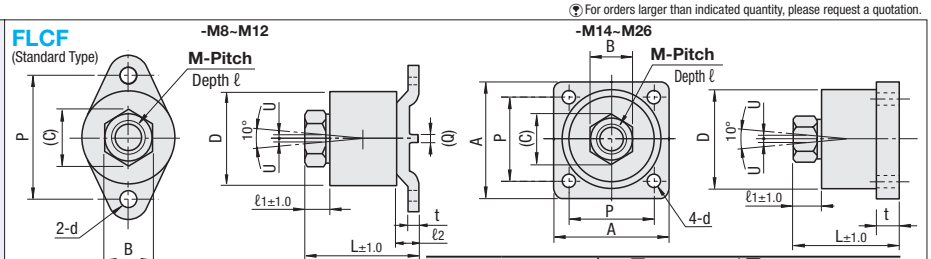
For orders larger than indicated quantity, please request a quotation.

■Flange Mounting Type



RoHS

FLCF
(Standard Type)



		Material	Surface Treatment
Body		Refer to P.1420	Trivalent Carbon Steel Bright Chromate
Thread		1.0038/S235JR	
Mounting Part	(M8~M12)	1.0330/DC01	
	(M14~M26)	EN-JL 1030	Enamel (Blue)

Part Number Type	M-Pitch	ℓ	ℓ1	ℓ2	t	L	D	d	A	P	(Q)	B	(C)	Allowable Misalignment U	Working Load kgf (N) For Push and Pull	Mass (kg)	€ Unit Price Qty. 1~4	Volume Discount 5~10
FLCF (Standard Type)	8-1.0	8	6	6	3	36.5	30	5.5	-	40	10	14	16.2	0.5	~60 (588)	0.14		
	10-1.25	10	9	7		43.5	36	6.5		48	14	19	22	0.75	~120 (1177)	0.20		
	12-1.5																	
	14-1.5	13	14	-	12	54	49	7	60	43	-	23	26.6	1	~540 (5296)	0.54		
	16-1.5																	
	18-1.5	15	24			64						29	33.5			0.60		
	22-1.5	22	31		15	78	61	9	76	55		35	40.4	1.5	~780 (7644)	1.10		
	26-1.5		33		16	88	69	11	90	64		41	47.3		~1380 (13524)	1.80		

For orders larger than indicated quantity, please request a quotation.

Reduced Delivery Time

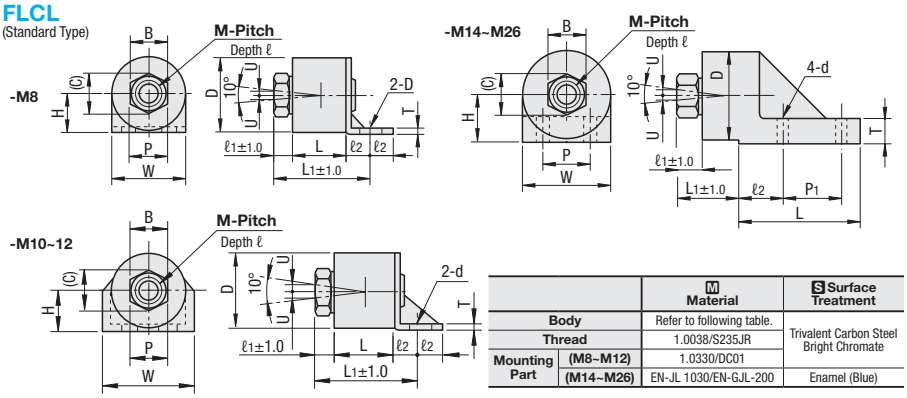
CAD Data

Bracket Mounting Type



RoHS

FLCL (Standard Type)



		Material	Surface Treatment
Body		Refer to following table.	Trivalent Carbon Steel Bright Chromate
Thread		1.0038/S235JR	
Mounting Part	(M8~M12)	1.0330/DC01	
	(M14~M26)	EN-JL 1030/EN-GJL-200	Enamel (Blue)

Part Number Type	M-Pitch	ℓ	ℓ1	ℓ2	L	L1	T	D	d	W	P	P1	H	B	(C)	Allowable Misalignment U	Working Load kgf (N) For Push and Pull	Mass (kg)	€ Unit Price Qty. 1~4	Volume Discount 5~10
FLCL (Standard Type)	8-1.0	8	6	10	23.5	39.5	3	30	5.5	31	16	-	16	14	16.2	0.5	~60 (588)	0.16		
	10-1.25	10	9	12	28.5	49.5		36	6.5	43	20		19	19	22	0.75	~120 (1177)	0.27		
	12-1.5																	0.28		
	14-1.5	13	14	27	72	36	14	51	7	51	28	35	26	23	26.6	1	~540 (5296)	0.80		
	16-1.5																			
	18-1.5	15	24			47								29	33.5			0.90		
	22-1.5	22	31	34	90	55	18	62	9	62	36	46	32	35	40.4	1.5	~780 (7644)	1.50		
	26-1.5		33	42	112	61	22	69	11	69	40	54	37	41	47.3		~1380 (13524)	2.30		

For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number: FLCM3-0.5, FLCT10-1.25

Days to Ship

-FLCM · FLCT (Products within Price List*): **6 Days**

-FLCF · FLCL · FLCT: **8 Days** — Express A: 3,00 EUR/piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

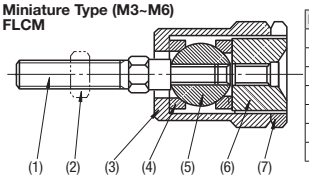
General Information

- The tip inside the connector is spherical, and absorption of misalignment is possible. Shaft alignment and parallelism setting in cylinder mounting can thus be achieved merely by visual estimation.
- Due to integration of connector and holder, selecting is easy, and at the same time, number of parts is reduced.
- For Miniature Type (FLCM), screws with sizes M3 to M6 are provided for small cylinders.
- For Standard Type, three mounting variations are offered: screw-in type (FLCT), Flange Mounting Type (FLCF), and Bracket Mounting Type (FLCL).

Components

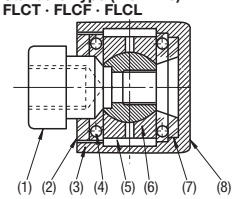
Thread Diameter		Type (How to Mount)
Miniature Type	M3~M6	FLCM (Screw-in)
Standard Type	M8~M26	FLCT (Screw-in), FLCF (Flange Mounting), FLCL (Bracket Mounting)

Miniature Type (M3~M6)
FLCM



Part No.	Part Name	Main Body
(1)	Stud	1.4301/X5CrNi18-10
(2)	Nut	1.0038/S235JR
(3)	Case	CW614N/CuZn39Pb3
(4)	Ball Holder	CW614N/CuZn39Pb3
(5)	Ball Joiner	CW614N/CuZn39Pb3
(6)	Socket	CW614N/CuZn39Pb3
(7)	Rod Tip Nut	JIS SWCH8R

Standard Type (M8~M26)
FLCT · FLCF · FLCL



Part No.	Part Name	Main Body
(1)	Rod Tip Socket	1.0038/1.1191/C45E (M26 is S45C)
(2)	Cap	1.3505/100Cr6
(3)	Rubber Steel Ball Retainer Plates	Nitrile Rubber
(4)	Steel Ball	-
(5)	Ball Holder	1.3505/100Cr6
(6)	Ball Joiner	1.1191/C45E
(7)	Steel Ball Retainer	1.3505/100Cr6
(8)	Case	EN-JL 1030/EN-GJL-200

Features

- Misalignment is absorbed in three-dimensions through the ball joint swing A and misalignment motion B(Refer to Figure (1)).
- FLCT, FLCF and FLCL have a built-in bearing, which reduces lateral load significantly and absorbs misalignment(Refer to Figure (2)).

Figure (1)

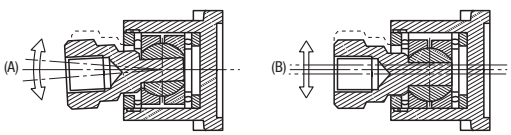
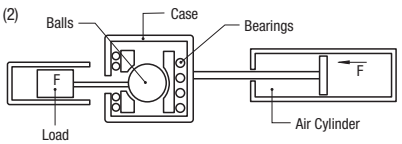


Figure (2)

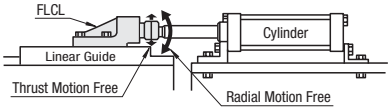


Effects

The following benefits are obtained by installing on the cylinder rod.

- Prevents one end of cylinder rod from getting worn out. Prevents breakage of the gasket.
- Enables operation at low pressure - Prevents thrust decline.

Example



Precautions for Use

- Although the screw is rotatable, the connector cannot be used as a rotating joint.
- Non-reusable after disassembled.
- Grease filled to eliminate oiling.
- The applied load shown is in static condition. Note that the applied load value for repeated impact load will be lower than shown.

Floating Joints
-Standard-

Part Number & Spec.Change Printed in Purple

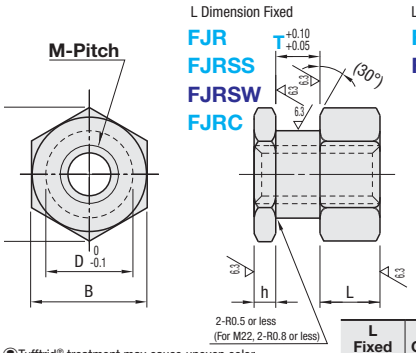
CAD Data

■Surface treatment of 1.4301/X5CrNi18-10 has changed from Tufftride® to Nitriding treatment. Better corrosion resistance and hardness, less particle generation on the surface than the conventional products.

■Standard Type



RoHS



Tufftrid® treatment may cause uneven color, which doesn't affect mechanical function.
Tufftride® is a trademark of DURFERRIT GmbH.
For details of Tufftride®, refer to **P.1799**
No Tufftride® treatment on the screw end of L Dimension Configurable Type.

L Fixed	L Configurable	M Material	S Surface Treatment	H Surface Hardness
FJR	FJRL	1.1191/C45E	Tufftride®	500HV~
FJRSS	-	1.4301/ X5CrNi18-10	-	-
FJRSW	FJRSWL		Nitride Treatment	1000HV~
FJRC	-		Hard Chrome Plating	750HV~

Part Number Type	M-Pitch	T Selection	L Selectable	L Configurable (1mm Increment)	h	D	B	(C)	€ Unit Price L Fixed FJR	FJRSS	FJRSW	FJRC	L Configurable FJRL	FJRSWL
L Fixed FJR FJRSS (★For T Dimension only.) FJRSW FJRC L Configurable FJRL FJRSWL	3-0.5	2 3★ 4★ 5 6	5	3~50	3	6	8	9.2						
	4-0.7	2 3★ 4★ 5★ 6★ 8★	6	3~60		7	10	11.5						
	5-0.8	3★ 4★ 5★ 6★ 8★ 9★ 10★	7	3~60		8	12	13.9						
	6-1.0	3 4★ 5★ 6★ 8★ 9 10 12	8	4~80		10	14	16.2						
	8-1.0	4 5★ 6★ 8★ 9 10 12★ 13 15 16	9	4~100		13	17	19.6		⊠		⊠		
	8-1.25													
	10-1.25	4 5 6★ 8★ 9★ 10★ 12★ 13 15 16 19 20	11	4~100	4	16	21	24.2		⊠		⊠		
	10-1.5													
	12-1.25	5 6 8 9 10 12★ 13 15 16 19 20	12	5~100		18	23	26.6		⊠		⊠		
	12-1.5													
	14-1.5	5 6 8★ 9★ 10★ 12★ 13 15 16★ 19★ 20	13	5~100		21	26	30						
	16-1.5	8 9 10 12 13 15★ 16 19 20	15	8~100	5	25	30	34.6		⊠				
	18-1.5	8 9 10 12★ 13 15★ 16 19 20		8~100										
	22-1.5	12 15 20★	17	10~100	6	27	32	36.9		⊠	⊠	⊠		⊠

For L Dimension Configurable type, when h+T+L≤3M, the tapped hole goes through. When T=2, only FJR is available.
* for T dimension only. Thread diameters 8, 10 and 12 are only applicable to 8-1.25, 10-1.25 and 12-1.25.

■Floating Joints and Holders Application Table (FJR · FJR_ · FJR_ _ · FJR_ _ _)

M-Pitch	FJR FJR_ FJR_ _ T Dim.*	HLRA_ P.1429 HLRB_ P.1429 HLRC_ P.1430	FJR FJR_ FJR_ _ T Dim.*	HLRE_ P.1428	FJR FJR_ FJR_ _ T Dim.	HLRD_ P.1430	FJR FJR_ FJR_ _ T Dim.	HLRL_ P.1428	FJR FJR_ FJR_ _ T Dim.	HLRAF P.1429
3-0.5	4	6	4	-	-	-	-	-	3~6	6-3~6
4-0.7		7		7	8	7		7	3~8	7-3~8
5-0.8	6	8	6	8	10	8	6	8	3~10	8-3~10
6-1.0		10		10	12	10		10	3~12	10-3~12
8-1.0	8	13	8	13	13	13		13	4~12	13-4~12
8-1.25										
10-1.25		16		16	15	16	8	16	5~15	16-5~15
10-1.5										
12-1.25	12	18	12	18	16	18		18	-	-
12-1.5										
14-1.5		21		21	19	21	10	21	6~15	21-6~15
16-1.5	15	25	15	25	20	25		25	8~20	25-8~20
18-1.5										
22-1.5	20	27	20	-	-	-	-	-	12~20	27-12~20

For holders of size 27, only HLRA · HLRC is available.
* For detailed holder dimensions, refer to **P.1428~1430**

■Floating Joints and Holders Application Table (FJD · FJDSW · FJDL)

M-Pitch	FJD_ FJDSW_ T Dim.*	HLRA_ P.1429 HLRB_ P.1429 HLRC_ P.1430	FJD_ FJDSW T Dim.*	HLRE_ P.1428	FJD_ FJDSW T Dim.	HLRD_ P.1430	FJD_ FJDSW T Dim.	HLRL_ P.1428	FJD_ FJDSW T Dim.	HLRAF P.1429
3-0.5	4	4	4	-	-	-	-	-	-	-
4-0.7										
5-0.8		6							3~6	6-3~6
6-1.0		7		7	8	7	6	7	4~8	7-4~8
8-1.25	6	10	6	10	12	10		10	5~12	10-5~12
10-1.5	8	13	8	13	-	-		13	6~12	13-6~12
16-2.0	12	21	12	21			-	-	-	-
20-2.5	15	25	15	25	20	25			15~20	25-15~20
22-2.5	20	27	20	-	20	25			12~20	27-12~20

For holders of size 27, only HLRA · HLRC is available.
* For detailed holder dimensions, refer to **P.1428~1430**

■Nitride Treatment
Pretreatment of JIS SUS facilitates formation of nitride layer.

Order Example

Part Number	-	T	-	L
FJR5-0.8	-	6		
FJRL14-1.5	-	12	-	20
FJRC10-1.25	-	8		

Days to Ship 8 Days — Express A 2,00 EUR/ piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Serviceis not available for FJRC · FJRSS and FJRL.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders of 30 or more pieces of L Dimension Configurable Type, please request a quotation.

Compact Floating Joints · Floating Joints

-Male Thread Type- -Sheet Metal Holder Set-

Part Number & Spec.Change Printed in Purple

CAD Data

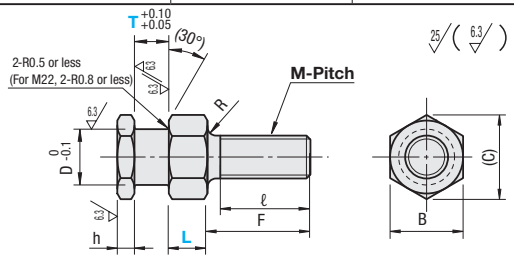
■Surface treatment of 1.4301/X5CrNi18-10 has changed from Tufftride® to Nitriding treatment. Better corrosion resistance and hardness, less particle generation on the surface than the conventional products.

■Compact Floating Joint -Male Thread Type-



RoHS

Type		M Material	S Surface Treatment	H Surface Hardness
L Fixed	L Configurable			
FJD	FJDL	1.1191/C45E	Tufftride®	500HV~
FJDSW	-	1.4301/X5CrNi18-10	Nitride Treatment	1000HV~



Tufftride® may cause uneven color, which doesn't affect mechanical function.
Tufftride® is a trademark of DURFERRIT GmbH.
For details of Tufftride®, refer to **P.1799**
No Tufftride® treatment on F Dimension for FJDL.

Part Number Type	M-Pitch	T Selection	L Selectable	L Configurable (1mm Increment)	h	D	F	ℓ	B	(C)	R	€ Unit Price L Fixed FJD	€ Unit Price L Fixed FJDSW	€ Unit Price L Configurable FJDL
L Fixed FJD FJDSW	3-0.5	3 4*	4	3~15	3	4	8	6	6	6.9	1			
	4-0.7	3 4* 5 6 8	5	3~20			11	9						
	5-0.8	3 4* 5 6 8 9 10		3~25		6	13	11	8	9.2				
	6-1.0	4* 5 6 8	6	4~30		7	19	17	10	11.5	1.5			
	8-1.25	5 6* 8 12	8	4~40	4	10	20	18	14	16.2				
L Configurable FJDL	10-1.5	6 8* 9 10 12	9	4~50		13	24	21	17	19.6				
	16-2.0	12* 20	12	8~80		21	40	37	26	30	2			
	20-2.5	15* 20	15	10~100	5	25	50	46	30	34.6				
	22-2.5	12 15 20*	17	10~100	6	27	60	56	32	36.9	2.5			

For Floating Joints and Holders Application Table, refer to the left page.

Order Example

Part Number	-	T	-	L
FJD5-0.8	-	5		
FJDL10-1.5	-	8	-	20

Days to Ship

-FJD: 8 Days — Express A 2,00 EUR/piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

-FJDSW · FJDL: 8 Days

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	15%

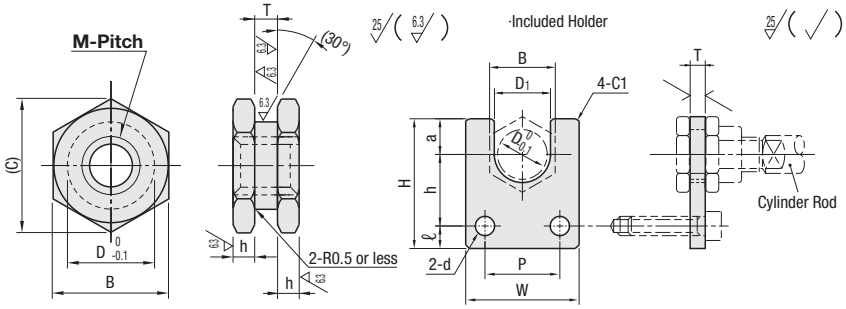
For orders of 20 or more pieces, please request a quotation.

■Floating Joint -Sheet Metal Holder Set-



RoHS

Type	M Material Floating Joint	M Material Holder	S Surface Treatment	H Surface Hardness
FJSC	1.1191/C45E	1.0330/DC01	Tufftride®	500HV~



Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.
Tufftride® is a trademark of DURFERRIT GmbH. For details of Tufftride®, refer to **P.1799**.

Part Number Type	M-Pitch	T	Tolerance	h	D	B	(C)	Included Holder T	Tolerance	B	D1	W	H	a	h	ℓ	P	d	Maximum Applied Tensile · Compression Force (N)	€ Unit Price
FJSC	3-0.5	2.3	+0.3 +0.25	2	6	8	9.2	2.3	±0.19	8	6.5	16	25	5	14	6	8	4.5	19	
	4-0.7				7	10	11.5			10	8	19	26	6			10		54	
	5-0.8	3.2	+0.35 +0.3	3	8	12	13.9	3.2	±0.23	12	9	22	33	7	18	8	12	5.5	123	
	6-1.0				10	14	16.2			14	11	25	34	8			14		123	

kgf=Nx0.101972

Order Example

Part Number
FJSC4-0.7

Days to Ship

8 Days — Express A 2,00 EUR/piece — P.88

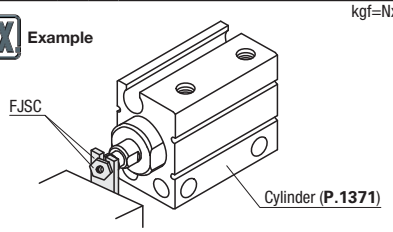
A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

Example



Floating Joints

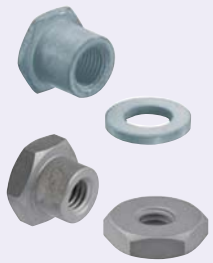
-Separate Type , Bolt Mount Type-

Part Number & Spec.Change Printed in Purple

CAD Data

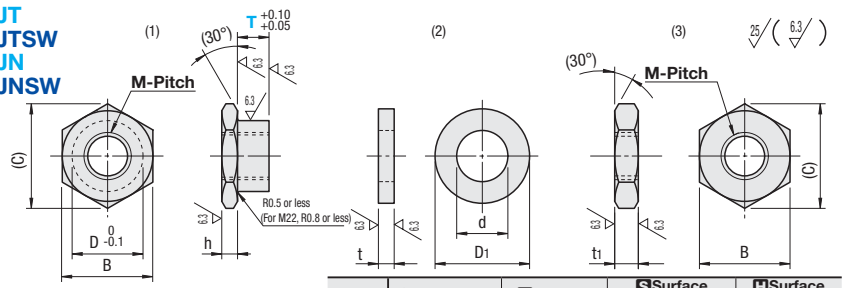
■Surface treatment of 1.4301/X5CrNi18-10 has changed from Tufftride® into Nitriding treatment.
®Better corrosion resistance and hardness, less particle generation on the surface than the conventional products.

■Separate Type
■Separate Nut Type



RoHS

FJT
FJTSW
FJN
FJNSW



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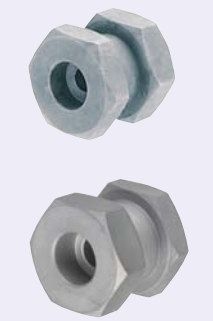
For details of Tufftride®, refer to **P.1799**

Type	Components	M Material	S Surface Treatment	H Surface Hardness
FJT	(1)(2)	1.1191/C45E	Tufftride®	500HV~
FJTSW	(1)(2)	1.4301/X5CrNi18-10	Nitride Treatment	1000HV~
FJN	(1)(3)	1.1191/C45E	Tufftride®	500HV~
FJNSW	(1)(3)	1.4301/X5CrNi18-10	Nitride Treatment	1000HV~

Part Number Type	M-Pitch	T Selection	h	D	B	(C)	t	t1	D1	d	€ Unit Price FJT	FJTSW	FJN	FJNSW
FJT FJTSW FJN FJNSW	3-0.5	2 3 4 5 6	3	6	8	9.2	3	3	9	3.2				
	4-0.7	2 3 4 5 6 8		7	10	11.5			11	4.3				
	5-0.8	3 4 5 6 8 9 10		8	12	13.9		4	13	5.3				
	6-1.0	3 4 5 6 8 9 10 12	4	10	14	16.2	4		15	6.4				
	8-1.0	4 5 6 8 9 10 12 13 15 16		13	17	19.6		5	18	8.4				
	8-1.25													
	10-1.25	4 5 6 8 9 10 12 13 15 16 19 20		16	21	24.2		6	22	10.5				
	10-1.5													
	12-1.25	5 6 8 9 10 12 13 15 16 19 20		18	23	26.6			24	13				
	12-1.5													
	14-1.5	5 6 8 9 10 12 13 15 16 19 20		21	26	30			27	15				
	18-1.5	8 9 10 12 13 15 16 19 20	5	25	30	34.6	5		31	19				
	22-1.5	12 15 20	6	27	32	36.9			35	23				

When T=2, only FJT and FJN are available.

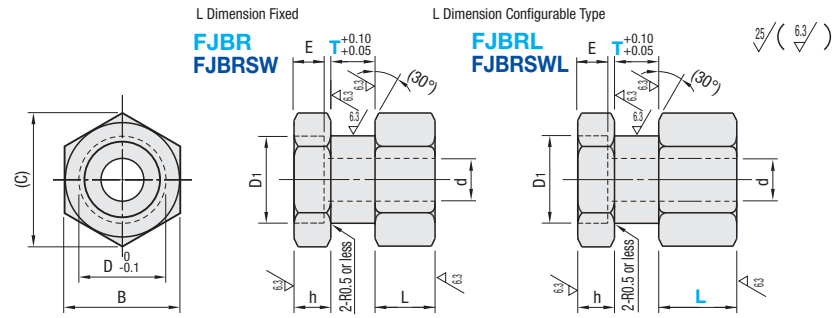
■Bolt Mount Type



RoHS

L Dimension Fixed
FJBR
FJBRSW

L Dimension Configurable Type
FJBRL
FJBRSWL



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For details of Tufftride®, refer to **P.1799**

L Fixed	L Configurable	M Material	S Treatment	H Hardness
FJBR	FJBRL	1.1191/C45E	Tufftride®	500HV~
FJBRSW	FJBRSWL	1.4301/X5CrNi18-10	Nitride Treatment	1000HV~

Part Number Type	No.	T Selection	L Fixed	L Configurable (1mm Increment)	h	D	B	(C)	D1	d	E	€ Unit Price FJBR	FJBRSW	FJBRL	FJBRSWL
L Fixed FJBR FJBRSW	3	3 4 5 6 8 9 10 12	5	3~10	4	10	14	16.2	6.5	3.4	3.5				
	4	4 5 6 8 9 10 12 15			5	13	17	19.6	8	4.5	4.5				
	5			3~20	6	16	21	24.2	9.5	5.5	5.5				
L Dimension Configurable FJBRL FJBRSWL	6	5 6 8 9 10 12 15	6		8	18	23	26.6	11	6.6	6.5				
	8			4~20	10	21	26	30	14	9	8.6				
	10	8 9 10 12 15	10	5~20	12	25	30	34.6	17.5	11	10.8				

Order Example

Part Number	-	T	-	L
FJT6-1.0	-	10		
FJBR6	-	8		
FJBRL10	-	12	-	14

Days to Ship: 8 Days

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Serviceis not available for FJBRL.

Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders of 20 or more pieces of L Dimension Configurable Type, please request a quotation.

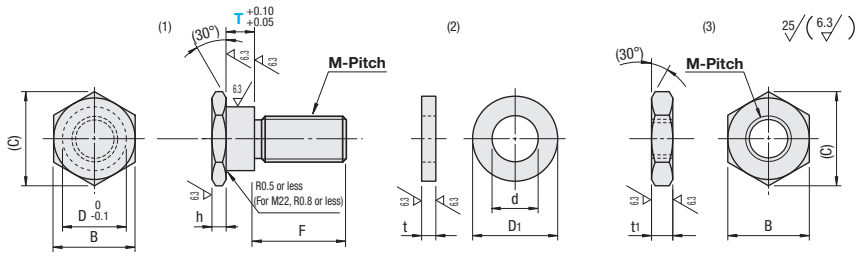
Floating Joints
-Separate Male Thread Type-

CAD Data



Type		Components	M Material	S Surface Treatment	H Surface Hardness
F Fixed Type	F Configurable Type				
FJTM	FJTMF	(1)(2)	1.1191/	Tufftride®	500HV~
FJNM	FJNMF	(1)(3)	C45E		

- No Tufftride® treatment on F Dimension for FJTMF and FJNMF.
- For details of Tufftride®, refer to **P.1799**
- Tufftride® is a trademark of DURFERRIT GmbH.
- Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.



Part Number Type	M-Pitch	T Selection	F Configurable Selectable	F Configurable 1mm Increment	h	D	B	(C)	t	t1	D1	d
F Fixed Type FJTM FJNM	3-0.5	3 4*	10	7~15	3	6	8	9.2	3	5	9	3.2
	4-0.7	3 4*	13	8~20		7	10	11.5			11	4.3
	5-0.8	3 4 6* 10	15	8~25		8	12	13.9		6	13	5.3
	6-1.0	4 6* 12	21	9~30		10	14	16.2			15	6.4
F Configurable Type FJTMF FJNMF	8-1.25	4 6 8* 9 12	23	11~40	4	13	17	19.6	4	8	18	8.4
	10-1.5	8* 10	27	13~50		16	21	24.2			22	10.5
	16-2.0	12 15*	43	21~80	5	25	30	34.6	5	14	31	17
	20-2.5	15*	48	24~100								21
	22-2.5	15 20*	52	27~100	6	27	32	36.9			35	23

Order Example

Part Number	-	T	-	F
FJTM5-0.8	-	4		
FJNMF10-1.5	-	8	-	20

Price

Days to Ship

- F Dimension Fixed Type: **8 Days**
- F Dimension Configurable Type: **8 Days**

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders of 20 or more pieces of F Dimension Configurable Type, please request a quotation.

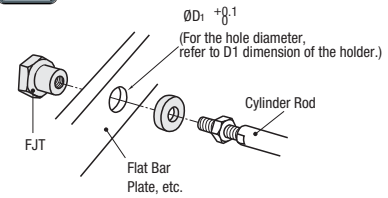
M-Pitch	€ Unit Price F Fixed Type FJTM	FJNM	F Configurable Type FJTMF	FJNMF
3-0.5				
4-0.7				
5-0.8				
6-1.0				
8-1.25				
10-1.5				
16-2.0				
20-2.5				
22-2.5				

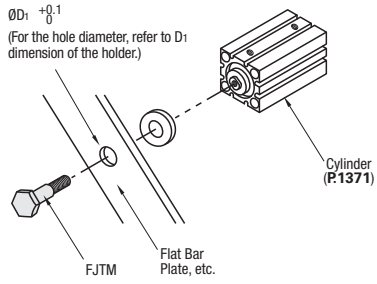
Floating Joints and Holders Application Table (FJTM, FJTMF, FJNM, FJNMF)

M-Pitch	FJTM_ FJNM_ T Dim.*	HLRA_P.1429 HLRB_P.1429 HLRC_P.1430	FJTM_ FJNM_ T Dim.*	HLRE_ P.1428	FJTM_ FJNM_ T Dimension	HLRD_ P.1430	FJTM_ FJNM_ T Dimension	HLRL_ P.1428	FJTM_ FJNM_ T Dimension	HLRAF P.1429
3-0.5	4	6	4	-	-	-	-	-	3~4	6-3~4
4-0.7		7		7					3~4	7-3~4
5-0.8	6	8	6	8	10	8	6	8	3~10	8-3~10
6-1.0		10		10	12	10		10	4~12	10-4~12
8-1.25	8	13	8	13	-	-		13	4~12	13-4~12
10-1.5		16		16			8	16	8~10	16-8~10
16-2.0	15	25	15	25			-	-	12~15	27-12~15
20-2.5									-	-
22-2.5	20	27	20	-					15~20	27-15~20

For holders of size 27, only HLRA, HLRC is available.
* For detailed holder dimensions, refer to **P.1428~1430**

Example





Compact Floating Joints
-Extension Rod Type-

Part Number & Spec.Change Printed in Purple

CAD Data

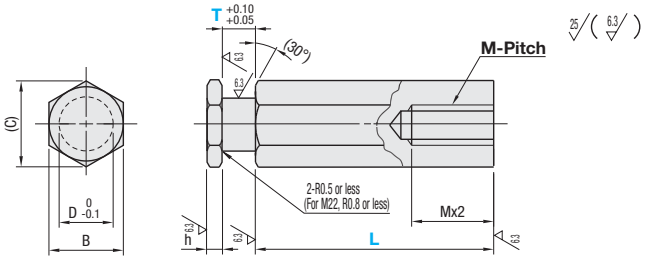
■Surface treatment of 1.4301/X5CrNi18-10 has changed from Tufftride® into Nitriding treatment. Better corrosion resistance and hardness, less particle generation on the surface than the conventional products.

RoHS



L Selectable Type
FJLC
FJLCSW

L Dimension Configurable
FJL
FJLSW



Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.
Tufftride® is a trademark of DURFERRIT GmbH.
No Tufftride® treatment on the thread end.
For details of Tufftride®, refer to **P.1799**

L Selectable	L Configurable	M Material	S	H Surface Hardness
FJLC	FJL	1.1191/C45E	Tufftride®	500HV~
FJLCSW	FJLSW	1.4301/X5CrNi18-10	Nitride Treatment	1000HV~

■L Selectable Type

Part Number Type	M-Pitch	L Selection	T	h	D	B	(C)	Applicable Holder HLRA_P.1429 HLRB_P.1429 HLRC_P.1430 HLRE_P.1428	€ Unit Price FJLC	€ Unit Price FJLCSW
FJLC FJLCSW	3-0.5	10 12 15 18 20 25	4	3	4	6	6.9	4		
	4-0.7	12 15 18 20 25 30			6	8	9.2	6		
	5-0.8	15 18 20 25 30 40								
	6-1.0	18 20 25 30 40 50			7	10	11.5	7		
	8-1.0	25 30 40 50 60 70	6	4	10	14	16.2	10		
	8-1.25									
	10-1.25	30 40 50 60 70 80	8		13	17	19.6	13		
	10-1.5									
	12-1.25	40 50 60 70 80 90			16	21	24.2	16		
	12-1.5									
	14-1.5	50 60 70 80 90 100	12		18	23	26.6	18		
	18-1.5	70 80 90 100			21	26	30	21		

■L Dimension Configurable Type

Part Number Type	M-Pitch	T Selection	L Specify in 1mm Increment	h	D	B	(C)	€ Unit Price FJL	€ Unit Price FJLSW
FJL FJLSW	3-0.5	3 4* 5 6	3~50	3	4	6	6.9		
	4-0.7	3 4* 5 6 8	3~60		6	8	9.2		
	5-0.8	3 4* 5 6 8 9 10	3~60						
	6-1.0	3 4* 5 6 8 9 10 12	4~80		7	10	11.5		
	8-1.0	4 5 6* 8 9 10 12 13 15 16	4~100	4	10	14	16.2		
	8-1.25								
	10-1.25	4 5 6 8* 9 10 12 13 15 16 19 20	4~100		13	17	19.6		
	10-1.5								
	12-1.25	5 6 8* 9 10 12 13 15 16 19 20	5~100		16	21	24.2		
	12-1.5								
	14-1.5	5 6 8 9 10 12* 13 15 16 19 20	5~100		18	23	26.6		
	18-1.5	8 9 10 12* 13 15 16 19 20	8~100		21	26	30		
	22-1.5	12 15* 20	10~100	5	25	30	34.6		

When h+T+L≤3M, the tapped hole goes through.

■Floating Joints and Holders Application Table (FJL · FJLSW)

M-Pitch	FJL FJLSW T Dimension*	HLRA_ P.1429 HLRB_ P.1429 HLRC_ P.1430	FJL FJLSW T Dim.*	HLRE_ P.1428	FJL FJLSW T Dim.	HLRD_ P.1430	FJL FJLSW T Dim.	HLRL_ P.1428	FJL FJLSW T Dim.	HLRAF P.1429
3-0.5	4	4	4	-	-	-	-	-	-	-
4-0.7		6							3~6	6-3~6
5-0.8										
6-1.0		7		7	8	7	6	7	3~8	7-3~8
8-1.0	6	10	6	10	12	10		10	3~12	10-3~12
8-1.25										
10-1.25	8	13	8	13	13	13		13	4~12	13-4~12
10-1.5										
12-1.25		16		16	15	16	8	16	5~15	16-5~15
12-1.5										
14-1.5	12	18	12	18	16	18		18	-	-
18-1.5		21		21	19	21	10	21	8~15	21-6~15
22-1.5	15	25	15	25	20	25	-	-	12~20	25-8~20

* For detailed holder dimensions, refer to **P.1428~1430**

Order Example

Part Number	-	L
FJLC8-1.0	-	25

Part Number	-	T	-	L
FJL6-1.0	-	6	-	70

Days to Ship

8 Days | Express A | 2,00 EUR/ piece | P.88

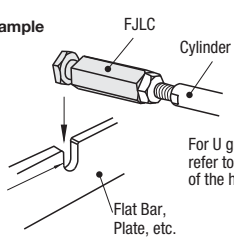
A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Serviceis not available for FJLCSW and FJLSW.

Price

■Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

Example



For U groove machining, refer to D1 and a dimension of the holder on **P.1429**

Compact Floating Joints
-Extension Rod Male Thread Type-

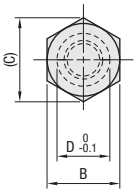
CAD Data

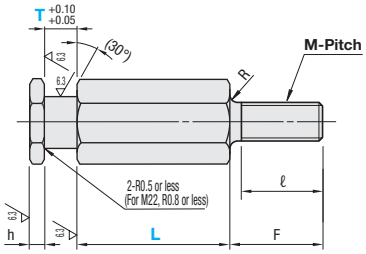


RoHS

L Selectable Type
FJLCM

L Dimension Configurable
FJLLM





- Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.
- Tufftride® is a trademark of DURFERRIT GmbH.
- No Tufftride® treatment on F Dimension.
- For details of Tufftride®, refer to **P.1799**

L Selectable	L Configurable	M Material	S	H Surface Hardness
FJLCM	FJLLM	1.1191/C45E	Tufftride®	500HV~

L Dimension Selectable Type

Part Number Type	M-Pitch	L Selection	T	h	D	F	ℓ	B	(C)	R	Applicable Holder HLRA_ HLRB_ HLRC_ HLRE_	€ Unit Price
FJLCM	3-0.5	10 12 15	4	3	4	8	6	6	6.9	1	4	
	4-0.7	12 15 18 20				11	9					
	5-0.8	15 18 20 25			6	13	11	8	9.2		6	
	6-1.0	18 20 25 30			7	19	17	10	11.5	1.5	7	
	8-1.25	25 30 40	6	4	10	20	18	14	16.2		10	
	10-1.5	30 40 50	8		13	24	21	17	19.6		13	
	16-2.0	60 70 80	12		21	40	37	26	30	2	21	
	20-2.5	70 80 90 100	15	5	25	50	46	30	34.6		25	

L Dimension Configurable Type

Part Number Type	M-Pitch	T Selection	L Specify in 1mm Increment	h	D	F	ℓ	B	(C)	R	€ Unit Price
FJLLM	3-0.5	3 4*	3~15	3	4	8	6	6	6.9	1	
	4-0.7	3 4* 5 6 8	3~20			11	9				
	5-0.8	3 4* 5 6 8 9 10	3~25		6	13	11	8	9.2		
	6-1.0	4* 5 6 8	4~30		7	19	17	10	11.5	1.5	
	8-1.25	5 6* 8 12	4~40	4	10	20	18	14	16.2		
	10-1.5	6 8* 9 10 12	4~50		13	24	21	17	19.6		
	16-2.0	12* 15 20	8~80		21	40	37	26	30	2	
	20-2.5	12 15* 20	10~100	5	25	50	46	30	34.6		
	22-2.5	12 15 20*	10~100		27	60	56	32	36.9	2.5	

Floating Joints and Holders Application Table (FJLLM)

M-Pitch	FJLCM FJLLM T Dimension*	HLRA_ P.1429 HLRB_ P.1429 HLRC_ P.1430	FJLCM FJLLM T Dimension*	HLRE_ P.1428	FJLLM T Dimension	HLRD_ P.1430	FJLLM T Dimension	HLRL_ P.1428	FJLMM T Dimension	HLRAF P.1429
3-0.5	4	4	4	-	-	-	-	-	-	-
4-0.7										
5-0.8		6							3~6	6-3~6
6-1.0		7		7	8	7	6	7	4~8	7-4~8
8-1.25	6	10	6	10	12	10		10	5~12	10-5~12
10-1.5	8	13	8	13	-	-		13	6~12	13-6~12
16-2.0	12	21	12	21			-	-	15	21-15
20-2.5	15	25	15	25	20	25			12~20	25-12~20
22-2.5	20	27	20	-	20	25				27-12~20

For holders of size 27, only HLRA - HLRC is available.
* For detailed holder dimensions, refer to **P.1428~1430**

Order Example

Part Number	-	L	Part Number	-	T	-	L
FJLCM6-1.0	-	25	FJLLM8-1.25	-	6	-	40

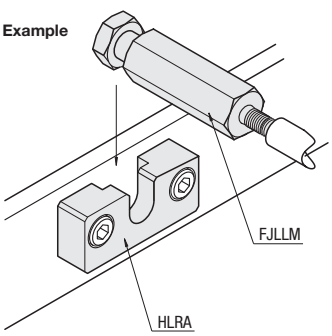
Days to Ship
8 Days

Price

Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

Example



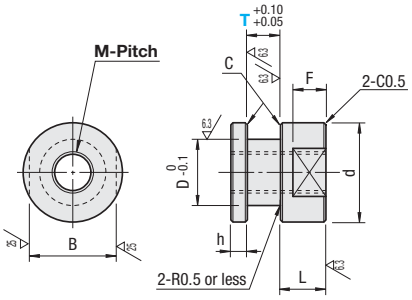
Compact Floating Joints
-Circular Female Thread Type-

CAD Data

RoHS



Type	M Material	S Surface Treatment	H Surface Hardness
FJCL	1.1191/C45E	Tufftride®	500HV~



Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.
Tufftride® is a trademark of DURFERRIT GmbH.
For details of Tufftride®, refer to **P.1799**

Part Number		T Selection	h	L	D	d	B	F	C	Applicable Holder		€ Unit Price
Type	M-Pitch									FJCL T Dimension*	HLRA_ HLRB_ HLRC_ HLRE_	
FJCL	3-0.5	4* 5	3	5	6	10	8	3	0.2	4	6	
	4-0.7	3 4* 5		6	7	14	10	4			7(*1)	
	5-0.8	4* 5 6		7	8		12	5		6	8	
	6-1.0	4 6* 8	4	8	10	16	14	6			10	
	8-1.25	8* 9 10		9	13	20	17	7	0.5	8	13	
	10-1.25	8*		11	16	24	21	8			16	
	10-1.5	8* 9 10										
	12-1.25	8 12*		12	18	26	22	10		12	18	
	14-1.5	12*		13	21	30	27	11			21	
	18-1.5	15*		15	25	35	30	13		15	25	

(*1) When M-Pitch is 4-0.7 and selecting T=4, applicable holders are HLRA_, HLRB_, HLRC_.
* For detailed holder dimensions, refer to **P.1428~1430**

Order Example

Part Number	-	T
FJCL6-1.0	-	8

Days to Ship: **6 Days** P.88

Price

Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Holder

-Compact Type, L-Shaped Type-

Part Number & Spec.Change Printed in Purple

CAD Data

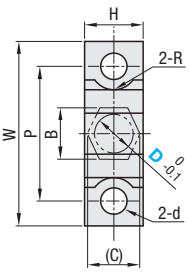
■Surface treatment of 1.4301/X5CrNi18-10 has changed from Tufftride® into Nitriding treatment. Better corrosion resistance and hardness, less particle generation on the surface than the conventional products.

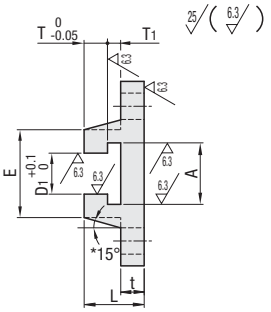
■Compact Type

RoHS



Type	Material	Surface Treatment	Surface Hardness
HLRE	1.1191/C45E	Tufftride®	500HV~
HLRESW	1.4301/ X5CrNi18-10	Nitride Treatment	1000HV~





*D=18, 21, 25 is straight without taper.

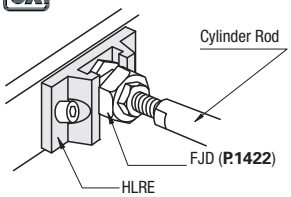
Tufftride® may cause uneven color, which doesn't affect mechanical function.

Tufftride® is a trademark of DURFERRIT GmbH.

For details of Tufftride®, refer to **P.1799**

Part Number Type	D	B	(C)	D1	T	T1	W	H	P	R	d	L	t	A	E	€ Unit Price HLRE	€ Unit Price HLRESW
HLRE HLRESW	7	10	11.5	8	4	4.5	45	12	32	5	4.5	13.5	5	13	20		
	8	12	13.9	9			48	14	34	5.5	5.5	14.5	6	15.4	22		
	10	14	16.2	11	6		52	16.5	38	7	6.8	16.5		17.5	24		
	13	17	19.6	14	8		63	20	46	8	9	20.5	8	21	30		
	16	21	24.2	18			78	25	58	10	11	22.5	10	25.5	39		
	18	23	26.6	20	12		90	26.5	66			28.5	12	28.5	50		
	21	26	30	23			96	29	72					31.5	56		
	25	30	34.6	27	15	5.5	104	32.5	80	11.5	13	35.5	15	35.2	64		

ex Example



Order Example — Part Number: HLRE8

Days to Ship — -HLRE: 8 Days; -HLRESW: 8 Days

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

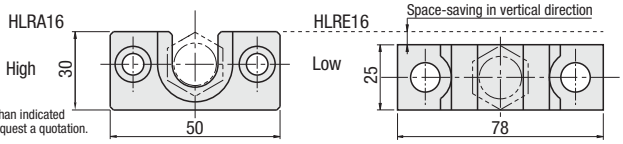
■Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Features

1. In comparison with the conventional holder (HLRA), overall height (H dimension) is lower.
2. The holder saves space.
3. The conventional floating joints (FJR etc.) can be used together.

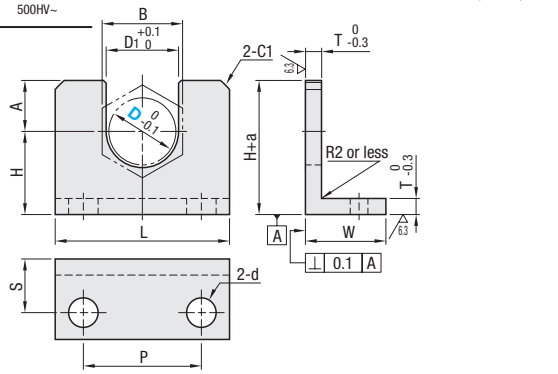


■L-shaped Type

RoHS



Type	Material	Surface Treatment	Surface Hardness
HLRL	1.0038/ S235JR	Tufftride®	500HV~



Tufftride® may cause uneven color, which doesn't affect mechanical function.

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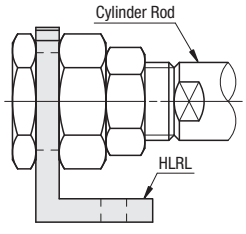
For details of Tufftride®, refer to **P.1799**

Part Number Type	D	H	B	D1	T	L	W	a	P	S	d	€ Unit Price
HLRL	7	20	10	8	6	19	22	6	10	14	4.5	
	8	25	12	9		22		7	12		5.5	
	10		14	11		25		8	14			
	13	30	17	14	8	32	32	10	20	20	6.5	
	16		21	18		38		12	26			
	18	35	23	20		50		14	34		9	
	21	40	26	23	10		40	15		25		
	25	45	30	27		60		19	40		11	

ex Example



Order Example — Part Number: HLRL10

Days to Ship — 8 Days

Price

■Volume Discount (Round down to one Cent.) **P.88**

Quantity	1~4	5~9
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Holder

-Side Mount Flange Type · Bar Type-

Part Number & Spec.Change Printed in Purple

CAD Data

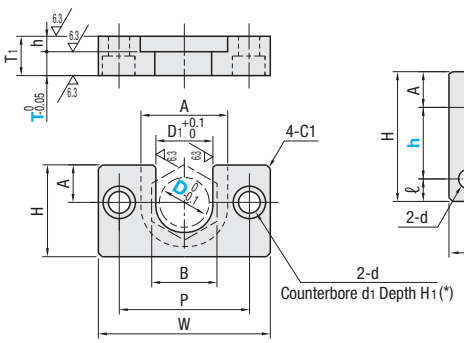
■Surface treatment of 1.4301/X5CrNi18-10 has changed from Tufftride® into Nitriding treatment. Better corrosion resistance and hardness, less particle generation on the surface than the conventional products.



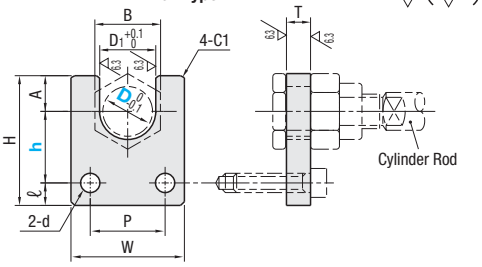
RoHS

Flanged Type		Bar Type		Material	Surface Treatment	Surface Hardness
T Fixed	T Configurable	Height h Fixed	Height h Configurable			
HLRA	HLRAF	HLRB	HLRBH	1.1191	Tufftride®	500HV~
HLRASW	-	HLRBSW	-	1.4301	Nitride Treatment	1000HV~
HLRASS	-	-	-		-	-
HLRAC	-	-	-		Hard Chrome Plating	700HV~

Flanged Type



Bar Type



25 (6.3)

Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.
Tufftride® is a trademark of DURFERRIT GmbH.
®For details of Tufftride®, refer to **P.1799**
* Holes for HLRAF are drill holes, not counterbored.

■Flanged Type

Part Number Type	D	T Fixed	T Configurable 1mm Increment	B	D1	A	T1 Fixed	T1 Configurable	h	W	H	a	P	d	d1	H1	€ Unit Price HLRA	HLRASW	HLRASS	HLRAC	HLRAF
T Dimension Fixed Type HLRA HLRASW HLRASS HLRAC	4	4	-	6	4.5	9	8	T+h	4	30	10	4	20	4.5	8	4.4					
	6		3~ 6	8	6.5	12				34	13	5	24								
	7		3~ 8	10	8	14				36	15	6	26								
	8	6	3~10	12	9	17	10			42	18	7	30	5.5	9.5	5.4					
	10		3~12	14	11	19	11		5	44	20	8	32								
	13	8	4~12	17	14	23	13			52	24	10	38	6.6	11	6.5					
T Dimension Configurable Type HLRAF	16		5~15	21	18	28				56	30	12	42								
	18	12	-	23	20	31	17			66	34	14	48	9	14	8.6					
	21		6~15	26	23	34				70	36	15	52								
	25	15	8~20	30	27	38	21		6	84	43	19	62	11	17	10.5					
	27	20	12~20	32	29	40	27		7												

■Bar Type

Part Number Type	D	h Height Fixed	h Height Configurable 1mm Increment	B	D1	T	Tolerance	W	H*	a	ℓ	P	d	€ Unit Price HLRB	HLRBSW	HLRBH
Height h Fixed Type HLRB HLRBSW	4	14	6~20	6	4.5	4	0 -0.12	16	24	4	6	8	4.5			
	6		5~19	8	6.5				25	5						
	7		7~18	10	8			19	26	6		10				
	8	18	7~25	12	9	6		22	33	7	8	12	5.5			
	10		9~24	14	11			25	34	8		14				
Height h Configurable Type HLRBH	13	25	12~30	17	14	8	0 -0.15	32	45	10	10	20	6.6			
	16		13~28	21	18			38	47	12		26				
	18	30	19~34	23	20	12	0 -0.18	50	56	14	12	34	9			
	21		18~33	26	23				57	15						
	25	40	21~46	30	27	15	0 -0.22	65	74	19	15	44	11			

* For height h configurable type, H=a+h+ℓ.

Order Example

Part Number	-	T	-	h
HLRA8				
HLRAF6	-	3		
HLRBH10			-	14

Days to Ship

-HLRA · HLRB
8 Days | Express A | 2,00 EUR/ piece | P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

-HLRASW · HLRBSW
8 Days

-HLRAC · HLRASS
10 Days | Express B | 2,00 EUR/ piece | P.88
A Express Charge of 8,10 EUR for 3 or more identical pieces.

-HLRAF · HLRBH
10 Days

Price

■Volume Discount (Round down to one Cent.) **P.87**

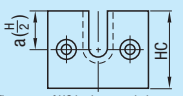
Quantity	1~9	10~14	15~19	20~30
Discount Rate	€ Unit Price	5%	10%	18%

For orders of 20 or more pieces of HLRAF - HLRBH, please request a quotation.

Alterations

Part Number	-	(HC)
HLRA8	-	HC30
10 Days		

Example

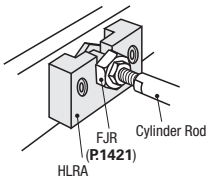
Alteration Code	Height HC
Spec.	Available for HLRA only.  The range of HC is shown as below.

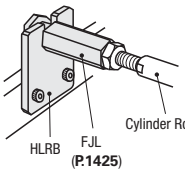
D	HC 1 mm Increment	a
4	12~20	H/2
6	16~25	
7	18~30	
8	22~30	
10	24~35	
13	28~40	
16	36~45	
18	40~50	
21	42~50	
25	48~60	

Not applicable to D27

Price Adder	10,00

Usage examples of Compact Floating Joints and Holders

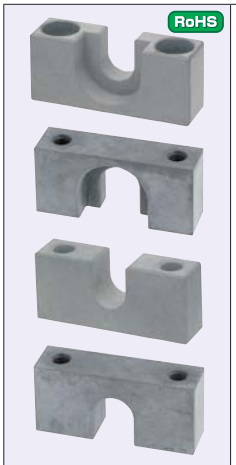




Holder

-Top Mount Flanged Type, Bar Type · Bottom Mount Flanged Type, Bar Type-

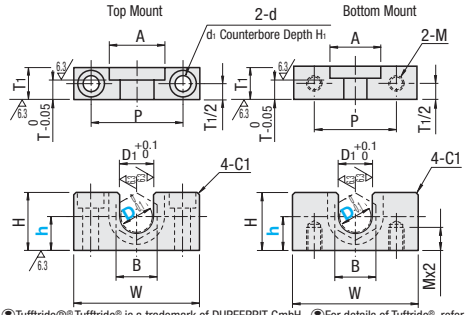
CAD Data



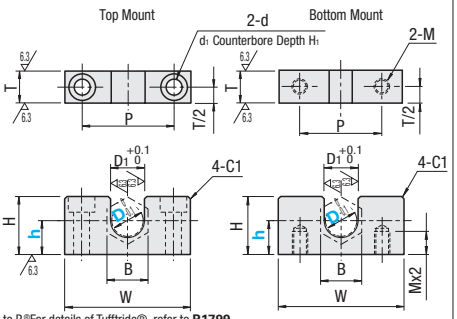
Type	Flanged Type		Bar Type		M Material	S Surface Treatment	H Surface Hardness
	Height h Fixed	Height h Configurable	Height h Fixed	Height h Configurable			
Top Mount	HLRC	HLRCH	HLRD	HLRDH	1.1191/C45E	Tufftride®	500HV~
Bottom Mount	HLRCB	HLRCBH	-	HLRDBH			

25 / (6.3 /)

Flanged Type



Bar Type



Tufftride® Tufftride® is a trademark of DURFERRIT GmbH. For details of Tufftride®, refer to P.®For details of Tufftride®, refer to **P.1799**
Tufftride® treatment may cause uneven color, which doesn't affect mechanical function.

Flanged Type

Part Number Type	D	h HLRC · HLRCB Fixed	h HLRCH · HLRCBH Specify in 1mm Increment	H	B	D1	A	T	T1	W	P	d	d1	H1	M
Top Mount, Height h Fixed Type HLRC / Height h Configurable Type HLRCH	4	6	7~16	h+4	6	4.5	9	4	8	30	20	3.5	6.5	3.5	3
	6	8	9~20	h+5	8	6.5	12		10	34	24	4.5	8	4.5	4
	7	9	10~24	h+6	10	8	14		10	36	26				
	8	11	12~23	h+7	12	9	17	6	12	42	30	5.5	9.5	5.5	5
	10	12	13~27	h+8	14	11	19		12	44	32				
Bottom Mount, Height h Fixed Type HLRCB / Height h Configurable Type HLRCBH	13	14	15~30	h+10	17	14	23	8	13	52	38	6.6	11	6.5	6
	16	18	19~33	h+12	21	18	28		13	56	42				
	18	20	21~36	h+14	23	20	31	12	17	66	48	9	14	9	8
	21	21	22~35	H+15	26	23	34		17	70	52				
	25	24	23~41	h+19	30	27	38	15	21	84	62	11	17	11	10
	27				32	29	40	20	27						

D27 is available for HLRC and HLRCH only.

Bar Type

Part Number Type	D	h HLRD Fixed	h HLRCH · HLRCBH Specify in 1mm Increment	H	B	D1	T	Tolerance	W	P	d	d1	H1	M
Top Mount, Height h Fixed Type HLRD / Height h Configurable Type HLRDH	7	9	10~24	h+6	10	8	8	0 -0.15	36	26	4.5	-	-	4
	8	11	12~23	h+7	12	9	10		42	30	5.5	9.5	5.5	5
	10	12	13~27	h+8	14	11	12	0 -0.18	44	32				
	13	14	15~30	h+10	17	14	13		52	38	6.6	11	6.5	6
Bottom Mount, Height h Configurable Type HLRDBH	16	18	19~33	h+12	21	18	15		56	42				
	18	20	21~36	h+14	23	20	16	0 -0.22	66	48	9	14	9	8
	21	21	22~35	H+15	26	23	19		70	52				
	25	24	25~41	h+19	30	27	20		84	62	11	17	11	10

Bar Type D7 and D8 don't have counterbore holes.

Order Example

- Height h Fixed Part Number	Height h Configurable Part Number	-	h
HLRC13	HLRDH16	-	21
HLRC27	HLRCH27	-	30

Days to Ship

-HLRC · HLRCB · HLRD: 8 Days (Express Service is not available for HLRCB.)
-HLRCH · HLRCBH HLRCH · HLRCBH: 10 Days

Express A 2,00 EUR/ piece **P.88**

A Express Charge of 5,40 EUR for 3 or more identical pieces.

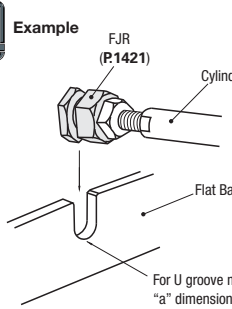
Price

Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

D	€ Unit Price: Flanged Type Top Mount Height h Fixed HLRC	Flanged Type Top Mount Height h Configurable HLRCH	Flanged Type Bottom Mount Height h Fixed HLRCB	Flanged Type Bottom Mount Height h Configurable HLRCBH	Bar Type Top Mount Height h Fixed HLRD	Bar Type Top Mount Height h Configurable HLRDH	Bar Type Bottom Mount Height h Configurable HLRDBH
4							
6							
7							
8							
10							
13							
16							
18							
21							
25							
27							

Example



Knuckle Joints
-Extra Short Type, Tool-less Type-

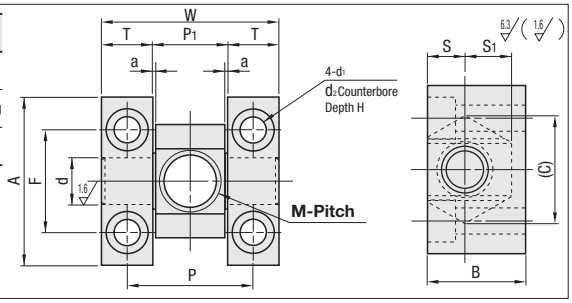
Spec.Change
Printed in Purple

CAD Data

■Extra Short Type RoHS



Type	Material	Surface Treatment
NJCB	1.1191/C45E	Black Oxide
NJCM		Electroless Nickel Plating
NJCS	1.4301/X5CrNi18-10	-



Part Number Type	M-Pitch	A	B	d	F	W	P	T	P1	a	S	S1	(C)	d1	d2	H	Mass (g)	€ Unit Price NJCB	NJCM	NJCS
NJCB NJCM NJCS	3-0.5	18	10.5	5	11	19	13.5	5.5	8	0.3	4	5	11.6	2.8	4.5	3	21			
	4-0.7	19	11.5		12	20.5	15		9.5			5.5	12.7				26			
	5-0.8	20				25.5	18	7.5	10.5			6	13.9				36			
	6-1.0		12.5	6	13	27	20	7	13		5			3.5	6.5	3.5	39			
	8-1.0	24	17	8	16	34	26	8	18		7	8.5	19.6				82			
	10-1.25	30	20.5	10	20	38	29	9	20		8	10.5	24.3	4.5	8	4.5	139			
	12-1.25	36	25	12	24	44	34	10	24		10	12.5	28.9				230			
	14-1.5	42	28.5	14	28	52	40	12	28		11	14.5	33.5				365			
	16-1.5	48	33	16	32	60	46	14	32	0.5	13	16	37	5.5	9.5	5.5	542			
	18-1.5	54	36	18	36	68	52	16	36		14	18	41.6				764			

Order Example
Part Number: NJCS10-1.25, NJCB18-1.5

Days to Ship
8 Days
Express A 3,00 EUR/piece P.88

(?)A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

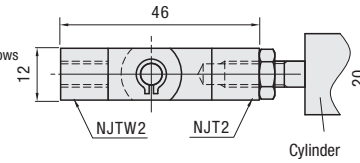
■ Volume Discount (?)Round down to one Cent.) P.87

Quantity	1~15	16~24	25~30	31~50
Discount Rate	€ Unit Price	5%	10%	18%

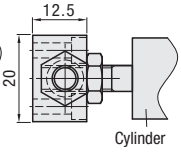
(?) For orders larger than indicated quantity, please request a quotation.

■Features
Compared with the conventional knuckle joints,
(1) It can greatly save the space required for installation.
(2) Supporting shaft is incorporated.
(3) A reduced number of component parts allows easy assembly.

· Conventional Knuckle Joints



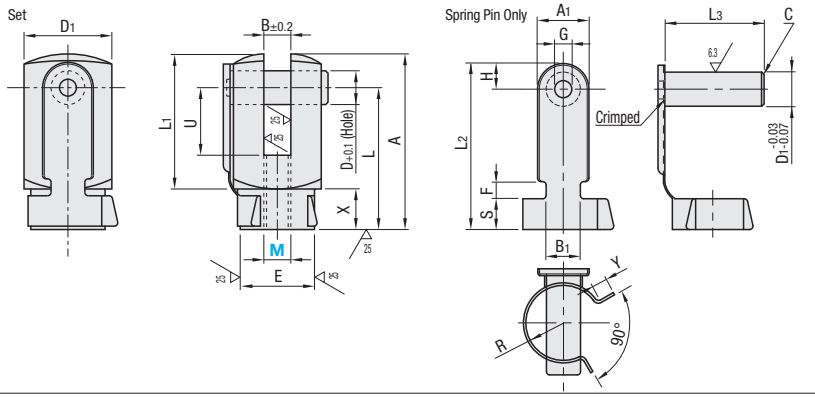
· Knuckle Joint Extra Short Type



■Tool-less Type RoHS



Type Set	Material Body	Material Spring Pin	Surface Treatment
NJUT	1.1191/C45E	1.4301/X5CrNi18-10	Trivalent Chromate
NJUTS	1.4301/X5CrNi18-10		-



Part Number Type	M	MxPitch	D±0.1	B±0.2	U	A	L	L1	D1	E	X	€ Unit Price Set NJUT	NJUTS
Set NJUT NJUTS	4	M4x0.7	4.2	4.3	6	21	16	13	11	8.5	8		
	5	M5x0.8	6.8	5.3	12	31	24	22	16	12.5	9		
	6	M6x1.0		6.8									
	8	M8x1.25	10.5	8.3	20	52	42	38	26	21	14		
	10	M10x1.25		10.3									
	14	M14x1.5	18.3	18.3	25	68	52.5	51.5	35	28	16.5		

Applicable M to Set	D1 -0.03 -0.07	A1	B1	Y	L2	L3	H	F	G	S	R	C
4	4	9.5	5	3	18	13	4	3	3	6	4.5	1
5 or 6	6.5	14	7	4	28	18	6	4	5		6.5	1.5
8 or 10	10	20	10	6	48	28	8		6	10	11	2
14	18	25	12		63	37	10	5	10	12	14	

Order Example
Part Number: NJUT6

Days to Ship
8 Days

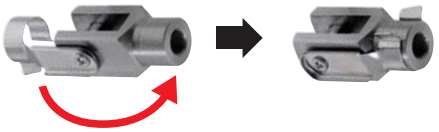
Price

■ Volume Discount (?)Round down to one Cent.) P.88

Quantity	1~15	16~24	25~29
Discount Rate	€ Unit Price	5%	10%

(?) For orders larger than indicated quantity, please request a quotation.

■Features
Quick assembly (removal) is possible.



Knuckle Joints

-Fixed-

CAD Data

RoHS



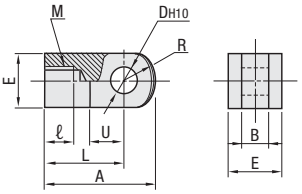


(Prong Type)

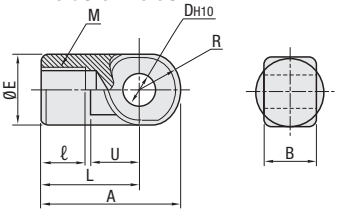
NJT

NJTSS

No.3A or 4A, No.1~No.4



No.5C or No.6C

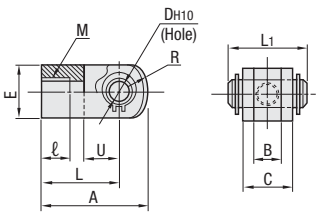


(Notch Type)

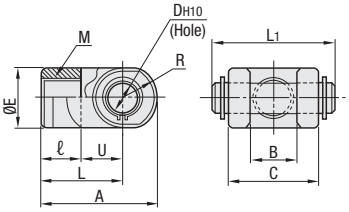
NJTW

NJTWS

No.3A or 4A, No.1~No.4



No.5C or No.6C



Material and accessory tolerance of (NJTW) 5C, 6C are EN JS-1030/EN-GJS400-15 and De8 respectively.
Note: Material and accessory tolerance of NJT (NJTW) 5, 6 are EN-JS 1040/EN-GJS400 and Dd9 respectively.

Type	No.	Material	Surface Treatment
NJT NJTW	3A or 4A 1~4	1.0038/S235JR	Nickel Plating (White) Black Galvanizing Trivalent Chromate for No.2 only
	5C or 6C	EN JS-1030/EN-GJS 400-15	Nickel Plating (White)
NJTSS NJTWS	3A or 4A 1~8	1.4301/X5CrNi18-10	-

Part Number Type	No.	Applicable Cylinders Inner Diameter (mm)	A	ℓ	E	L	M	R	U	DH10	B	Tolerance	€ Unit Price NJT	€ Unit Price NJTSS
NJT NJTSS	3A	6	19	5	8	14	M3x0.5	5	5	$4^{+0.048}_{0}$	4	-0.2 -0.4		
	4A	10					M4x0.7							
	1	12	21.5	6	10	16	M5x0.8	6.3	7	$5^{+0.048}_{0}$	5			
	2	16	32	8	12	25	M6x1	8.1	14		6.4	$^{-0.1}_{-0.3}$		
	3	20	34	8.5	16		M8x1.25	10.3	11.5	$8^{+0.058}_{0}$	8	-0.2		
	4	25	41	10.5	20	30	M10x1.25	12.8	14	$10^{+0.058}_{0}$	10	-0.4		
	5C	32 or 40	42	14	22		M14x1.5	12			18	-0.3		
	6C	50 or 63	56	18	28	40	M18x1.5	16	20	$14^{+0.070}_{0}$	22	-0.5		

Inner diameter (mm) of an applicable cylinder is for a standard cylinder. In the selection, please also check M (diameter of a mounting screw).

Part Number Type	No.	Applicable Cylinders Inner Diameter (mm)	A	ℓ	E	L	M	R	U	DH10	B	Tolerance	C	L1	€ Unit Price NJTW	€ Unit Price NJTWS
NJTW NJTWS	3A	6	19	5	8	14	M3x0.5	5	5	$4^{+0.048}_{0}$	4	$^{+0.4}_{+0.2}$	8	12		
	4A	10					M4x0.7									
	1	12	21.5	6	10	16	M5x0.8	6.3	7	$5^{+0.048}_{0}$	5	$^{+0.4}_{+0.2}$	10	14.6		
	2	16	28	11	12	21	M6x1	8.1	10		6.5	$^{+0.2}_{+0}$	12	16.6		
	3	20	34	8.5	16	25	M8x1.25	10.3	11.5	$8^{+0.058}_{0}$	8	$^{+0.4}_{+0.2}$	16	21		
	4	25	41	10.5	20	30	M10x1.25	12.8	14	$10^{+0.058}_{0}$	10	$^{+0.4}_{+0.2}$	20	25.6		
	5C	32 or 40	42	16	22		M14x1.5	12			18	$^{+0.5}_{+0.3}$	36	41.6		
	6C	50 or 63	56	20	28	40	M18x1.5	16	20	$14^{+0.070}_{0}$	22	$^{+0.5}_{+0.3}$	44	50.6		

Inner diameter (mm) of an applicable cylinder is for a standard cylinder. In the selection, please also check M (diameter of a mounting screw).
* The knuckle joint pin and retaining ring (2 pcs.) are included in the package of NJT, NJTSS, NJTW and NJTWS.

Order Example

Part Number
NJT8
NJT3A
NJTW5C

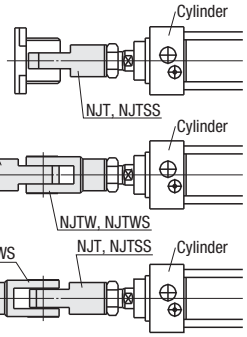
Days to Ship

- NJT · NJTW: 6 Days P.87
- NJTSS · NJTWS: 8 Days

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Example



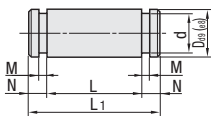
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29	30~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.
For orders of 20 or more pieces of 1.4301/X5CrNi18-10, please request a quotation.

Accessory



NJT · NJTW
NJTSS · NJTWS

M Material: 1.1191/C45E
M Material: 1.4301/X5CrNi18-10

No.	Applicable Cylinders Inner Diameter (mm)	Dd9 or De8	L1	d	L	N	M	Retaining Ring
3A	6	4 $^{-0.030}_{-0.060}$	12	3.8	8.2	1.9	0.5	C Type for Shaft 4
4A	10							
1	12	5 $^{-0.030}_{-0.060}$	14.6	4.8	10.2	2.2	0.7	C Type for Shaft 5
2	16		16.6		12.2			
3	20	8 $^{-0.040}_{-0.076}$	21	7.6	16.2	2.4	0.9	C Type for Shaft 8
4	25	10 $^{-0.040}_{-0.076}$	25.6	9.6	20.2	2.7	1.15	C Type for Shaft 10
5C	32 or 40		41.6		36.2			
6C	50 or 63	14 $^{-0.050}_{-0.093}$	50.6	13.4	44.2	3.2		C Type for Shaft 14

D tolerance of NJT (NJTW) 5C - 6C is De8 ($10^{-0.025}_{-0.047}$, $14^{-0.032}_{-0.059}$).
D tolerance of NJTSS (NJTWS) 5C - 6C is Dd9 (above table).

Knuckle Joints
-B Dimension Selectable Type-

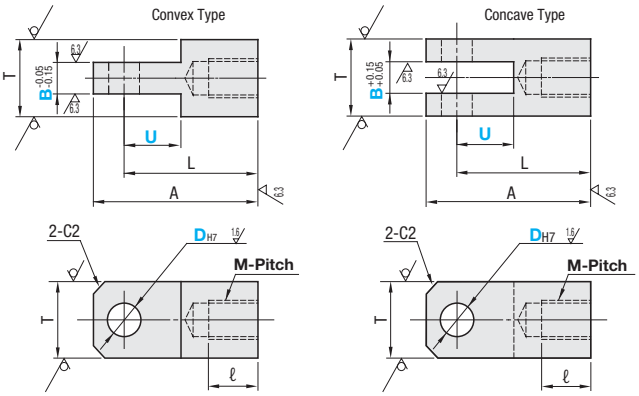
CAD Data

RoHS



B Dimension Selectable Type		Material	Surface Treatment
Convex	Concave		
NJSB	NJTB	1.1191/C45E	Black Oxide
-	NJTM		Electroless Nickel Plating
NJSS	NJTS	1.4301/X5CrNi18-10	-

Thread depth ℓ: When M3~8, the thread depth is ℓ=Mx1.5
When M10~18, the thread depth is ℓ=Mx1



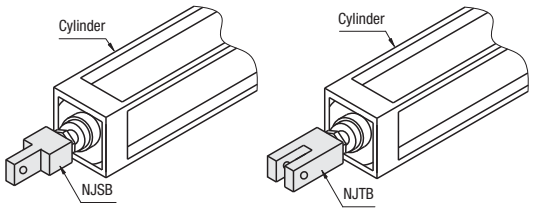
B Dimension Selectable Type

Part Number Type	M-Pitch	B Selection	DH7	U	A	L	T	€ Unit Price Convex Type NJSB	Convex Type NJSS	Concave Type NJTB	Concave Type NJTM	Concave Type NJTS
	3-0.5	4 or 5	4	10	26	20	10					
	4-0.7	5 or 6	5		31	25	12					
	5-0.8											
(Prong Type) NJSB NJSS	6-1.0	4 or 6										
	8-1.0	5 or 8	8	15	43	35	16					
	8-1.25											
(Notched Type) NJTB NJTM NJTS	10-1.25	6 or 10	10				20					
	10-1.5											
	12-1.25	8 or 10	12		50	40	22					
	12-1.5											
	14-1.5	10 or 12		20	62	50	25					
	16-1.5				67	55						
	18-1.5	12 or 14			69		28					

Order Example

Part Number	-	B
NJSB5-0.8	-	B6
NJTS8-1.25	-	B5

Example



Days to Ship

8 Days | Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Knuckle Joints
-Female Thread and Configurable Type-

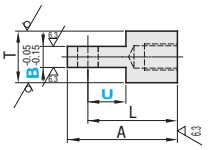
CAD Data

RoHS

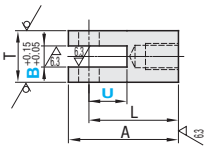


Convex	Concave			Material	Surface Treatment
	Standard Type	Wide Type	Bolt Fixing Type		
FNNB	FNTB	FNTWB	FNTFB	1.1191/C45E	Black Oxide
FNNM	FNTM	FNTWM	-		Electroless Nickel Plating
FNNS	FNTS	FNTWS	-	1.4301/X5CrNi18-10	-

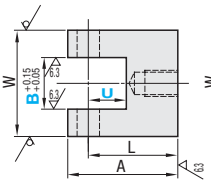
Convex Type



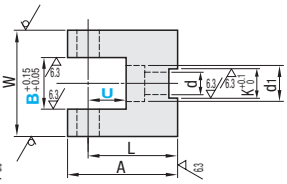
Standard Concave Type

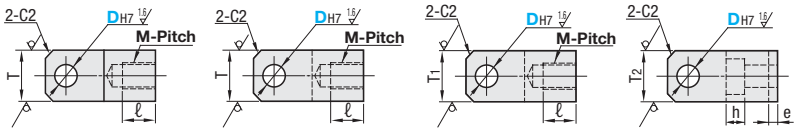


Wide Concave Type



Bolt Fixing Concave Type





Thread depth ℓ: When M3~8, the thread depth is ℓ=Mx1.5
When M10~26, the thread depth is =Mx1

Part Number			B 1mm Increment				U 5mm Unit	A	L	T	T1	T2	W	d	h	d1	K	e
Type	M-Pitch	DH7 Selection	Convex Type	Concave Type: Standard Type	Concave Type: Wide Type	Concave Type: Bolt Fixing Type												
Convex Type FNNB FNNM FNNS	* 3-0.5	3 4 5	3~10	3~5	6~10	6~10	10~20	L+6	U+10	10	9	10	19	3.2	3.5	6.5	5	2.5
	* 4-0.7											12		4.2	4.5	8	6	
	* 5-0.8	4 5 6	4~12	4~6	7~12	7~12	10~30		U+15	12	12	12	25	5.2	5.5	9.5	8	3.5
	* 6-1.0											16		6.2	6.5	11	10	4
Standard Concave Type FNTB FNTM FNTS	8-1.0	5 6 8	5~16	5~8	9~16	-		L+8	U+20	16	16	-	32	-	-	-	-	-
	* 8-1.25					9~16						20		8.2	9	14	14	4
	10-1.25	6 8 10	6~20	6~10	11~20	-	15~30			20	19	-	38	-	-	-	-	-
	* 10-1.5					11~20						25		10.2	11	18	17	4
Wide Concave Type FNTWB FNTWM FNTWS	12-1.25	8 10 12 13	8~22	8~11	12~22			L+10	U+25	22	22		44					
	12-1.5																	
	14-1.5	10 12 13 14 15 16	10~25	10~13	14~25	-	20~30	L+12	U+30	25	25	-	50	-	-	-	-	-
	16-1.5								U+35									
Bolt Fixing Concave Type (Only * marked sizes) FNTFB	18-1.5		12~28	12~14	15~28			L+14		28	30							
	22-1.5	12 13 14 15 16 20	12~32	12~16	-			L+16	U+45	32	-		-					
	26-1.5		12~38	12~18				L+19	U+50	38								

Only * marked sizes are available for Bolt Fixing Concave Type (FNTFB).
For Bolt Fixing Concave Type (FNTFB), when B<d1 is specified, the knuckle joint shape is as the lower right picture shown above.
For M22-1.5 and M26-1.5, only Convex Type and Standard Concave Type are available.

Order Example

Part Number	-	D	-	B	-	U
FNNB8-1.0	-	D6	-	B8	-	U20
FNTWM6-1.0	-	D6	-	B9	-	U10

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Type	€ Unit Price									
	Convex Type			Standard Concave Type			Wide Concave Type			Bolt Fixing Concave Type
M-Pitch	FNNB	FNNM	FNNS	FNTB	FNTM	FNTS	FNTWB	FNTWM	FNTWS	FNTFB
3-0.5										
4-0.7										
5-0.8										
6-1.0										
8-1.0										
8-1.25										
10-1.25										
10-1.5										
12-1.25										
12-1.5										
14-1.5										
16-1.5										
18-1.5										
22-1.5										
26-1.5										

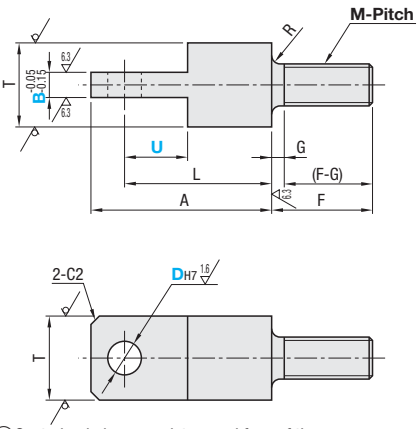
Knuckle Joints
-Male Thread and Configurable Type-

CAD Data

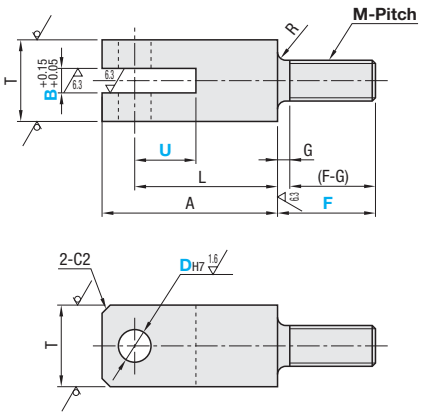


Convex Type	Concave Type		Material	Surface Treatment
F Fixed	F Fixed	F Configurable		
FNMB	FNMTB	FNMTBF	1.1191/C45E	Black Oxide
FNMS	FNMTS	-	1.4301/X5CrNi18-10	-

Convex Type



Concave Type



RoHS

Centering hole may exist on end face of the screw.

Part Number		DH7 Selection	B 1mm Increment		U 5mm Increment	F		A	L	T	G	R
Type	M-Pitch		Convex Type	Concave Type		Selectable	Configurable Specify in 1mm Increment					
Convex Type F Fixed FNMB FNMS	3-0.5	3 4 5	3~10	3~5	10~20	9	8~12	L+5	U+10	10	3	0.8
	4-0.7					12	10~16					
	5-0.8	4 5 6	4~12	4~6	10~30	14	12~19	L+6		12	4	
	6-1.0					16	13~22					
Concave Type F Fixed FNMTB FNMTS / F Configurable FNMTBF	8-1.25	5 6 8	5~16	5~8	15~30	20	16~28	L+8	U+15	16		
	10-1.5	6 8 10	6~20	6~10		25	20~35	L+10		20	5	
	16-2.0	12 13 14 15 16 20	12~32	12~16	20~30	39	31~55	L+16	U+20	32	7	1.6
	20-2.5	12 13 14 15 16 20	12~38	12~18		49	39~69	L+19		38	9	

Order Example

Part Number	-	D	-	B	-	U	-	F
FNMB8-1.25	-	D8	-	B9	-	U20		
FNMTBF10-1.5	-	D10	-	B7	-	U25	-	F30

Days to Ship

10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

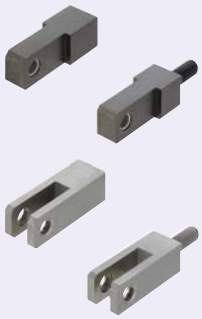
For orders larger than indicated quantity, please request a quotation.

M-Pitch	€ Unit Price				
	Convex Type F Fixed		Concave Type F Fixed		F Configurable
	FNMB	FNMS	FNMTB	FNMTS	FNMTBF
3-0.5					
4-0.7					
5-0.8					
6-1.0					
8-1.25					
10-1.5					
16-2.0					
20-2.5					

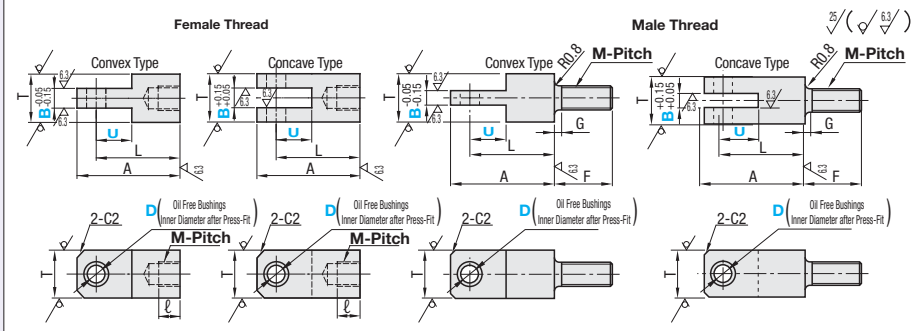
Knuckle Joints
-Oil Free Bushings Press-Fit-

CAD Data

Features : Knuckle joints with embedded oil-less bushings to prevent abrasions by rotating.



Female Thread		Male Thread		M Material	S Surface Treatment	A Accessory
Convex	Concave	Convex	Concave			
FNBNB	FNBTB	FNBMB	FNBMTB	1.1191/C45E	Black Oxide	Oil Free Bushing
FNBNM	FNBTM	FNBMM	FNBMTM		Electroless Nickel Plating	
FNBNS	FNBTS	-	-	1.4301/X5CrNi18-10	-	



When M3~8, thread depth ℓ=Mx1.5.
When M10 or 12, thread depth ℓ=Mx1.

Centering hole may exist on end face of the screw.

RoHS

Female Thread

Part Number Type	M-Pitch	D Selection	B 1mm Increment Convex	B 1mm Increment Concave	U 5mm Increment	A	L	T	€ Unit Price Convex Type FNBNB	FNBNM	FNBNS	Concave Type FNBTB	FNBTM	FNBTS
Convex Type FNBNB FNBNM FNBNS	3-0.5	3 4 5	4~10	3	10~20	L+6	U+10	10						
	4-0.7													
	5-0.8	4 5 6	4~12	4~5	10~30		U+15	12						
	6-1.0													
Concave Type FNBTB FNBTM FNBTS	8-1.25	5	5~13	5~8	15~30	L+8	U+20	16						
		6	5~16											
		8		5										
	10-1.25 10-1.5	6	8~16	6~10				20						
		8	8~20	6~9										
		10		6~7										
	12-1.25 12-1.5	8	8~20	8~11		L+10	U+25	22						
		10		8~9										
		12	8~22											

Male Thread

Part Number Type	M-Pitch	D Selection	B 1mm Increment Convex	B 1mm Increment Concave	U 5mm Increment	F	A	L	T	G	€ Unit Price Convex Type FNBMB	FNBMM	Concave Type FNBMTB	FNBMTM
Convex Type FNBMB FNBMM	3-0.5	3 4 5	4~10	3	10~20	9	L+5	U+10	10	3				
	4-0.7					12				4				
	5-0.8	4 5 6	4~12	4~5	10~30	14	L+6		12					
	6-1.0					16								
Concave Type FNBMTB FNBMTM	8-1.25	5	5~13	5~8	15~30	20	L+8	U+15	16					
		6	5~16											
		8	6~16	5										
	10-1.5	6	6~16	6~10		25	L+10		20	5				
		8	6~20	6~9										
		10	7~20	6~7										

Order Example

Part Number	-	D	-	B	-	U
FNBNB8-1.25	-	D6	-	B10	-	U20
FNBMTM6-1.0	-	D5	-	B5	-	U20

Days to Ship 10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request aquotation.

Convex Type (1pc.)

D	B	Oil Free Bushing d (Inner Ø)	Oil Free Bushing L (Overall Length)
3	4	3	3
	5	3	4
	6	3	5
	7~10	3	6
4	4	4	3
	5	4	4
	6	4	5
	7~8	4	6
	9~12	4	8
5	4	5	3
	5	5	4
	6	5	5
	7~8	5	6
	9~13	5	8
6	4	6	3
	5	6	4
	6	6	5
	7~8	6	6
	9~10	6	8
	11~12	6	10
	13~16	6	12

Convex Type (1pc.)

D	B	Oil Free Bushing d (Inner Ø)	Oil Free Bushing L (Overall Length)
8	6	8	5
	7~8	8	6
	9~10	8	8
	11~12	8	10
	13~15	8	12
	16~20	8	15
10	7~8	10	6
	9~10	10	8
	11~12	10	10
	13~15	10	12
	16~20	10	15
12	8	12	6
	9~10	12	8
	11~12	12	10
	13~15	12	12
	16~20	12	15
	21~22	12	20

Concave Type (2pcs.)

M-Pitch	D	B	Oil Free Bushing d (Inner Ø)	Oil Free Bushing L (Overall Length)
3-0.5 4-0.7	3	3	3	3
	4	3	4	3
	5	3	5	3
5-0.8 6-1.0	4	4	4	3
		5		
	5	4	5	3
		5		
	6	4	6	3
		5		
8-1.25	5	5	5	4
		6		
		7	5	3
		8		
	6	5	6	4
		6		
		7	6	3
		8		
	8	5	8	5

Concave Type (2pcs.)

M-Pitch	D	B	Oil Free Bushing d (Inner Ø)	Oil Free Bushing L (Overall Length)
10-1.25 10-1.5	6	6	6	6
		7	6	5
		8		
	8	9	6	4
		10		
		6	8	6
		7		
		8	8	5
		9		
	10	6	10	6
		7		
12-1.25 12-1.5	8	8	8	6
		9		
		10	8	5
		11		
	10	8	10	6
		9		
	12	8	12	6
		9		

Pushers for Cylinder with Guide · MC Nylon · Polyacetal Pushers

-Metal Plate Baked Type · MC Nylon Type-

CAD Data

Features: Upper: Pushers which fit mounting diameters (pitch) for cylinder with guide. Bottom : MC nylon used pushers. For maintenance, resin for replacement is provided.

Pushers for Cylinder with Guide

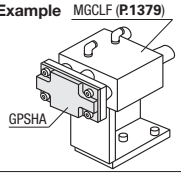
RoHS

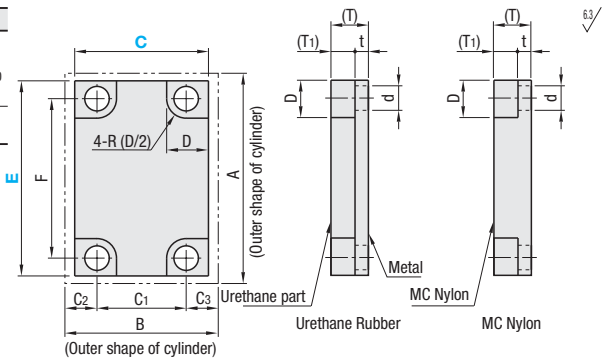


Type	Material	Hardness	Plate
GPSHA	Ether Polyurethane	Shore A90	1.4301/ X5CrNi18-10
GPSHS	Ester Polyurethane	Shore A70	
GPSHM	MC Nylon	-	-

For urethane rubber properties, refer to **P.358**
For MC nylon properties, refer to **P.858**

Example MGCLF (**P.1379**)





Part Number Type	Plate Mounting Part External Dimensions C	E	Cylinder External Dimensions A	B	Reference Tube Inner Diameter	Mounting Hole Pitch F	C1	C2	C3	(T)	(T1)	t	Mounting Hole Information D	d	€ Unit Price GPSHA	GPSHS	GPSHM
GPSHA GPSHS GPSHM	22	56	58	26	12	48	14	6	6	12	7	4.9	8	4.5			
	25	62	64	30	16	52	16	7	7	13	8		9.5	5.5			
	30	72	85	36	20	60	18	8	10				12				
	38	86	96	42	25	70	26	8	8	14	9		13.5	6.6			
	48	112	116	51	32	96	30	11	10	16	11		17	8.5			

Urethane rubber is baked on a metal plate. Although urethane rubber could be discolored over time, it does not affect its property.
For MC nylon, use a float washer (**P.232**) to protect the resin from being damaged.

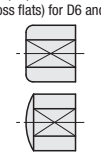
MC Nylon Polyacetal Pushers

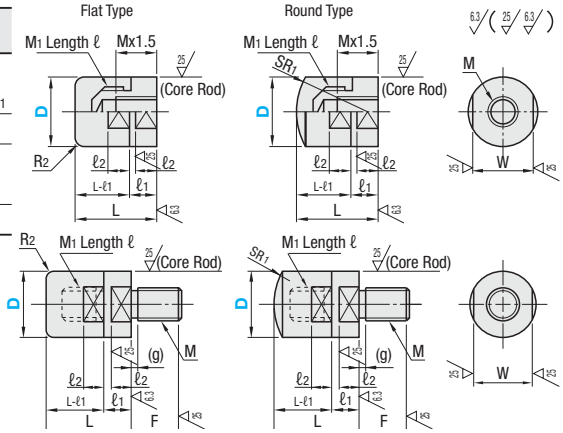
RoHS



Type		Shape Flat	Shape Round	Material
MC Nylon	Female Thread	PSHMC	RSHMC	1.4301/ X5CrNi18-10 Nylon Core Rod: 1.4301
	Male Thread	PSHMMC	RSHMMC	
	Replacement Resin	MCKK	MCRKK	MC Nylon
Poly-acetal	Female Thread	PSHPA	RSHPA	Polyacetal Core Rod: 1.4301/ X5CrNi18-10
	Male Thread	PSHMPA	RSHMPA	
	Replacement Resin	PAKK	PARKK	Polyacetal

For MC nylon properties, refer to **P.858**
For polyacetal properties, refer to **P.858**
ℓ2 (resin across flats) for D6 and D8 is as follows.





Female Thread

Tap depth for resin for replacement is ℓ. Positions of the flats on resin and core rod may not coincide.

Part Number Type	D	L	MxPitch	M1xPitch	ℓ	SR1	R2	ℓ1	ℓ2	W	€ Unit Price MC Nylon Set PSHMC	MC Nylon Set RSHMC	MC Nylon Replacement Resin MCKK	MC Nylon Replacement Resin MCRKK	Polyacetal Set PSHPA	Polyacetal Set RSHPA	Polyacetal Replacement Resin PAKK	Polyacetal Replacement Resin PARKK
Set Flat PSHMC PSHPA Round RSHMC RSHPA / Replacement Resin Flat MCKK PAKK Round MCRKK PARKK	8	12	M3x0.5	M5x0.8	4.5	8	1	5	4	7								
	10	15	M4x0.7	M6x1.0	7	10				8								
	12	16	M5x0.8	M8x1.25	8	12	2	6	5	10								
	15	20	M6x1.0	M10x1.5	10	16				14								
	16																	
	20	25	M8x1.25	M12x1.75	12	20	3	8	6	17								
	25	30	M10x1.5	M16x2.0	14	25		10	8	22								
	30	35	M12x1.75	M16x2.0	18	30				27								

Male Thread

Part Number Type	D	L	MxPitch (Coarse Thread)	M1xPitch (Coarse Thread)	ℓ	SR1	R2	F	(g)	ℓ1	ℓ2	W	€ Unit Price MC Nylon Set PSHMMC	MC Nylon Set RSHMMC	MC Nylon Replacement Resin MCKK	MC Nylon Replacement Resin MCRKK	Polyacetal Set PSHMPA	Polyacetal Set RSHMPA	Polyacetal Replacement Resin PAKK	Polyacetal Replacement Resin PARKK
Set Flat PSHMMC PSHMPA Round RSHMMC RSHMPA / Replacement Resin Flat MCKK PAKK Round MCRKK PARKK	6	10	M3x0.5	M3x0.5	3	6	1	4.5	1.5	5	4	5								
	8	12	M4x0.7	M5x0.8	4.5	8		6				7								
	10	15	M5x0.8	M6x1.0	7	10		7	2			8								
	12	16	M6x1.0	M8x1.25	8	12		10				10								
	15	20	M8x1.25	M10x1.5	10	16	2	12	2.5	6	5	14								
	16																			
	20	25	M10x1.5	M12x1.75	12	20	3	14		8	6	17								

Order Example

Part Number
GPSHA2562
GPSHM48112
PSHMC20
MCRKK12

Days to Ship: 6 Days (P.87)

Price

Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~19	20~49
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Low Hardness Urethane Pushers · Fluororubber Pushers
-Female Thread Type - Male Thread Type-

CAD Data

Features: Low hardness urethane pushers: Shore A30 used urethane pushers which give small impact to work. Fluoro-Rubber Pushers: Pushers which is made of fluorine with excellent chemical resistance.

Female Thread Type

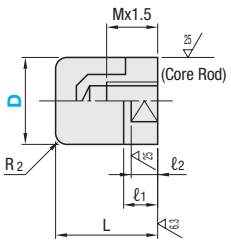
RoHS



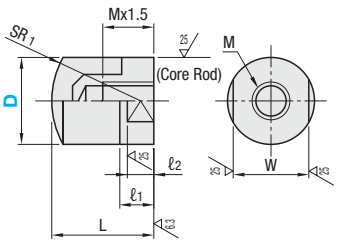
Type		M Material	H Hardness	Color	M Material
Flat	Round				
PSHLH	RSHLH	Ester Polyurethane	Shore A30	Natural color	1.4301/X5CrNi18-10
PSHPT	RSHPT	Fluorine Rubber (FPM)	Shore A80	Black	

For properties of urethane rubber and fluoro- rubber, refer to **P.358**

Flat Type



Round Type



Part Number Type	D	L	MxPitch	SR1	R2	ℓ1	ℓ2	W	€ Unit Price PSHLH	RSHLH	PSHPT	RSHPT
Flat / Round	8	12	M3x0.5	8	1	5	4	7				
PSHLH / RSHLH	10	15	M4x0.7	10				8				
PSHPT / RSHPT	12	16	M5x0.8	12	2			10				
	16	20	M6x1.0	16		6	5	14				
	20	25	M8x1.25	20	3	8	6	17				

Urethane rubber and fluororubber are thermally bonded to a core rod. Although urethane rubber could be discolored over time, it does not affect its property.

Male Thread Stud Type

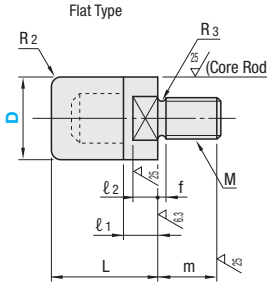
RoHS



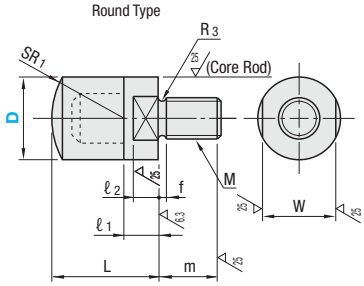
Type		M Material	H Hardness	Color	M Material
Flat	Round				
PSHMLH	RSHMLH	Ester Polyurethane	Shore A30	Natural color	1.4301/X5CrNi18-10
PSHMPT	RSHMPT	Fluorine Rubber (FPM)	Shore A80	Black	

For properties of urethane rubber and fluoro- rubber, refer to **P.358**

Flat Type



Round Type



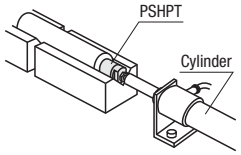
Part Number Type	D	L	MxPitch (Coarse Thread)	SR1	R2	m	ℓ1	ℓ2	f	R3 Max.	W	€ Unit Price PSHMLH	RSHMLH	PSHMPT	RSHMPT
Flat / Round	6	10	M3x0.5	6	1	4.5	5	4	1	0.3	5				
PSHMLH / RSHMLH	8	12	M4x0.7	8		6				0.5	7				
PSHMPT / RSHMPT	10	15	M5x0.8	10		7					8				
	12	16	M6x1.0	12	2	10			1.5	0.75	10				
	16	20	M8x1.25	16		12	6	5	2	1	14				

Urethane rubber and fluororubber are thermally bonded to a core rod. Although urethane rubber could be discolored over time, it does not affect its property.

Order Example — Part Number: PSHLH8

Days to Ship — 6 Days P.87

Example



Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Urethane Pushers · Silicon Pushers

-Female Thread Type - Male Thread Type-

CAD Data

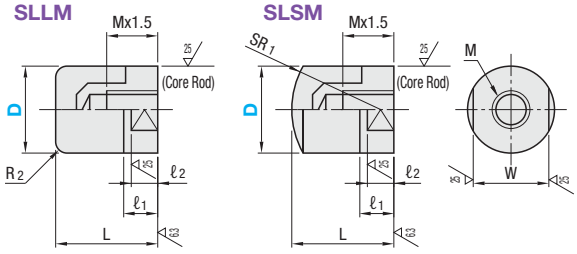
■Female Thread Type

RoHS



Flat Type
URLH
URLM
URLL
SLLM

Round Type
URSH
URSM
URSL
SLSM



For properties of urethane rubber and silicon rubber, refer to P.358

Type	Core Rod	Pushers	
	M Material	M Material	H Hardness
URLH	1.4301/ X5CrNi18-10	Ether Type Polyurethane	Shore A90
URLM		Ester Polyurethane	Shore A70
URLL			Shore A50
SLLM		Silicon Rubber	Shore A70
URSH	1.4301/ X5CrNi18-10	Ether Type Polyurethane	Shore A90
URSM		Ester Polyurethane	Shore A70
URSL			Shore A50
SLSM		Silicon Rubber	Shore A70

Part Number Type	D	L	MxPitch	SR1	R2	ℓ1	ℓ2	W	€ Unit Price URLH URSH	€ Unit Price URLM · URLL URSM · URSL	€ Unit Price SLLM SLSM
Flat Type: URLH URLM URLL SLLM / Round: URSH URSM URSL SLSM	8	12	M3x0.5	8	1	5	4	7			
	10	15	M4x0.7	10				8			
	12	16	M5x0.8	12	2			10			
	16	20	M6x1.0	16		6	5	14			
	20	25	M8x1.25	20	3	8	6	17			
	25	30	M10x1.5	25		10	8	22			
	25A		M10x1.25								
	30	35	M12x1.75	30				27			
	32	37	M14x1.5	32				30			
	36	45	M18x1.5	36	3.5	12	10	32			
	40	50	M20x1.5	40		14	12	36			
	40A		M22x1.5								

Pitches of D Dimension 25A are fine threaded. The thread of D dimension 40A are M22x1.5. Urethane rubber and silicon rubber are thermally bonded to the core rod.
Urethane may discolor over time but there is no effect on properties.

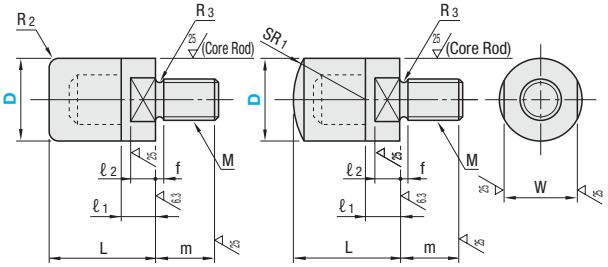
■Male Thread Type

RoHS



Flat Type
USLH
USLM
USLL
SSLM

Round Type
USSH
USSM
USSL
SSSM



For properties of urethane rubber and silicon rubber, refer to P.358

Type	Core Rod	Pushers	
	M Material	M Material	H Hardness
USLH	1.4301/ X5CrNi18-10	Ether Type Polyurethane	Shore A90
USLM		Ester Polyurethane	Shore A70
USLL			Shore A50
SSLM		Silicon Rubber	Shore A70
USSH	1.4301/ X5CrNi18-10	Ether Type Polyurethane	Shore A90
USSM		Ester Polyurethane	Shore A70
USSL			Shore A50
SSSM		Silicon Rubber	Shore A70

Part Number Type	D	L	MxPitch (Coarse Thread)	SR1	R2	m	ℓ1	ℓ2	f	R3 Max.	W	€ Unit Price USLH USSH	€ Unit Price USLM · USLL USSM · USSL	€ Unit Price SSLM SSSM
Flat Type: USLH USLM USLL SSLM / Round Type: USSH USSM USSL SSSM	6	10	M3x0.5	6	1	4.5	5	4	1	0.3	5			
	8	12	M4x0.7	8		6				0.5	7			
	10	15	M5x0.8	10		7					8			
	12	16	M6x1.0	12	2	10			1.5	0.75	10			
	16	20	M8x1.25	16		12	6	5	2	1	14			
	20	25	M10x1.5	20	3	14	8	6			17			
	25	30	M16x2.0	25		18	10	8	3		22			
	32	37	M20x2.5	32		22			3.5		30			
	36	45	M22x2.5	36	3.5	24	12	10			32			

Urethane may discolor over time but there is no effect on properties. Urethane rubber and silicon rubber are thermally bonded to the core rod.

Order Example

Part Number
URLM10
USLM12

Days to Ship

6 Days
2 Days

P.87

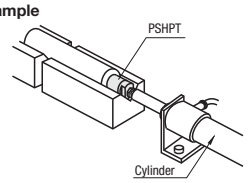
Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Example

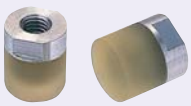


Small Diameter Pushers
-Female Thread Type - Male Thread Type

CAD Data

Features: Pushers suitable for space saving with small D dimension (outer diameter). Small diameter alleviates the burden on the cylinder rod.

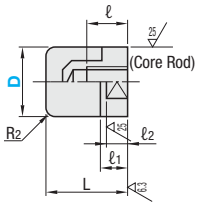
RoHS



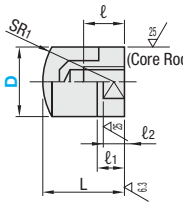
Type		Pushers		Core Rod
Flat	Round	Material	Hardness	Material
PSHEH	RSHEH	Ether-based Polyurethane	Shore A90	1.4301/ X5CrNi18-10
PSHES	RSHES	Ester Polyurethane	Shore A70	

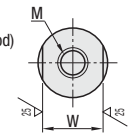
For urethane rubber properties, refer to **P.358**

Flat Type



Round Type





Part Number Type		D	L	MxPitch	SR1	R2	ℓ	ℓ1	ℓ2	W	€ Unit Price PSHEH RSHEH	€ Unit Price PSHES RSHES
Flat Type	Round Type	6	10	M3x0.5	6	1	3.5	5	4	5		
		8	12	M4x0.7	8		5			7		
PSHEH	RSHEH	10	15	M5x0.8	10		6.5			8		
PSHES	RSHES	12	16	M6x1.0	12	2	7			10		
		16	20	M8x1.25	16		10	6	5	14		

Urethane may discolor over time but there is no effect on properties. Urethane rubber is thermally bonded to the core rod.

Male Thread Type

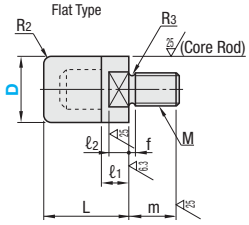


RoHS

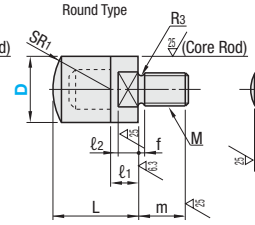
Type		Pushers		Core Rod
Flat	Round	Material	Hardness	Material
PSHEMH	RSHEMH	Ether-based Polyurethane	Shore A90	1.4301/ X5CrNi18-10
PSHEMS	RSHEMS	Ester Polyurethane	Shore A70	

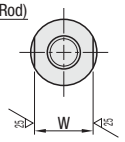
For urethane rubber properties, refer to **P.358**

Flat Type



Round Type





Part Number Type		D	L	MxPitch	SR1	R2	m	ℓ1	ℓ2	f	R3 Max.	W	€ Unit Price PSHEMH RSHEMH	€ Unit Price PSHEMS RSHEMS
Flat Type	Round Type	8	12	M5x0.8	8	1	6	5	4	1.3	0.3	7		
		10	15	M6x1.0	10		7			1.5	0.5	8		
PSHEMH	RSHEMH	12	16	M8x1.25	12	2	10			2		10		
PSHEMS	RSHEMS	16	20	M10x1.5	16		12	6	5	2	0.75	14		

Urethane may discolor over time but there is no effect on properties. Urethane rubber is thermally bonded to the core rod.

Order Example

Part Number
PSHEH16
RSHEMS12

Days to Ship: **6 Days** P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~29
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

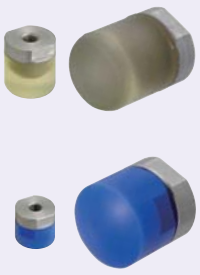
Large Diameter Pusher

-Female Thread Type - Male Thread Type-

CAD Data

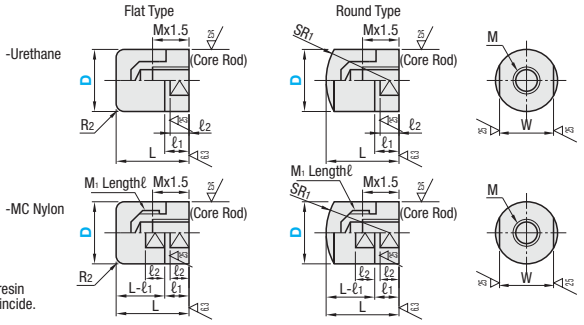
Features: Work contact area is larger by enlarging D dimension (outer diameter). For MC Nylon Type, resin for replacement is provided.

Female Thread Type



	Type		Pushers		Core Rod
	Flat	Round	M Material	H Hardness	M Material
Set	PSHDH	RSHDH	Ether Polyurethane	Shore A90	1.4301/ X5CrNi18-10
	PSHDS	RSHDS	Ester Polyurethane	Shore A70	
	PSHDMC	RSHDMC	MC Nylon	-	
Replacement Resin	MCDKK	MCRDKK	MC Nylon	-	-

For urethane rubber properties, refer to **P.358**
For MC nylon properties, refer to **P.858**



Tap depth for resin for replacement is ℓ.
Positions of the flats on resin and core rod may not coincide.

Part Number Type	D	L	MxPitch	M1xPitch	ℓ	SR1	R2	ℓ1	ℓ2	W	€ Unit Price PSHDH RSHDH	PSHDS RSHDS	PSHDMC RSHDMC	MCDKK MCRDKK
Set Flat Round PSHDH RSHDH PSHDS RSHDS PSHDMC RSHDMC	10	15	M3x0.5	M5x0.8	4.5	10	1	5	4	8				
	12	16	M4x0.7	M6x1.0	7	12	2			10				
	16	20	M5x0.8	M8x1.25		16		6	5	14				
	20	25	M6x1.0	M10x1.5	8	20	3	8	6	17				
Replacement Resin Flat Round MCDKK MCRDKK	25	30	M8x1.25	M12x1.75	10	25		10	8	22				
	30	35	M10x1.5	M16x2.0	14	30				27				
	36	45	M12x1.75		16	36	3.5	12	10	32				

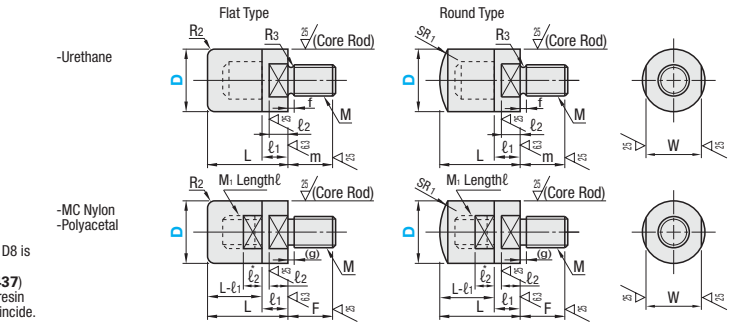
Urethane may discolor over time but there is no effect on properties. Urethane rubber is thermally bonded to the core rod.

Male Thread Type



	Type		Pushers		Core Rod
	Flat	Round	M Material	H Hardness	M Material
Set	PSHDMH	RSHDMH	Ether Polyurethane	Shore A90	1.4301/ X5CrNi18-10
	PSHDMS	RSHDMS	Ester Polyurethane	Shore A70	
	PSHDMMC	RSHDMMC	MC Nylon	-	
	PSHDMPA	-	Polyacetal	-	
Replacement Resin	MCDKK	MCRDKK	MC Nylon	-	-

For urethane rubber properties, refer to **P.358**
For properties of MC nylon and polyacetal, refer to **P.858**



Tap depth for resin for replacement is ℓ.
* ℓ2 (resin with flats) for D8 is the entire part of L--ℓ1. (For details, refer to **P.1437**)
Positions of the flats on resin and core rod may not coincide.

Part Number Type	D	L	MxPitch (Coarse Thread)	Material: Resin M1xPitch (Coarse Thread)	ℓ	F	(g)	SR1	R2	M	ℓ1	ℓ2	F	R3 Max.	W	€ Unit Price PSHDMH RSHDMH	PSHDMS RSHDMS	PSHDMMC RSHDMMC	MCDKK MCRDKK	PSHDMPA
Set Flat Round PSHDMH RSHDMH PSHDMS RSHDMS PSHDMMC RSHDMMC PSHDMPA	8	12	M3x0.5	M3x0.5	3	5	1.5	8	1	6	5	4	1	0.3	7					
	10	15	M4x0.7	M5x0.8	4.5	6		10		7				0.5	8					
	12	16	M5x0.8	M6x1.0	7	7	2	12	2	10			1.5		10					
	16	20	M6x1.0	M8x1.25		10		16		12	6	5	2	0.75	14					
Replacement Resin Flat Round MCDKK MCRDKK	20	25	M8x1.25	M10x1.5	8	12	2.5	20	3	14	8	6		1	17					
	25	30	M10x1.5	M12x1.75	10	14		25		18	10	8	3		22					
	30	35	M16x2.0	M16x2.0	14	18	3.5	30		20			3.5		27					

Urethane may discolor over time but there is no effect on properties. Urethane rubber is thermally bonded to the core rod.

Order Example

Part Number
PSHDH20
MCRDKK30
RSHDMS16

Days to Ship: 6 Days — P.87

Price

Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~19	20~49
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Bushing Part Area Comparison

Standard Pushers (P.1439) D	Bushing Part Area	Large Diameter Pusher D	Bushing Part Area	Increase D	Increase Bushing Part Area
6	28	8	50	2	78%
8	50	10	79	2	56%
10	79	12	113	2	44%
12	113	16	201	4	78%

Formula : $(D/2)^2 \times 3.14$

Standard Pushers (P.1439) D	Bushing Part Area	Large Diameter Pusher D	Bushing Part Area	Increase D	Increase Bushing Part Area
16	201	20	314	4	56%
20	314	25	491	5	56%
25	491	30	707	5	44%
30	707	36	1,017	6	44%

Resin Pushers

- L Dimension Fixed Type · Shape Selectable · L Dimension Configurable Type-

CAD Data

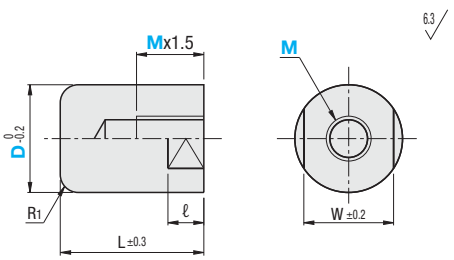
■L Dimension Fixed Type



RoHS

Type	Material	Color	Thread
JPHJ	Polyacetal	White	Thread Insert (1.4301/ X5CrNi18-10)
JPHM	MC Nylon Conductive CDR2	Black	
JPHMC	MC Nylon	Blue	

For properties of MC nylon and polyacetal, refer to **P.858**



Part Number Type	D	M Selection	L	R1	ℓ	W	€ Unit Price JPHJ	JPHM	JPHMC
JPHJ JPHM JPHMC	8	3 4	12	1	8	7			
	10	3 4 5	15			8			
	12	4 5 6	16	2	10	10			
	15	5 6 8S 8	20			14			
	16	6 8S 8							
	18	6 8S 8 10S 10 12S 12	25	3		17			
	20	8S 8 10S 10 12S 12 12M							
	30	10S 10 12S 12 12M 14S 18S	35		15	27			
	40	10S 10 12S 12 12M 14S 18S	45		20	37			

8S, 10S, 12, 12S, 14S and 18S are fine thread pitch. For thread details, refer to information in the lower right corner. 12M is course thread pitch.

Order Example: Part Number JPHJ10 - M 4

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Shape Selectable, L Dimension Configurable Type

RoHS

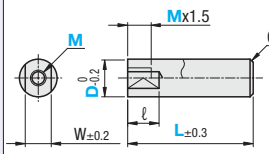


Type	Material	Color	Thread
JPFJ	Polyacetal	White	Thread Insert (1.4301/ X5CrNi18-10)
JPFM	MC Nylon Conductive CDR2	Black	
JPFMC	MC Nylon	Blue	
JPFP	PEEK	Gray	

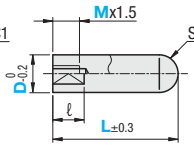
For properties of MC nylon, polyacetal and PEEK, refer to **P.858**

6.3

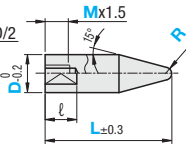
Shape F (Flat Type)



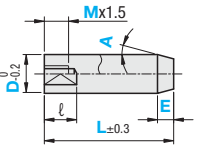
Shape R (Spherical Type)



Shape Q (Tapered R Type)



Shape T (Tapered Type)



D−2E tan A 1.0 (Tip diameter Ø1.0 or more)

Part Number Type	Shape	D	L Specify in 1mm Increment	M Selection	Only Tapered Type E 0.5mm Increment	Only Tapered Type A 1° Increment	R	ℓ	W
JPFJ (Polyacetal)	F R Q* T	6	10 (17)~50	3	5.0≤E E≤Mx3	1~45°	1	8	5
		8	12 (19)~50	3 4			1.5		7
JPFM (MC Nylon Conductive CDR2)		10	15 (22)~50	3 4 5			2		8
		12	16 (27)~100	4 5 6				10	10
		15	20 (35)~100	5 6 8S 8					14
JPFMC (MC Nylon)		16		6 8S 8					
		18	25 (40)~100	6 8S 8 10S 10					17
		20		8S 8 10S 10 12S 12 12M					
JPFP (PEEK)		30	35 (63)~100	10S 10 12S 12 12M 14S 18S			3	15	27
		40	45 (87)~100	10S 10 12S 12 12M 14S 18S				20	37

Dimensions in ( ) are the minimum L dimensions when shape Q is selected. 8S, 10S, 12, 12S, 14S and 18S are fine thread pitch. For thread details, refer to information in the lower right corner. 12M is course thread pitch.

Order Example

Part Number: Type | Shape | D - L - M - E - A

JPFJ R 12 - 40 - 6

JPFMC T 12 - 35 - 5 - E8 - A15

Days to Ship: 8 Days

<Price Calculation Example>
JPFJR12-40-6
11,40+3,00=14,40

Price

■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

D	€ Unit Price L Min. ~59 JPFJ	JPFM	JPFMC	JPFP	L60~100 JPFJ	JPFM	JPFMC	JPFP	Machining Charge (Body+) FShape	RShape	QShape	TShape
6												
8												
10												
12												
15												
16												
18												
20												
30												
40												

- Thread

M	MxPitch
3	M3x0.5
4	M4x0.7
5	M5x0.8
6	M6x1.0
8S	M8x1.0
8	M8x1.25
10S	M10x1.25
10	M10x1.5
12S	M12x1.25
12	M12x1.5
12M	M12x1.75
14S	M14x1.5
18S	M18x1.5

Metal Pushers · Urethane Caps

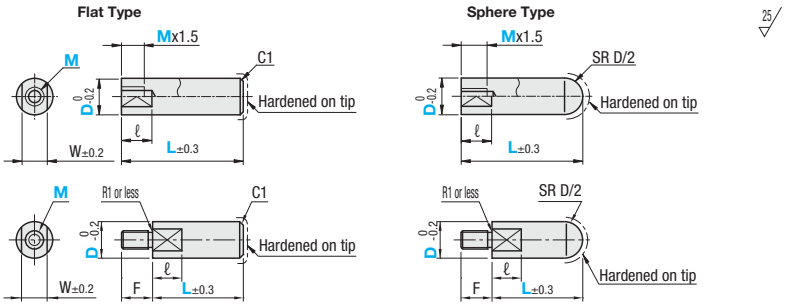
CAD Data

Metal Pushers

RoHS



Type				M Material	S Surface Treatment	H Hardness
Flat Type		Spherical Type				
Female Thread	Male Thread	Female Thread	Male Thread			
KPHF	KPMF	KPHR	KPMR	1.1191/C45E	Black Oxide	Induction Hardening and Tempered HRC45~50
KPHFS	-	KPHRS	-	1.4031/X38Cr13	-	



Female Thread Type

KPHFS and KPHRS (1.4031/X38Cr13) may discolor due to Hardening.

Part Number Type	D	L 1mm Increment Flat Type	L 1mm Increment Spherical Type	M Selection	ℓ	W	€ Unit Price KPHF	KPHFS	KPHR	KPHRS
Flat Type KPHF KPHFS	6	15~50	17~50	3	8	5				
	8	17~50	20~50	3 4		7				
	10	19~50	23~50	3 4 5		8				
	12	21~100	26~100	4 5 6	10	10				
Spherical Type KPHR KPHRS	15	23~100	30~100	5 6 8S 8		14				
	16									
	18	26~100	34~100	6 8S 8 10S 10 12S 12 12M		17				
	20	28~100	37~100	8S 8 10S 10 12S 12 12M						
	30	36~100	50~100	10S 10 12S 12 12M 14S 18S	15	27				
	40	41~150	60~100	10S 10 12S 12 12M 14S 18S	20	37				

Mx2.5+5≤L is required for Female Thread Type. 8S · 10S · 12 · 12S · 14S and 18S are fine thread pitch. For thread details, refer to information in the lower right corner of the next page. 12M is course thread pitch.

- Thread

M	MxPitch	F
3	M3x0.5	5.5
4	M4x0.7	6.5
5	M5x0.8	
6	M6x1.0	11
8S	M8x1.0	12
8	M8x1.25	
10S	M10x1.25	14
10	M10x1.5	
12S	M12x1.25	16
12	M12x1.5	
12M	M12x1.75	
14S	M14x1.5	18
16	M16x2.0	20
18	M18x2.5	22
18S	M18x1.5	
20	M20x2.5	25

Male Thread Stud Type

Part Number Type	D	L 1mm Increment Flat Type	L 1mm Increment Spherical Type	M Selection	ℓ	W	€ Unit Price KPMF	KPMR
Flat Type KPMF	6	15~50	17~50	3 4 5	8	5		
	8	17~50	20~50	4 5 6		7		
	10	19~50	23~50	5 6 8S 8		8		
	12	21~100	26~100	6 8S 8 10S 10	10	10		
Spherical Type KPMR	15	23~100	30~100	8S 8 10S 10 12S 12 12M		14		
	16			8S 8 10S 10 12S 12 12M				
	18	26~100	34~100	10S 10 12S 12 12M 16		17		
	20	28~100	37~100	10S 10 12S 12 12M 16				
	25	36~100	55~100	16 18 20	15	22		
	30			16 18 20		27		

8S, 10S, 12, 12S are fine thread pitch. For thread details, refer to information in the lower right corner of the next page. 12M is course thread pitch.

Order Example

Part Number	-	L	-	M
KPHF10	-	20	-	5
KPMF18	-	40	-	12S

Days to Ship 8 Days

Price euros

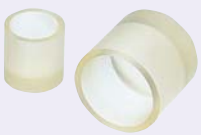
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

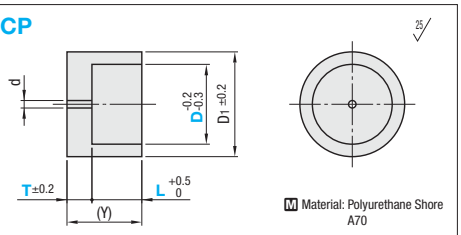
For orders larger than indicated quantity, please request a quotation.

Urethane Caps

RoHS



URCP



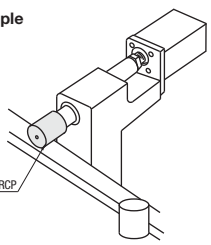
For urethane rubber properties, refer to P.358

Part Number Type	D	T Selection	L Selection	D1	d	(Y)	€ Unit Price
URCP	3	3	5 8	8	1	Y=T+L	
	4		5 10				
	5	3 5	10 15	12			
	6						
	8			15			
	10		15 20				
	12	5 7		20			
	13				1.5		
	16						
	20			25			
	25	7 10	20 25	30			
	30			35			
	35	10	20 25	40			

Urethane may discolor over time but there is no effect on properties.

The Urethane Cap hole diameter is designed to fit the tolerances of MISUMI Linear Shafts.

Example



Order Example

Part Number	-	T	-	L
URCP6	-	5	-	10

Days to Ship 6 Days P.87

Price euros

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49
Discount Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Pushers for Air Leak Inspection

-Air In Type, Hole Blocking Type, O-Ring Type-

CAD Data

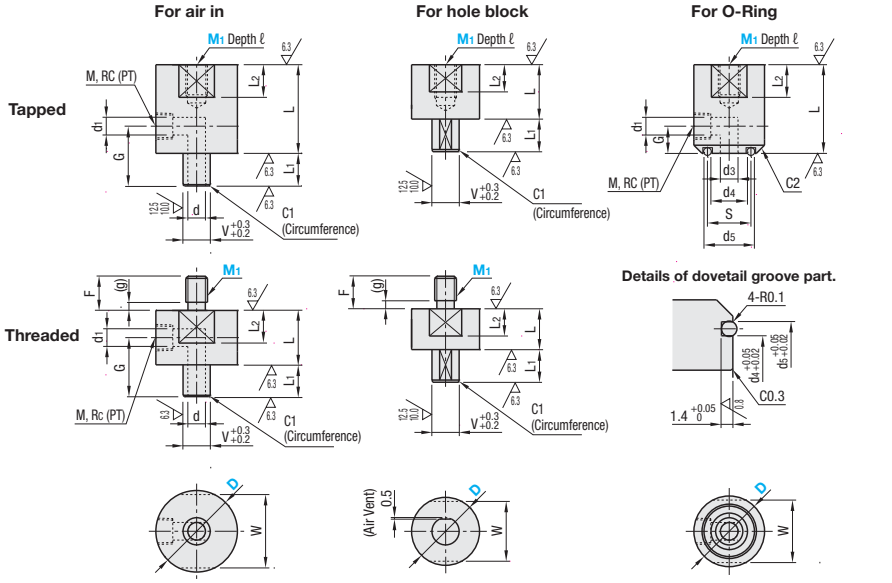
For inspection tips, refer to P.375

RoHS



Shape	Type		Material	Accessory
	Female Thread	Male Thread		
Air Injection	PSHAA	PSHMAA	1.4301/ X5CrNi18-10	-
Hole Blocking	PSHAB	PSHMAB		
O-Ring	PSHAR	-		O-Ring (NPA P.1309)

Thread for air in	d	d_1	V	L_1
M5	5	4.2	8	10
1/8	6.5	6.5	10	12
1/4	9.2	9.2	14	15



Confirm with the material list on the right for d, d_1, V and L_1.

Air Inject Type

Part Number Type	D	Nominal (Air inject)	M_1 Selection	Nominal Thread Size M or Rc	L Female Thread	L Male Thread	L_2	G	W	Applicable Tip D	Applicable Tip V	€ Unit Price PSHAA	€ Unit Price PSHMAA
Female Thread PSHAA	15	M5	M5 M6	M5-0.8	26	13	8	16.5	13	15	8		
	20	M5	M5 M6 M8	M5-0.8	29		10		18	20	8		
		1		Rc1/8	33	18		21			10		
	25	M5		M5-0.8	29	13		16.5	22	25	8		
		1		Rc1/8	33	18		21			10		
		2		Rc1/4	36	22		26			14		
Male Thread PSHMAA	30	M5	M6 M8 M10	M5-0.8	34	15	12	17.5	27	30	8		
		1		Rc1/8	37	20		22			10		
		2		Rc1/4	41	25		27.5			14		
	40	M5		M5-0.8	37	20		20	36	40	8		
		1		Rc1/8	41	25		24.5			10		
		2		Rc1/4	45	30		30			14		

The mating side (tip parts for air leak inspection P.375) of Air In Type, use D and V together. Refer to the bottom right table for details of M1 part.

Hole Blocking Type

Part Number Type	D	M_1 Selection	L Female Thread	L Male Thread	L_1	L_2	V	W	€ Unit Price PSHAB	€ Unit Price PSHMAB
Female Thread PSHAB	15	M5 M6	18	13	10	8	8	13		
	20	M5 M6 M8	20	15	12	10	10	18		
Male Thread PSHMAB	25							22		
	30	M6 M8 M10	24	18	15	12	14	27		
	40		26					36		

The mating side (tip parts for air leak inspection P.375) of Hole Blocking Type, use D and V together.

Details of M1 Part

M1-Pitch	ℓ	F	(g)
M5-0.8	8	8	1.5
M6-1.0	10	10	2
M8-1.25	12	12	2.5
M10-1.5	15	14	

O-Ring Type

Part Number Type	D	Nominal (Air inject)	M_1 Selection	Nominal Thread Size M or Rc	L	L_2	G	d_3	d_4	d_5	S	W	Applicable O-Ring	€ Unit Price PSHAR
Female Thread PSHAR	15	M5	M5 M6	M5-0.8	28	8	8.5	3	5.75	9.61	7.7	13	P6	
	18	M5	M5 M6 M8	M5-0.8	31	10	11	4	7.77	11.62	9.7	16	P8	
		1		Rc1/8	35									
	20	M5		M5-0.8	31		8.5	6.5	9.8	13.65	11.7	17	P10	
		1		Rc1/8	35		11							
		2		Rc1/4	40		13							

Use NPA on P.1309 as the mating part for O-Ring Type. When using other materials, there will be tolerance difference and mating could be weak. Refer to the upper right table for details of M_1 part.

Order Example

Part Number	-	Nominal	-	M_1
PSHAA20	-	1	-	M5
PSHMAB30			-	M8
PSHAR18	-	1	-	M5

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Coupling Rods for Air Cylinders · Thread Conversion Adapters

-L Dimension Selectable · L Dimension Configurable · L and F Dimension Configurable Type-

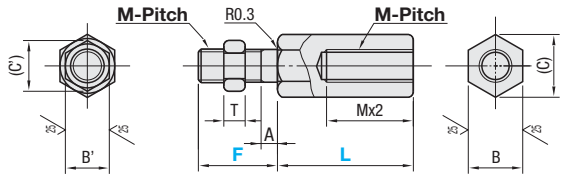
CAD Data

Coupling Rod for Air Cylinders

RoHS



Type			Material	Surface Treatment	Accessory	
L Selectable	L Dimension Configurable	L · F Dimension Configurable			Material	Surface Treatment
FJEBC	FJEB	FJEBF	1.1191/C45E	Black Oxide	1.0038/S235JR	Trivalent Chromate
FJERC	FJER	FJERF		Electroless Nickel Plating		
FJESC	FJES	-	1.4301/X5CrNi18-10	-	1.4301/X5CrNi18-10	-



6.3 (25)

For L Dimension Configurable Type, surface treatment is not added to the female thread side.

Part Number Type	M-Pitch	L Selectable	L Configurable (1mm Increment)	F Select-able	F Configurable (1mm Increment)	A	B	(C)	Included Nuts B'	(C')	T	Quan-tity	€ Unit Price FJEBC	FJERC	FJESC	FJEB	FJER	FJES	FJEBF	FJERF
L Selectable Type FJEBC FJERC FJESC	3-0.5	20 25 30 35 40 50 75 100	20~100	17.5	10~15	2.5	6	6.9	5.5	6.4	2.4	2 pcs.								
	4-0.7				12~20		8	9.2	7	8.1	3.2									
	5-0.8				14~20				8	9.2	4									
	6-1.0		24~100		14~30		10	11.5	10	11.5	5	1 pc.								
L Dimension Configurable FJEB FJER FJES	8-1.0	*30 35 40 50 75 100 150 200	32~200	18	14~40		14 (13)	16.2 (15)	13	15										
	8-1.25																			
	10-1.25*																			
	10-1.5*		40~200	22	14~50		17	19.6	17	19.6	6									
L, F Dimension Configurable FJEBF FJERF	12-1.25	*40 50 75 100 150 200	48~200	24	16~60	3	21 (19)	24.2 (21.9)	19	21.9	7									
	12-1.5																			
	14-1.5*		56~200		17~70		23 (22)	26.6 (25.4)	22	25.4	8									
	18-1.5*		72~200	30	25~80		26 (27)	30 (31.2)	27	31.2	15									
FJEBC · FJEB Dimensions in ( ) are for FJESC and FJES.	20-1.5	75 100 150 200	80~200	35	30~80	5	30	34.6	30	34.6	16									
	22-1.5			40			32	37	32	37	18									

* For M Pitch 10-1.25(M10-1.5) - L=30, M Pitch 14-1.5 - L=40 and M18-1.5 - L=40, the effective thread length of Tap is M x 1.5.

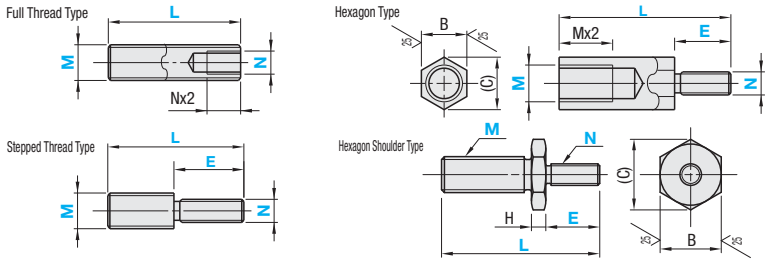
Thread Conversion Adapters

RoHS



Type				Material	Surface Treatment
Full Thread	Stepped Thread	Hexagon	Hexagon Shoulder		
SAA	SAB	SAC	SAD	1.1191/C45E	Black Oxide
SAAM	SABM	SACM	SADM		Electroless Nickel Plating
SAAS	SABS	SACS	SADS	1.4301/X5CrNi18-10	-

6.3 (25)

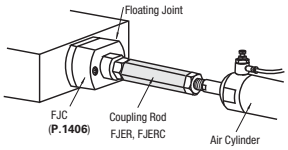


Part Number Type	M Coarse Thread	M Fine Thread	L 1mm Increment	N (Coarse Thread) NS (Fine Thread)	E 1mm Increment	H	B	(C)
SAA	5	-	20~100	*3 *(4)	5~16	3	8	9.2
SAB	6	-	20~100	*3 *4 *(5)	6~20		10	11.5
SAC	8	8S	30~150	*4 *5 *(6)	8~24		13	15
SAD	10	10S	30~150	*5 *(6) (8)	10~32	4	17	19.6
SAAM	12	12S	40~200	*6 8 (10)	12~40	5	19	21.9
SABM	14	14S	40~200	*6 8 (10) (12)	14~48	6	22	25.4
SACM	16	16S	40~200	8 10 (12) (14)	16~56	7	24	27.7
SADM	18	18S	50~200	10 12 (14) (16)	18~64	8	27	31.2
SAAS	20	20S	50~200	10 12 14 (16) (18)	20~72	10	30	34.6
SABS								
SACS								
SADS								

The circled numbers in the N column (Coarse) are not available for SAA, SAAM and SAAS. * marked dimensions are applicable for Coarse Thread only.

For SAA, SAAM and SAAS, L≥Nx4 For SAB, SABM and SABS, L≥Mx2+EFor SAC, SACM and SACS, L≥Mx4+EFor SAD, SADM and SADS, M+H+N (NS)≤L≤Mx4+H+N (NS)x4

Example



Part Number	-	L	-	N	-	E	-	F
FJERC10-1.5	-	30						
FJEBF14-1.5	-	100					-	50
SAB16 (Coarse Thread)	-	50	-	NS10 (Fine)	-	E20		

8 Days

Express A 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Alterations

Part Number	-	L	-	N	-	E	-	(MWC · NWC)
SABS14	-	100	-	N6	-	E18	-	NWC

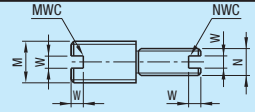
Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

M Coarse Thread	M Fine Thread	€ Unit Price SAA	SAB	SAC	SAD	SAAM	SABM	SACM	SADM	SAAS	SABS	SACS	SADS
5	-												
6	-												
8	8S												
10	10S												
12	12S												
14	14S												
16	16S												
18	18S												
20	20S												

Thread Coarse Thread M-Pitch	Fine Thread M-Pitch
3-0.5	-
4-0.7	
5-0.8	
6-1.0	
8-1.25	8-1.0
10-1.5	10-1.25
12-1.75	12-1.25
14-2.0	14-1.5
16-2.0	16-1.5
18-2.5	18-1.5
20-2.5	20-1.5

Alterations	Slitting
	
Code	MWC · NWC
Spec.	Ordering Code MWC · NWC For W dimensions, refer to the right table. Applicable to SAA, SAAM, SAAS, SAB, SABM and SABS.
Price Adder	MWC 2,00 · NWC 2,00

M or N	W
3	0.6
4 or 5	1
6 · 8	1.5
10	2
12 · 14 · 16	2.5
18 · 20	3

Spherical Bearings · Spherical Bearing Holder Sets
-Standard Type-

Price Reduction 2% in Average

CAD Data

■Oil Free Type is available on our website.

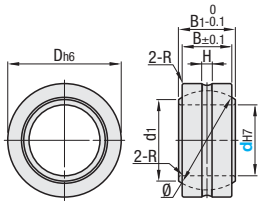
■Spherical Bearing



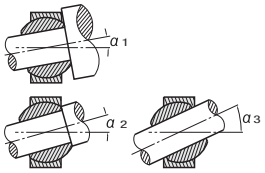
RoHS

	Type	Material		
		Holder	Spherical Inner Ring	Bushing
Standard Type	RBPB	1.1181/C35E	* 1.3505/100Cr6 (58HRC~)	Special Copper Alloy

* Hard Chrome Plating



■Allowable Incline



Shaft Step Shape	Shaft Condition	Allowable Incline Angle
Large	Stepped part of the shaft contacts the outer circumference of the holder.	Small (α1)
Medium	Stepped part of the shaft contacts the side or the inner circumference of the holder.	Middle (α2)
No	Shaft contacts the inner circumference of the holder.	Large (α3)

Part Number Type	d	D	B	B1	d1	H	R	Ball Dia. Ø (mm)	Allowable Incline Angle α1°	α2°	α3°	Static Load Capacity Radial Cs (kN)	Mass (g)	€ Unit Price Qty. 1~9	Volume Discount 10~29
RBPB	5	16	6	8	7.7	1	0.3	11.112	8	13	30	7.84	8.5		
	6	18	6.75	9	9			12.7				9.8	13		
	8	22	9	12	10.4		0.5	15.875		14	25	16.7	24		
	10	26	10.5	14	12.9	1.2		19.05	8			23.5	39		
	12	30	12	16	15.4	1.5		22.225		13		31.4	58		
	14	34	13.5	19	16.9		0.7	25.4	10	16	24	40.2	84		
	16	38	15	21	19.4	2.5		28.575	9			50	111		
	18	42	16.5	23	21.9			31.75		15		61.8	160		
	20	46	18	25	24.4			34.925				73.5	210		
	22	50	20	28	25.8			38.1	10		23	88.2	265		
	25	56	22	31	29.6	3	0.8	42.862	9			111	390		
	30	66	25	37	34.8			50.8	10	17		148	610		

Part Number RBPB14

Days to Ship: 8 Days — Express A: 3,00 EUR/piece P.88

For orders larger than indicated quantity, please request a quotation.

A Express Charge of 8,10 EUR for 3 or more identical pieces.

■Shaft Fitting

Usage Condition		Shaft	Housing
Inner Wheel Rotary Load	Normal Load	m6	H7
	Non-directional Load	n6	
Outer Wheel Rotary Load	Normal Load	h7	M7
	Non-directional Load	k6	

■Clearance

	Standard Type
Radial Direction Clearance	0.035mm or Less
Axial Clearance	0.1mm or Less

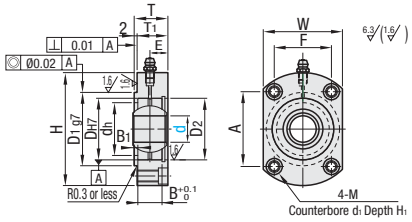
■Spherical Bearing Holder Sets



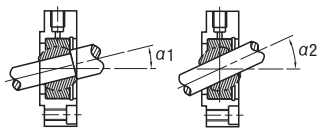
RoHS

Type		Material: Spherical Bearings Holder	Spherical Inner Ring	Bushing	Material: Holder	Surface Treatment: Holder	Accessory: Retaining Ring
Standard Type	RBPBCB	1.1181/C35E	* 1.3505/100Cr6 (58HRC~)	Special Copper Alloy	1.1191/C45E	Black Oxide	1.4301/X5CrNi18-10
	RBPBCM					Electroless Nickel Plating	

* Hard Chrome Plating



■Allowable Incline



Part Number Type	d	DH7	B	B1	H	W	T	T1	E	dh	D1	Tolerance	D2	A	F	M (Coarse) (d2)	d1	H1	RBPBCB € Unit Price Qty. 1~9	RBPBCB Volume Discount 10~19	RBPBCM € Unit Price Qty. 1~9	RBPBCM Volume Discount 10~19
RBPBCB RBPBCM	5	16	6	4	38	25	13	11	6	12	20	−0.007 −0.028	16	24	15	M5 (4.3)	8	5				
	6	18	6.75	3.25	40	28			6.38	14	23		18	26	17							
	8	22	9	2	45	31	14	12	7.5	18	27		22	29	19							
	10	26	10.5	2.5	50	36	16	14	8.25	22	32	−0.009 −0.034	26	31	25							
	12	30	12	3	54	40	18	16	9	24	36		30	34	28							
	14	34	13.5	2.5	63	45	20	18	10.75	28	41		34	40	31	M6 (5.2)	9.5	6				
	16	38	15	2	70	50	21	19	11.5	35	46		38	43	37	M8 (6.8)	11	7				
	18	42	16.5	2.5	77	54	23	21	12.25	36	50		42	51	39							
	20	46	18	2	87	57	24	22	13	40	53	−0.01 −0.04	47	58	39	M10 (8.5)	14	9				
	22	50	20		92	62	27	25	15	43	58		50	60	44							
	25	56	22		97	67	29	27	16	49	63		56	63	49							
	30	66	25		112	80	33	31	18.5	58	76		68	70	62							

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number RBPBCB12 RBPBCM5

Days to Ship: 8 Days

■Specifications for Spherical Bearing Holder Set

d	Ball Dia. Ø (mm)	Allowable Incline Angle α1°	α2°	Static Load Capacity Radial Cs (kN) Standard	Mass (g)
5	11.112	13°	30°	7.84	8.5
6	12.7		29°	9.8	13
8	15.875	14°	25°	16.7	24
10	19.05	13°	24°	23.5	39
12	22.225			31.4	58
14	25.4	16°		40.2	84
16	28.575	15°		50	111
18	31.75			61.8	160
20	34.925	14°		73.5	210
22	38.1	15°	23°	88.2	265
25	42.862	9°		111	390
30	50.8	17°	24°	148	610

Shaft Step Shape	Shaft Condition	Allowable Incline Angle
Medium	Stepped part of the shaft contacts the side or the inner circumference of the holder.	Medium (α1)
No	Shaft contacts the inner circumference of the holder.	Large (α2)

■Shaft Fitting

Usage Condition		Shaft	Housing
Inner Wheel Rotary Load	Normal Load	m6	H7
	Non-directional Load	n6	
Outer Wheel Rotary Load	Normal Load	h7	M7
	Non-directional Load	k6	

■Clearance

	Standard Type
Radial Direction Clearance	0.035mm or Less
Axial Clearance	0.1mm or Less

Rod End Bearings
-Standard Type-

Spec.Change Printed in Purple

Price Reduction Up to 34%

CAD Data

■Aluminum Oil Free Type is available on our website.



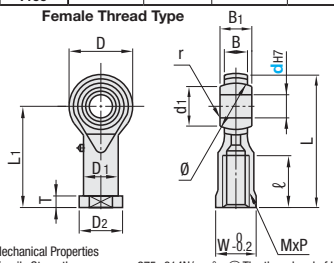
RoHS

Type		Standard Type: Female Thread Type: Right-Hand Thread	Standard Type: Female Thread Type: Left Hand Thread	Standard Type: Male Thread Stud Type: Right-Hand Thread	Standard Type: Male Thread Stud Type: Left Hand Thread	L Dimension Short Type: Female Thread Type: Right-Hand Thread	L Dimension Short Type: Female Thread Type: Left Hand Thread	L Dimension Short Type: Male Thread Stud Type: Right-Hand Thread	L Dimension Short Type: Male Thread Stud Type: Left Hand Thread
(1)	Steel	PHSC	PHSCL	PHSO	PHSOL	PHSCN	PHSCLN	PHSON	PHSOLN
(2)	Oil Free	PHSCM	PHSCLM	PHSOM	PHSOLM	PHSCMN	PHSCLMN	PHSOMN	-
(3)	Stainless Steel Oil Free	PHSS	PHSSL	PHSOS	PHSOSL	PHSSN	PHSSLN	PHSOSN	-

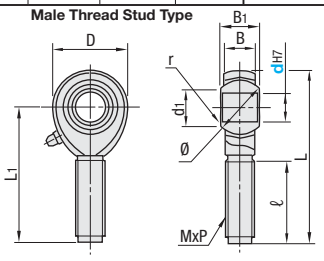
Material: Holder	Material: Spherical Inner Ring	Material: Bushing (Liner)
1.1181 (Trivalent Chromate)	* 1.3505 (58HRC~)	Special Copper Alloy
d3 and d4: 1.1181 (Trivalent Chromate)		Self-lubricating Synthetic Resin
Other than the above	1.3505 (58HRC~)	Polytetrafluoro-ethylene
1.4305/X10CrNiS18-9	1.4125 (58HRC~)	Polytetrafluoro-ethylene

* Hard Chrome Plating

Female Thread Type



Male Thread Stud Type



·Mechanical Properties
- Tensile Strength 275~314N/mm²
- Tensile Proof Strength (0.2%) 216~245N/mm²

(T)The thread end of L Dimension Short Type has no surface treatment.
(T)The above drawing is for standard type. L Dimension Short Type has no T Dimension, W Dimension parts.

-Tol. of B Dimension and B~1 Dimension

Type	B	B~1
(1)	0~-0.1	±0.1
(2)	+0.1~-0.4	0~-0.1
(3)	±0.3	0~-0.13

Part Number: Type	d	D	D1	D2	L: Standard	L: Short	L1: Standard	L1: Short	MxP	ℓ: Standard (1)(2)	ℓ: Standard (3)	ℓ: Short	B	B1	T	W	d1 (1)(2)	d1 (3)	r	Static Load Capacity Radial Cs {kN} (1)	(2)	(3)	Mass (1)(2)	Mass (3)
Female Thread Type	3	12	6.5	8	27	-	21	-	M3x0.5	10	-	-	4.5	6	3	7	7.4	-	0.3	-	1.57	-	6.5	-
Standard Type L Dim. Short Type	4	14	8	9.5	31		24		M4x0.7	12			5.3	7	4	8	7.6	-		-	2.25	-	10	
Right-Hand Thread PHSC PHSCN PHSCM PHSCMN PHSS PHSSN	5	16	9	11	35	28	27	20	M5x0.8	14	12.5	7	6	8		9	7.7	8.8		5.59	3.92	0.98	16.5	16
	6	18	10	13	39	35	30	26	M6x1.0		13.5	10	6.75	9	5	11	9	11.1		6.86	5	1.44	25	25
	8	22	12.5	16	47	42	36	31	M8x1.25	17	16	12	9	12		14	10.4	12.7	0.5	9.8	7.45	2.69	43	43
	10	26	15	19	56	49	43	36	M10x1.5	21	19	14	10.5	14	6.5	17	12.9	15.2		13.2	9.41	4.16	72	72
	10A								M10x1.25		-							-			-	-		-
Left Hand Thread PHSCL PHSCLN PHSCLM PHSCLMN PHSSL PHSSLN	12	30	17.5	22	65	59	50	44	M12x1.75	24	24	18	12	16		19	15.4	17.6		16.7	11	5.88	107	107
	14	34	20	25	74	66	57	49	M14x2.0	27	27	19	13.5	19	8	22	16.9	19.2	0.7	20.6	15.2	6.61	160	160
	14A								M14x1.5		-							-			-	-		-
	16	38	22	27	83	70	64	51	M16x2.0	33	33	20	15	21			19.4	19.4		25	20.2	8.33	210	210
	18	42	25	31	92	81	71	60	M18x2.5	36	-	25	16.5	23	10	27	21.9	21.9		29.4	-	-	295	-
	18A								M18x1.5		36							-			25.2	11.52		11.52
(T)L Dimension Short Type For L Dimension Short Type, available dimensions are d5 to d22.	20	46	27.5	34	100	87	77	64	M20x1.5	40	-	27	18	25		30	24.4	-		34.3	27.8	-	380	-
	22	50	30	37	109	99	84	74	M22x1.5	43		33	20	28	12	32	25.8			41.2	35.9	-	490	

(T)(1) Steel, (2) Oil Free, (3) Stainless Steel Oil Free

kgf=N×0.101972

Part Number: Type	d	D	L: Standard	L: Short	L1: Standard	L1: Short	MxP	ℓ: Standard	ℓ: Short	B	B1	d1 (1)(2)	d1 (3)	r	Static Load Capacity Radial Cs {kN} (1)	(2)	(3)	Mass (1)(2)	Mass (3)
Male Thread Stud Type	3	12	33	-	27	-	M3x0.5	15	-	4.5	6	7.4	-	0.3	-	1.57	-	4.5	-
Standard Type L Dim. Short Type	4	14	37		30		M4x0.7	17		5.3	7	7.6			-	2.25	-	7	
Right-Hand Thread PHSO PHSON PHSOM PHSOMN PHSOS PHSOSN	5	16	41	28	33	20	M5x0.8	20	7	6	8	7.7	8.8		3.43	3.43	0.98	12.5	12
	6	18	45	33	36	24	M6x1.0	22	10	6.75	9	9	11.1		4.9	4.9	1.44	19	19
	8	22	53	40	42	29	M8x1.25	25	12	9	12	10.4	12.7		6.86	6.86	2.69	32	32
	10	26	61	46	48	33	M10x1.5	29	14	10.5	14	12.9	15.2	0.5	10.8	9.41	4.16	54	54
	10A						M10x1.25						-			-	-		-
Left Hand Thread PHSOL PHSOLN PHSOLM PHSOSL	12	30	69	54	54	39	M12x1.75	33	18	12	16	15.4	17.6		16.7	11	5.88	85	85
	14	34	77	60	60	43	M14x2.0	36	19	13.5	19	16.9	19.2	0.7	20.6	15.2	6.61	126	126
	14A						M14x1.5						-			-	-		-
	16	38	85	65	66	46	M16x2.0	40	20	15	21	19.4	19.4		25	20.2	8.33	185	185
	18	42	93	74	72	53	M18x2.5	44	25	16.5	23	21.9	-		29.4	-	-	260	-
	18A						M18x1.5						21.9			25.2	11.52		258
(T)L Dimension Short Type For L Dimension Short Type, available dimensions are d5 to d22.	20	46	101	84	78	61	M20x1.5	47	30	18	25	24.4	-		34.3	27.8	-	340	-
	22	50	109	91	84	66	M22x1.5	51	33	20	28	25.8			41.2	35.9	-	435	

(T)(1) Steel, (2) Oil Free, (3) Stainless Steel Oil Free (T)No Grease Nipple for PHSO (L) 5~6 and PHSO (L) N5~6.

kgf=N×0.101972

Order Example: Part Number PHSC5

Days to Ship

■Standard Type (Steel, Oil Free): 6 Days / 2 Days

•Stainless Steel Oil Free: 8 Days / 2 Days — Express A 3,00 EUR/piece — P.88

(T)A Express Charge of 8,10 EUR for 3 or more identical pieces.

■L Dimension Short Type: 10 Days / 2 Days — Express B 3,00 EUR/piece — P.88

(T)A Express Charge of 8,10 EUR for 3 or more identical pieces.

1. Shaft Fits

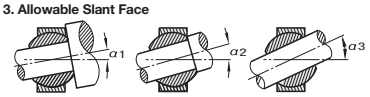
Usage Condition	Tolerance of Shaft Dimensions: Steel	Tolerance of Shaft Dimensions: Oil Free - Stainless Steel Oil Free
Normal Load	h7	p6
Non-directional Load	p6	p6

2. Clearance

Unit: mm

	Steel	Oil Free - Stainless Steel Oil Free
Radial Direction Clearance	0.035 or Less	0.045 or Less
Axial Clearance	0.1 or Less	0.1 or Less

3. Allowable Slant Face



Shaft Step Shape	Shaft Condition	Allowable Incline Angle α
Large	Stepped part of the shaft contacts the outer circumference of the holder.	Small (α1)
Medium	Stepped part of the shaft contacts the side or the inner circumference of the holder.	Middle (α2)
No	Shaft contacts the inner circumference of the holder.	Large (α3)

d	Ball Dia.Ø (mm) (1)	(2)	(3)	α1 (1)	(2)	α2 (1)	(2)	α3 (1)	(2)	(3)
3	-	9.525	-	-	8	-	10	-	42	-
4	-	10.319	-	-	9	-	11	-	35	-
5	11.112	11.112	11.91	8	8	13	13	30	30	12
6	12.7	12.7	14.29	8	8	13	13	30	30	10
8	15.875	15.875	17.46	8	8	14	14	25	25	12
10	19.05	19.05	20.64	8	8	14	14	25	25	12
12	22.225	22.225	23.81	8	8	13	13	25	25	12
14	25.4	25.4	26.99	10	10	16	16	24	24	14
16	28.575	28.575	28.58	9	9	15	15	24	24	15
18	31.75	31.75	31.75	9	9	15	15	24	24	15
20	34.925	-	-	9	-	15	-	24	-	-
22	38.1	-	-	10	-	15	-	23	-	-

(T)(1) Steel, (2) Oil Free, (3) Stainless Steel Oil Free

Price

euros

(T)For orders larger than indicated quantity, please request a quotation.

(T)The unit price of L Dimension Short Type is Standard Type shown below+6,00 EUR (T)L Dimension Short Type is available for the types whose prices are shown in the below Standard Type price table. (d3 and d4 are not available)

d	Standard Type: PHSC · PHSCL: € Unit Price / Qty.1~9	PHSC · PHSCL: Volume Discount / Qty. 10~29	PHSO · PHSOL: € Unit Price / Qty.1~9	PHSO · PHSOL: Volume Discount / Qty. 10~29	PHSCM · PHSCLM: € Unit Price / Qty.1~9	PHSCM · PHSCLM: Volume Discount / Qty.10~49	PHSOM · PHSOLM: € Unit Price / Qty.1~9	PHSOM · PHSOLM: Volume Discount / Qty.10~49	PHSS · PHSSL: € Unit Price / Qty.1~9	PHSS · PHSSL: Volume Discount / Qty. 10~29	PHSOS · PHSOSL: € Unit Price / Qty.1~9	PHSOS · PHSOSL: Volume Discount / Qty. 10~29
3												
4												
5												
6												
8												
10												
10A												
12												
14												
14A												
16												
18												
18A												
20												
22												

Rod End Bearings
-Link Ball Type with Thread-

Price Reduction 7%

CAD Data

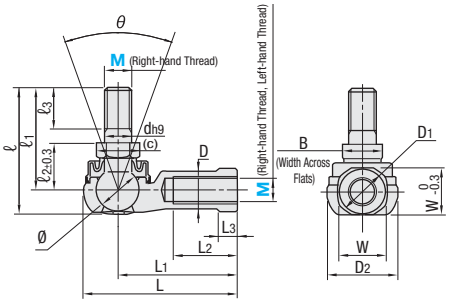
■ Compact Embedded Type is available on our website.

■Link Ball L Type



RoHS

RBLD (Right-Hand Thread)
RBLDL (Left-Hand Thread)



M Material: Holder: High Strength Zinc Alloy
* M4 - 5 High Strength Aluminum Alloy
Shank with Ball: 1.1181/C35E (20~28HRC)
Boot: NBR Type Special Synthetic Rubber
H Hardness: Sphere 650HV~

Part Number		Holder Part									Shank with Ball								Allowable Incline Angle θ	Strength of Yielding Point Pk (N)	Static Load Capacity Radial Cs (N)	Mass (g)	€ Unit Price	Volume Discount
Type	M	D	D1	D2	L	L1	L2	MxP	L3	W	dh9	(c)	ℓ	ℓ1	ℓ2	ℓ3	B	Ball Dia. Ømm					Qty. 1~9	Qty. 10~29
RBLD (Right-Hand Thread) RBLDL (Left-Hand Thread)	4	7.5	9.5	13	24.5	18	8	M4x0.7	4	8	4 0 -0.030	8.1	20	15	7	6	7	7.938	40°	1370	4510	7		
	5	9	12	15	34.5	27	15	M5x0.8		10	5	9.2	26.7	21	10	8	8	9.525		2250	6470	12		
	6	10	13	16	38	30	16	M6x1.0	5	11	6	11.6	32.6	26	11	11	10	11.112		3920	9900	26		
	8	12.5	16	19	45.5	36	19	M8x1.25	6	14	8 0 -0.036	13.8	38.6	31	14	12	12	12.7		6570	12500	49		
	10	14.5	19	25	55.5	43	23	M10x1.5	7	17	10	16.2	52.3	43	17	21	14	15.875		11300	18300	90		
	10A							M10x1.25					46.3	37		15						87		
	12	17.5	22	29	64.5	50	26	M12x1.75	8	19	12	19.6	59.7	49	19	24	17	19.05		16400	26700	148		
	12A							M12x1.25					52.7	42		17						143		
	14	20	25	34	74	57	30	M14x2.0	10	22	14 0 -0.043	21.9	74.4	62	21.5	28	19	22.225		19800	36400	245		
	14A							M14x1.5					68.4	56		22						235		
	16	22	27	38	83	64	34	M16x2.0	11	24	16	25.4	80	66	23.5	29	22		30°	26900		325		
	16A							M16x1.5					74	60		23						315		

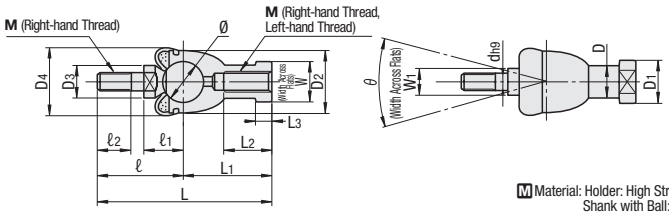
kgf=Nx0.101972 For orders larger than indicated quantity, please request a quotation.

■Link Ball Straight Type



RoHS

RBID (Right-Hand Thread)
RBIDL (Left-Hand Thread)



M Material: Holder: High Strength Zinc Alloy
Shank with Ball: 1.1181/C35E (20~28HRC)
Boot: NBR Type Special Synthetic Rubber
H Hardness: Sphere 650HV~

Part Number		Holder Part									Shank with Ball									Allowable Incline Angle θ	Strength of Yielding Point Pk (N)	Static Load Capacity Radial Cs (N)		Mass (g)	€ Unit Price	Volume Discount
Type	M	D	D1	D2	L	L1	L2	MxP	L3	W	dh9	ℓ	ℓ1	ℓ2	W1	D3	D4	Ball Dia. Ømm				Tensile Cs (N)	Compression Cs (N)		Qty. 1~9	Qty. 10~29
RBID (Right-Hand Thread) RBIDL (Left-Hand Thread) ※M16A is available for RBID only.	5	9	11	17	46	24	12	M5x0.8	4	9	5 0 -0.030	22	11	8	7	9	20	11.112	25°	2840	5690	11400	25		
	6	10	13	20	55.2	28	15	M6x1.0	5	11	6	27.2	12.2	11	8	10		12.7		3730	7450	14900	40		
	8	12.5	16	24	65	32	16	M8x1.25		14	8 0 -0.036	33	16	12	10	12	24	15.875		5880	11700	23200	75		
	10	15	19	28	80.5	35	18	M10x1.5	6.5	17	10	45.5	19.5	21	11	14	30	19.05		8430	16800	33500	123		
	10A				74.5			M10x1.25				39.5		15									120		
	12	17.5	22	32	91	40	20	M12x1.75		19	12 0 -0.043	51	21	24	17	19	32	22.225		11400	22800	45600	190		
	12A				84			M12x1.25				44		17									185		
	14	20	25	36	109	45	25	M14x2.0	8	22	14	64	23.5	28			38	25.4	17°	14900	29800	59600	280		
	14A				103			M14x1.5				58		22									275		
	16	22	27	40	118	50	27	M16x2.0			16	68	25.5	29	19	22	44						370		
	16A				112			M16x1.5				62		23									360		

kgf=Nx0.101972 ※ For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number
RBLD8
RBIDL12A

Days to Ship

•RBLD · RBLDL · RBID
6 Days P.87

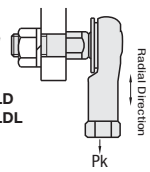
•RBIDL
8 Days Express A 3,00 EUR/piece P.88
※A Express Charge of 8,10 EUR for 3 or more identical pieces.

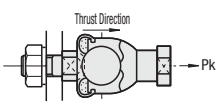
1. Clearance of Sphere Unit: mm

	RBLD · RBLDL	RBID · RBIDL
Radial Direction Clearance	0.02~0.06	0.03 or Less
Axial Clearance	0.3 or Less	0.1 or Less

2. H10 tolerance is recommended for Shank with Ball and the mating hole.
3. Yield strength (Pk) shows the strength of the direction shown in the figure below.

Example





Rod End Coupling Rods

-Both Ends Male Thread · Both Ends Male Thread Compact · Both Ends Female Thread · One End Male Thread · One End Female Thread-

■When assembling rod end bearings, please use PMC (Fine Thread) alteration as required.

■Both Ends Male Thread Type

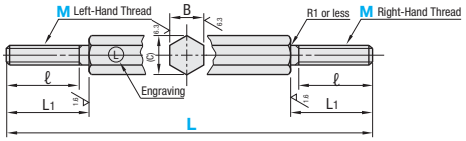




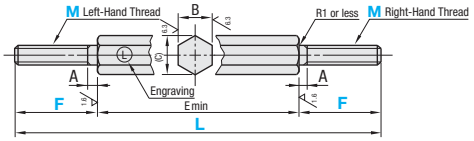
RoHS

Type				M Material	S Surface Treatment	A Accessory Hexagon Nut (Right · Left-hand Thread 1 pc. for Each)	
L Fixed	L Dimension Configurable	L Dimension Configurable Compact	L, F Dimension Configurable			M Material	S Surface Treatment
-	LBRBF	-	LBRBFF	1.1191/C45E	Black Oxide	1.1191/C45E	Trivalent Chromate
LBRKN	LBRFN	LBRSM	LBRFNF		Electroless Nickel Plating		
SLBRKN	SLBRFN	SLBRS	SLBRFNF	1.4301/X5CrNi18-10	-	1.4301/X5CrNi18-10	-

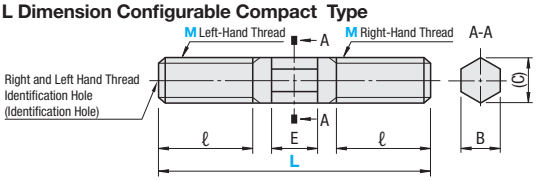
L Dimension Selectable · L Dimension Configurable Type



L, F Dimension Configurable Type



L Dimension Configurable Compact Type



25 (6.3 1.6)

※Both Ends Male Thread Compact Type has an hand thread.
L Dimension Configurable Compact Type has an identification hole on the side of its left-hand thread.

■Both Ends Female Thread Type

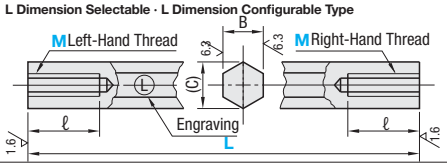
RoHS



Type		M Material	S Surface Treatment	A Accessory Hexagon Nut (Right · Left-hand Thread 1 pc. for Each)	
L Fixed Type	L Dimension Configurable			M Material	S Surface Treatment
-	LBMBF	1.1191/C45E	Black Oxide	1.0038/S235JR	Trivalent Chromate
LBMKN	LBMFN	1.1191/C45E	Electroless Nickel Plating		
SLBMKN	SLBMFN	1.4301/X5CrNi18-10	-	1.4301/X5CrNi18-10	-

L Dimension Selectable · L Dimension Configurable Type

25 (6.3 1.6)



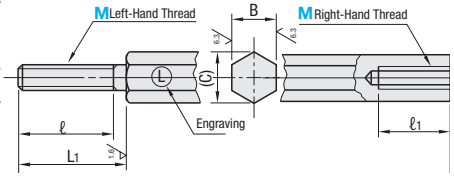
■One End Male Thread One End Female Thread Type



RoHS

Type	M Material	S Surface Treatment	A Accessory Hexagon Nut (Right · Left-hand Thread 1 pc. for Each)	
			M Material	S Surface Treatment
LBGBF	1.1191/C45E	Black Oxide	1.0038/S235JR	Trivalent Chromate
LBGF	1.1191/C45E	Electroless Nickel Plating		
SLBGF	1.4301/X5CrNi18-10	-	1.4301/X5CrNi18-10	-

25 (6.3 1.6)



■Both Ends Male Thread L Dimension Fixed Type

Part Number		L Selection										L1	ℓ	B	(C)	€ Unit Price	
Type	M (Coarse)															LBRKN	SLBRKN
LBRKN SLBRKN	3	40	50	60	70	80	90	100	110	120		15	14	6	6.9		
	4		50	60	70	80	90	100	110	120		20	18	7	8.1		
	5			60	70	80	90	100	110	120		25	23	8	9.2		
	6				70	80	90	100	110	120		30	28	10	11.5		
	8						90	100	110	120		40	37	13	15.0		

■Both Ends Female Thread L Dimension Fixed Type

Part Number		L Selection										ℓ1	B	(C)	€ Unit Price	
Type	M (Coarse)														LBMKN	SLBMKN
LBMKN SLBMKN	3	20	30	40	50	60	70	80	90	100	110	120	9	6	6.9	
	4		30	40	50	60	70	80	90	100	110	120	12	7	8.1	
	5			40	50	60	70	80	90	100	110	120	16	8	9.2	
	6				50	60	70	80	90	100	110	120	18	10	11.5	
	8					60	70	80	90	100	110	120	24	13	15.0	

※For minimum L dimension, a tap pilot hole of Tap may go through.

Order Example · L Fixed

Part Number	-	L
LBRKN6	-	100

Price

■Volume Discount (※Round down to one Cent.) P.87

Quantity	1~9	10~14
Discount Rate	€ Unit Price	5%

※For orders larger than indicated quantity, please request a quotation.

Days to Ship · L Fixed

6 Days P.87

■Both Ends Female Thread L Configurable Type

Part Number Type	M (Coarse Thread)	L 1mm Increment	L_1	ℓ	B	(C)
L Dimension Configurable **LBRBF LBRFN SLBRFN** ※SLBRFN is available for M3~18 only.	3	25~39	8	7	6	6.9
		40~300	15	14		
	4	35~49	12	10	7	8.1
		50~400	20	18		
	5	40~59	13	11	8	9.2
		60~600	25	23		
	6	50~69	17	15	10	11.5
		70~600	30	28		
	8	60~89	23	20	13	15.0
		90~1000	40	37		
	10	70~109	28	25	17	19.6
		110~1000	50	47		
	12	80~129	33	30	19	21.9
		130~1000	60	56		
	14	130~1000	60	56	21	24.0
	16	170~1000	80	76	24	27.7
	18	170~1000	80	76	27	31.2
	20	170~1000	80	76	30	34.6
	22	170~1000	80	76	32	36.9

※When assembling rod end bearings, check M-Pitch.

■Both Ends Male Thread L, F Dimension Configurable Type

Part Number Type	M (Coarse Thread)	L 1mm Increment	F 1mm Increment	A	B	(C)	E min
L, F Dimension Configurable Type **LBRBFF LBRFNF SLBRFNF**	3	19~300	5~15	1.5	6	6.9	10
	4	22~400	6~20	1.5	7	8.1	
	5	25~600	7~25	1.5	8	9.2	
	6	32~600	9~30	2.5	10	11.5	14
	8	38~1000	12~40	2.5	13	15.0	
	10	44~1000	15~50	2.5	17	19.6	
	12	54~1000	18~60	3.0	19	21.9	18
	14	60~1000	21~70	3.0	21	24.0	
	16	66~1000	24~80	3.0	24	27.7	
	18	72~1000	27~90	4.0	27	31.2	
	20	85~1000	30~100	4.0	30	34.6	25
	22	91~1000	33~110	5.0	32	36.9	

※L≥2F+Emin. ※When assembling rod end bearings, check M-Pitch.

■One End Male Thread, One End Female Thread L Configurable Type

Part Number Type	M (Coarse Thread)	L 1mm Increment	L_1	ℓ	$ℓ_1$	B	(C)
L Dimension Configurable **LBGBF LBGF SLBGF**	3	40~300	15	14	9	6	6.9
	4	50~400	20	18	12	7	8.1
	5	60~600	25	23	16	8	9.2
	6	70~600	30	28	18	10	11.5
	8	90~1000	40	37	24	13	15.0
	10	110~1000	50	47	30	17	19.6
	12	130~1000	60	56	36	19	21.9
	14	130~1000	60	56	36	21	24.1
	16	170~1000	80	76	48	24	27.7
	18	170~1000	80	76	56	27	31.2

※For minimum L dimension, a tap pilot hole of Tap may go through.
※When assembling rod end bearings, check M-Pitch.

Order Example

• L · F Dimension Configurable Type

Part Number	-	L	-	F
SLBRFN8	-	225		
SLBRFNF5	-	275	-	20

Days to Ship

• M20 · 22 (Except LF Dimension Configurable Type)

8 Days

• Other than the above

8 Days | Express A | 5,00 EUR/pc. | P.88

※A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (※Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~29
Discount Rate	€ Unit Price	5%	10%	18%

※For orders larger than indicated quantity, please request a quotation.

■Both Ends Male Thread L Dimension Configurable Compact Type

Part Number Type	M (Coarse Thread)	L 1mm Increment	ℓ	E	B	(C)
L Dimension Configurable Compact Type **LBRSM SLBRS**	3	20~39	7	3	2.5	2.9
		40~100	17			
	4	20~39	7	4	3	3.4
		40~100	17			
	5	30~59	10	6	4	4.6
		60~150	25			
	6	30~59	10	6	5	5.8
		60~150	25			
	8	50~89	18	8	6	6.9
		90~150	38			
	10	50~89	18	8	8	9.2
		90~150	38			
	12	60~129	22	10	10	11.6
		130~200	56			
	16	75~169	28	10	13	15.0
		170~300	76			

※When assembling rod end bearings, check M-Pitch.

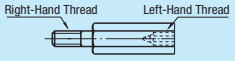
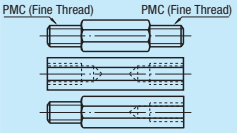
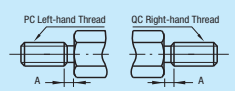
■Both Ends Female Thread, L Dimension Configurable Type

Part Number Type	M (Coarse Thread)	L 1mm Increment	ℓ	B	(C)
L Dimension Configurable **LBMBF LBMFN SLBMFN** ※SLBMFN is available for M3~18 only.	3	20~300	9	6	6.9
	4	30~400	12	7	8.1
	5	40~600	16	8	9.2
	6	50~600	18	10	11.5
	8	60~1000	24	13	15.0
	10	70~1000	30	17	19.6
	12	80~1000	36	19	21.9
	14	80~1000	36	21	24.1
	16	100~1000	48	24	27.7
	18	120~1000	56	27	31.2
	20	130~1000	60	30	34.6
	22	140~1000	66	32	36.9

※When assembling rod end bearings, check M-Pitch.

Part Number	-	L	-	F	- (RLC · PMC · PC · QC)
LBRBFF5	-	100	-	10	- QC

Alterations ※Not applicable to LBRSM and SLBRS

Alterations	Code	Spec.	Price Adder
	RLC	One End Male Thread, One End Female Thread Type. Reverses thread twist direction of each for One End Male Thread, One End Female Thread Type. Ordering Code RLC	Free of Charge
	PMC	Changes both threads to fine threads. ※Applicable to M10, 14, 18, 20 and 22 only. Ordering Code PMC M (N) / Pitch: 10 / 1.25; 14, 18, 20, 22 / 1.5	3,00
	PC QC	Adds an undercut to A part. Ordering Code PC ※Applicable to LBRBFF, LBRFNF and SLBRFNF only.	PC 3,00 QC 3,00

M (Coarse Thread)	€ Unit Price																			
	LBRBF · LBRBFF · LBMBF · LBGBF*					LBRSM · SLBRS			LBRFN · LBRFNF · LBMFN · LBGF*					SLBRFN* · SLBRFN · SLBMFN* · SLBGF*						
	Min. L~200	L201~400	L401~600	L601~800	L801~1000	Min. L~100	L101~200	L201~300	Min. L~200	L201~400	L401~600	L601~800	L801~1000	Min. L~200	L201~400	L401~600	L601~800	L801~1000		
3																				
4																				
5																				
6																				
8																				
10																				
12																				
14																				
16																				
18																				
20																				
22																				

※* For LBKT, LBKTM and SLBKTS, the maximum L dimension is the largest available size.

Links
-Standard-

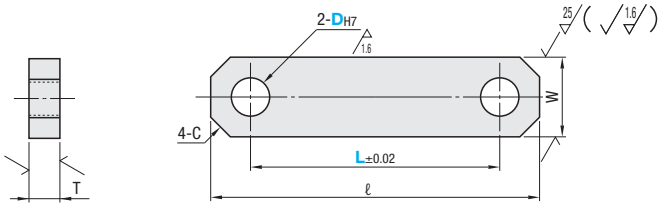
■L dimension is configurable in 0.1mm increment (Alteration)



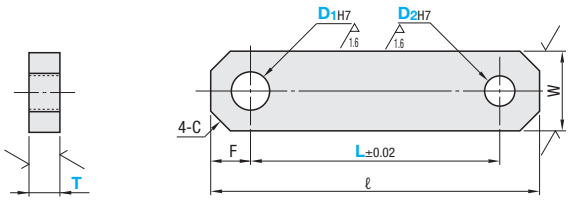
L Selectable Type	D_2 Configurable Type	W Dimension Configurable Type	R Type	M Material	S Surface Treatment
LNSB	LNDB	LNFB	LNFRB	1.1191/C45E*	Black Oxide
-	LNDM	LNFM	LNFRM		Electroless Nickel Plating
LNSS	LNDS	LNFS	LNFRS	1.4301/X5CrNi18-10	-

* 1.0038/S235JR for T=2.

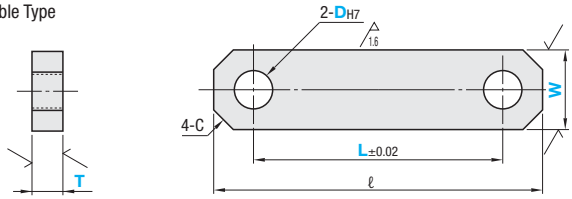
- L Selectable Type



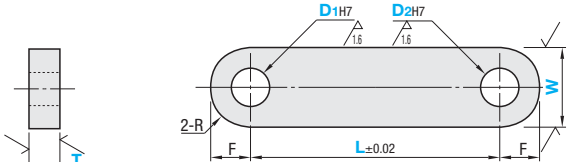
- D_2 Configurable Type



- W Dimension Configurable Type



- R Type



- T Dimension Tolerance

T	2	3~16	19~22
	±0.15	-0.3~0	-0.33~0

■L Selectable Type

Part Number Type	DH7	L Selection	W	T	ℓ	C	€ Unit Price LNSB	€ Unit Price LNSS
LNSB LNSS	5	25 30 40 50	13	5	L+13	3		
	6	25 30 35 40 45 50 75						
	8	25 30 35 40 45 50 75						
	10	30 40 50 75	16		L+16			
	12	50 75	19	9	L+19	5		

■D_2 Dimension Configurable Type

Part Number Type	D1H7	D2H7 1mm Increment	L 1mm Increment	T Selection	W	ℓ	F	C
LNDB LNDM LNDS	2	2~20 D1≥D2 (When D2H7=2, T≤9)	5~75	2 3	8	L+8	4	2
	3		5~150	5 6	13	L+10	5	
	4		6~150	5 6 9				
	5		7~150	5 6 9		L+12	6	3
	6		8~150	5 6 9	16			
	8		10~150	5 6 9		L+16	8	
	10		12~200	5 6 9	19	L+18	9	5
	12		14~200	5 6 9 12	25	L+20	10	
	13		15~200	5 6 9 12				
	14		16~200	5 6 9 12		L+24	12	
	15		18~200	5 6 9 12	32			
	16		20~200	5 6 9 12 16				8
	18		22~200	9 12 16	38	L+28	14	
	20		25~300	9 12 16 19		L+30	15	
	25		30~300	9 12 16 19	50	L+36	18	

■W Dimension Configurable Type

Part Number Type	D_{H7}	L 1mm Increment	W 1mm Increment	T Selection	ℓ	C
LNFB LNFM LNFS	2	10~75	7~12	2 3	L+8	2
	3	10~150	10~20	5 6	L+10	3
	4			5 6 9		
	5			5 6 9		
	6			5 6 9	L+12	
	8			5 6 9 10	L+16	
	10	20~200	15~30	5 6 9 10	L+20	5
	12		20~30	5 6 9 10 12 16	L+30	
	13			5 6 9 10 12 16		
	14		20~40	9 10 12 16		
	15			9 10 12 16		
	16			9 10 12 16	L+32	
	18			9 10 12 16	L+36	
	20	30~300	25~50	9 10 12 16 19	L+45	8
	25		30~60	9 10 12 16 19 22	L+50	

■R Type

Part Number Type	D_{1H7}	D_{2H7} 1mm Increment	L 1mm Increment	W 1mm Increment	T Selection	F	R
LNFRB LNFRM LNFRS	2	2~20 $D_1 \geq D_2$ ※When D_{2H7}=2, T≤10	20~75	6~12	2 3	W/2	W/2
	3		20~150	7~20	5 6		
	4			8~20	5 6 9		
	5			9~20	5 6 9		
	6			10~20	5 6 9		
	8			12~20	5 6 9 10		
	10		30~200	16~30	5 6 9 10		
	12			18~30	9 10 12 16		
	13			19~30	9 10 12 16		
	14			20~40	9 10 12 16		
	15			21~40	9 10 12 16		
	16			22~40	9 10 12 16		
	18			24~40	9 10 12 16		
	20		40~300	30~50	9 10 12 16 19		
	25			35~60	9 10 12 16 19 22		

Order Example

Part Number	-	D_2	-	L	-	W	-	T
LNSB5			-	L25				
LNDB10	-	8	-	L100			-	T6
LNFB10			-	L60	-	W20	-	T9
LNFRB8	-	6	-	L100	-	W15	-	T9

Days to Ship

- L Dimension Selectable Type: 6 Days P.88
- D_2 Dimension Configurable Type / W Dimension Configurable Type / R Type: 8 Days
- Express A: 2,00 EUR/piece P.88

※A Express Charge of 5,40 EUR for 3 or more identical pieces.

Price

■Volume Discount (※Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

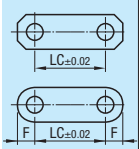
※For orders larger than indicated quantity, please request a quotation.

D_{1H7}	€ Unit Price											
	LNDB		LNDM		LNDS		LNFRB		LNFRM		LNFRS	
	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L
2												
3												
4												
5												
6												
8												
10												
12												
13												
14												
15												
16												
18												
20												
25												

D_{H7}	€ Unit Price					
	LNFB		LNFM		LNFS	
	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L
2						
3						
4						
5						
6						
8						
10						
12						
13						
14						
15						
16						
18						
20						
25						

Alterations

Part Number	-	D_2	-	L (LC)	-	W	-	T
LNFB10			-	LC100.5	-	W20	-	T9

Alteration	Code	Spec.	Price Adder
	LC	L dimension in 0.1mm increment- Specify dimension L changed as LC. Ordering Code LC100.5 ⊗Not available for L Dimension Configurable Type	2,00

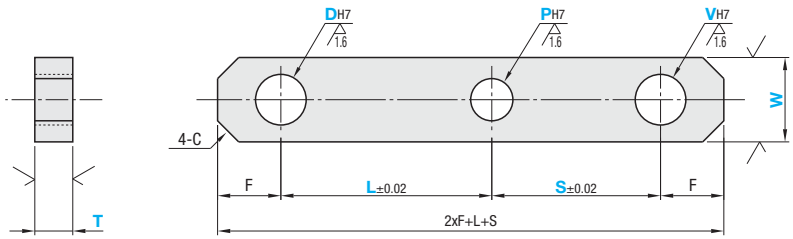
Links
-3 Hole Type-

CAD Data

RoHS

Type Without Tap	Material	Surface Treatment
LNFTB	1.1191/C45E	Black Oxide
LNFTM		Electroless Nickel Plating
LNFTS	1.4301/X5CrNi18-10	-





- T Dimension Tolerance

T	5~16	19~22
	-0.3~0	-0.33~0

(?) L≥S

(?) When D≥P, W≥D+4.
When P>D, W≥P+4 is required.

Link -3-Hole Type-

Part Number Type	*DH7	PH7 1mm Increment	VH7 1mm Increment	L 1mm Increment	S 1mm Increment	*W 1mm Increment	T Selection	F	C
LNFTB LNFTM LNFTS	3	*3~20	3~20 V≤D	10~150 (L≥S)	10~150 (S≤L)	10~20	5 6	5	3
	4						5 6 9		
	5						5 6 9	6	
	6						5 6 9		
	8						5 6 9 10	8	
	10			20~200 (L≥S)	20~200 (S≤L)	10~30	5 6 9 10	9	5
	12					20~30	9 10 12 16	10	
	13						9 10 12 16		
	14					20~40	9 10 12 16	12	
	15						9 10 12 16		
	16						9 10 12 16		
	18						9 10 12 16	14	
	20			30~200 (L≥S)	30~200 (S≤L)	25~50	9 10 12 16 19	15	8
	25					30~60	9 10 12 16 19 22	18	

*When D≥P, W≥D+4 is required. When P>D, W≥P+4 is required.

Order Example

Part Number	-	P	-	V	-	L	-	S	-	W	-	T
LNFTB10	-	P8	-	V10	-	L100	-	S50	-	W20	-	T9

Days to Ship: 8 Days — Express A — 5,00 EUR/piece — P.88

(?) A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount ((?) Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

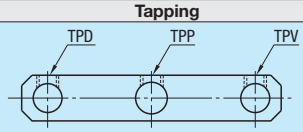
(?) For orders larger than indicated quantity, please request a quotation.

DH7	€ Unit Price Qty. 1~4 (L≥S)								
	LNFTB			LNFTM			LNFTS		
	Min. L~50	L51 ~150	L151 ~Max.L	Min. L~50	L51 ~150	L151 ~Max.L	Min. L~50	L51 ~150	L151 ~Max.L
3									
4									
5									
6									
8									
10									
12									
13									
14									
15									
16									
18									
20									
25									

Alterations

Part Number Order Example

Part Number	-	P	-	V	-	L	-	S	-	W	-	T	- (TPD, TPP, TPV)
LNFTB20	-	P18	-	V18	-	L50	-	S30	-	W40	-	T16	- TPD

Alterations	Tapping
	
Code	TPD · TPP · TPV
Spec.	Adds tapped holes at D, P and V. Applicable Possible Dimension
Price Adder	3,00

D·P·V	W	Set Screw M (Included)
12	24~30	M4
13	25~30	
14	26~40	
15	27~40	
16	28~40	
18	36~40	M5
20	38~50	
25	43~60	

Links
-Bent Type · Standard Type-

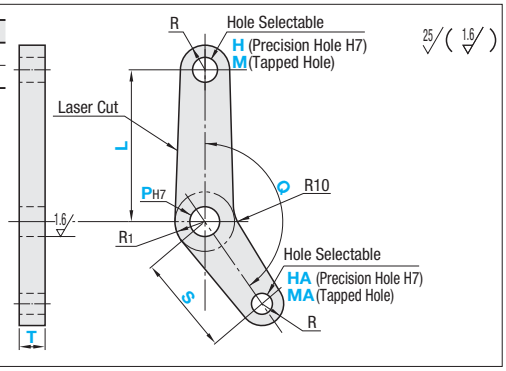
CAD Data

■Link -Bent Type- RoHS



Type	Material	Surface Treatment
LKBK	1.0038/	Black Oxide
LKBM	S235JR	Electroless Nickel Plating

Hole Type	
H, HA, M, MA	R
3	3
4	4.5
5	5
6	6.5
8	8.5
10	10
12	11.5
16	14.5



Part Number Type	P	L 1mm Increment	S 1mm Increment	Q 1° Increment	Hole Selection		T Selection	R1	€ Unit Price LKBK	€ Unit Price LKBM
LKBK LKBM	4	40~100	30~100	90~180	H HA M MA	3 4 5 6 8 10 12 16	5 6	P/2+6		
	5									
	6									
	8									
	10									
	12									
	14									
	15									
	16									
	18									
	20									
	25									

Order Example

Part Number	-	L	-	S	-	Q	-	H · M	-	HA · MA	-	T
LKBK10	-	L80	-	S35	-	Q130	-	H8	-	HA8	-	T5

Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

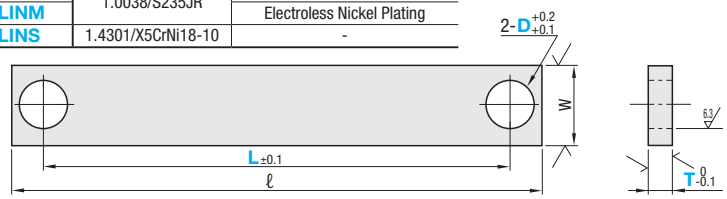
For orders larger than indicated quantity, please request a quotation.

■Link -Standard Type-



RoHS

Type	Material	Surface Treatment
LINB	1.0038/S235JR	Black Oxide
LINM		Electroless Nickel Plating
LINS	1.4301/X5CrNi18-10	-



Part Number Type	D	L 1mm Increment	T Selection	W	ℓ	€ Unit Price LINB	€ Unit Price LINM	€ Unit Price LINS
LINB LINM LINS	3	10~150	5	10	L+8			
	4		5					
	5		5		L+10			
	6		5 9	13	L+12			
	8	15~150	5 9	16	L+16			
	10	20~200	5 9	19	L+20			
	12		9					
	13		9		L+22			
	14	20~200	9	19	L+30			
	15		9		L+30			
	16		9	25	L+32			
	18		9		L+36			
	20	30~300	9	32	L+45			
	25		9		L+50			

Order Example

Part Number	-	L	-	T
LINS10	-	80	-	9

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Days to Ship: 8 Days

Express A: 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Links
-Bearing Embedded-

CAD Data

Features: Bearing integrated links to support rotations.



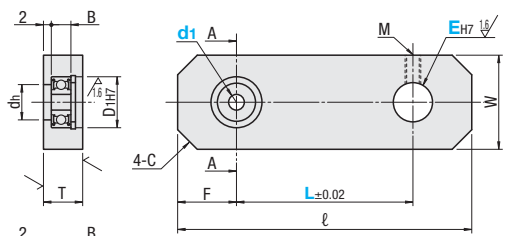
Type		Material		Surface Treatment	Accessory	
Single Bearing	Double Bearings	Links	Bearing		Retaining Ring	Set Screws
LNBB	LNBWB	1.1191/C45E	Steel	Black Oxide	Spring Steel	1.4301/ X5CrNi18-10
LNBM	LNBWM			Electroless Nickel Plating	1.4301/ X5CrNi18-10	
-	LNBWS	1.4301/X5CrNi18-10	Stainless Steel	-		

25/ (1.6/)

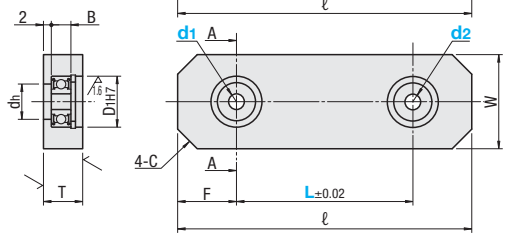
* Double Bearings Type has no set screw.

Section View A-A

Single Bearing Type



Double Bearing Type



- T Dimension Tolerance

T	10~16	19
	-0.3~0	-0.33~0

Bearing Accuracy JIS B 1514 Class 0 For details, refer to P.1-1909

Single Bearing Type

Part Number Type	d1	EH7 Selection	L 1mm Increment	W	T	ℓ	F	C	Tightening Screw M	Bearing Part No.	D1H7	Tolerance	dh	B
LNBB LNBM	5	3 4 5 6 8	20~150	20	10	L+22	10	5	When EH7 is 3~6, M3 8~16, M4 18~25, M6	605ZZ	14	+0.018 0	10	5
	6	3 4 5 6 8 10	25~150		12	L+25	12			606ZZ	17		13	6
	8	3 4 5 6 8 10 12 13 14 15 16	30~150			L+32	14			608ZZ	22	+0.021 0	18	7
	10				16	L+36	17	8		6000ZZ	26		22	8
	12	3 4 5 6 8 10 12 13 14 15 16 18	35~200	36		L+40	18			6001ZZ	28		24	8
	15	3 4 5 6 8 10 12 13 14 15 16 18 20	40~200	40		L+44	20			6002ZZ	32		28	9
	20	3 4 5 6 8 10 12 13 14 15 16 18 20 25	45~300	50	19	L+56	26	10		6004ZZ	42	+0.025 0	36	12
	25		55~300	56		L+63	29			6005ZZ	47		41	12

Double Bearing Type

Part Number Type	d1	d2 Selection	L 1mm Increment	W	T	ℓ	F	C
LNBWB LNBWM LNBWS	5	5	20~150	20	10	L+20	10	5
	6	5 6	25~150		12	L+24	12	
	8	5 6 8	30~150	29		L+28	14	
	10	5 6 8 10	30~150	34		L+34	17	8
	12	5 6 8 10 12	35~200	36	16	L+36	18	
	15	5 6 8 10 12 15	40~200	40		L+40	20	
	20	5 6 8 10 12 15 20	45~300	50	19	L+52	26	10
	25	5 6 8 10 12 15 20 25	55~300	56		L+58	29	

d1, d2 Selection Dimensions

d1 d2	D1H7	dh	B	Bearing No.
5	14	10	5	605ZZ
6	17	13	6	606ZZ
8	22	18	7	608ZZ
10	26	22	8	6000ZZ
12	28	24	8	6001ZZ
15	32	28	9	6002ZZ
20	42	36	12	6004ZZ
25	47	41	12	6005ZZ

Order Example

Part Number	-	E	-	d2	-	L
LNBB12	-	16			-	150
LNBWS10			-	5	-	150

Days to Ship: 8 Days

Price

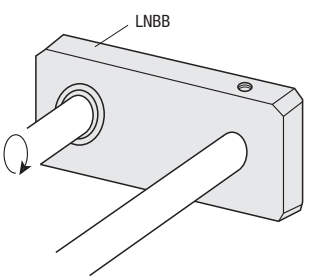
Volume Discount (Round down to one Cent.) P88

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example

-Fixes the shaft by the set screw side, and supports rotations by the bearing side.



d1	€ Unit Price									
	LNBB		LNBM		LNBWB		LNBWM		LNBWS	
	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L
5										
6										
8										
10										
12										
15										
20										
25										

Links
-Oil Free Bushings Press-Fit-

CAD Data

Features: Links with embedded oil-less bushings to prevent abrasions by rotating.

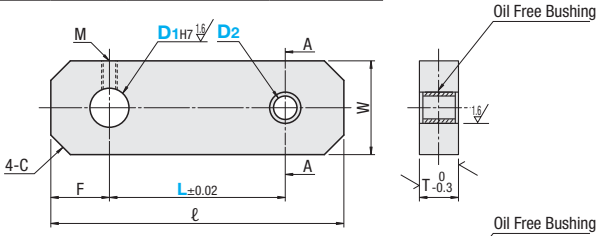


Type		Material		Surface Treatment	Accessory
Single Bushing	Double Bushings	Links	Bushing		
-	LNMWB	1.1191/C45E	Oil Free Bushing	Black Oxide	Hexagon Socket Set Screws (1.4301/ X5CrNi18-10)
-	LNMWM			Electroless Nickel Plating	
LNMS	LNMWS	1.4301/X5CrNi18-10		-	

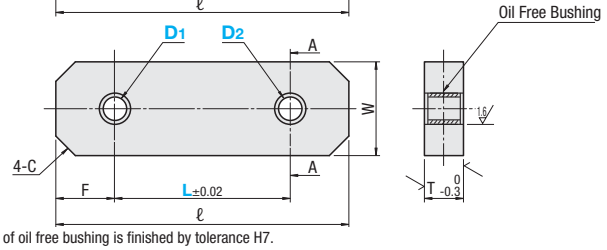
* Double Bushing Type has no set screw.

Section View A-A

Single Bushing Type



Double Bushing Type



* The housing diameter of press fit part of oil free bushing is finished by tolerance H7.

Part Number Type	D1	D2 Selection	L 1mm Increment	T	W	ℓ	F	C	Tightening Screw M
Single Bushing Type LNMS	3	3 4	10~150	5	13	L+10	5	3	M3
	4	3 4	10~150		16	L+12	6		
	5	3 4 5	10~150			L+14			
	6	3 4 5 6	10~150						
	8	4 5 6 8	10~150	6	22	L+17	8		
	10	5 6 8	15~200			L+19	9	5	M4
	12	6 8	15~200		25	L+21	10		
	13	6 8 10 12 13	20~200	9		L+22			
	14	8 10 12 13 15	20~200		30	L+25	12		
	15	8 10 12 13 15	20~200		32				
	16	8 10 12 13 15	20~200					8	
	18	10 12 13 15 16 18	35~200	12	38	L+28	14		M6
	20	10 12 13 15 16 18 20	35~300			L+32	15		
	25	12 13 15 16 18 20 25	35~300		50	L+38	18		
Double Bushing Type LNMWB LNMWM LNMWS	3	3	10~150	5	13	L+10	5	3	-
	4	3 4	10~150		16	L+12	6		
	5	3 4 5	10~150						
	6	3 4 5 6	10~150						
	8	4 5 6 8	15~150	6	22	L+16	8		
	10	5 6 8 10	15~150			L+18	9		
	12	6 8 10 12	20~200	9	25	L+20	10	5	
	13	6 8 10 12 13	20~200						
	15	8 10 12 13 15	20~200		32	L+24	12		
	16	8 10 12 13 15 16	20~200						
	18	10 12 13 15 16 18	35~200	12	38	L+28	14	8	
	20	10 12 13 15 16 18 20	35~300			L+30	15		
	25	12 13 15 16 18 20 25	35~300		50	L+36	18		

Order Example

Part Number		D2		L
LNMS10	-	6	-	70

Days to Ship: **8 Days**

Express A: 5,00 EUR/ piece — P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Example

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

D1	€ Unit Price							
	LNMS		LNMWB		LNMWM		LNMWS	
	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L	Min.L~100	L101~Max.L
3								
4								
5								
6								
8								
10								
12								
13								
14								
15								
16								
18								
20								
25								

Oil Free Bushing

Single Bushing Type		Oil Free Bushing	
D1	D2	d (Inner Dia.)	L (Overall Length)
3•4•5•6	3	3	4
	4	4	4
	5	5	4
	6	6	4
8•10•12	4	4	5
	5	5	5
	6	6	5
	8	8	5
13•14•15•16	6	6	8
	8	8	8
	10	10	8
	12	12	8
	13	13	8
	15	15	8
18•20•25	10	10	10
	12	12	10
	13	13	10
	15	15	10
	16	16	10
	18	18	10
	20	20	10
	25	25	10

Double Bushing Type		Oil Free Bushings (2 pcs.)	
D1	D2	d (Inner Dia.)	L (Overall Length)
3•4•5•6	3	3	4
	4	4	4
	5	5	4
	6	6	4
8	4	4	5
	5	5	5
	6	6	5
	8	8	5
10•12•13•15	5	5	8
	6	6	8
	8	8	8
	10	10	8
	12	12	8
	13	13	8
	15	15	10
16•18•20•25	8	8	10
	10	10	10
	12	12	10
	13	13	10
	15	15	10
	16	16	10
	18	18	10
	20	20	10
	25	25	10

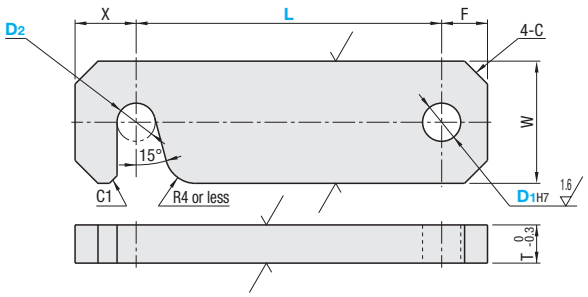
Links
-Notched · Slotted Hole-

CAD Data

■Notched



Type	Material	Surface Treatment
LNCB	1.1191/C45E	Black Oxide
LNCM		Electroless Nickel Plating
LNCS	1.4301/X5CrNi18-10	—



Part Number Type	D1H7	D2 Selection	L 1mm Increment	W	T	F	X	C	€ Unit Price LNCB	LNCM	LNCS
LNCB LNCM LNCS	5	3 4 5	15~150	16	5	6	(D2/2) +C+3	3			
	6	4 5 6	15~150	16	5	6		3			
	8	5 6 8	22~150	22	6	8		3			
	10	6 8 10	25~200	22	6	9		5			
	12	6 8 10 12	28~200	25	6	10		5			
	15	8 10 12 15	35~200	32	9	12		5			
	20	10 12 15 20	45~300	38	12	15		8			

Order Example: Part Number - D2 - L → LNCB10 - 6 - 150

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

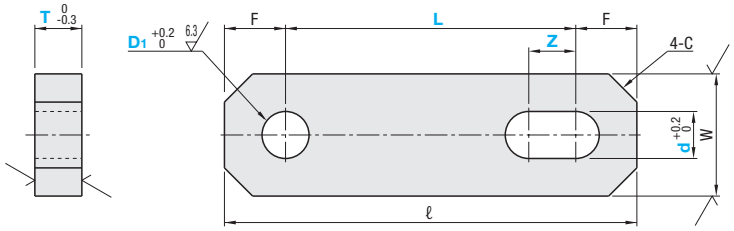
Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

■Slotted Hole



Type	Material	Surface Treatment
LNDLB	1.1191/C45E	Black Oxide
LNDLM		Electroless Nickel Plating
LNDLS	1.4301/X5CrNi18-10	—



Part Number Type	D1	L 1mm Increment	d 1mm Increment	Z 1mm Increment	T Selection	W	ℓ	F	C	€ Unit Price LNDLB	LNDLM	LNDLS
LNDLB LNDLM LNDLS	5	10~150	3~12 D1≥d	1~30	5 6 9	13	L+13	W/2	3			
				31~50								
	6	11~150		1~30	5 6 9	16	L+16					
				31~50								
	8	12~150		1~30	5 6 9	16	L+16					
				31~50								
	10	13~200		1~30	5 6 9	19	L+19		5			
				31~50								
	12	14~200		1~30	5 6 9 12	25	L+25					
				31~50								

L≥(D1/2)+(d2)+5 1≤Z≤L-(D1/2)+(d2+d)+5 When d=3, T≤6. When d=4, T≤9.

Order Example: Part Number - L - d - Z - T → LNDLM8 - 120 - 6 - 40 - 5

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Link Bars

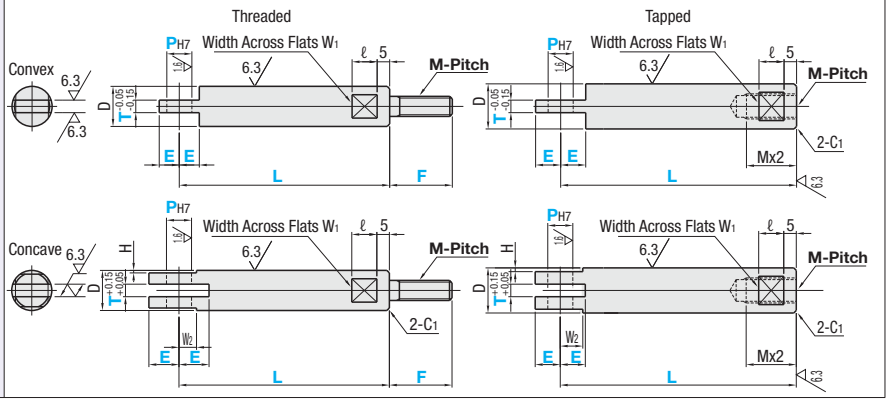
-Male Thread Type · Female Thread Type-

CAD Data



Male Thread Stud Type		Female Thread Type		M Material	S Surface Treatment
Notched	Prong Type	Notched	Prong Type		
LKTMB	LKSMB	LKTFB	LKSFB	1.1191/C45E	Black Oxide
LKTMM	-	-	LKSFM		Electroless Nickel Plating
LKTMS	LKSMS	LKTFS	-	1.4301/X5CrNi18-10	-

25 (6.3 6.3 1.6)



Link Bar, Male Thread Type

** The tolerance is H8 when P Dimension of Notched Male Thread is 10mm or more.

Part Number Type	M-Pitch	L 1mm Increment	F 1mm Increment	E 1mm Increment	**P 1mm Increment	T Selection	D	ℓ	W1	H	W2
Notched - Female Prong – Male	4-0.7	20~50 L≥E+ℓ+6	10~15	3~12 E≥P/2+1	3~6	5	10	8	8	0.5	6
Thread Thread	5-0.8										
LKTMB LKSMB	6-1.0		10~20		3~8	5 6	12	10	10	1	7
LKTMM	8-1.25	20~90 L≥E+ℓ+6	10~25	5~20 E≥P/2+1	3~8 * 3~10	5 6 9 * 10 * 12	16		13	1.5	9
LKTMS LKSMS	10-1.5		10~30		3~8 * 3~12	5 6 9 10 * 12	20		17		
* marked is for Prong Type only.	16-2.0		10~50		3~16	5 6 9 10 12 * 16	25		22		

Link Bar, Female Thread Type

Part Number Type	M-Pitch	L 1mm Increment	E 1mm Increment	P 1mm Increment	T Selection	D	ℓ	W1	H	W2
Notched Male Prong Female	5-0.8	30~60 L≥Mx2+9+E	3~12 E≥P/2+1	3~5 * 3~6	5 * 6	10	8	8	0.5	6
Thread Thread	6-1.0			3~6 * 3~8	5 6	12	10	10	1	7
LKTFB LKSFB LKSFM	8-1.25	30~100 L≥Mx2+9+E	5~20 E≥P/2+1	3~8 * 3~10	5 6 9 * 10 * 12	16		13	1.5	9
LKTFS	10-1.25			3~8 * 3~12	5 6 9 10 * 12	18		14		
* marked is for Prong Type only.	10-1.5									

Order Example

Part Number	-	L	-	F	-	E	-	P	-	T
LKTMB10-1.5	-	55	-	F15	-	E6	-	P6	-	T5
LKTFB8-1.25	-	55			-	E6	-	P6	-	T5

Days to Ship

8 Days

Price

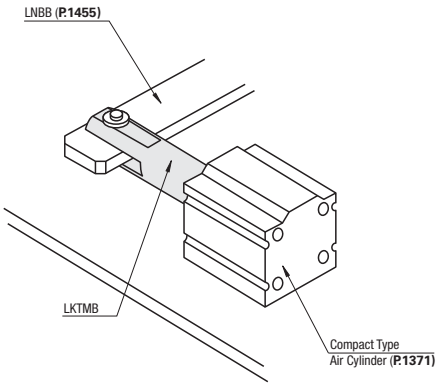
Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

M-Pitch	€ Unit Price					
	Male Thread Stud Type			Female Thread Type		
	LKTMB LKSMB	LKTMM	LKTMS LKSMS	LKTFB LKSFB	LKSFM	LKTFS
4-0.7						
5-0.8						
6-1.0						
8-1.25						
10-1.25						
10-1.5						
16-2.0						

Example



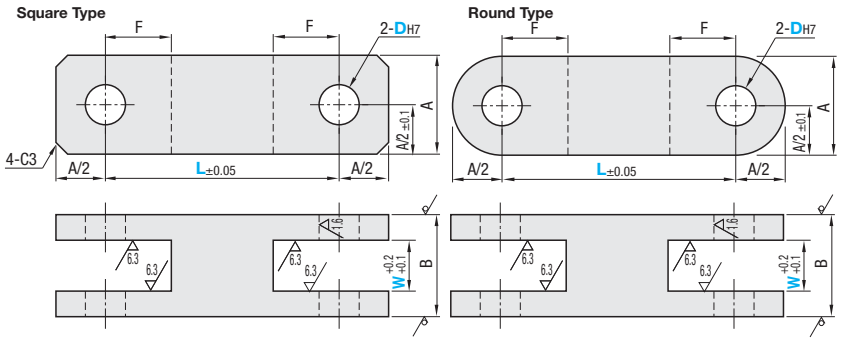
Links
-General Purpose Type-

CAD Data

RoHS



Type		Material
Square	Round	
LACF	LACG	1.0038/S235JR



■W Dimension Selectable Type

Part Number Type	DH7	L 5mm Increment	W Selection	A	B	F	€ Unit Price LACF	€ Unit Price LACG
Square LACF / Round LACG	3	40~100	5 6 9	20	20	15		
	4							
	5	50~100	5 6 9 12	25	25	18		
	6							
	8	50~120	9 12 16 19	28	28	20		
	10							
	12	60~120	12 16 19	32	32			
	13							
	14							
	15							
	16		12 16 19 22	38	38	25		
	18							
	20							
	25							

Order Example

Part Number	-	L	-	W
LACF12	-	120	-	16

Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

8 Days

Express A 5,00 EUR/ piece P.88

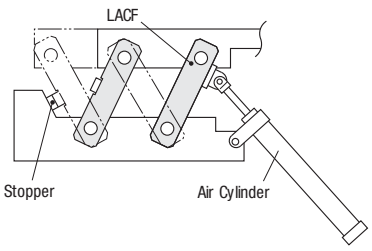
A Express Charge of 13,50 EUR for 3 or more identical pieces.

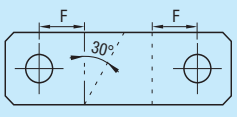
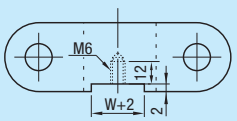
Alterations

Part Number - L - W - (KC, SC)
LACF10 - 75 - 16 - KC

8 Days

Example



Alterations	30° Relief Machining	Groove - Tapping
		
Code	KC	SC
Spec.	Adds 30° relief machining ⊗ Not applicable when L-(Fx2)<30	Adds a relief and a tap for mounting a stopper. ⊗ Not applicable when L-(Fx2)<30
Price Adder	4,00	6,00

Clamp Links

-Standard Type for Rod End Bearing, 2 Clamps Type-

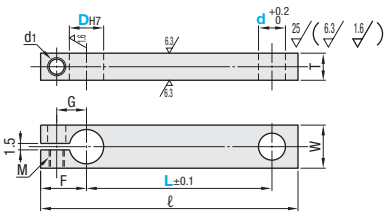
CAD Data

■Standard Type

RoHS



Type	Material	Surface Treatment	Accessory
CLKB	1.1191/C45E	Black Oxide	Hexagon Socket Head Cap Screw (1.7220/34CrMo4)
CLKM		Electroless Nickel Plating	Hexagon Socket Head Cap Screw (1.4301/X5CrNi18-10)
CLKS	1.4301/X5CrNi18-10	-	
CLKA	EN AW-6063/AlMg0,7Si	-	



DH7 tolerance is measured before slit machining.

■ℓ Dimension Table

D	d 3	4	5	6	8	10	12	14	15	16	18	20	25
5	L+16	L+17	L+18										
6	L+17	L+18	L+19	L+20									
8		L+21	L+22	L+23	L+24								
10		L+22	L+23	L+24	L+25	L+27							
12			L+23	L+24	L+25	L+27	L+30						
14				L+27	L+28	L+29	L+31	L+32					
15				L+27	L+28	L+30	L+32	L+34	L+35				
16					L+30	L+31	L+33	L+34	L+35	L+36			
18					L+32	L+33	L+35	L+36	L+37	L+38	L+40		
20					L+32	L+34	L+35	L+36	L+37	L+38	L+40	L+42	
25						L+36	L+37	L+38	L+39	L+40	L+42	L+44	L+48

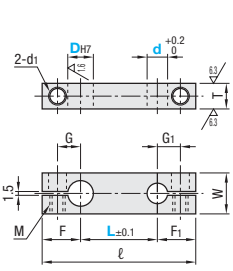
Part Number Type	DH7	d Selection	L 1mm Increment	T	W	F	G	Included Bolts M	d1	€ Unit Price CLKB Min.L~90	CLKB L91~150	CLKM Min.L~90	CLKM L91~150	CLKS Min.L~90	CLKS L91~150	CLKA Min.L~90	CLKA L91~150
CLKB CLKM CLKS CLKA	5	3 4 5	10~100	6	10	11	6	M4-10	4.5								
	6	3 4 5 6				12	7										
	8	4 5 6 8	15~150	10	12	14	8	M6-12	6.6								
	10	4 5 6 8 10			16	15	9	M6-15									
	12	5 6 8 10 12	20~150	12	18	16	10										
	14	6 8 10 12 14			22	18	12	M6-20									
	15	6 8 10 12 14 15															
	16	8 10 12 14 15 16	30~150			20	14										
	18	8 10 12 14 15 16 18			25	22	15	M6-25									
	20	8 10 12 14 15 16 18 20	40~150	15	28			M8-25	9								
	25	10 12 14 15 16 18 20 25			32	25	18	M8-30									

■2 Clamps Type

RoHS



Type	Material	Surface Treatment	Accessory
CLKWB	1.1191/C45E	Black Oxide	Hexagon Socket Head Cap Screw (1.7220/34CrMo4)
CLKWM		Electroless Nickel Plating	Hexagon Socket Head Cap Screw (1.4301/X5CrNi18-10)
CLKWS	1.4301/X5CrNi18-10	-	



d	F1	G1
3	10	5
4	11	6
5		
6	12	7
8	14	8
10	15	9
12	16	10
14	18	12
15		
16	20	14
18	22	15
20		
25	25	18

Tolerance DH7-d is the tolerance before slitting.

Part Number Type	DH7	d Selection	L 1mm Increment	W	F	G	Included Bolts M (2pcs.)	d1	T	€ Unit Price CLKWB Min.L~90	CLKWB L91~150	CLKWM Min.L~90	CLKWM L91~150	CLKWS Min.L~90	CLKWS L91~150
CLKWB CLKWM CLKWS	5	3 4 5	10~100	10	11	6	M4-10	4.5	6						
	6	3 4 5 6			12	7									
	8	4 5 6 8	15~150	12	14	8	M6-12	6.6	10						
	10	4 5 6 8 10		16	15	9	M6-15								
	12	5 6 8 10 12	20~150	18	16	10			12						
	14	6 8 10 12 14		22	18	12	M6-20								
	15	6 8 10 12 14 15													
	16	8 10 12 14 15 16	30~150		20	14									
	18	8 10 12 14 15 16 18		25	22	15	M6-25								
	20	8 10 12 14 15 16 18 20	40~150	28			M8-25	9	15						
	25	10 12 14 15 16 18 20 25		32	25	18	M8-30								

Order Example

Part Number	-	d	-	L
CLKB8	-	6	-	100
CLKWM20	-	16	-	100

Price

■Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

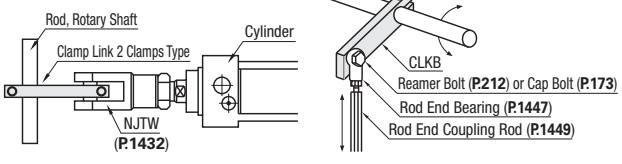
Days to Ship

-Standard Type: 8 Days | Express A | 5,00 EUR/ piece | P.88

-2 Clamps Type: 8 Days

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Example



Alterations

Part Number	-	d	-	L	-	(DKC, CKC, RC)
CLKB12	-	8	-	90	-	DKC

10 Days

Alterations	Part d Reamer Machining (dH7 - L Tolerance)	C Chamfering	Part d Slot Hole
			
Code	DKC	CKC	RC
Spec.	Adds reamer machining (dH7) on d part and changes L tolerance. Ordering Code DKC	Adds chamfering on d side Ordering Code CKC	Changes d part to slotted hole. Z = 1mm Increment Ordering Code RC-Z5
Price Adder	2,00	3,00	5,00

d	dH7 Tol.	L Tol.
3	+0.010 0	±0.02
4		
5	+0.012 0	
6		
8	+0.015 0	
10		
12		±0.05
14	+0.018 0	
16		
18		
20	+0.021 0	
25		

d	Chamfering
3~12	C2
14~25	C3

Z≤L−(D/2 +d+5)

1≤Z≤100

⊗ Combination with DKC is not possible

Applicable to CLKB, CLKM, CLKS and CLKA only.

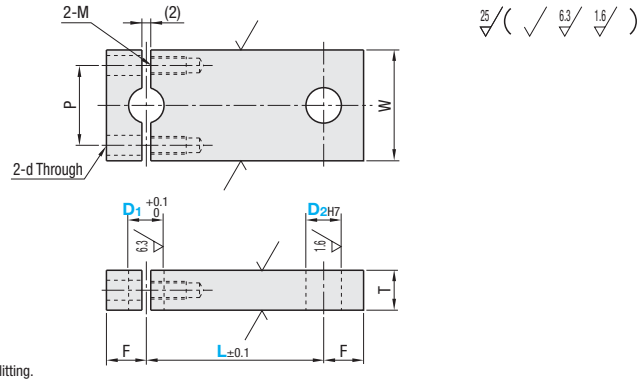
Clamp Links · Joint Plates
-Separate Type-

CAD Data

Clamp Links -Separate Type-



Type	Material	Surface Treatment	Accessory
CLHPB	1.1191/C45E	Black Oxide	Hexagon Socket Head Cap Screw (1.7220)
CLHPM		Electroless Nickel Plating	Hexagon Socket Head Cap Screw (1.4301/X5CrNi18-10)
CLHPS	1.4301/X5CrNi18-10		



RoHS

Tolerance D_1 is the tolerance before slitting.

Part Number Type	D_1	D_{2H7} Selection	L 1mm Increment	T	W	F	P	M	d	€ Unit Price CLHPB Max. L~100	CLHPB 101~Max. Large L	CLHPM Max. L~100	CLHPM 101~Max. Large L	CLHPS Max. L~100	CLHPS 101~Max. Large L
CLHPB	8	3 4 5 6 8	20~150	9	25	9	18	M4	4.5						
CLHPM	10	4 5 6 8 10													
CLHPS	12	5 6 8 10 12	20~150	12	32	10	22	M5	5.5						
	15	8 10 12 14 15 16	30~200	12	32	12	22								
	20	8 10 12 14 15 16 18 20	30~200	12	44 (40)	15	32 (30)	M6	6.5						

Dimensions in ( ) are for CLHPS only.

Order Example

Part Number	-	D_2	-	L
CLHPB8	-	6	-	100

Days to Ship: 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	D_2	-	L	-	(CKC)
CLHPB8	-	6	-	100	-	CKC

10 Days

Alterations	C Chamfering
Code	CKC
Spec.	Adds a chamfering on D_2. Ordering Code CKC
Price Adder	4,00

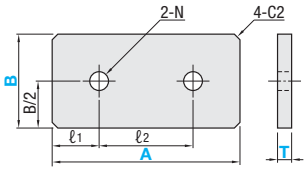
D_2	Chamfering
3~12	C5
14~20	C6

Joint Plate



RoHS

Type	Material	Surface Treatment
JNPB	1.0330	Carbon Steel Bright Chromate
JNPS	1.4301	-



Part Number Type	A	B	T JNPB	T JNPS	ℓ1	ℓ2	N	€ Unit Price JNPB T2.0	JNPB T4.5	JNPS T2.0	JNPS T4.0
JNPB	30	10 20	2.0	2.0	5	20	4.5				
	40	10 20 30				30					
	50	10 20 30 40			10	30					
	60	10 20 30 40 50				40					
JNPS	70	10 20 30 40 50	4.5	4.0		50	5.5				
	80	10 20 30 40 50				60					
	90	10 20 30 40 50			15	60					
	100	10 20 30 40 50				70					

Order Example

Part Number	-	B	-	T
JNPB50	-	30	-	2.0

Days to Ship: 8 Days

Express A 3,00 EUR/ piece P.88

A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~49
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Hinge Bases

-Prong T-Shape Type · Notched π-Shape Type-

CAD Data

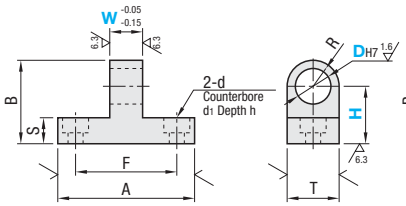
RoHS



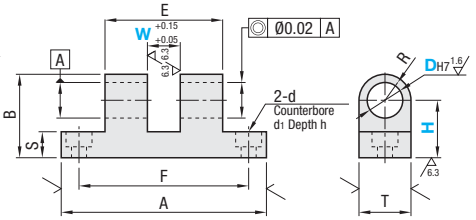
Prong Type		Notched Type		M Material	S Surface Treatment
W Dimension Fixed	W, H Configurable	W Dimension Fixed	W, H Configurable		
HKHHB	HGHHB	HKHJB	HGHJB	1.1191/C45E	Black Oxide
HKHHM	HGHHM	HKHJM	HGHJM		Electroless Nickel Plating
HKHHS	-	HKHJS	-	1.4301/X5CrNi18-10	-

25 (6.3 1.6)

Prong Type



Notched Type



Prong Type

Part Number Type	DH7	W Select-able	W 1mm Increment	H 1mm Increment	A	F	B (H+R)	S	T	R (T/2)	d1	d	h	€ Unit Price W Dimension Fixed HKHHB	HKHHM	HKHHS	W, H Configurable HGHHB	HGHHM
W Dimension Fixed HKHHB HKHHM HKHHS	3	6	3~6	12~20	25	15	H+4.5	5.5	9	4.5	6.5	3.5	3.5					
	4	8	4~8			17												
	5		5~10	16~25	32	22	H+6	7.5	12	6								
	6	10	6~12								8	4.5	4.5					
	8		8~16	18~30	38	27	H+8		16	8								
	10		10~16	18~35														
W, H Dimension Configurable HGHHB HGHHM	12	12	12~16	21~35	50	37	H+9.5	9.5	19	9.5	9.5	5.5	5.5					
	13		13~24															
	14		14~24	24~35			H+12.5		25	12.5								
	15	16	15~24															
	16		16~24	26~40														
	20	20	20~30	29~40	65	49	H+15	11.5	30	15	11	6.5	6.5					
	25	30	25~35	30~45			H+16		32	16								

Notched Type

Part Number Type	DH7	W Select-able	W 1mm Increment	H 1mm Increment	A	F	B (H+R)	E	S	T	R (T/2)	d1	d	h	€ Unit Price W Dimension Fixed HKHJB	HKHJM	HKHJS	W, H Configurable HGHJB	HGHJM
W Dimension Fixed HKHJB HKHJM HKHJS	3	6	3~8	12~20	32	24	H+4.5	14	5.5	9	4.5	6.5	3.5	3.5					
	4	8	4~12		38	30		20											
	5		5~15	16~25	50	40	H+6	25	7.5	12	6								
	6	10	6~14					28				8	4.5	4.5					
	8		8~24	20~30	65	52	H+8	38	9.5	16	8								
	10		10~23	20~35	75	62		43											
W, H Dimension Configurable HGHJB HGHJM	12	12	12~23	21~35			H+9.5			19	9.5	9.5	5.5	5.5					
	13		13~23																
	14		14~23	24~35			H+ 12.5			25	12.5								
	15	16	15~23																
	16		16~23	26~40															
	20	20	20~30	29~40	100	84	H+15	65	11.5	30	15	11	6.5	6.5					
	25	30	25~35	30~45			H+16			32	16								

Order Example

Part Number	-	W	-	H
HKHHB10			-	H18
HGHJM16	-	W20	-	H27

Days to Ship

10 Days

Express B | 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

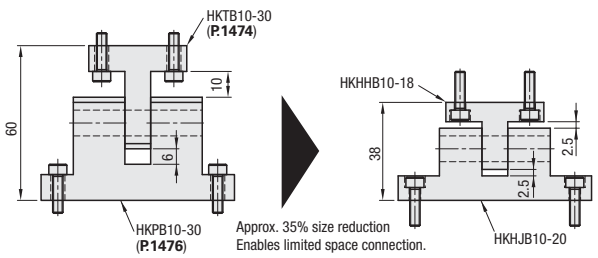
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	18%

For orders larger than indicated quantity, please request a quotation.

- Comparison between T-Shaped Type and U-Shaped Type when connected

Conventional Type | H Dimension Compact



Approx. 35% size reduction
Enables limited space connection.

Hinge Bases -A Dimension Compact Type-

-Standard Type · Miniature Type-

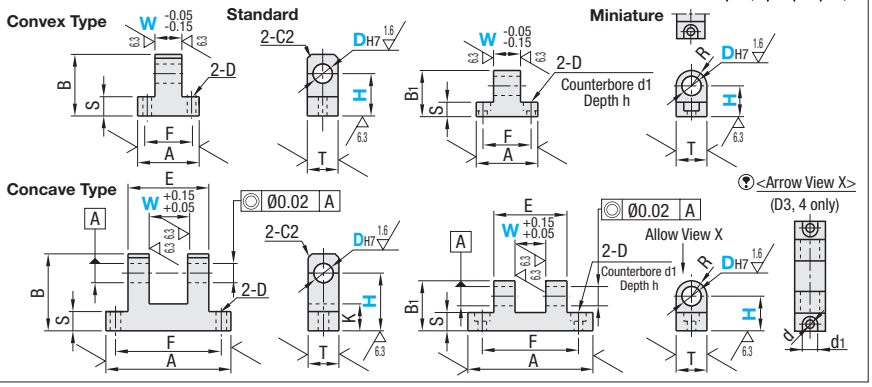
CAD Data

Features: A dimension (lateral direction) is more compact than conventional hinges. For miniature type. H dimension (lengthwise direction) is also compacted.

RoHS



Standard		Miniature		Material	Surface Treatment
Prong Type	Notched Type	Prong Type	Notched Type		
HGAAB	HGAAJB	HGHAB	HGHAJB	1.1191/C45E	Black Oxide
HGAAM	HGAAJM	HGHAM	HGHAJM		Electroless Nickel Plating
HGAAS	HGAAJS	-	HGHAJS	1.4301/X5CrNi18-10	-



For Miniature Notched Type, when choosing DH73 - 4, no counterbore shown as <Allow View>. (When DH75 or more, with counterbore)

Prong Type

Part Number Type	DH7	W 1mm Increment	H 1mm Increment Standard	H 1mm Increment Miniature	A	F	B	B1 (H+R)	S	T	R (T/2)	d1	d	h
Standard	3	3~6	14~20	11~20	22	15	H+5	H+4.5	5 (5.5)	9	4.5	6.5	3.5	3.5
HGAAB	4	3~6												
HGAAM	5	4~10	16~25	12~25	25	18	H+6	H+6		12	6		4.5 (3.5)	
HGAAS	6	5~10	19~25				H+8							
	8	6~16 (15)	25~30	16~30	32	25		H+8	10 (7.5)	16	8	8	4.5	4.5
	10	8~16 (15)	26~35	16~35			H+10							
	12	8~16 (15)	27~35	18~35				H+9.5	10 (9.5)	19	9.5			
Miniature	13	12~20 (18)	28~35	20~35										
HGHAB	14	12~20 (18)	35~40	23~35	38	30	H+12	H+12.5	15 (9.5)	22 (25)	12.5	9.5	5.5	5.5
HGHAM	15	12~20 (18)												
	16	12~20 (18)												
	20	15~25	39~45	27~40	50	40	H+14	H+15	15 (11.5)	25 (30)	15	11	6.5	6.5
	25	20~25	40~45	28~45			H+17	H+16		30 (32)	16			

Dimensions in ( ) are for Miniature Type.

Notched Type

Part Number Type	DH7	W 1mm Increment	H 1mm Increment Standard	H 1mm Increment Miniature	A	F	B	B1 (H+R)	E	K	S	T	R (T/2)	d1	d	h
Standard	3	3~6	16~20	11~20	25	20	H+5	H+4.5	12	10	5 (5.5)	9	4.5	6.5	3.5	3.5
	4	3~10			32	25			18 (17)							
HGAAJB	5	4~12	18~25	12~25	38	30	H+6	H+6	22			12	6	6.5	4.5 (3.5)	3.5
HGAAJM	6	5~12	19~25				H+8									
HGAAJS	8	6~18	25~30	16~30	50	40		H+8	30	14	10 (7.5)	16	8	8	5.5 (4.5)	4.5
	10	8~25 (20)	26~35	18~35	65	55 (50)	H+10	H+9.5	42 (38)		10 (9.5)	19	9.5	9.5	5.5	5.5
	12	8~25 (20)	27~35	20~35												
Miniature	13	8~25 (20)														
HGHAJB	14	12~25 (20)	31~40	23~35			H+12	H+12.5		15	15 (9.5)	22 (25)	12.5	9.5	6.5 (5.5)	5.5
HGHAJM	15	12~25 (20)									15 (11.5)			11	6.5	6.5
HGHAJS	16	12~25 (20)		25~35												
	20	15~25	36~45	27~40	75	60	H+14	H+15	45	18		25 (30)	15	11	9 (6.5)	6.5
	25	15~25	40~45	28~45			H+17	H+16				30 (32)	16			

Dimensions in ( ) are for Miniature Type.

Order Example: Part Number - W - H
HGAAB10 - W12 - H30
HGHAJS10 - W20 - H18

Days to Ship: 10 Days — Express B 5,00 EUR/piece — P88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Comparison of A Dimensions

DH7	Standard Type Prong Type Conventional Type (P.1474)	Standard Type Prong Type A Dimension Compact	Standard Type Prong Type Reduction Ratio	Standard Type Notched Conventional Type (P.1476)	Standard Type Notched A Dimension Compact	Standard Type Notched Reduction Ratio	Miniature Type Prong Type Conventional Type (P.2068)	Miniature Type Prong Type A Dimension Compact	Miniature Type Prong Type Reduction Ratio	Miniature Type Notched Conventional Type (P.2068)	Miniature Type Notched A Dimension Compact	Miniature Type Notched Reduction Ratio
3	25	19	-24%	32	25	-22%	25	22	-12%	32	25	-22%
4		22	-12%	38	32	-16%				38	32	-16%
5	32		-31%	50	38	-24%	32	25	-22%	50	38	-24%
6		25	-22%									
8				65	50	-23%				65	50	-23%
10	38	32	-16%				38	32	-16%			
12												
13				75	65	-13%				75	65	-13%
14	50	38	-24%				50	38	-24%			
15												
16												
20	65	50	-23%	100	75	-25%	65	50	-23%	100	75	-25%
25												

* A dimension (lateral direction) has been shortened as well as F dimension (mounting dimension)

DH7	€ Unit Price Prong Type Standard HGAAB	HGAAM	HGAAS	Prong Type Miniature HGHAB	HGHAM	Notched Type Standard HGAAJB	HGAAJM	HGAAJS	Notched Type Miniature HGHAJB	HGHAJM	HGHAJS
3 or 4											
5 or 6											
8 or 10											
12~14											
15•16											
20											
25											

Hinge Bases -Installation Hole Center Type-

-Prong Type · Notched Type-

CAD Data

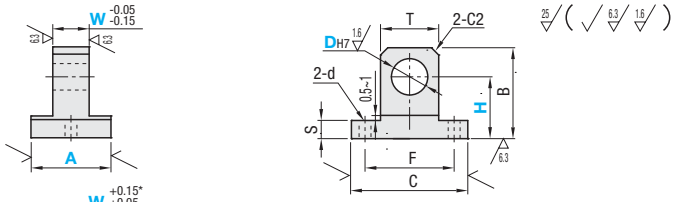
Features: A dimension (lateral direction) has been minimized by placing a mounting hole in the center.

RoHS

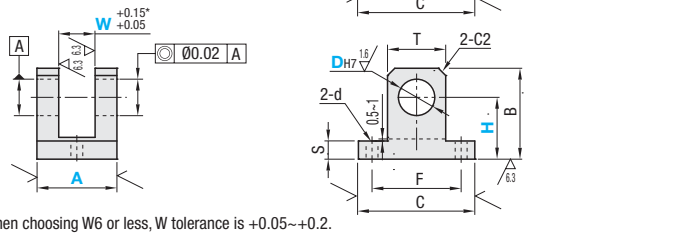


Prong Type	Notched Type	Material	Surface Treatment
HGCCB	HGCCJB	1.1191/C45E	Black Oxide
HGCCM	HGCCJM		Electroless Nickel Plating
HGCCS	HGCCJS	1.4301/X5CrNi18-10	-

Prong Type



Notched Type



* For Notched Type, when choosing W6 or less, W tolerance is +0.05~+0.2.

Part Number Type	DH7	A Selection	W 1mm Increment	H 1mm Increment	C	F	B	S	T	d	€ Unit Price Prong Type HGCCB	HGCCM	HGCCS	Notched Type HGCCJB	HGCCJM	HGCCJS
Prong Type HGCCB HGCCM HGCCS / Notched Type HGCCJB HGCCJM HGCCJS	3	12	3~6	12~20	25	18	H+T/2	5	9	4.5						
	4	12														
	5	19	5~11	14~25	32	25			12							
		22	5~14													
	6	19	5~11													
		22	5~14													
	8	19	6~11	17~25					16							
		22	6~14													
	10	22	10~12	17~30												
		25	10~15													
	12	22	10~12	22~35	38	30		8	19	5.5						
		25	10~15													
	13	25														
	14	30	12~20	26~40	50	40		10	22	6.5						
	15	30														
	16	30														
	20	38	15~25	28~45					25							
	25	38		36~50	65	50		15	30	9						

Order Example

Part Number	-	A	-	W	-	H
HGCCB10	-	A25	-	W12	-	H20
HGCCJS12	-	A22	-	W10	-	H30

Days to Ship

10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

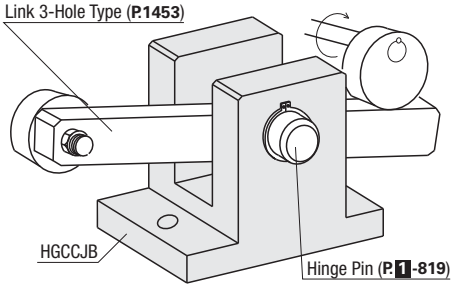
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example

Link 3-Hole Type (P.1453)



Hinge Bases -Installation Hole Center Type-

-Notched Counterbore Hole · Bottom Mount Type-

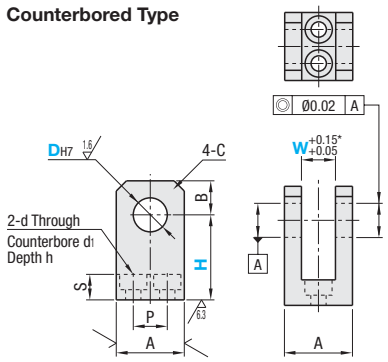
CAD Data



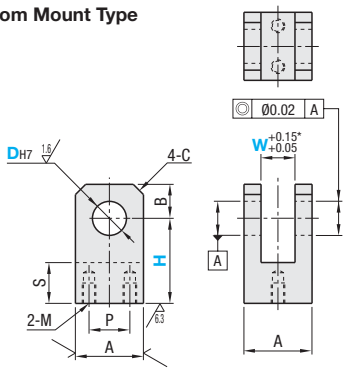
Type		M Material	S Surface Treatment
Counterbored	Bottom Mount		
HBNTB	HBNUB	1.1191/C45E	Black Oxide
HBNTM	HBNUM		Electroless Nickel Plating
HBNTS	HBNUS	1.4301/X5CrNi18-10	—



Counterbored Type



Bottom Mount Type



RoHS

When choosing W6 or less, W tolerance is +0.05~+0.2.

Part Number Type	DH7	W 1mm Increment	H 1mm Increment	A	P	B	C	S	d1	d	h	€ Unit Price HBNTB	HBNTM	HBNTS
Counterbored Type HBNTB HBNTM HBNTS	4	4~12	12~20	16	8	4	3	5.5	6.5	3.5	3.5			
	5													
	6	6~12	14~25	20	10	6	4	7.5	8	4.5	4.5			
	8		17~25			8								
	10		17~30			10								
	12	10~20	22~35	28	14	12	5	9.5	9.5	5.5	5.5			
	13		22~35			13								
	14	12~22	26~40	32	16	14								

When W<d1 is specified, the knuckle joint shape is as the lower picture shown above.

Part Number Type	DH7	W 1mm Increment	H 1mm Increment	A	P	B	C	S	M	€ Unit Price HBNUB	HBNUM	HBNUS
Bottom Mount Type HBNUB HBNUM HBNUS	4	4~12	15~20	16	10	4	3	10	M3			
	5											
	6	6~12	20~35	20	12	6	4	12	M4			
	8					8						
	10					10						
	12	10~20	30~45	28	14	12	5	14	M5			
	13					13						
	14	12~22		32	16	14						

Features: Compact in size, and small installation footprint.

-Comparison Table

D	New Product Vertical	Horizontal	Installation Footprint	HGCCB (P.1464) Vertical	Horizontal	Installation Footprint	Reduction Ratio	HGCTB (P.1471) Vertical	Horizontal	Installation Footprint	Reduction Ratio
4	16	16	256	12	25	300	-15%	28	28	784	-67%
5	16	16	256	12	25	300	-15%	32	32	1024	-75%
6	20	20	400	19	35	665	-40%	32	32	1024	-61%
8	20	20	400	19	32	608	-34%	38	38	1444	-72%
10	20	20	400	22	32	704	-43%	38	38	1444	-72%
12	28	28	784	22	38	836	-6%	45	45	2025	-61%
13	28	28	784	25	38	950	-17%	50	50	2500	-69%
14	32	32	1024	30	50	1500	-32%	50	50	2500	-59%

Order Example

Part Number	-	W	-	H
HBNTB10	-	W8	-	H20
HBNUM12	-	W12	-	H35

Days to Ship

10 Days

Express B 5,00 EUR/ piece

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price P.88

Volume Discount

(Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Thick Hinge Bases T-Shaped Type

-Standard · A Dimension Compact-

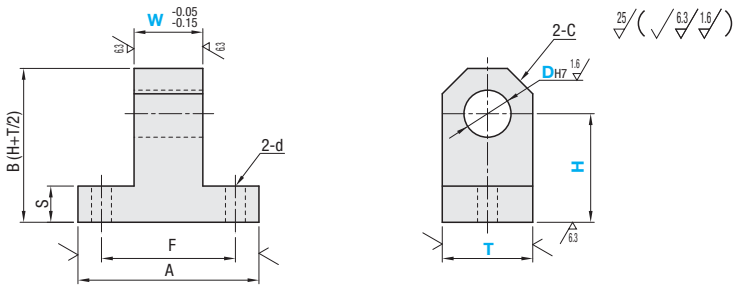
CAD Data

Features: Hinge base is added with A dimension (lateral) more compact than conventional hinges



RoHS

Type				Material	Surface Treatment
Standard		A Dimension Compact			
W Dimension Fixed	W · H Configurable	W Dimension Fixed	W · H Configurable		
HKNNB	HGNNB	-	HGNAB	1.1191/C45E	Black Oxide
-	HGNNM	-	-		Electroless Nickel Plating
-	-	HKNAS	HGNAS	1.4301/X5CrNi18-10	-



For comparison of Standard Type and A Dimension Compact Type, refer to the comparison table on **P.1467**

Part Number Type	DH7	T Selection	W Standard Selectable	W Standard 1mm Increment	W A Dimension Compact Selectable	W A Dimension Compact 1mm Increment	H 1mm Increment	Standard A	Standard F	A Dimension Compact A	A Dimension Compact F	S	d	C	€ Unit Price W Dimension Fixed HKNNB	€ Unit Price W Dimension Fixed HKNAS	€ Unit Price W, H Configurable HGNNB	€ Unit Price W, H Configurable HGNNM	€ Unit Price W, H Configurable HGNAS
Standard Type W Dimension Fixed **HKNNB**	4	12	8	3~8	5	3~6	16~25	25	17	22	15	5	4.5	3					
	5	16		5~12	6	4~8	18~30	32	23	25	18			4					
		19					20~30							5					
	6	16	10		8	5~10	18~30							4					
		19					20~30							5					
W, H Configurable **HGNNB** **HGNNM**	8	19		8~16	10	6~12	26~35	38	27	32	25	10	5.5	5					
		22					28~35							6					
	10	19		10~18	12	8~15	26~35		28					5					
		22					28~35							6					
	12	22					28~40							6					
		25					29~40							7					
A Dimension Compact Type W Dimension Fixed **HKNAS**	13	22	12	12~24	14	12~18	28~40	50	37	38	30	15	6.5	6					
		25					29~40							7					
	14	25					35~45							7					
		30					38~45							8					
W, H Configurable **HGNAB** **HGNAS**	15	25			16		35~45							7					
		30					38~45							8					
	16	25					35~45							7					
		30					38~45							8					
	20	30	20	20~35	18	15~24	40~55	65	49	50	38		9	8					
		38					44~55							11					
	25	38	30		20									11					

Price of HGNAB is HGNNBx0.95 (rounded down to the nearest ten Cent).

Order Example

Part Number	-	T	-	W	-	H
HKNNB10	-	T22	-	W25	-	H35
HGNNM20	-	T38			-	H48

Days to Ship 8 Days

Price

Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

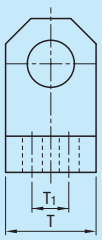
List of Diameter (DH7), Thickness (T) and Thickness on one side

DH7	Hinge Base Standard Type (P.1470~P.1479) T	Thickness on one side (T-DH7)/2)	Hinge Base Thick Type T	Thickness on one side (T-DH7)/2)	T	Thickness on one side (T-DH7)/2)
4	9	2.5	12	4	-	-
5	12	3.5	16	5.5	19	7
6		3		5		6.5
8	16	4	19	5.5	22	7
10		3		4.5		6
12	19	3.5	22	5	25	6.5
13		3		4.5		6
14	22	4	25	5.5	30	8
15		3.5		5		7.5
16		3		4.5		7
20	25	2.5	30	5	38	9
25	30	2.5	38	6.5	-	-

Features: (1)The hole's thickness on one side is selectable by working load.
(2)New products can specify H and W dimensions in 1mm increment.

Alterations

Part Number	-	T	-	W	-	H	-	(WDC)
HKNNB10	-	T22			-	H35	-	WDC

Alteration	Code	Spec.	Price Adder
	WDC	Changes the number of d holes from 2 to 4. The holes are drilled at T1 position. Ordering Code WDC	3,00

T	T1
16	8
19	10
22	12
25	14
30	15
38	20

⊗ Not applicable to D4.

Thick Hinge Bases Notched Type

-Standard · A Dimension Compact-

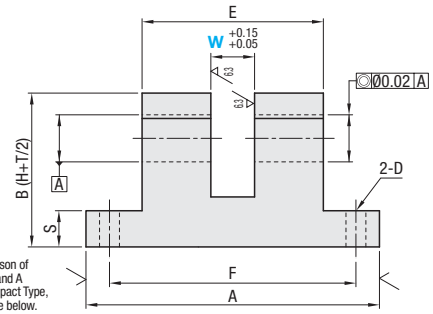
CAD Data

Features: Hinge base is added with A dimension (lateral) more compact than conventional hinges

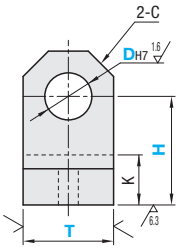
RoHS



Type				Material	Surface Treatment
Standard		A Dimension Compact			
W Dimension Fixed	W, H Configurable	W Dimension Fixed	W, H Configurable		
HKNJB	HGNJB	HKNAJB	HGNAJB	1.1191/C45E	Black Oxide
HKNJM	HGNJM	HKNAJM	-		Electroless Nickel Plating
-	-	-	HGNAJS	1.4301/X5CrNi18-10	-



For the comparison of Standard Type and A Dimension Compact Type, refer to the table below.



Part Number Type	DH7	T Selection	W Standard Selectable	W Standard 1mm Increment	W A Dimension Compact Selectable	W A Dimension Compact 1mm Increment	H 1mm Increment	Standard A	Standard F	Standard E	A Dimension Compact A	A Dimension Compact F	A Dimension Compact E	K	S	d	C	€ Unit Price W Dimension Fixed HKNJB	€ Unit Price W Dimension Fixed HKNJM	€ Unit Price W, H Configurable HGNJB	€ Unit Price W, H Configurable HGNJM	€ Unit Price W, H Configurable HGNAJS
Standard Type W Dimension Fixed HKNJB HKNJM	4	12	8	4~12	5	4~8	17~25	38	29	20	32	25	16	10	5	4.5	3					
	5	16		5~15	6	4~12	19~30	50	41	25	38	30	22	12 (10)			4					
		19					21~30										5					
	6	16	10	6~18	8	5~12	19~30			32							4					
		19					21~30										5					
W, H Configurable HGNJB HGNJM	8	19		8~24	10	6~18	25~35	65	52	38	50	40	30				5					
		22					27~35										6					
	10	19		10~30	12	8~25	25~35	75	62	50	65	55	42	14	10	5.5	5					
		22					27~35										6					
A Dimension Compact Type W Dimension Fixed HKNAJB HKNAJM	12	22	12				27~40										6					
		25					28~40										7					
	13	22			14		27~40										6					
		25					28~40										7					
	14	25				12~25	29~45							15	15	6.5	7					
		30					32~45										8					
	15	25	16		16		29~45		63								7					
		30					32~45										8					
	16	25					29~45										7					
W, H Configurable HGNAJB HGNAJS		30					32~45										8					
	20	30	20	20~35	18	15~25	35~50										8					
		38					39~50	100	82	65	75	60	45	18	9		11					
	25	38	30		20		39~50										11					

* Dimensions in ( ) are for A Dimension Compact Type.

Price of A Dimension Compact (1.1191/C45E) is above price x 0.95 (rounded down to the nearest ten Cent).

Order Example

Part Number	-	T	-	W	-	H
HKNJB6	-	T19			-	H27
HGNJM20	-	T38	-	W25	-	H48
HGNAJB10	-	T22	-	W15	-	H30

Days to Ship 8 Days

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

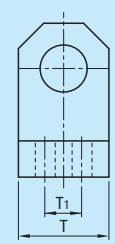
Comparison of A Dimensions

DH7	T	Prong T-Shape Type Standard Type (P.1466)	Prong T-Shape Type A Dimension Compact	Prong T-Shape Type Reduction Ratio	Notched π-Shape Type Standard Type	Notched π-Shape Type A Dimension Compact	Notched π-Shape Type Reduction Ratio
4	12	25	22	-12%	38	32	-16%
5	16	32	25	-22%	50	38	-24%
	19						
6	16						
	19						
8	19	38	32	-16%	65	50	-23%
	22				75	65	-13%
10	19						
	22						
12	22						
	25						
13	22	50	38	-24%			
	25						
14	25						
	30						
15	25						
	30						
16	25						
	30						
20	30	65	50	-23%	100	75	-25%
	38						
25	38						

* A dimension (lateral direction) has been shortened as well as F dimension (mounting dimension)

Alterations

Part Number	-	T	-	W	-	H	-	(WDC)
HKNJB6	-	T19			-	H27	-	WDC

Alteration	Code	Spec.	Price Adder
	WDC	Changes the number of d holes from 2 to 4. The holes are drilled at T1 position. Ordering Code WDC	3,00

T	T1
16	8
19	10
22	12
25	14
30	15
38	20

⊗ Not applicable to D4.

Thick Hinge Bases L-Shaped Type

CAD Data

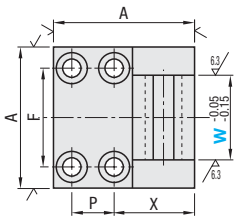
RoHS

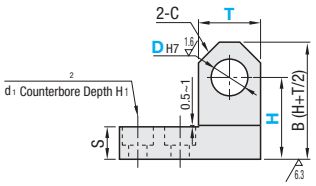


Type		M Material	S Surface Treatment
Prong Type	Notched Type		
HGLKB	HGLJB	1.1191/C45E	Black Oxide
HGLKM	HGLJM		Electroless Nickel Plating
-	HGLJS	1.4301/X5CrNi18-10	-

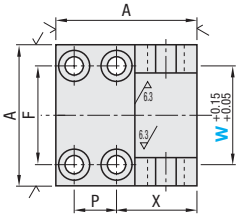
25 / (6.3 / 1.6 /)

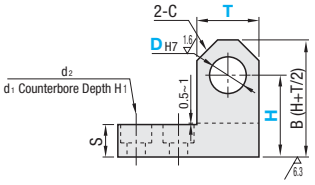
Prong Type





Notched Type





Part Number Type	DH7	T Selection	W 1mm Increment	H 1mm Increment	A	F	P	X	S	d2	d1	H1	C	€ Unit Price Prong Type HGLKB	Prong Type HGLKM	Notched Type HGLJB	Notched Type HGLJM	Notched Type HGLJS
Prong Type HGLKB HGLKM / Notched Type HGLJB HGLJM HGLJS	4	12	4~8	20~30	25	12	-	18.5	7.5	4.5	8	4.5	3					
	5	16	5~10		28			22	9.5	5.5	9.5	5.5	4					
		19		21~31	32	20		25.5					5					
	6	16	6~12	25~35	28	12		22					4					
		19			32	20		25.5					5					
	8	19	8~16		38	25		28.5					5					
		22			45	30	12	27.5					6					
	10	19	10~20					26					5					
		22			50	35	15	28.5					6					
	12	22	12~30	30~40									6					
		25					12	31.5					7					
	13	22	13~30				15	28.5					6					
		25						35					7					
	14	25	14~30	35~45	60	40			11.5	6.5	11	6.5	7					
		30						37.5					8					
	15	25						35					7					
		30						37.5					8					
	16	25						35					7					
		30						37.5					8					
	20	30	20~35	40~50	65	45	17	39	16	9	14	9	8					
		38			70		16	46					11					
	25	38	25~35										11					

Order Example

Part Number	-	T	-	W	-	H
HGLKB10	-	T19	-	W15	-	H35
HGLKM16	-	T30	-	W25	-	H42

Days to Ship

-1.1191/C45E

10 Days

Express B | 5,00 EUR/ piece

P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

-1.4301/X5CrNi18-10

10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

List of Diameter (DH7), Thickness (T) and Thickness on one side

DH7	Hinge Base Standard Type (P.1470~P.1479) T	Thickness on one side (T-DH7)/2)	Hinge Base Thick Type T	Thickness on one side (T-DH7)/2)	T	Thickness on one side (T-DH7)/2)
4	9	2.5	12	4	-	-
5	12	3.5	16	5.5	19	7
6		3		5		6.5
8	16	4	19	5.5	22	7
10		3		4.5		6
12	19	3.5	22	5	25	6.5
13		3		4.5		6
14	22	4	25	5.5	30	8
15		3.5		5		7.5
16		3		4.5		7
20	25	2.5	30	5	38	9
25	30	2.5	38	6.5	-	-

Features: The hole's thickness on one side is selectable based on applied working load.

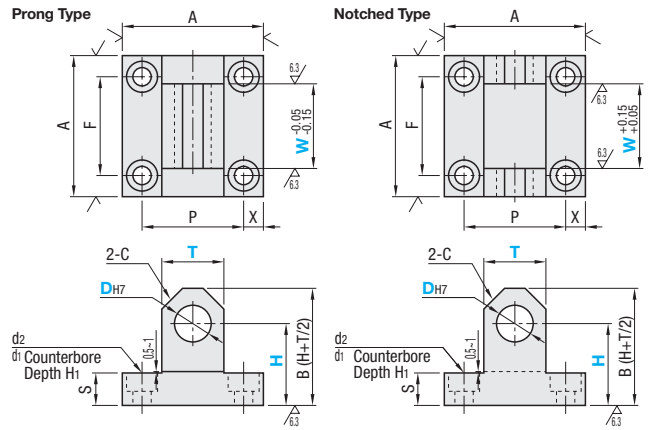
Thick Wall Hinge Bases

-Center Fulcrum Type-

CAD Data



Type		M	S
Prong Type	Notched Type	Material	Surface Treatment
HGCKB	HGCJB	1.1191/C45E	Black Oxide
HGCKM	HGCJM		Electroless Nickel Plating



Part Number		T	W	H	A	F	P	X	S	d2	d1	H1	C	€ Unit Price			
Type	DH7	Selection	1mm Increment	1mm Increment										Prong Type		Notched Type	
														HGCKB	HGCKM	HGCJB	HGCJM
Prong Type HGCKB HGCKM / Notched Type HGCJB HGCJM	4	12	4~8	20~30	32	18	22	5	7.5	4.5	8	4.5	3				
	5	16	5~10		38	27	27	5.5					4				
		19					28.5	4.75					5				
	6	16	6~12	25~35			27	5.5					4				
		19					28.5	4.75					5				
	8	19	8~16		45	32	32	6.5	9.5	5.5	9.5	5.5	5				
		22					33.5	5.75					6				
	10	19	10~20	30~40			32	6.5					5				
		22			50	35	36	7					6				
	12	22	12~30										6				
		25					37	6.5					7				
	13	22	13~30				36	7	11.5	6.5	11	6.5	6				
		25			60	40	43	8.5					7				
	14	25	14~30	35~45									7				
		30					45	7.5					8				
	15	25					43	8.5					7				
		30					45	7.5					8				
	16	25					43	8.5					7				
		30					45	7.5					8				
	20	30	20~35	40~50	65		48	8.5	16	9	14	9	8				
		38			70	45	54	8					11				
	25	38	25~35										11				

Order Example

Part Number	-	T	-	W	-	H
HGCKB6	-	T19	-	W10	-	H27
HGCJB20	-	T30	-	W30	-	H45

Days to Ship

10 Days | Express B | 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

List of Diameter (DH7), Thickness (T) and Thickness on one side

DH7	Hinge Base Standard Type (P.1470~P.1479)		Hinge Base Thick Type			
	T	Thickness on one side (T-DH7)/2)	T	Thickness on one side (T-DH7)/2)	T	Thickness on one side (T-DH7)/2)
4	9	2.5	12	4	-	-
5	12	3.5	16	5.5	19	7
6		3		5		6.5
8	16	4	19	5.5	22	7
10		3		4.5		6
12	19	3.5	22	5	25	6.5
13		3		4.5		6
14	22	4	25	5.5	30	8
15		3.5		5		7.5
16		3		4.5		7
20	25	2.5	30	5	38	9
25	30	2.5	38	6.5	-	-

Features: The hole's thickness on one side is selectable based on applied working load.

Hinge Bases L-Shaped Type

-Standard Type · With Female Thread Hole for Stopper-

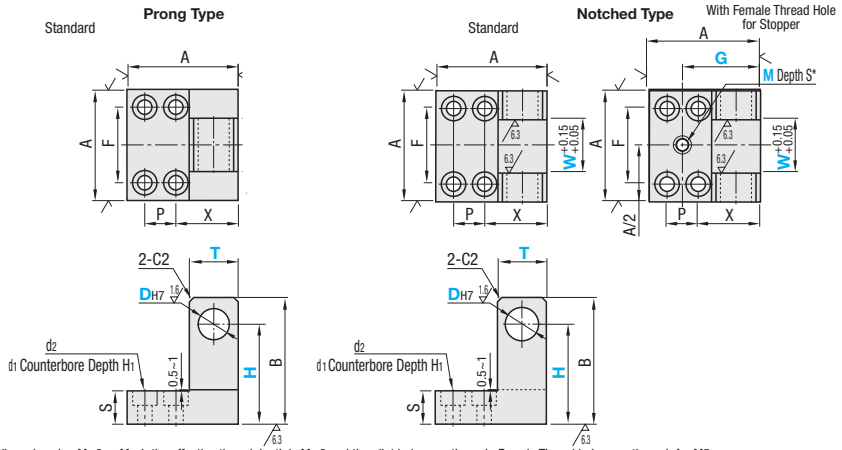
CAD Data

RoHS



Type			M Material	S Surface Treatment
Standard		With Female Thread Hole for Stopper		
Prong Type	Notched Type	Notched Type		
HGLNB	HGLTB	-	1.1191/C45E	Black Oxide
HGLNM	HGLTM	HGLSTM		Electroless Nickel Plating
-	HGLTS	-	1.4301/ X5CrNi18-10	-

25 / (6.3 / 1.6 /)



* When choosing M=3 or M=4, the effective thread depth is M×2 and the pilot hole goes through. Female Thread hole goes through for M5 or more.

Part Number Type	DH7	W 1mm Increment	H 5mm Increment	G 1mm Increment	M Selection	A	F	P	X	B	S	T	d2	d1	H1
Standard Prong Type HGLNB HGLNM	3	3~6	15~25	-	-	20	10	-	14.5	H+5	8	9	4.5	8	4.5
	4	4~8	20~30			22	11	-	15.5		10				
	5	5~10				25	12	-	18.5	H+6	12	12	5.5	9.5	5.5
	6	6~12	25~35					-		H+8					
	8	8~16		X-3≤G≤X+3	3 4 5 6	32	20	-	24			16			
Notched Type HGLTB HGLTM HGLTS	10	10~18	30~40	X-6≤G≤X+6		38	25	-	27						
	12	12~30			4 5 6 8	45	28	12	25	H+10	14	19			
	13	13~30		X≤G≤X+P											
	14	14~24	35~45		4 5 6 8 10	50	34	14	28	H+12	15	22	6.5	11	6.5
With Female Thread Hole for Stopper Notched Type HGLSTM	15	15~24													
	16	16~24													
	20	20~30	40~50		5 6 8 10 12	60	40	17	33	H+14	18	25	9	14	9
	25	25~35				65	45		38	H+17		30			

Order Example

Part Number	-	W	-	H	-	G	-	M
HGLNB12	-	W12	-	H35				
HGLTS20	-	W20	-	H40				
HGLSTM10	-	W15	-	H35	-	G27	-	M5

Days to Ship

10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

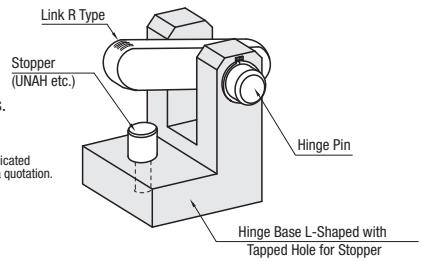
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

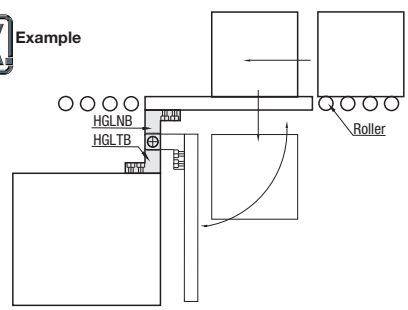
Features

Size and position of tapped hole is selectable.



DH7	€ Unit Price					
	Standard Type					With Female Thread Hole for Stopper Type
	Prong Type		Notched Type			Notched Type
	HGLNB	HGLNM	HGLTB	HGLTM	HGLTS	HGLSTM
3						
4						
5						
6						
8						
10						
12						
13						
14						
15						
16						
20						
25						

Example



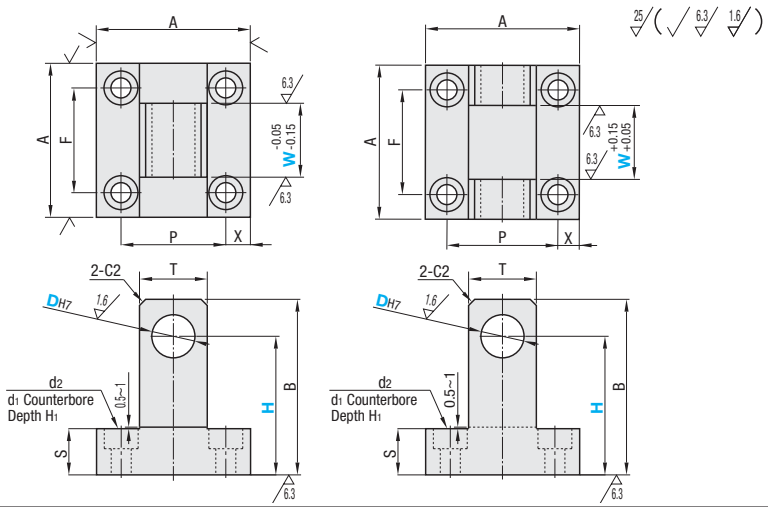
Hinge Bases
-Center Fulcrum Type-

CAD Data

RoHS



Type		Material	Surface Treatment
Prong Type	Notched Type		
HGCNB	HGCTB	1.1191/C45E	Black Oxide
HGCNM	HGCTM		Electroless Nickel Plating
HGCNS	HGCTS	1.4301/X5CrNi18-10	-



Part Number Type	DH7	W 1mm Increment	H 5mm Increment	A	F	P	X	B	S	T	d2	d1	H1
Prong Type HGCNB HGCNM HGCNS	3	3~6	15~25	28	18	18	5	H+5	8	9	4.5	8	4.5
	4	4~8	20~30						10				
	5	5~10		32	22	22		H+6	12	12			
	6	6~12	25~35					H+8					
	8	8~16		38	27	27	5.5			16	5.5	9.5	5.5
	10	10~18	30~40	45	32	32	6.5	H+10	14	19			
Notched Type HGCTB HGCTM HGCTS	12	12~30											
	13	13~30		50	35	35	7.5	H+12	15	22	6.5	11	6.5
	14	14~24	35~45										
	15	15~24											
	16	16~24											
	20	20~30	40~50	60	40	40	10	H+14	18	25	9	14	9
	25	25~35		65	45	45		H+17		30			

Order Example

Part Number	-	W	-	H
HGCNB12	-	W12	-	H35
HGCTS20	-	W20	-	H40

Days to Ship

10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

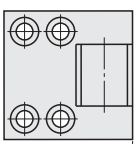
Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18

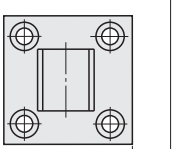
For orders larger than indicated quantity, please request a quotation.

Example

Features

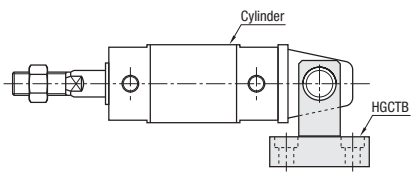


Tighten with 4 screws, L-Shaped Type



Tighten with 4 screws, Center Fulcrum Type

Interference avoided



Features:
The hinge base can be used as a cylinder mount.

D	€ Unit Price					
	Prong Type			Notched Type		
	HGCNB	HGCNM	HGCNS	HGCTB	HGCTM	HGCTS
3						
4						
5						
6						
8						
10						
12						
13						
14						
15						
16						
20						
25						

Thick Hinge Bases with Oil Free Bushings

-Prong T-Shape Type · Notched π-Shape Type-

CAD Data

Features: Thick-wall hinge base which oil-less bushings are embedded to prevent abrasion by rotating. Can be specified by 1mm.

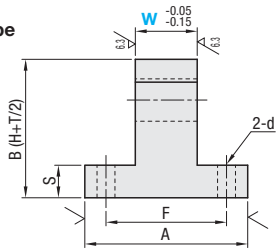
RoHS

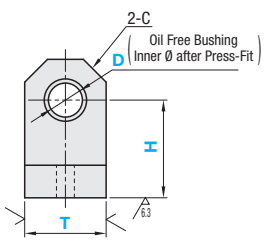


Type		M Material	S Surface Treatment	A Accessory
Prong Type	Notched			
HKNMB	HKNJMB	1.1191/C45E	Black Oxide	Oil Free Bushing
HKNMM	-		Electroless Nickel Plating	
HKNMS	-	1.4301/X5CrNi18-10	-	

25 / (6.3 / 1.6 /)

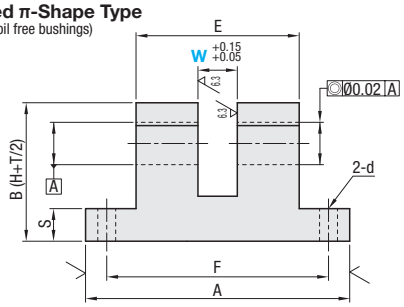
Prong T-Shape Type

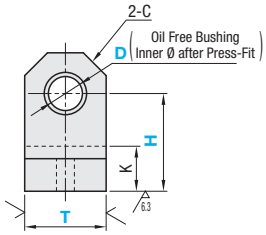




Notched π-Shape Type

(2 pcs. for oil free bushings)





Prong Type

Part Number Type	DH7	T Selection	W Selection	H 1mm Increment	A	F	S	d	C	€ Unit Price HKNMB	HKNMM	HKNMS
HKNMB HKNMM HKNMS	4	12	5 6 8	17~25	25	17	5	4.5	3			
	5	16	5 6 8	18~30	32	23			4			
		19		20~30					5			
	6	16	6 8 10 12	18~30					4			
		19		20~30					5			
	8	19	8 10 12 16	26~35	38	27	10	5.5	5			
		22		28~35					6			
	10	19	10 12 16 18	26~35		28			5			
		22		28~35					6			
	12	22	12 16 18	28~40					6			
		25		30~40					7			

Notched Type

Part Number Type	DH7	T Selection	W Selection	H 1mm Increment	A	F	E	K	S	d	C	€ Unit Price
HKNJMB	4	12	6 8 9	17~25	38	29	20	10	5	4.5	3	
	5	16	6 8 9 10	21~30	50	41	25	12			4	
		19		23~30							5	
	6	16	6 8 9 10 12	21~30			32				4	
		19		23~30							5	
	8	19	8 9 10 12 15 20	25~35	65	52	38	14	10	5.5	5	
		22		27~35							6	
	10	19	15 20 24 30	25~35	75	62	50				5	
		22		27~35							6	
	12	22	15 20 24 30	27~40							6	
		25		28~40							7	

Order Example

Part Number	-	T	-	W	-	H
HKNMB8	-	T19	-	W10	-	H30
HKNJMB10	-	T22	-	W20	-	H30

Days to Ship

10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

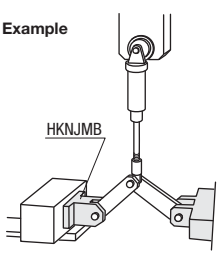
Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Example



for Prong Type (1pc)

d	W	Oil Free Bushing d (Inner Dia.)	L (Overall Length)
4	5	4	4
	6	4	5
	8	4	6
5	5	5	4
	6	5	5
	8	5	6
6	6	6	5
	8	6	6
	10	6	8
	12	6	10
8	8	8	6
	10	8	8
	12	8	10
	16	8	15
10	10	10	8
	12	10	10
	16 or 18	10	15
12	12	12	10
	16 or 18	12	15

for Notched Type (2pcs)

D	W	Oil Free Bushing d (Inner Dia.)	L (Overall Length)
4	6, 8	4	5
	9	4	4
5	6	5	8
	8~10	5	6
6	6	6	12
	8~10	6	10
	12	6	8
8	8~12	8	12
	15	8	10
	20	8	8
10	15	10	15
	20• 24	10	12
	30	10	8
12	15	12	15
	20• 24	12	12
	30	12	8

Hinge Bases
-Fixed Dimension T-Shape · U-Shape-

CAD Data

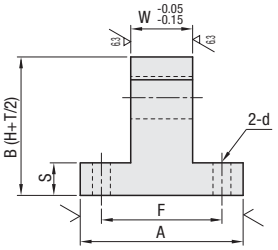
Features: Hinge Base in stock which allows you to choose 2 T dimensions (thickness) and H dimension (height) to DH7

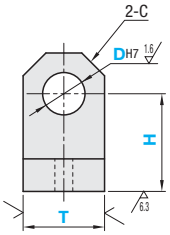
Prong T-Shape Type

RoHS



Type	Material	Surface Treatment
HKNKB	1.1191/C45E	Black Oxide





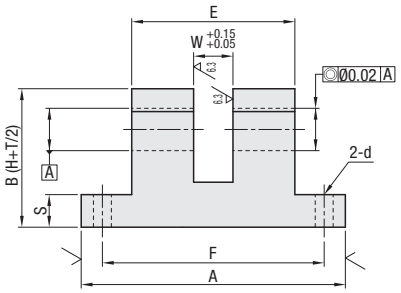
Part Number Type	DH7	T Selection	H Selection	W	A	F	S	d	C	€ Unit Price
HKNKB	5	12	20 25	6	25	18	5	4.5	3	
		16							4	
	6	12	20 25						3	
		16							4	
	8	16	25 30	8	32	25	10	5.5	4	
		19							5	
	10	16	25 30	10					4	
		19							5	
	12	19	30 35	12					5	
		22							6	

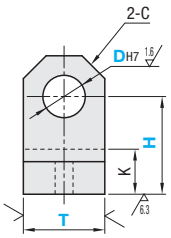
Notched π-Shape Type

RoHS



Type	Material	Surface Treatment
HKNKJB	1.1191/C45E	Black Oxide



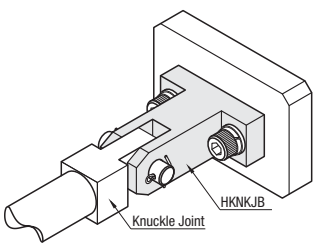


Part Number Type	DH7	T Selection	H Selection	W	A	F	E	K	S	d	C	€ Unit Price
HKNKJB	5	12	20 25	6	38	30	22	12	5	4.5	3	
		16									4	
	6	12	20 25								3	
		16									4	
	8	16	25 30	8	50	40	30	14	10	5.5	4	
		19									5	
	10	16	25 30	10	65	55	42				4	
		19									5	
	12	19	30 35	12							5	
		22									6	

Order Example

Part Number	-	T	-	H
HKNKB8	-	T16	-	H25

Example



Days to Ship

6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Discount Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

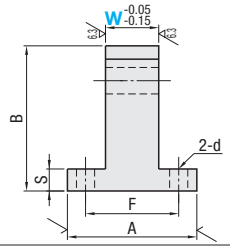
Hinge Bases
-T-Shaped Type-

CAD Data

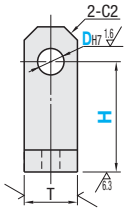


RoHS

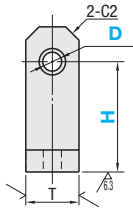
W Dimension Fixed Type		W, H Dimension Configurable Type		M Material	S Surface Treatment
H7 Type	Oil Free Type	H7 Type	Oil Free Type		
HKTB	HKTBM	HGBTB	HGBTBM	1.1191/C45E	Black Oxide
HKTM	-	HGBTM	-		Electroless Nickel Plating
HKTS	-	HGBTS	-	1.4301/X5CrNi18-10	-



H7 Type



Oil Free Type



W Dimension Fixed Type

Type	D	H7 Type D Tolerance	Oil Free Type D Tolerance (Reference)	H 1mm Increment	W	A	F	B	S	T	d	Oil Free Bushing d (Inner Dia.)	Oil Free Bushing L (Overall Length)
(H7 Type) HKTB HKTM HKTS	2	+0.01 0	-	15~20	4	22	15	H+3	5	6	3.5	-	-
	3			15~25	6	25		H+5		9	4.5		
	4	+0.012 0	+0.062 0		8		17					4	6
	5		+0.065 0	20~30		32	23	H+6		12		5	6
	6							H+8				6	8
	8	+0.015 0		25~35	10	38	27		10	16	5.5	8	8
	10		+0.068 0	30~40			28	H+10		19		10	8
	12	+0.018 0			12	50	37		15	22	6.5	12	10
(Oil Free Type) HKTBM	13		-									-	-
	14			35~45				H+12				-	-
	15				16							-	-
	16											-	-
	20	+0.021 0		40~50	20	65	49	H+14		25	9	-	-
	25				30			H+17		30		-	-

For detailed pivot pin dimensions, refer to P.1-820

W, H Dimension Configurable Type (for Oil Free Type, H dimension is fixed)

Type	D	H7 Type D Tolerance	Oil Free Type D Tolerance (Reference)	H7 Type W 1mm Increment	H7 Type H 5mm Increment	Oil Free Type W Selection	Oil Free Type H Selectable	A	F	B	S	T	d
(H7 Type) HGBTB HGBTM HGBTS	2	+0.01 0	-	3~5	15~20	-	-	22	15	H+3	5	6	3.5
	3			3~6	15~25			25		H+5		9	4.5
	4	+0.012 0	+0.062 0	4~8		4 5 6 8	20		17				
	5		+0.065 0	5~10	20~30	5 6 8 9 10		32	23	H+6		12	
	6			6~12		6 8 9 10 12				H+8			
	8	+0.015 0		8~16	25~35	8 9 10 12 14 15 16	25	38	27	H+10	10	16	5.5
	10			10~18		10 12 14 15 16 18			28			19	
	12	+0.018 0	+0.068 0	12~18	30~40	12 14 15 16 18	30						
(Oil Free Type) HGBTBM	13			13~24		14 15 16 18 20 22 24							
	14		-	14~24	35~45	-	-	50	37	H+12	15	22	6.5
	15		+0.068 0	15~24		15 16 18 20 22 24	35						
	16			16~24		16 18 20 22 24							
	20	+0.021 0	-	20~30	40~50	-	-	65	49	H+14		25	9
	25			25~35						H+17		30	

For detailed pivot pin dimensions, refer to P.1-820

Order Example

Part Number	-	W	-	H
HKTB13			-	H35
HGBTB10	-	W15	-	H30
HGBTBM4	-	W6		

Days to Ship: 8 Days

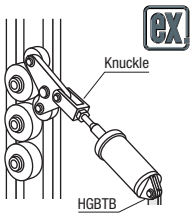
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

D	€ Unit Price							
	W Dimension Fixed Type				W, H Dimension Configurable Type			
	H7 Type			Oil Free Type	H7 Type			Oil Free Type
	HKTB	HKTM	HKTS	HKTBM	HGBTB	HGBTM	HGBTS	HGBTBM
2								
3								
4								
5								
6								
8								
10								
12								
13								
14								
15								
16								
20								
25								



HGBTBM Oil Free Bushing

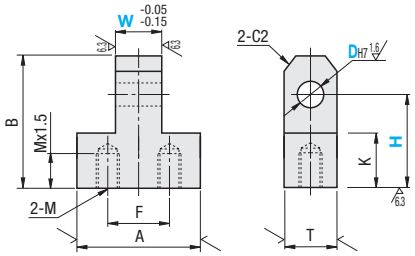
d	W	Oil Free Bushing d (Inner Dia.)	Oil Free Bushing L (Overall Length)
4	4	4	3
	5	4	4
	6	4	5
	8	4	6
5	5	5	4
	6	5	5
	8	5	6
	9	5	8
	10	5	8
6	6	6	5
	8	6	6
	9	6	8
	10	6	8
	12	6	10
8	8	8	6
	9	8	8
	10	8	8
	12	8	10
	14	8	12
	15	8	12
	16	8	15
10	10	10	8
	12	10	10
	14	10	12
	15	10	12
	16	10	15
	18	10	15
12	12	12	10
	14	12	12
	15	12	12
	16	12	15
	18	12	15
13	14	13	12
	15	13	12
	16	13	15
	18	13	15
	20	13	15
	22	13	20
	24	13	20
15	15	15	12
	16	15	15
	18	15	15
	20	15	15
	22	15	20
	24	15	20
16	16	16	15
	18	16	15
	20	16	15
	22	16	20
	24	16	20

Hinge Bases
-T-Shaped Bottom Mount Type-

CAD Data



W Dimension Fixed Type	W · H Dimension Configurable Type	M Material	S Surface Treatment
HKKBB	HGBBB	1.1191/C45E	Black Oxide



■W Dimension Fixed Type

Part Number Type	D	D Tolerance	H 1mm Increment	W	A	F	B	K	T	M (Coarse Thread)	€ Unit Price
HKKBB	2	+0.01 0	15~20	4	13	7	H+3	10	6	M3	
	3		15~25	6	16	8	H+5		9		
	4	+0.012 0		8	19	11					
	5		20~30		25	16	H+6	12	12	M4	
	6				32	20	H+8				
	8	+0.015 0	25~35	10	38	26		14	16	M5	
	10		30~40		50	38	H+10				
	12	+0.018 0		12					19		
	13					36					
	14										
	15		35~45	16			H+12	15	22	M6	
	16										
	20	+0.021 0	40~50	20	65	47	H+14	18	25	M8	
	25			30			H+17		30		

For detailed pivot pin dimensions, refer to P.1-820

■W, H Dimension Configurable Type

Part Number Type	D	D Tolerance	W 1mm Increment	H 5mm Increment	A	F	B	K	T	M (Coarse Thread)	€ Unit Price
HGBBB	2	+0.01 0	3~5	15~20	13	7	H+3	10	6	M3	
	3		3~6	15~25	16	8	H+5		9		
	4	+0.012 0	4~8		19	11					
	5		5~10	20~30	25	16	H+6	12	12	M4	
	6		6~12		32	20	H+8				
	8	+0.015 0	8~16	25~35	38	26		14	16	M5	
	10		10~18	30~40	50	38	H+10				
	12	+0.018 0	12~18						19		
	13		13~24								
	14		14~24	35~45		36	H+12	15	22	M6	
	15		15~24								
	16		16~24								
	20	+0.021 0	20~30	40~50	65	47	H+14	18	25	M8	
	25		25~35				H+17		30		

For detailed pivot pin dimensions, refer to P.1-820

Order Example

Part Number	-	W	-	H
HKKBB8			-	H27
HGBBB8	-	W8	-	H25

Days to Ship

8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

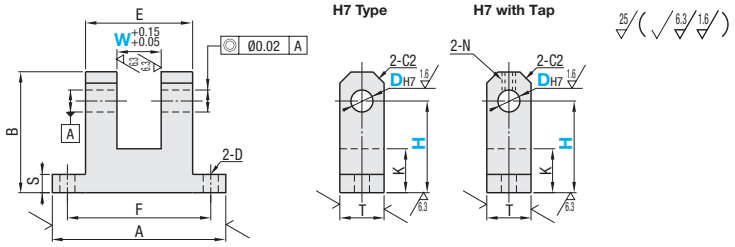
Hinge Bases
-Concave U-Shaped-

CAD Data



RoHS

W Dimension Fixed Type		W, H Dimension Configurable Type		M Material	S Surface Treatment	A Accessory (H7 Type with Tap only)
H7 Type	H7 Type with Tap	H7 Type	H7 Type with Tap			
HKPB	HKPBT	HGBPB	-	1.1191/C45E	Black Oxide	2 Set Screws (1.4301/X5CrNi18-10)
HKPM	HKPMT	HGBPM	HGBPMT		Electroless Nickel Plating	
HKPS	-	HGBPS	-	1.4301/X5CrNi18-10	-	



■W Dimension Fixed Type

Part Number Type	D	D Tol.	H 1mm Increment	W	A	F	B	E	K	S	T	d	N	€ Unit Price H7 Type HKPB	HKPM	HKPS	H7 Type with Tap HKPBT	HKPMT
(H7 Type) HKPB HKPM HKPS (H7 Type with Tap) HKPBT HKPMT	2	+0.01 0	15~20	4	25	18	H+3	10	10	5	6	3.5	-					
	3		20~25	6	32	24	H+5	15			9	4.5	M3					
	4	+0.012 0		8	38	29		20										
	5		25~30		50	41	H+6	25	12		12		M4					
	6			10			H+8	32										
	8	+0.015 0	30~40		65	52		38	14	10	16	5.5						
	10																	
	12	+0.018 0		12	75	62	H+10	50			19		M5					
	13																	
	14																	
	15		35~45	16		63	H+12		15	15	22	6.5						
	16												M6					
	20	+0.021 0	40~50	20	100	82	H+14	65	18		25	9						
	25			30			H+17				30							

For detailed pivot pin dimensions, refer to P.1-820

■W, H Dimension Configurable Type

Part Number Type	D	D Tolerance	W 1mm Increment	H 5mm Increment	A	F	B	E	K	S	T	d	N	€ Unit Price H7 Type HGBPB	HGBPM	HGBPS	H7 Type with Tap HGBPMT
(H7 Type) HGBPB HGBPM HGBPS (H7 Type with Tap) HGBPMT	2	+0.01 0	3~5	15~20	25	18	H+3	10	10	5	6	3.5	-				
	3		3~9	20~25	32	24	H+5	15			9	4.5	M3				
	4	+0.012 0	4~12		38	29		20									
	5		5~15	25~30	50	41	H+6	25	12		12		M4				
	6		6~18				H+8	32									
	8	+0.015 0	8~24	30~40	65	52		38	14	10	16	5.5					
	10		10~30														
	12	+0.018 0	12~30		75	62	H+10	50			19		M5				
	13		13~30														
	14		14~30	35~45		63	H+12		15	15	22	6.5					
	15		15~30														
	16		16~30										M6				
	20	+0.021 0	20~30	40~50	100	82	H+14	65	18		25	9					
	25		25~35				H+17				30						

For detailed pivot pin dimensions, refer to P.1-820 For H7 type with tap, (E – W)2≥/2N + 2 is required.

Order Example

Part Number	-	W	-	H
HKPM12			-	H35
HGBPB8	-	W12	-	H35

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

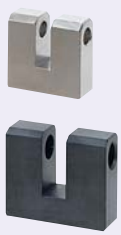
Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

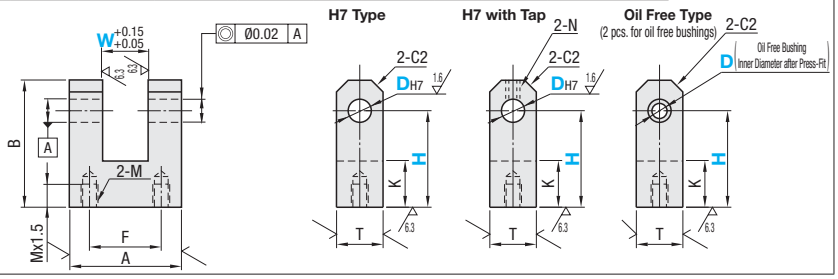
Hinge Bases
-Notched U-Shaped Type-

CAD Data

RoHS



W Dimension Fixed Type		W · H Dimension Configurable Type			M Material	S Surface Treatment	A Accessory
H7 Type	Oil Free Type	H7 Type	H7 Type with Tap	Oil Free Type			(H7 Type with Tap only)
HKUB	-	HGBUB	HGBUBT	-	1.1191/C45E	Black Oxide	Set Screws 2 pcs. (1.4301/X5CrNi18-10)
HKUM	-	HGBUM	-	-		Electroless Nickel Plating	
HKUS	HKUSM	-	-	HGBUSM	1.4301/X5CrNi18-10	-	



■W Dimension Fixed Type

Part Number Type	D	H7 Type D Tolerance	Oil Free Type D Tolerance (Reference)	H 1mm Increment	W	A	F	B	K	T	M (Coarse Thread)	Oil Free Bushing d (Inner Dia.)	Oil Free Bushing L (Overall Length)
(H7 Type) HKUB HKUM HKUS (Oil Free Type) HKUSM	2	+0.01 0	-	15~20	4	13	7	H+3	10	6	M3	-	-
	3				6	16	8	H+5		9		-	-
	4	+0.012 0	+0.062 0	20~25	8	19	11					4	4
	5		+0.065 0	25~30		25	16	H+6	12	12	M4	5	6
	6				10	32	20	H+8				6	10
	8	+0.015 0				38	26		14	16	M5	8	12
	10		+0.068 0	30~40		50	38	H+10				10	15
	12	+0.018 0			12					19		12	15
	13		-									-	-
	14			35~45			36	H+12	15	22	M6	-	-
	15				16							-	-
	16											-	-
	20	+0.021 0		40~50	20	65	47	H+14	18	25	M8	-	-
	25				30			H+17		30		-	-

For detailed pivot pin dimensions, refer to P.1-820

■HGBUSM Oil Free Bushing

d	W	Oil Free Bushing d (Inner Dia.)	Oil Free Bushing L (Overall Length)
4	8	4	5
	9	4	4
5	9	5	6
	10	5	6
	12	5	5
6	10	6	10
	12	6	8
	15	6	6
8	15	8	10
	16	8	10
10	15	10	15
	16	10	15
	18	10	15
12	15	12	15
	16	12	15
	20	12	12

■W · H Dimension Configurable Type (for Oil Free Type, H dimension is fixed)

Part Number Type	D	H7 Type D Tolerance	Oil Free Type D Tolerance (Reference)	H7 Type · H7 Type with Tap W 1mm Increment	H7 Type · H7 Type with Tap H 5mm Increment	Oil Free Type W Selection	Oil Free Type H Selectable	A	F	B	K	T	M (Coarse Thread)	N
(H7 Type) HGBUB HGBUM (H7 Type with Tap) HGBUBT (Oil Free Type) HGBUSM	2	+0.01 0	-	3~ 5	15~20	-	-	13	7	H+3	10	6	M3	-
	3			3~ 9	20~25			16	8	H+5		9		M3
	4	+0.012 0	+0.062 0	4~12		8 9	20	19	11					
	5		+0.065 0	5~15	25~30	9 10 12	25	25	16	H+6	12	12	M4	M4
	6			6~18		10 12 15		32	20	H+8				
	8	+0.015 0		8~24	30~40	15 16	30	38	26		14	16	M5	
	10		+0.068 0	10~30		15 16 18		50	38	H+10		19		M5
	12	+0.018 0		12~30		15 16 20								
	13		-	13~30		-	-							
	14			14~30	35~45				36	H+12	15	22	M6	
	15			15~30										
	16			16~30										
	20	+0.021 0		20~30	40~50			65	47	H+14	18	25	M8	M6
	25			25~35						H+17		30		

For detailed pivot pin dimensions, refer to P.1-820 For H7 type with tap, (A – W)/2≥N + 2 is required.

Order Example

Part Number	-	W	-	H
HKUB6			-	H28
HGBUB8		- W8	-	H30

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

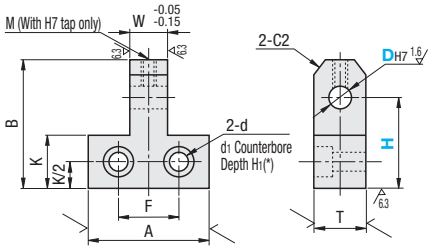
D	€ Unit Price							
	W Dimension Fixed Type				W, H Dimension Configurable Type			
	H7 Type			Oil Free Type	H7 Type		H7 Type with Tap	Oil Free Type
	HKUB	HKUM	HKUS	HKUSM	HGBUB	HGBUM	HGBUBT	HGBUSM
2								
3								
4								
5								
6								
8								
10								
12								
13								
14								
15								
16								
20								
25								

Hinge Bases
-Side Mounting T-Shaped Type-

CAD Data



H Dimension Configurable Type		M Material	S Surface Treatment	A Accessory
H7 Type	H7 Type with Tap			
HKSBB	HKSBBT	1.1191/C45E	Black Oxide	Set Screws 1 pc. (1.4301/X5CrNi18-10)
HKSBS	-	1.4301/X5CrNi18-10	-	



For H7 Type, M part doesn't have tap and set screw. * Holes for D2 are drill holes, not counterbored.

H Dimension Configurable Type

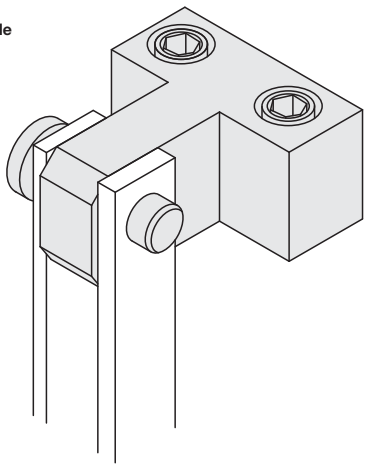
Part Number Type	DH7	H 1mm Increment	W	A	F	B	K	T	d	d1	H1	M	€ Unit Price HKSBB	HKSBS	HKSBBT
(H7 Type) HKSBB HKSBS (H7 Type with Tap) HKSBBT	2	15~20	4	13	7	H+3	10	6	3.5	-	-	-			
	3	15~25	6	16	8	H+5		9		6.5	3.5	M3			
	4		8	19	11										
	5	20~30		25	16	H+6	12	12	4.5	8	4.5	M4			
	6		10	32	20	H+8									
	8	25~35		38	26		14	16	5.5	9.5	5.5				
	10	30~40		50	38	H+10									
	12		12					19				M5			
	13														
	14														
	15	35~45	16		36	H+12	15	22	6.5	11	6.5				
	16														
	20	40~50	20	65	47	H+14	18	25	9	14	9	M6			
	25					H+17		30							

For detailed pivot pin dimensions, refer to P.1-820

Order Example

Part Number	-	H
HKSBB6	-	H30

Example



Days to Ship 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Hinge Bases

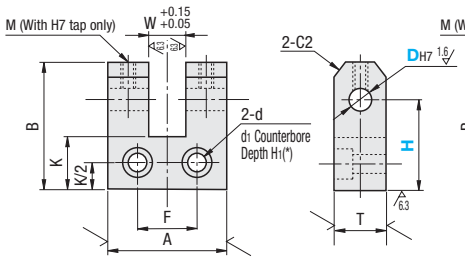
-Side Mounting U-Shaped Type-

CAD Data

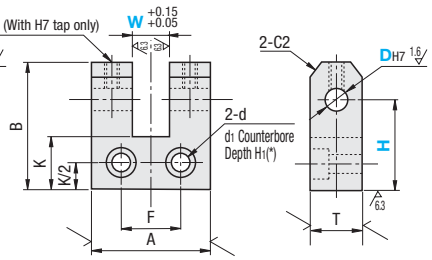


H Dimension Configurable Type		W, H Dimension Configurable Type		M Material	S Surface Treatment	A Accessory
H7 Type	H7 Type with Tap	H7 Type	H7 Type with Tap			
HKSUB	HKSUBT	HGSUB	HGSUBT	1.1191/C45E	Black Oxide	Set Screws 2 pcs. (1.4301/ X5CrNi18-10)
HKSUM	-	-	HGSUMT		Electroless Nickel Plating	
HKSUS	-	HGSUS	-	1.4301	-	

H Dimension Configurable Type



W, H Dimension Configurable Type



For H7 Type, M part doesn't have tap and set screw. * Holes for D2 are drill holes, not counterbored.

H Dimension Configurable Type

Part Number Type	DH7	H 1mm Increment	W	A	F	B	K	T	d	d1	H1	M	€ Unit Price HKSUB	HKSUM	HKSUS	HKSUBT
(H7 Type) HKSUB HKSUM HKSUS (H7 Type with Tap) HKSUBT	2	15~20	4	13	7	H+3	10	6	3.5	-	-	-				
	3	20~25	6	16	8	H+5		9		6.5	3.5	M3				
	4		8	19	11											
	5	25~30		25	16	H+6	12	12	4.5	8	4.5	M4				
	6		10	32	20	H+8										
	8	30~40		38	26		14	16	5.5	9.5	5.5					
	10			50	38	H+10										
	12		12					19				M5				
	13															
	14	35~45			36	H+12	15	22	6.5	11	6.5					
	15		16													
	16															
	20	40~50	20	65	47	H+14	18	25	9	14	9	M6				
	25					H+17		30								

For detailed pivot pin dimensions, refer to P.1-820

W, H Dimension Configurable Type

Part Number Type	DH7	W 1mm Increment	H 5mm Increment	A	F	B	K	T	d	d1	H1	M	€ Unit Price HGSUB	HGSUS	HGSUBT	HGSUMT
(H7 Type) HGSUB HGSUS (H7 Type with Tap) HGSUBT HGSUMT	2	3~5	15~20	13	7	H+3	10	6	3.5	-	-	-				
	3	3~9	20~25	16	8	H+5		9		6.5	3.5	M3				
	4	4~12		19	11											
	5	5~15	25~30	25	16	H+6	12	12	4.5	8	4.5	M4				
	6	6~18		32	20	H+8										
	8	8~24	30~40	38	26		14	16	5.5	9.5	5.5					
	10	10~30		50	38	H+10										
	12	12~30						19				M5				
	13	13~30														
	14	14~30	35~45		36	H+12	15	22	6.5	11	6.5					
	15	15~30														
	16	16~30														
	20	20~30	40~50	65	47	H+14	18	25	9	14	9	M6				
	25	25~35				H+17		30								

For detailed pivot pin dimensions, refer to P.1-820 For H7 type with tap, (A – W)/2≥M + 2 is required.

Order Example

Part Number	-	H
HKSUB10	-	H33

Part Number	-	W	-	H
HGSUB10	-	W16	-	H35

Days to Ship 8 Days

Price

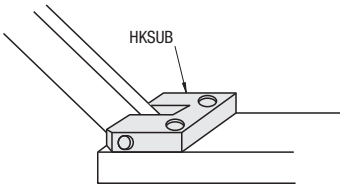
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

Example

Features: Side mounting allows to reduce height direction.



Hinge Bolt

-Male Thread Standard · R Type · Oil Free Type-

CAD Data

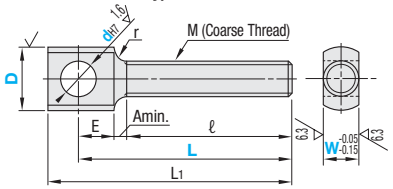


RoHS

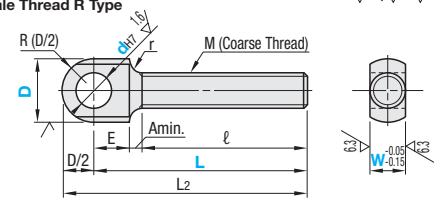
Male Thread			M Material	S Surface Treatment
Standard Type		R Type		
Right-Hand Thread	Left Hand Thread	Right-Hand Thread		
HGBB	HGBBL	HGBBR	1.1191/C45E	Black Oxide
HGBM	-	HGBMR		Electroless Nickel Plating
HGBS	-	HGBSR	1.4301	-

25 (√ 6.3 1.6)

- Male Thread Standard Type



- Male Thread R Type



Centering hole may exist on end face of the screw.
Mx2+E+Amin≤L
Left-Hand Thread Type has an identification groove on D circumference.

Male Thread Type

Part Number Type	dH7	D	L 1mm Increment	W 1mm Increment	M (Coarse Thread)	ℓ max	L1	L2	E	A min	r
Standard Type Right-Hand Thread HGBB HGBM HGBS	3	8	13~34	3~6	3	ℓ≤Mx5	L+4	-	4	3	0.8
	4	8	16~44	4~5	4					4	
		10	17~45	4~7			L+5		5		
	5	10	19~55	5~6	5						
		12	20~56	5~9			L+6		6		
	6	12	24~68	6~9	6		L+8	L+6	8		
		15		6~12				L+7.5			
	8	15	28~88	8~11	8			L+10	10		
		20	30~90	8~17							
	10	20	37~112	10~16	10		L+10		12	5	
Left Hand Thread HGBBL	12	20	42~132	12~15	12					6	
		25		12~21				L+12.5			
R Type HGBBR HGBMR HGBSR	14	25	49~154	14~19	14		L+12	L+15	14	7	1.6
		30		14~25							
	16	30	53~174	16~24	16			L+17			
		34		16~28							
	20	30	65~216	20~21	20		L+14	L+15	16	9	
		34		20~25				L+17			
		36		20~28				L+18			
		40		20~30				L+20			
	25	36	73~240	22~23	22		L+18	L+18	20		
		40		22~26				L+20			

Order Example

Part Number	-	D	-	L	-	W
HGBB12	-	20	-	55	-	13
HGBMR12	-	25	-	80	-	15

Days to Ship: 10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

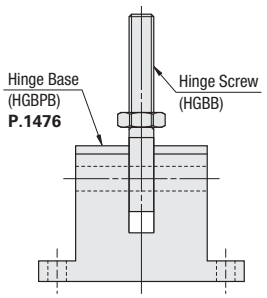
Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~25
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

dH7	D	€ Unit Price Standard Type HGBB HGBBL	HGBM	HGBS	R Type HGBBR	HGBMR	HGBSR
3	8						
4	8						
	10						
5	10						
	12						
6	12						
	15						
8	15						
	20						
10	20						
12	20						
	25						
14	25						
	30						
16	30						
	34						
20	30						
	34						
	36						
	40						
25	36						
	40						

Example

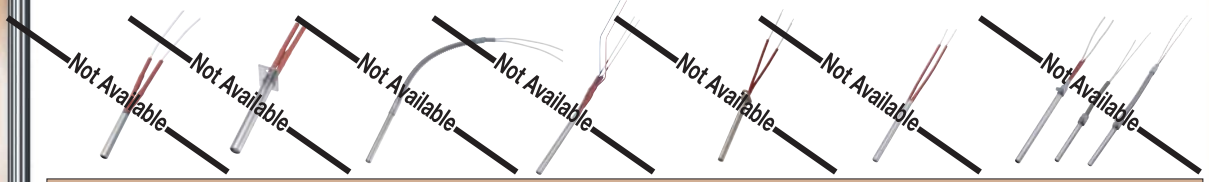


Heaters · Temperature Controllers

Heaters/ Temperature Controllers



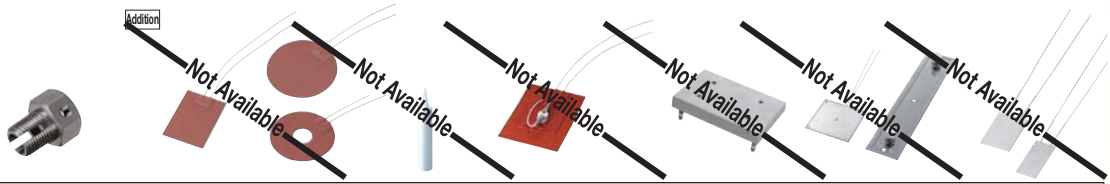
Product Name	Cartridge Heaters-Standard · Configurable L & W-	Anti-seize Agent	Thermally Conductive Grease	Cartridge Heaters -High Temperature-	-High Temperature Configurable L & W	-Lead Wire Protection · Internal Connection-
Page	1487	1488	1488	1489	1491	1492



-Configurable L, W and F-	-Flanged-	-Flexible Hose-	-With Sensor-	Cartridge Heaters -Lead Wire, Flange Selectable-	-Break Resistant, Internal Connection-	-Lead Wire Protection Type with Knurled Flange-
1493	1494	1495	1496	1497	1498	1499



-Uniform Heating-	-L-shaped-	-L-shaped Knurled Flanged-	-L-shaped Reinforcement-	-Heat Generating Part & Length Configurable-	Hot Plates	Cooling Plates
1500	1501	1502	1503	1504	1505	1505



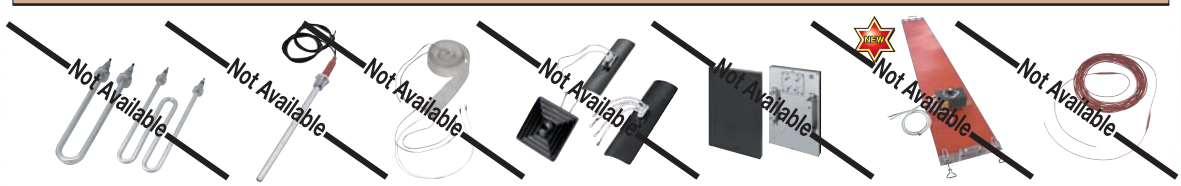
Mounting Bolts for Cartridge Heaters	Rubber Heaters-Square-	-Round-	Adhesives for Rubber Heater	Rubber Heaters -Square (With Thermostat)-	Cast-in Heaters	Plate Heaters	Small-Size Ceramic Plate Heaters
1506	1508	1509	1509	1510	1510	1511	1512



Air Sheathed Heaters	-Standard-	Finned Tubes	Air Sheathed Plug Heaters	Small Hot Air Generators	Heat Resistant Duct Hoses for Hot Air Generating Units	Piping Parts for Duct Hoses
1515	1516	1516	1517	1517	1518	1518



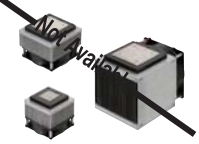
Hot Air Generating Units	-Hot Air Circulation Unit-	Sheathed Heaters for Liquid Heating -With Plug-	-With Overheating Prevention-	Connecting Parts for Heater	Float Switches
1519	1520	1523	1523	1524	1524



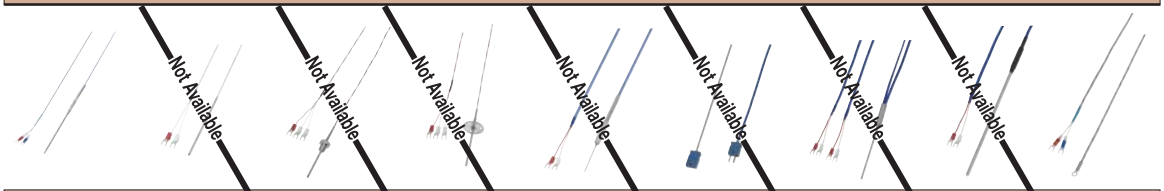
Sheathed Heaters for Liquid Heating -Standard U, M-	-Straight One Terminal-	Ribbon Heaters	Far Infrared Ceramic Plate Heaters	Far Infrared Plate Heaters	Drum Heaters -Economical Type-	Cord Heaters
1525	1525	1526	1527	1527	1528	1529



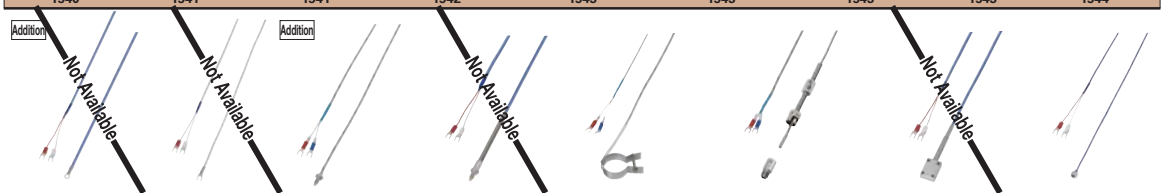
Heat Resistant Tapes	Micro Heaters	Silicon Belt Heaters	Silicon Rubber Heaters for Tubes	Band Heaters	Quartz Far Infrared Heaters	Peltier Cooling Unit Controller
1529	1530	1530	1530	1531	1531	1532



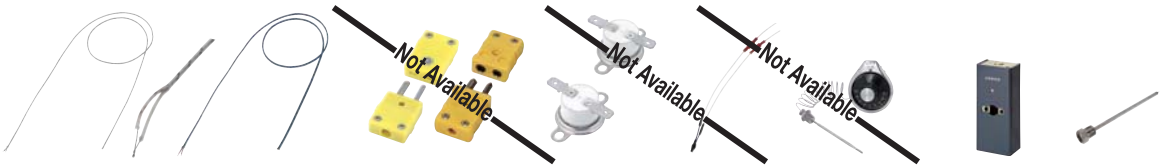
Peltier Cooling Unit	Jet Air Coolers	Plugs, Holes, Bolts for Mounting Temperature Sensor	Temperature Sensors	-Sheath - Lead Wire Length Configurable Type-	-L-shaped-	- Lead Wire Protection
1533	1535	1537	1538	1539	1540	1540



-Heat-resistant-	-Compact Type-	-Taper Screw Type-	-Flanged-	-Sheath Type for Moving Parts-	-Connector Type-	-Double Element Type-	-Chemical Resistant Type-	-Round Thermal Tip Sensors-
1540	1541	1541	1542	1543	1543	1543	1543	1544



-Round Thermal Tip Sensors for Moving Part-	Spade Type	-Screw Mount Type-	-Screw Mount Type for Moving Parts-	-Band Type-	-Spring Contact Type-	Surface Temperature Measurement Type	Surface Temperature Measuring Measurement Type
1544	1544	1545	1545	1545	1546	1546	1546



Sheathed Thermocouples	Compensation Lead Wires	K Thermocouple Connectors	Bimetal Thermostats	-Lead Wire-	Thermostats	Boxes for Thermostats	Protection Tubes
1547	1547	1548	1548	1548	1549	1549	1549



Electromagnetic Contactor	Temperature Controllers -24x48-	Temperature Controllers -48x48-	Temperature Controllers -96x96-	SSR (Solid State Relays)	Heatsinks	Universal Relays	Terminal Blocks
1550	1553	1554	1554	1555	1555	1556	1556



Temperature Controllers Universal - Compact	Universal - Two-series	Universal - High Electrical Current	Heat Insulating Plates -Standard Grade-	-Heat Resistant Grade-	-High Strength Grade-	High Temperature Resistant Grade -High Temperature Insulating Grade-
1558	1558	1558	1561	1561	1563	1563 1565



-High Temperature Super Insulating Grade-	- Very High Temperature Insulating Grade -	-Free Cutting Grade-	Thermal Plates	Insulating Papers	High Temperature Insulation Sheets	Heat Insulating Plates -Circular Type-	Machined Resin Plates
1565	1567	1569	1569	1570	1571	1572	1573

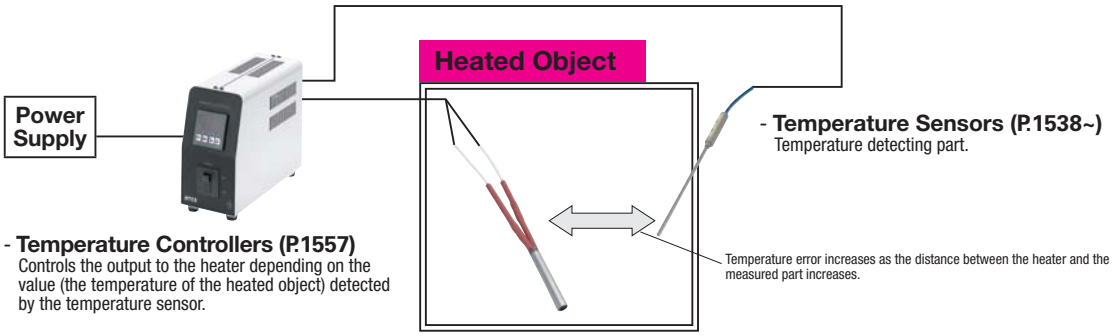
Heaters · Heating Items · Insulating Plates -Guide-

Guide

MISUMI offers variety of heaters specialized in FA application.
Temperature Sensors and Temperature Controller which are required to control heaters can be selected from the catalog at the same time.

Basic Components (Example)

-Heaters can be used in combination with Temperature Sensor and Temperature Control Unit.



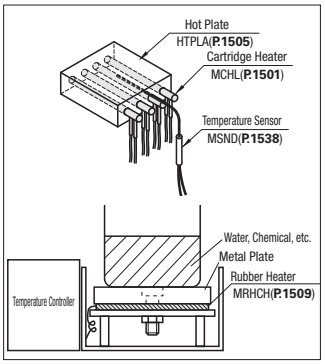
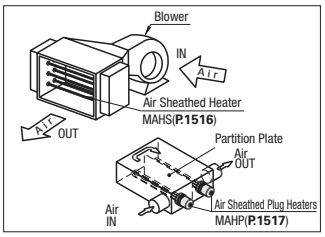
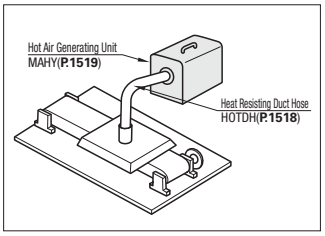
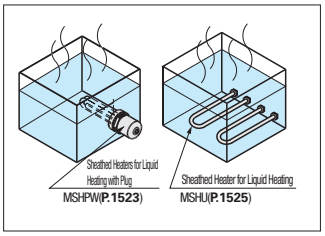
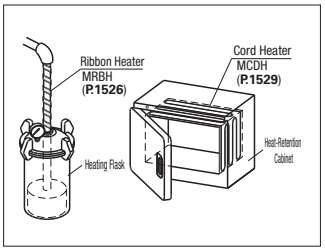
Products

- Parts for safety measures, heat insulating plates and cooling related products are also available as well as parts introduced in the basic structure.

Heaters	Temperature Sensors	Temperature Controllers
		
Cartridge Heaters (P.1487~1504) Rubber Heaters (P.1508~1510) Air Sheathed Heaters (P.1515- 1516) Plug Heaters for air (P.1523) Hot Air Generating Units (P.1519- 1520) ...etc.	Sheath Thermocouple (P.1538~1543) Temperature Measuring Resistor (P.1538) Screw Mount Type (P.1545) Terminal Mount Type (P.1544) Surface Temperature Measuring Type (P.1546) ...etc.	Temperature Controller (P.1553- 1554) Temperature Controller (P.1558) Relays (P.1556) SSR (P.1555) ...etc.

Devices for Safety Measure	Heat Insulating Plates	Cooling related products
These devices avoid unanticipated accidents by preventing over-heat and idle running. 	It prevents heat-retention of a heated object and burning of workers. 	Suitable for use when a rapid cooling is required. 
Thermostats (P.1549) Bimetal Thermostats (P.1548) Electromagnetic Contactor (P.1550) ...etc.	Standard Grade (P.1561) Special Heat Resistant Grade (P.1561) High Strength Grade (P.1563) High Temperature Insulating Grade (P.1565) ...etc.	Jet Air Coolers (P.1535) Peltier Cooling Unit (P.1533) Finned Hollows (P.1516) ...etc.

Heater Selection Chart

Purpose		Type of Heater	Usage of example
Heat the metal	Heating by inserting into plates	**Cartridge Heaters (P.1487~1504)**	
	Heating from the surface of plates	**Rubber Heaters (P.1508~1510)**	
		Plate Heaters (P.1511)	
Heating of the air	Want to select according to the equipment I'm using	**Air Sheathed Heaters (P.1515- 1516)**	
		Air Sheathed Plug Heaters (P.1517)	
	Want to use an easy unit product	**Small Hot Air Generators (P.1517)**	
		Hot Air Generating Units (P.1519- 1520)	
Heat-retention and heating of liquid	Need to heat fluids directly	**Sheathed Heaters for Liquid Heating with Plug (P.1523)**	
		Sheathed Heaters for Liquid Heating (P.1525)	
	Need to heat indirectly from the outside	**Cord Heaters (P.1529) Ribbon Heaters (P.1526) Band Heaters (P.1531)**	
Need to heat objects without contacting		**Quartz Far Infrared Heaters (P.1531)**	

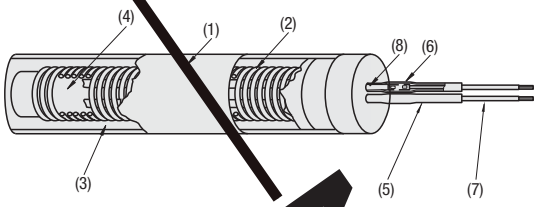
Cartridge Heaters -Guide-

■Features

· This heater has long-life and high-power density, which is perfect for heating metal plates.
· For the maximum operating temperature, refer to specification of each product.
A High Temperature Type whose maximum operating temperature is up to 900˚C is available.

■Basic Structure

Compression type heater with ceramic core of high temperature property wrapped with Nickel-chrome wires and isolated by magnesium oxide.



(1)Stainless Steel Sheath (Incoloy for High Temperature Type)
(2)Heating Coil (Nickel-chrome Wire)
(3)Insulation Powder (Magnesium Oxide)
(4)Ceramic Core
(5)Silicon (Insulation) Tube
(6)Crimp Terminal
(7)Lead Wire Film
(8)Nickel Pin

* Outer diameter of Lead Wire is approximately in the range of Ø2~Ø4, depending on the voltage and the amount of electric power.

■Mounting Method

· The clearance of the mounting hole of heater and metal block should be as small as possible.
Recommended clearance of hole machining is 0.05 or less (one side).
* The degree of adherence between a heated object and heater product affects the life of heater. Also, a large clearance increases the time needed to raise the temperature and creates a slow response speed for temperature control. When the temperature of heating product is 300˚C or less, work with drill holes, but reamer holes (H7) for the mounting hole of all heaters are recommend.
* The life span of the heater largely depends on the operating environment. Wires might be broken in a short time depending on the operating temperature and the adjustment of the temperature. Preparing new cartridge heaters for replacement is recommended.

■Precautions for Use

(1)Do not let heater be in idle running in the atmosphere.
Breaking of wire and ignition may occur by abnormal heat if the heater is operated in the condition the heat-generating part is even partly out of heated object.
(2)Prevent the lead wire of the heater from getting wet. It may cause leakage or short.
(3)Remove machine oil and grease used at the time of hole machining of heated parts. it may carbonize and can be a cause of abnormal heating.
(4)When the ON-OFF cycle is extraordinarily short, it affects the life of heater. Use of PID control is recommended.
(5)When the nickel pin is bent many times, it may be broken.
(6)Do not use over the rated voltage (V).
(7)When the heater is removed from the heat generating body, make sure that the power is turned off.
In addition, do not touch the heater immediately after the power is turned off.
(8) Keep the temperature around the lead wire exit at 130°C or less.
(9) Keep the temperature around the flange at 180°C or less when using Flanged Type.
(10) Do not use in a vacuum.
* Refer to Cautions of each type of heaters and ensure a proper and safety use of the heaters.

Not Available

■ Cartridge Heater Selection Chart

		Shapes		
		Straight	With Flange	L-shaped
Select from the fixed type Products with fewer days to ship	Reduces cost	L Dimension · W Electrical Power Fixed Type (P.1487)		
	High electrical power density	High Temperature Type (P.1489)		
Want to choose the length, power, and etc freely	Reduces cost	Configurable L & W (P.1493) Lead Wire Selectable (P.1493)	Flange Type (P.1494) Lead Wire - Flange Selectable Type (P.1494)	L-shaped Type (P.1501) L-shaped Knurled Flanged Type (P.1502)
	Avoid Breaking	Lead Wire Protection · Internal Connection (P.1492) Break Resistant · Internal Connection (P.1498)		
	Lead wire protection	Flexible Hose Type (P.1495) Knurled Flanged Lead Wire Protection (P.1499)		L-shaped Reinforcement (P.1503)
	Sensor embedded	With Sensor (P.1496)		
	Usage at high temperature (800°C or more)	High Temperature Configurable L & W (P.1491)		
	The temperature on the heated object will be more uniform	Uniform Heating (P.1500)		
	Warms the tip only	Heat Generating Part & Length Configurable (P.1504)		

■Selection Method

(1) Determine the calories(W) required for the heater.

Calculate with the following formula, by using the weight of heating product, the specific heat of heating product, the increased temperature, and the heating time until the setting temperature.

$$\text{Calories Required for The Heater (kW)} = \frac{\text{Weight of Heating Product (kg)} \times \text{Specific heat of Heating Product (kcal/kg°C)} \times \text{Increased Temperature (°C)}}{860 \times \text{Heating Time (h)} \times \text{Efficiency } \eta}$$

It is difficult to calculate the efficiency η precisely because it varies by heat-retention, insulation, arrangement of heaters but the suitable value is generally about 0.2~0.5.

· Specific Gravity and Specific Heat of Major Materials

Materials	Specific Gravity (g/cm³)	Specific Heat (kcal/kg°C)
Aluminum (EN AW-7075/AlZn5,5MgCu P Type)	2.80	0.230
Steel	7.9	0.113
Stainless Steel	7.82	0.110
Brass	8.70	0.100

Ex.) When the heater block of around 8kg, 200x100x50 (mm) stainless steel, is heated to 180°C.
(It is assumed that the temperature of the heater block is 20°C, and the heating time until the setting temperature is 30 minutes.)

$$\text{Calories Required for The Heater (kW)} = \frac{8 \times 0.11 \times (180-20)}{860 \times 0.5 \times 0.3} = 1.1 \text{ (kW)} = 1100 \text{ (W)}$$

* Efficiency is assumed to be 0.3 as the standard.
* Refer to Actual Measurement Data: Temperature Rise Time / Electrical Power (Electrical Power Density)

(2) Determine the number of heaters and the quantity of heat (W) per one heater.

Determine the number of heaters based on the size of heated product, and total calories (W) to be the quantity of heat required for heating product.

Ex.) Using 2 heaters of 550(W) (Total 1100W)

· Selection of Cartridge Heater (P. 1487 ~ 1489)

(1) Determine the diameter and length of the heater.
Ex.) MCHS12-200
(D) (L)

(2) Determine the voltage (V) to use.
Ex.) MCHS12-200-V200
(V)

(3) Determine the calories (W) required for the heating product.
Ex.) MCHS12-200-V200-W550
(D) (L) (V) (W)

(4)Check if required heater diameter (D), length (L), voltage (V) and calories (W) are available in L dimension - W (Electrical Power) Fixed Type (**P.1487**) and High Temperature Type (**P.1489**).
Caution: Select the larger electric power (W) than the required for L dimension - W (electrical power) Fixed Type.

Ex.) MCHS12-200-V200-W550 L Dimension, Calories (Electrical Power) Type is Not Available (Go to (5)
(D) (L) (V) (W)

(5) Available to produce when the electrical power density (W/cm2) of heat-generating part is between 5 and 15 (W/cm2).

$$\text{Electrical Power Density (W/cm}^2\text{)} = \frac{\text{Electrical Power (W)}}{\pi(3.14) \times \text{Heater Diameter (cm)} \times (*)\text{Length of Heat-Generating Part (cm)}}$$

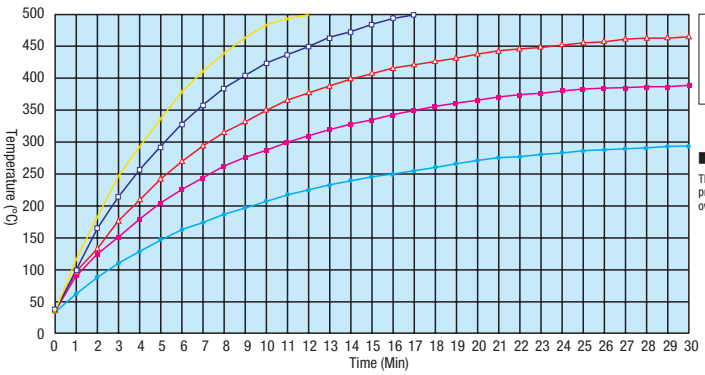
$$\text{Ex.) Electrical Power Density (W/cm}^2\text{)} = \frac{550}{3.14 \times 1.2 \times (20-1.5)} = 7.9$$

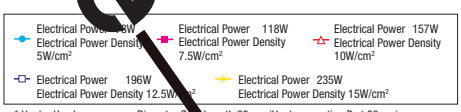
→ Available to produce *Length of Heat-Generator Part = L/10-1.5(cm)

(6) Determine the length of lead wires.
Ex.) MCHS12-200-V200-W550-F500
(D) (L) (V) (W) (F)

* When the electrical power density (W/cm²) is not more than 2: 1) Reduce the heater diameter, 2) Shorten the heater length, 3) Reduce the number of heaters to use.
* When the electrical power density (W/cm²) is not 15 or less: 1) Increase the heater diameter, 2) Increase the heater length, 3) Increase the number of heaters to use.
* The electrical power density (W/cm²) of heater should be as low as possible, which enables a long-life and stable control.

· Actual Measurement Data: Temperature Rise Time / Electrical Power (Electrical Power Density)



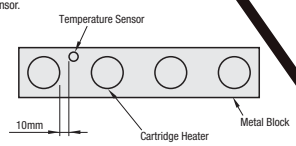


* Heater Used: Diameter Ø12 Length 65mm (Heat-generating Part 50mm)
* Heated Object : Aluminum (60×80×20)
* The temperature is of the central surface temperature of aluminum.

■Temperature Control

The position of the temperature sensor is determined by the setting conditions of the heated product (metal block), however, it is recommended to place near the heater to prevent heater overheating.

* Generally, around 10mm suitable for the distance between the heater and the temperature sensor.



· Temperature Controllers

All cartridge heaters are single-phase. Select temperature controllers (**P.1558**) for single-phase (MTCS · MTCD and MTCRM). For the possible numbers of cartridge heaters to connect one controller, refer to the example below.

(Ex.)When connecting MTCS (Max. allowable electric current: 20A) to MCHK12-150-V100-W300

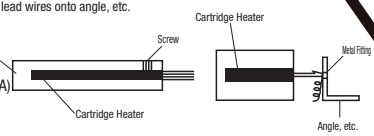
The electric current which streams in one cartridge heater: $\text{Electrical Current (A)} = \frac{\text{Electrical Power (W)}}{\text{Voltage (V)}} = \frac{300 \text{ (W)}}{100 \text{ (V)}} = 3 \text{ (A)}$

The possible numbers (N) of cartridge heaters to connect one temperature controller (MTCS): $N = \frac{20 \text{ (A)}}{3 \text{ (A)}} = 6.7 \rightarrow 6 \text{ pcs.}$

(However, only 2 cartridge heaters can be connected to a terminal. Please use terminal blocks (**P.1556**) for branching.)

■Fixation of Cartridge Heater

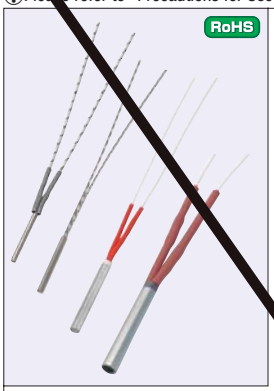
In order to prevent the cartridge heater from falling off
(1) Fix the sheath with screw.
(2) Fix the lead wires onto angle, etc.



Not Available

Cartridge Heaters / Anti-seize Agents / Thermally Conductive Grease
-Standard / Configurable L & W-

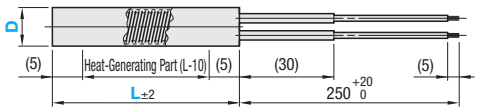
Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**



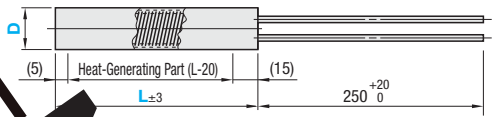
RoHS

[Standard] [Configurable L & W]

D=3.1

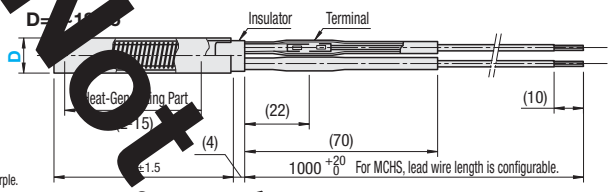


D=4



The heater has nickel lead wire wrapped with "heat-resistant insulation tape" of polyimide film. That is wrapped with glass fiber which is braided with glass. Please peel off the light yellow "heat-resistance insulation tape" before actual use.

D=5~18.95



D=3.1

Material:
Heater : 1.4301/X5CrNi18-10
Lead Wire : Glass Braid + Copper Wire
Lead Wire Heat Resistance Temperature: 180°C

D=4

Material:
Heater : 1.4301/X5CrNi18-10
Lead Wire : Nickel + Glass Braid + Polyimide Film
Lead Wire Heat Resistance Temperature: 250°C

D=5~18.95

Material:
Heater : 1.4541/X6CrNiTi18-10
Terminal : Copper
Lead Wire : Nickel (N)
Lead Wire Film : Glass Braid
Lead Wire Heat Resistance Temperature: 180°C

D Tolerance *The tolerance is the value of heat generator part.

D	Tolerance
3.1	+0.05 -0.1
4	0 -0.08
5 6 8 10 12 14 16 18	-0.02 -0.08
6.25 9.42 12.6 15.77 18.95	+0.05 0

The color of insulation at the root of the wire is white or purple.

When D = 5, there is no dimension of (4) on the end surface of the stainless steel sheath. For D5, 6, 6.25, 8, 9.42, 12.6, 15.77, 18.95, position of the terminal (22) is 17 and 37 with shifting two terminals.

Maximum Operation Temperature: 600°C

Not Available

Standard (Electrical Power)

Part Number Type	D	L	V (Voltage)	W (Electrical Power)	electrical power density (W/cm²)	€ Unit Price
3.1 (1/8 Inch)		31.8	120	25	11.8	
				50	23.6	
		38.1	120	30	11.0	
				60	21.9	
		50.8	120	50	12.6	
			240	50	12.6	
4		40	120	30	11.9	
		50	120	45	11.9	
		80	120	90	11.9	
		100	120	120	11.9	
5		30	100	40	17.0	
			200	40	17.0	
		40	100	40	10.2	
				60	15.3	
			200	60	15.3	
		50	100	50	9.1	
				80	14.6	
			200	80	14.6	
		60	100	100	14.2	
			200	100	14.2	
		80	100	150	14.7	
			200	150	14.7	
		100	100	200	15.0	
			200	240	18.0	
6		30	100	50	17.7	
			200	50	17.7	
		40	100	80	17.0	
			200	80	17.0	
		50	100	100	15.2	
			200	100	15.2	
		60	100	50	5.9	
				130	15.3	
			200	80	9.4	
				130	15.3	
		80	100	100	8.2	
				200	16.3	
			200	120	9.8	
				200	16.3	
		100	100	120	7.5	
				250	15.6	
			200	200	12.5	
				250	15.6	
6.25 (1/4 Inch)		60	100	50	5.7	
			200	80	9.1	
		80	100	100	7.8	
			200	120	9.4	
		100	100	120	7.2	
			200	200	12.0	

Part Number Type	D	L	V (Voltage)	W (Electrical Power)	electrical power density (W/cm²)	€ Unit Price
8		30	[illegible]	60	15.9	
			200	60	15.9	
		40	100	[illegible]	15.9	
			2[illegible]	[illegible]	15.9	
		50	100	[illegible]	11.4	
				15[illegible]	[illegible]	
			200	[illegible]	11.4	
				150	17.1	
		60	100	[illegible]	[illegible]	
				200	17.7	
			200	120	[illegible]	
				200	[illegible]	
		80	100	150	[illegible]	
				250	[illegible]	
			200	150	9.2	
				250	15.3	
		100	100	200	9.4	
				350	16.4	
			200	200	9.4	
				350	16.4	
		150	100	300	8.8	
				500	14.7	
			200	350	10.3	
				500	14.7	
9.42 (3/8 Inch)		60	100	100	7.5	
			200	120	9.0	
		80	100	150	7.8	
			200	150	7.8	
		100	100	200	8.0	
			200	200	8.0	
		150	100	300	7.5	
			200	350	8.8	
10		30	100	80	17.0	
			200	80	17.0	
		40	100	120	15.3	
			200	120	15.3	
		50	100	120	10.9	
				180	16.4	
			200	120	10.9	
				180	16.4	
		60	100	120	8.5	
				250	17.7	
			200	150	10.6	
				250	17.7	
		80	100	150	7.3	
				300	14.7	
			200	180	8.8	
				300	14.7	

Part Number Type	D	L	V (Voltage)	W (Electrical Power)	electrical power density (W/cm²)	€ Unit Price
10		100	100	200	7.5	
				400	15.0	
			200	250	9.4	
				400	15.0	
		150	100	300	7.1	
				500	11.8	
			200	300	7.1	
				500	11.8	
12		60	100	120	7.1	
				300	17.7	
			200	150	8.8	
				300	17.7	
		80	100	150	6.1	
				300	12.2	
			200	180	7.3	
				300	12.2	
		100	100	200	6.2	
				400	12.5	
			200	250	7.8	
				500	15.6	
		150	100	300	5.9	
				600	11.8	
			200	300	5.9	
				600	11.8	
12.6 (1/2 Inch)		[illegible]	100	120	6.7	
		[illegible]	200	150	8.4	
		80	200	180	7.0	
		100	200	200	5.9	
		[illegible]	200	250	7.4	
		150	100	300	5.6	
			200	300	5.6	
14		60	200	200	10.1	
		80	200	250	8.7	
		100	200	[illegible]	6.7	
		150	200	300	5.1	
		200	200	400	4.9	
16		100	200	200	4.7	
		150	200	250	[illegible]3.7	
		200	200	300	[illegible]2	
		250	200	500	[illegible]	
		300	200	700	4.9	

CAD Date

Configurable L & W

Part Number Type		L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) 10mm Increment	Electrical Power Density (W/cm²)	€ Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600
	6	50~250	100	50~500	100~1000	2≤W/cm²≤15 ※W/cm²= W/{Dπ (L-15)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)						
			110	50~500								
			200	60~600								
			220	80~600								
	6.25 (1/4 Inch)		100	50~500								
			110	50~500								
			200	60~600								
			220	80~600								
	8	50~400	100	50~600								
			110	50~600								
			200	50~1200								
			220	70~1200								
	9.42 (3/8 Inch)		100	50~600								
			110	50~600								
			200	50~1200								
			220	70~1200								
	10	50~600	100	50~800								
			110	50~800								
			200	50~1200								
			220	70~1200								
	12		100	50~800								
			110	50~800								
			200	50~1600								
			220	70~1600								
	12.6 (1/2 Inch)		100	50~800								
			110	50~800								
			200	50~1600								
			220	70~1600								
	14		100	50~800								
			110	50~800								
			200	60~1600								
			220	80~1600								
	15.77 (5/8 Inch)		100	50~800								
			110	60~800								
			200	70~1600								
			220	90~1600								
	16		100	50~800								
			110	60~800								
			200	70~1600								
			220	90~1600								
	18		100	50~800								
			110	60~800								
			200	100~1600								
			220	130~1600								
	18.95 (3/4 Inch)		100	50~800								
			110	60~800								
			200	100~1600								
			220	130~1600								

Order Example: Part Number - L - V - W - F
- 60 - V200 - W80
- 120 - V200 - W650 - F800

Days to Ship: ■Standard 6 Days P.87 ■Configurable L & W 10 Days

Price ■Volume Discount (※Round down to one Cent.) P.88

- MCHK

Quantity	1~4	5~
Rate	€ Unit Price	5%

- MCHS

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

※For orders larger than indicated quantity, please request a quotation.

Alteration ※ Applicable to MCHK.

Order Example: Part Number - L - V - W - F (FC)
- 220 - V100 - W450 - FC2

Alteration	Lead Wire Length	
Code	FC	
Spec.	Changes lead wire length. Ordering Code FC	
	FC	Lead Wire Length (mm)
	2	2000
	3	3000
Price Adder	FC2	FC3
	7,00	12,00

■Anti-seize Agent RoHS



A Accessory: Working Gloves

Part Number Type	No.	Volume	Heat Resistance Temperature	Specific Gravity	Color	Main Components	€ Unit Price
	30	30g	600°C	1.4	Black	Molybdenum	

- By applying to cartridge heaters, gaps will be filled and prevent seizing.
- Please remove leaks in installation before actual use.
- It also works as anti-baking agent for parts surrounding of heat source such as set screws and flanges.
- Wear a pair of working gloves when applying the grease.

■Thermally Conductive Grease RoHS



A Accessory: Working Gloves

Part Number Type	No.	Volume	Heat Resistance Temperature	Conditions of Thermal Conduction	Color	Main Components	€ Unit Price
	50	50g	200°C	0.96W/m-K	White	Silicon	

- By applying to a cartridge heater, heat can be effectively transferred to metal plates.
- Grease may outflow when heat reaches around 200°C. Wipe off the out-flowed grease and then use the heater.
- Wear a pair of working gloves when applying the grease.

Order Example: Part Number

Days to Ship: 8 Days Express A 3,00 EUR/piece P.88
※A Express Charge of 8,10 EUR for 3 or more identical pieces.

Price ■Volume Discount (※Round down to one Cent.) P.87

Quantity	1~9	10~19	20~29
Rate	€ Unit Price	5%	10%

※For orders larger than indicated quantity, please request a quotation.

Not Available

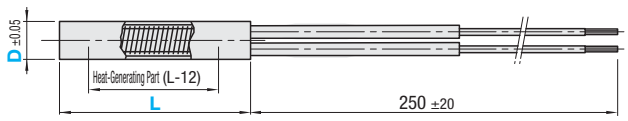
NEW

Cartridge Heaters
-High Temperature Type-

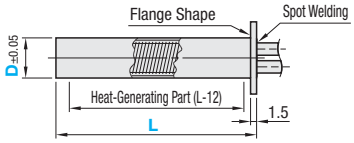
Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485** Part number has changed to . (No change has been made to the performance and the standard.)

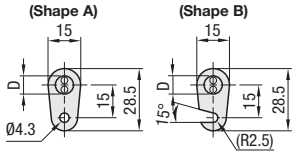


(No Flange)



(Flange Shape A)
(Flange Shape B)





L Tolerance

L	Tolerance
101.6 or Less	±2.4
127.0 or More	L dimension ±2%

Maximum operating temperature: 871°C. (Heater Surface Temperature)
The color of insulation tube is white or red.

Material: Heater: Incoloy
Lead Wire: Glass Braid Lead (Heat Resistance Temperature: 200°C)

Features of the Cartridge Heater -High Temperature Type-

This cartridge heater has higher electrical power density and efficiency compared with conventional products.
Maximum operating temperature: 871°C. (Heater Surface Temperature)
Sheath part, made of Incoloy that excels in heat-resistance, long operation life.

Precautions for Use

Do not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
Pay attention to insulation tube as it is easy to fall off.
Keep the temperature around the lead wire exit at 130°C or less.

High Temperature Type

Part Number Type	D	L	V (Voltage) Selection	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price Qty.1~9
	6.25	25.4	120	80	32.3	
			120	100	40.3	
			120	150	60.5	
		31.8	120	75	20.2	
			120	100	26.8	
			120	125	33.7	
			120	150	40.3	
			240	150	40.3	
			240	200	53.6	
		38.1	120	100	20.2	
			120	150	30.2	
			240	150	30.2	
			240	175	35.4	
			120	200	40.3	
			240	200	40.3	
			240	250	50.4	
		50.8	120	50	7.4	
			120	100	13.5	
			120	150	20.2	
			240	150	20.2	
			120	200	26.8	
			240	200	26.8	
			120	250	33.6	
			240	250	33.6	
			240	300	40.3	
		76.2	120	100	8.1	
			120	150	12.1	
			120	200	16.1	
			240	200	16.1	
			120	250	20.2	
			240	250	20.2	
			120	300	24.2	
			240	300	24.2	
		101.6	120	100	5.7	
			120	150	8.7	
			120	200	11.5	
			240	200	11.5	
			120	250	14.4	
			240	250	14.4	
			120	300	17.2	
			240	300	17.2	
		152.4	120	300	11.0	
			240	300	11.0	
			120	400	14.7	
			240	400	14.7	
			240	600	22.0	

Unit price on the right + 15,70 EUR

For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	L	V (Voltage) Selection	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price Qty.1~9
	9.42	25.4	120	50	13.2	
			120	100	26.7	
			120	150	40.1	
		31.8	120	75	13.2	
			120	100	17.5	
			120	125	22.0	
			120	150	26.4	
			240	150	26.4	
			120	200	35.7	
			240	200	35.7	
		38.1	120	100	10.1	
			120	150	15.2	
			120	200	19.7	
			240	200	19.7	
			120	200	26.4	
			240	200	26.4	
			120	250	33.0	
			240	250	33.0	
		44.5	120	125	13.2	
			120	150	15.8	
			120	175	18.9	
			240	200	21.2	
			120	250	26.7	
			240	250	26.7	
		50.8	120	50	4.3	
			120	100	8.7	
			120	150	13.2	
			240	150	13.2	
			120	200	17.5	
			240	200	17.5	
			120	250	22.0	
			240	250	22.0	
			120	300	26.8	
			240	300	26.8	
			240	350	30.7	
			120	400	35.7	
			240	400	35.7	
		57.2	120	75	5.7	
			120	100	7.6	
			240	150	11.3	
			120	175	13.2	
			240	200	15.0	
			240	250	18.9	
		63.5	120	200	13.5	
			120	250	16.7	
			240	250	16.7	
			120	300	20.2	
			240	300	20.2	
			240	500	33.5	

Unit price on the right + 15,70 EUR

For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	L	V (Voltage) Selection	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price Qty.1~9
	9.42	76.2	120	100	5.3	
			120	150	8.0	
			120	200	10.5	
			240	200	10.5	
			120	250	13.2	
			240	250	13.2	
			120	300	15.8	
			240	300	15.8	
			120	400	21.4	
			240	400	21.4	
			120	500	26.4	
			240	500	26.4	
			240	600	32.2	
		88.9	120	250	11.2	
			120	300	13.3	
			240	300	13.3	
			120	500	22.3	
			240	500	22.3	
		101.6	120	150	5.7	
			120	200	7.6	
			120	250	9.5	
			240	250	9.5	
			120	300	11.3	
			240	300	11.3	
			120	400	15.0	
			240	400	15.0	
			120	500	18.9	
			240	500	18.9	
		127.0	120	150	4.5	
			120	200	5.9	
			120	300	8.8	
			240	300	8.8	
			120	500	14.7	
			240	500	14.7	
			240	750	22.0	
		152.4	120	150	4.8	
			120	250	6.0	
			120	300	7.3	
			240	300	7.3	
			120	400	9.8	
			240	400	9.8	
			120	500	12.2	
			240	500	12.2	
			120	600	14.6	
			240	600	14.6	
			120	750	18.1	
			240	750	18.1	
			240	900	21.5	
			240	1000	24.0	

Unit price on the right + 15,70 EUR

For orders larger than indicated quantity, please request a quotation.

Not Available

CAD Data

Part Number Type	D	L	V (Voltage) Selection	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price Qty.1~9
Unit price on the right + 15,70 EUR	9.42	177	120	250	5.1	
			120	600	12.4	
			240	600	12.4	
		203.2	[illegible]	300	5.3	
			12[illegible]	450	7.9	
			120	500	9.0	
			240	[illegible]00	9.0	
			120	6[illegible]	10.7	
			240	750	13.2	
			240	1000	17.5	
		254.0	120	400	[illegible].6	
			120	500	7.[illegible]	
			240	500	7.0	
			240	600	8.4	
			240	800	11.[illegible]	
			240	1000	14.0	
		304.8	120	400	4.7	
			120	600	7.0	
			240	600	7.0	
			240	1000	11.5	
	12.6	31.8	120	125	16.6	
		38.1	120	150	15.0	
		50.8	120	75	5.0	
			120	150	8.4	
			120	200	13.3	
			240	200	13.3	
			120	250	16.7	
			240	250	16.7	
			120	300	20.0	
			240	300	20.0	
			120	400	26.5	
			240	400	26.5	
		57.2	120	75	4.3	
			120	125	7.1	
			120	250	14.3	
			240	250	14.3	
			120	500	28.5	
			240	500	28.5	
		63.5	120	100	5.0	
			120	250	12.6	
			240	250	12.6	
			120	300	14.9	
			240	300	14.9	
			120	400	20.0	
			120	500	25.0	
			240	500	25.0	
		76.2	120	125	5.0	
			240	125	5.0	
			120	250	10.0	
			240	250	10.0	
			120	300	12.0	
			240	300	12.0	
			120	400	16.1	
			120	500	19.8	
			240	500	19.8	
			120	600	23.9	
			240	600	23.9	
			240	750	29.9	
		88.9	120	250	8.4	
			240	250	8.4	
			240	500	16.6	

For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	L	V (Voltage) Selection	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price Qty.1~9
	12.6	101.6	120	150	4.3	
			240	150	4.3	
			120	250	7.1	
			240	250	7.1	
			120	300	8.7	
			240	300	8.7	
			120	400	11.5	
			240	400	11.5	
			120	500	14.3	
			240	500	14.3	
			240	750	21.4	
			240	1000	28.5	
		127.0	120	200	4.5	
			120	350	7.8	
			240	350	7.8	
			120	400	9.0	
			240	400	9.0	
			120	500	11.2	
			240	500	11.2	
			240	750	16.6	
			240	1000	22.2	
		[illegible]	120	250	4.5	
			120	350	6.4	
			[illegible]0	500	9.0	
		[illegible]2	240	500	9.0	
			240	750	13.6	
			[illegible]	800	14.4	
	12.6		12[illegible]	1000	18.1	
			[illegible]	1000	18.1	
		177.8	120	[illegible]	3.9	
			[illegible]	50[illegible]	7.8	
			24[illegible]	[illegible]	[illegible]	
			240	600	9.3	
			240	[illegible]	[illegible]	
		203.2	120	30[illegible]	4.0	
			120	500	[illegible].7	
			240	500	6.[illegible]	
			240	600	[illegible]	
			120	800	10.7	
			120	1000	13.3	
			240	1000	13.3	
			240	1500	20.0	
		228.6	240	500	5.9	
			240	1000	11.8	
		254.0	120	500	5.3	
			240	500	5.3	
			240	800	8.4	
			120	1000	10.5	
			240	1000	10.5	
			240	1500	15.8	
		304.8	120	600	5.3	
			240	600	5.3	
			120	1000	8.7	
			240	1000	8.7	
			240	1500	13.0	
			240	2000	17.4	
	15.77	31.8	120	200	21.2	
			120	400	42.5	
		50.8	120	100	5.3	
			120	200	10.7	
			240	400	21.2	
		57.2	120	250	11.5	
			240	250	11.5	
			120	350	16.0	
			240	500	22.6	

For orders larger than indicated quantity, please request a quotation.

Part Number Type	D	L	V (Voltage) Selection	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price Qty.1~9
	15.77	76.2	120	150	4.8	
			120	250	8.1	
			240	250	8.1	
			120	500	16.0	
			240	500	16.0	
			240	750	23.9	
		101.6	120	250	5.7	
			240	250	5.7	
			240	400	9.1	
			120	500	11.3	
			240	500	11.3	
			240	750	17.1	
			240	1000	22.6	
		127.0	120	250	4.3	
			240	250	4.3	
			240	500	8.8	
			240	750	13.3	
		152.4	120	300	4.3	
			240	300	4.3	
			120	500	7.1	
			240	500	7.1	
			240	750	10.9	
			240	1000	14.4	
			240	1500	21.7	
		177.8	120	500	6.1	
			240	500	6.1	
			240	1000	12.2	
		203.2	120	500	5.3	
			240	500	5.3	
			240	850	9.0	
			240	1000	10.5	
			240	1200	12.7	
			240	1500	15.8	
			240	2000	21.1	
		254.0	240	500	4.2	
			120	600	5.0	
			240	1000	8.4	
			240	1600	13.3	
			240	2000	16.7	
		304.8	240	500	3.4	
			120	600	4.2	
			240	1000	7.0	
			240	1500	10.4	
			240	2000	14.0	
	18.95	76.2	120	250	6.7	
			240	500	13.3	
		101.6	240	500	9.5	
			240	1000	19.0	
		[illegible]	120	500	6.0	
			240	500	6.0	
		[illegible]	240	1000	12.1	
			240	2000	24.2	
		[illegible]	[illegible]0	500	4.5	
		203.2	24[illegible]	500	4.5	
			240	1000	8.8	
			240	[illegible]000	17.7	
		254.0	240	1[illegible]	7.0	
			240	2000	14.0	
		304.8	240	1000	5.7	
			240	2000	[illegible].5	

For orders larger than indicated quantity, please request a quotation.

Not Available

Order Example

Part Number	-	L	-	V	-	W
	-	25.4	-	V120	-	W80
	-	203.2	-	V120	-	W500

Days to Ship

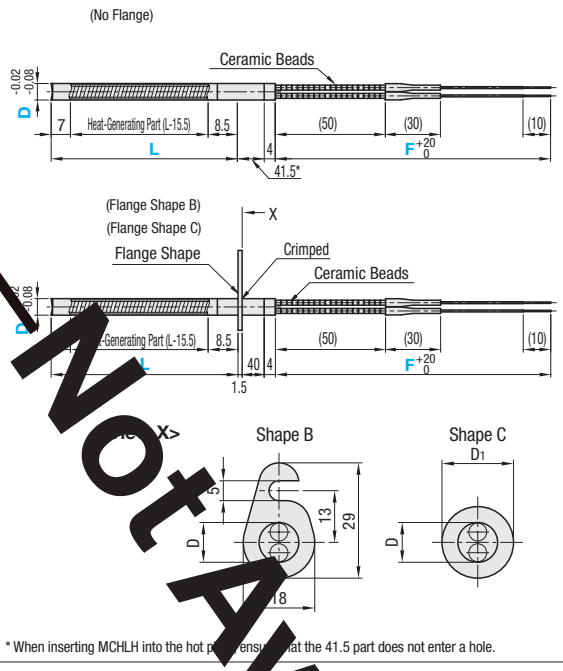
- part: 6 Days P.88
- (Others): 8 Days
- . : 10 Days

Cartridge Heaters
-High Temperature Configurable L & W-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





Terminal Selection

N (No Crimp Terminal)

M (With Round Crimp Terminal)

Y (With Y-Shaped Crimp Terminal)

Ⓜ Material:
Heater: Incoloy
Flange: 1.4301/X5CrNi18-10
Lead Wire: Glass Fiber Coating
Lead Wire Heat Resistance Temperature: 180°C
Maximum Operation Temperature: 900°C

RoHS

* When inserting MCHLH into the hot p… ensu… at the 41.5 part does not enter a hole.

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	(Lead Wire Length) 10mm… rement	Terminal Selection	Electrical Power Density (W/cm²)
	8	50~200	100 110 200 220	50~500		N M Y	2≤W/cm²≤10 ⓘW/cm²=W/{Dπ(L-15.5)/100} (Calculate with the electrical power density of heat-generating part, not with the full length.)
	10	50~200	100 110 200 220	50~600	300 … 00		
	12	50~300	100 110	50~900			
			200 220	50~1100			

Price

Volume Discount (ⓘRound down to one Cent.) P87

Quantity	1~4	5~10
Rate	€ Unit Price	5%

ⓘFor orders larger than indicated quantity, please request a quotation.
ⓘVolume discount rate is applicable to the price of heater body only.

D	Heater Body Price € Unit Price						Price for Additional Terminal (€ Body Price +)		
	L50~100	L101~200	L201~300	L50~100	L101~200	L201~… 00	N	M	Y
8									
10									
12									

Order Example

Part Number	-	L	-	V	-	W	-	F	-	Terminal
	-	150	-	V200	-	W250	-	F500	-	M

Days to Ship

13 Days

<Price Calculation Example>
12-300-V100-W350-F1000-Y
19,710+300=0,20 EUR

Type of Terminal

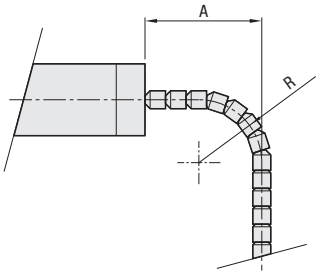
Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-Shaped -	M4

Flanged Type Dimension

D	Shape C D1
8	14
10	16
12	18

Precautions for Use

- Do not let heater run exposed in the atmosphere. Operating the heater with the heat-generating part out of heated products may cause the wire to break or ignite due to abnormal heating.
- Keep the temperature around the lead wire exit at 250°C or less.
- Because the ceramic beads are very fragile, be sure to follow the bend dimensions on the right. Do not apply strong impacts.



D	R	A
8	12	20
10		
12	18	25

Features

- High temperature resistant heater with max. operating temperature of 900°C.
- Maintains high insulation even at high-temperature region of 700°C to 900°C, and presents long-life.

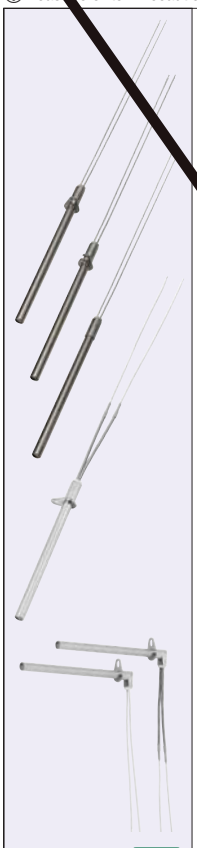
Not Available

Cartridge Heaters

-Lead Wire Protection · Internal Connection-

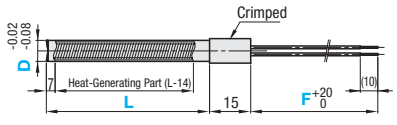
CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**

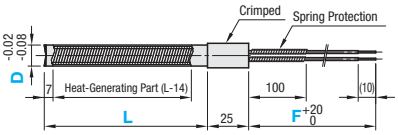


- Straight (No Flange)

(No Protective Spring)

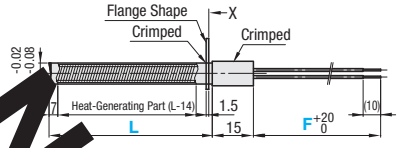


(With Protective Spring)

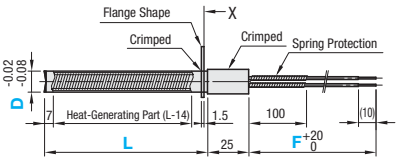


- Straight (With Flange)

(Flange Shape A)
(Flange Shape B)

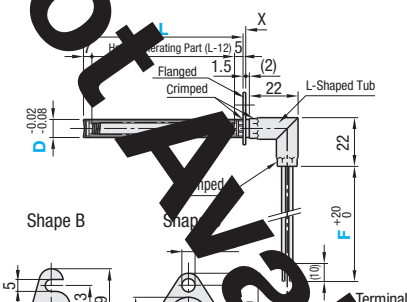


(Flange Shape C)

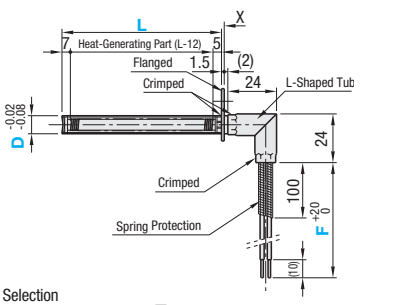


- L-shaped (With Flange)

(Flange Shape A)



(Flange Shape A)



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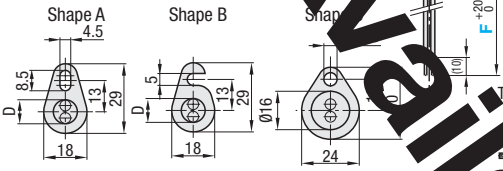


Applicable only when D=16 is selected.

Terminal Selection

- N (No Crimp Terminal)
- M (With Round Crimp Terminal)
- Y (With Y-Shaped Crimp Terminal)

Material:
Heater: 1.4301/X5CrNi18-10
Flange: 1.4301/X5CrNi18-10
Lead Wire: Glass Fiber Coating
Lead Wire Heat Resistance Temperature: 180°C
Maximum Operation Temperature: 600°C

RoHS

Not Available

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) 10mm Increment	Terminal Selection	Heater Body Price € Unit Price L50~100	L101~200	L201~300	L301~400	Price for Additional Terminal (€ Body Price +) N	M	Y	Additional Price for Protective Spring (€ Body Price +)
(No Protective Spring)	8	50~400	100 110 200 220	50~500 50~1100	300~1000	N M Y								
(With Protective Spring)	10		100 110 200 220	50~600 50~1600										
	12		100 110 200 220	50~900 50~1800										
	16		100 110 200 220	50~1000 50~2000										

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) 10mm Increment	Terminal Selection	Heater Body Price € Unit Price Straight L50~100	Straight L101~200	Straight L201~300	Straight L301~400	L-shaped L50~100	L-shaped L101~200	L-shaped L201~300	L-shaped L301~400	Price for Additional Terminal (€ Body Price +) N	M	Y	Additional Price for Protective Spring (€ Body Price +)
(No Protective Spring (With Protective Spring)	8	50~400	100 110 200 220	50~500 50~1100	300~1000	N M Y												
	10		100 110 200 220	50~600 50~1600														
	12		100 110 200 220	50~900 50~1800														
(With Protective Spring)	16		100 110 200 220	50~1000 50~2000														

2≤W/cm²≤15 W/cm²=W/{Dπ(L-14) *100} *L-12 for Shape L (Calculate with the electrical power density of heat-generating part, not with the full length.)

Order Example

Part Number	-	L	-	V	-	W	-	F	-	Terminal
	-	150	-	V200	-	W250	-	F500	-	N

<Price Calculation Example>
12-300-V100-W350-F1000-Y
10,670+300=109,70 EUR

Days to Ship

13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.
Volume discount rate is applicable to the price of heater body only.

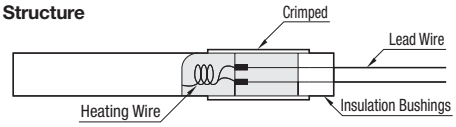
Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-Shaped -	M4

Features

- Heat generating wire and lead wire are connected in stainless steel sheath.
- Since crimp terminal is not exposed, it has stronger structure against breakage due to bending and vibration.

Basic Structure



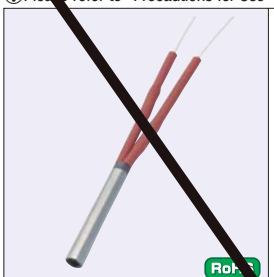
Precautions for Use

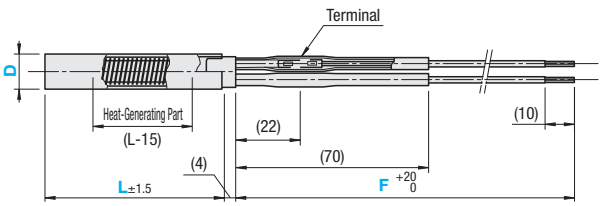
- Do not let heater run idle in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break due to abnormal heating.
- Keep the temperature around the lead wire exit at 180° C or less.
  Cartridge Heater with protective spring is recommended for a use at a moving part.

Cartridge Heaters
-Configurable L · W and F-

CAD Data

(?)Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





(?)For D6, 6.25, 8 and 9.42, the position of the terminal (22) is 17 and 37 with shifting two terminals.

D Tolerance

D	Tolerance
6 8 10 12 14 16 18	-0.02 -0.08
6.25 9.42 12.65 15.77 18.95	+0.05 0

Material:
Heater : 1.4541/X6CrNiTi18-10
Terminal : Copper
Lead Wire : Insulation Tube
Insulation Tube : 180°C
(Heat Resistance Temperature)
Maximum Operation Temperature: 600°C

Configurable L, W and F

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire) Lead Wire Type	F (Lead Wire) 10mm Increment	Electrical Power Density (W/cm²)	€ Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600
	6	50~250	100	50~ 500									
			110	50~ 500									
			200	60~ 600									
			220	60~ 600									
	6.25 (1/4 Inch)		100	50~ 500									
			110	50~ 500									
			200	60~ 600									
			220	60~ 600									
	8	50~400	100	50~ 600									
			110	50~ 600									
			200	50~1200									
			220	70~1200									
	9.42 (3/8 Inch)		100	50~ 600									
			110	50~ 600									
			200	50~1200									
			220	70~1200									
	10	50~600	100	50~ 600									
			110	50~ 600									
			200	50~1200									
			220	70~1200									
	12		100	50~ 800									
			110	50~ 800									
			200	50~1600									
			220	70~1600	T (Teflon Wire)	100~500	2≤W/cm²≤15 (?)W/cm²=W/{Dπ (L-15)/100} (?)Calculate with the electrical power density of heat-generating part, not with the overall length.)						
	12.6 (1/2 Inch)		100	50~ 800									
			110	50~ 800									
			200	50~1600									
			220	70~1600									
	14		100	50~ 800									
			110	50~ 800									
			200	60~1600									
			220	80~1600									
	15.77 (5/8 Inch)		100	50~ 800	*M (Silica Wire)								
			110	60~ 800									
			200	70~1600									
			220	90~1600									
	16		100	50~ 800									
			110	50~ 800									
			200	60~1600									
			220	90~1600									
	18		100	50~ 800									
			110	60~ 800									
			200	100~1600									
			220	130~1600									
	18.95 (3/4 Inch)		100	50~ 800									
			110	60~ 800									
			200	100~1600									
			220	130~1600									

Not Available

Lead Wire Type

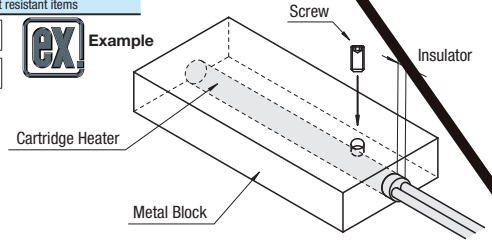
Symbols	Lead Wire Type	Heat Resistance Temperature	Features
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and water resistant items
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and weather resistant items
*M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

* The price of mica polyimide-wound silica + nickel coated copper wire is the unit price above + 10,00 EUR
Ex.) MCHSR12-500-V100-W500-MT500
100,010+10,00=110,10 EUR

Order Example

Part Number	-	L	-	V	-	W	-	F Lead Wire: Lead Wire Type	F Lead Wire: Length
	-	60	-	V200	-	W80	-	T	500

Example



Days to Ship

10 Days

Price

Volume Discount (?)Round down to one Cent. P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

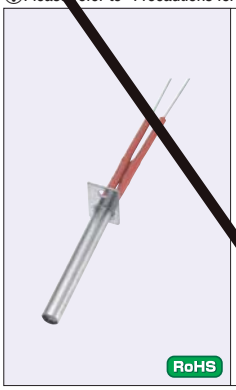
(?)For orders larger than indicated quantity, please request a quotation.

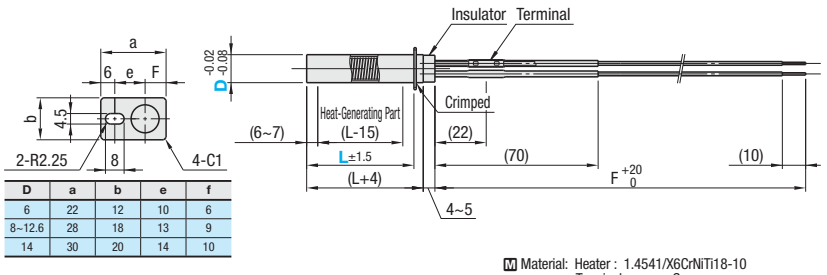
Precautions for Use
(?)Do not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.

Cartridge Heaters
-Flanged-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





D	a	b	e	f
6	22	12	10	6
8~12.6	28	18	13	9
14	30	20	14	10

Material: Heater : 1.4541/X6CrNiTi18-10
Terminal : Copper
Lead Wire : Nickel (N)
Lead Wire Film : Glass Braid
Lead Wire Heat Resistance Temperature: 180°C
Maximum Operation Temperature: 600°C

RoHS

When D=9.42 and 12.6, the tolerance will be +0.05~0.
For D6 and D8, position of the terminal (22) is 17 and 37 with shifting two terminals.
Insulator is not attached for D=6.

Flanged Type

Part Number Type	Part Number D	L 1mm Increment	V (Voltage) Selection	Electrical Power 10W Increment	F (Lead Wire Length)	Electrical Power Density (W/cm²)	€ Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600
	6	50~250	100	50~ 50	1000	2≤W/cm²≤15 ※W/cm²=W/{Dπ(L-15)/100} ※Calculate with the electric power density of heat-generating part, not with the overall length.						
			110	50~ 60								
			200	60~ 600								
			220	80~ 600								
	8	50~400	100	50~ 600								
			110	50~ 600								
			200	50~1200								
			220	70~1200								
	9.42 (3/8 Inch)		100	50~ 600								
			110	50~ 600								
			200	50~1200								
			220	70~1200								
	10	50~600	100	50~ 600								
			110	50~ 600								
			200	50~1200								
			220	70~1200								
	12		100	50~ 800								
			110	50~ 800								
			200	50~1600								
			220	70~1600								
	12.6 (1/2 Inch)		100	50~ 800								
			110	50~ 800								
			200	50~1600								
			220	70~1600								
	14		100	50~ 800								
			110	50~ 800								
			200	60~1600								
			220	80~1600								

Not Available

Order Example Part Number - L - V - W
- 250 - V200 - W1200

Days to Ship 13 Days

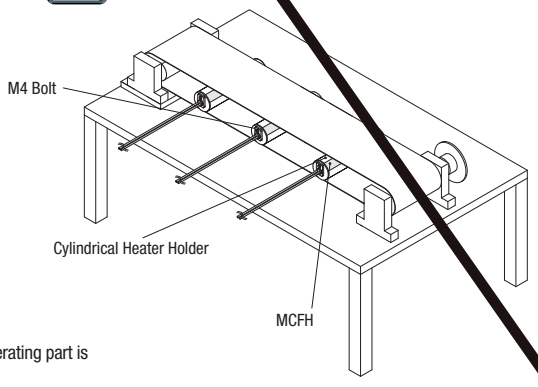
Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

For orders larger than indicated quantity, please request a quotation.

Example



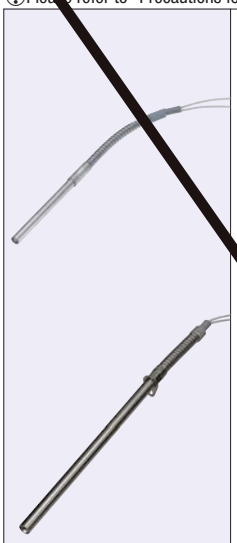
Features
- Cartridge heater with flange mounted on the end part. The heater can be easily secured with M4 bolts.
- Prevent the Cartridge Heater from falling off from the device.

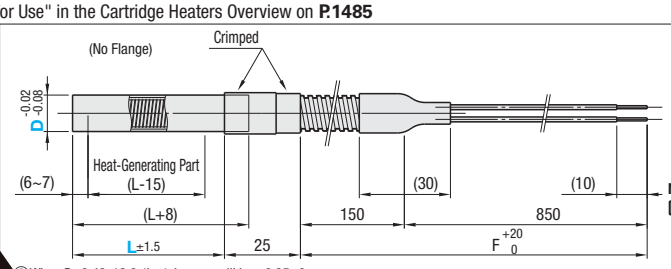
Precautions for Use
Do not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.

Cartridge Heaters
-Flexible Hose-

CAD Data

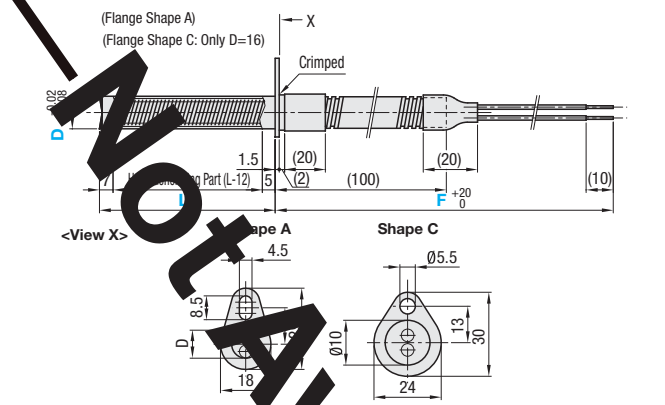
Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





When D=9.42, 12.6, the tolerance will be +0.05~0.

MCHH
Material:
Heater : 1.4541/X6CrNiTi18-10
Lead Wire : Nickel (N)
Lead Wire Film : Silicon + Glass Braid
Lead Wire Heat Resistance Temperature: 180°C
Maximum Operation Temperature: 600°C



Applicable only when D=16 is selected.

Terminal Selection
N (No Crimp Terminal)
M (With Round Crimp Terminal)
Y (With Y-Shaped Crimp Terminal)

MCHHA / MCHHC
Material:
Heater : 1.4301/X5CrNi18-10
Flange : 1.4301/X5CrNi18-10
Lead Wire : Lead Wire Heat Resistance Temperature:
Lead Wire Heat Resistance Temperature:180°C
Maximum Operation Temperature: 600°C

RoHS

■Flexible Hose Type

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length)	Electrical Power Density (W/cm²)	€ Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600
	8	50~400	100	50~600	1000	2≤W/cm²≤15 W/cm²=W/{Dπ(L-12)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)						
			110	50~600								
			200	50~1200								
			220	70~1200								
	9.42 (3/8 Inch)		100	50~600								
			110	50~600								
			200	50~1200								
			220	70~1200								
	10	50~600	100	50~600								
			110	50~600								
			200	50~1200								
			220	70~1200								
	12		100	50~800								
			110	50~800								
			200	50~1600								
			220	70~1600								
	12.6 (1/2 Inch)		100	50~800								
			110	50~800								
			200	50~1600								
			220	70~1600								

■Flexible Hoses -Flanged-

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) 10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)	Heater Body Price € Unit Price L50~100	L101~200	L201~300	L301~400	Price for Additional Terminal (Body Price +) N	M	Y
	8	50~400	100 110	50~500	300~1000	N M Y	2≤W/cm²≤15 W/cm²=W/{Dπ(L-12)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)							
			200 220	50~1100										
	10		100 110	50~600										
			200 220	50~1600										
	12		100 110	50~900										
			200 220	50~1800										
	16		100 110	50~1000										
			200 220	50~2000										

Order Example

Part Number	L	V	W	F	Terminal
	250	V200	W1200		
	200	V100	W500	F500	N

Days to Ship: 13 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

For orders larger than indicated quantity, please request a quotation.

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.
Volume discount rate is applicable to the price of heater body only.

■Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-Shaped -	M4

■Features

- The lead wire is covered with flexible hose made of stainless steel for external impacts.
- As the product has a protection cover at the base, the lead wire is not pulled directly when the heater is being pulled out.
- The flexible hose prevents the lead wire from damages due to metal fatigue.

■Precautions for Use

Do not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
Operating the heater with the heat-generating part out of heated products may cause the wire to break or ignite due to abnormal heating.
The flexible hose is not water resistant. Use it away from water.
Cartridge Heaters cannot be used in water.

■Minimum Bending Radius R

MCHH

D	R
	27.5
9.42	37.5
10	37.5
12	37.5
12.6	37.5

• MCHHA · MCHHC

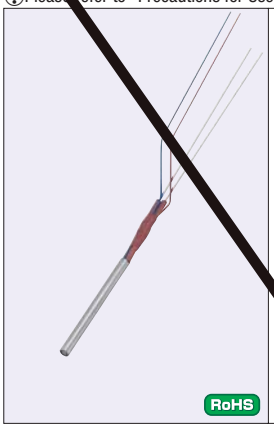
D	R
8	25
10	25
12	27
16	27

Not Available

Cartridge Heaters
-With Sensor-

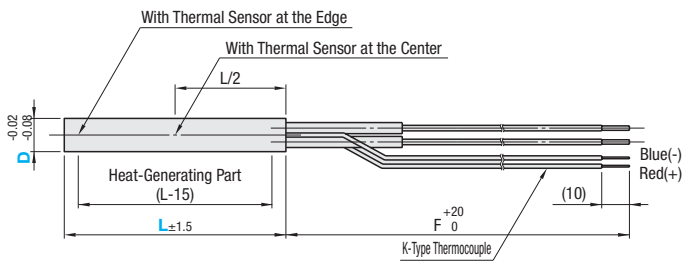
CAD Data

(?)Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**



RoHS

(With Thermal Sensor at the Edge)
(With Thermal Sensor at the Center)



Material: Heater : 1.4541/X6CrNiTi18-10
Terminal : Copper
Lead Wire : Nickel (Ni)
Lead Wire Film : Glass Braid
Lead Wire Heat Resistance Temperature: 180°C

K-Type Thermocouple Film: Glass Braid
Thermocouple Heat Resistant Temperature: 180°C
Maximum Operation Temperature: 600°C

Configurable L and W with Sensor

Part Number Type	D	L 1mm Increment	(Voltage Selection)	W (Electrical Power) 10W Increment	F (Lead Wire Length)	Electrical Power Density (W/cm²)	€ Unit Price L50~100	L101~200	L201~300
(With Thermal Sensor at the Edge) (With Thermal Sensor at the Center)	8	50~300	100	50~ 600	250	2≤W/cm²≤15 (?)W/cm²=W/{Dπ (L-15)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)			
			110	50~ 600					
			200	70~1000					
			220	90~1000					
	10		100						
			110						
			200	1 00					
			220	1 120					
	12		100	50~					
			110	50~					
			200	140~1500					
			220	160~1500					

Order Example Part Number - L - V - W
- 170 - V200 - W450

Days to Ship 13 Days

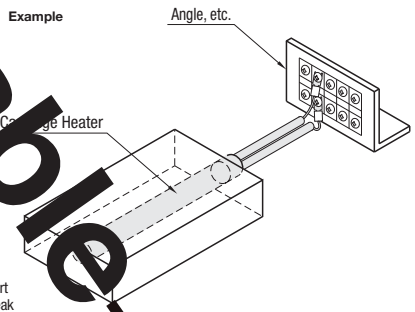
Price

Volume Discount ((?)Round down to one Cent.) **P.87**

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

(?)For orders larger than indicated quantity, please request a quotation.

Example



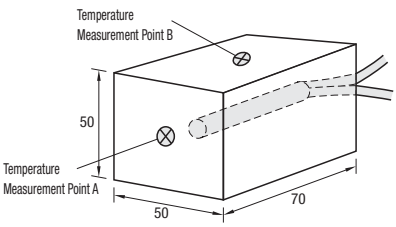
Features

- This unit contains the Cartridge Heater with built-in K Type Thermocouple.
- As the temperature sensor is integrated into the heater, the heater can be used in smaller space.
- The heater has a function to prevent the rise in temperature of the heater itself. Accurate temperature control of the heater can be made.

Precautions for Use

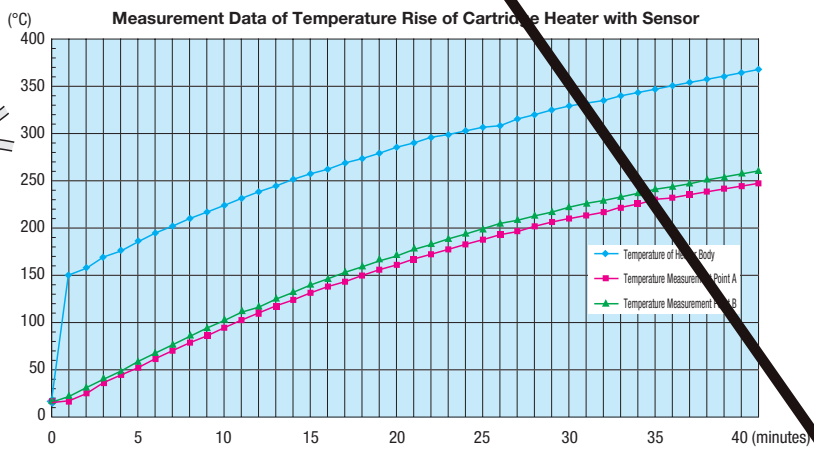
(?)Do not let heater run idle in the atmosphere. Operating the heater with the heat-generating part out of heated products may cause the wire to break or ignite due to abnormal heating.
(?)The temperature measured by the Thermocouple is the temperature of the heater.
(?)To measure the temperature of the heated object, separate sensor needs to be installed.

• Measurement Data of Temperature Rise of Cartridge Heater with Sensor



Heater Used : MCHSSS8-60-V100-W130 (Electrical Power Density10W/cm²)
Heated Object : 1.0038/S235JR (50x50x70)
Point of temperature measurement : Center part of each surface of block

Measurement Data of Temperature Rise of Cartridge Heater with Sensor



* The data above shows the difference of temperature between the heater body and the heated object.

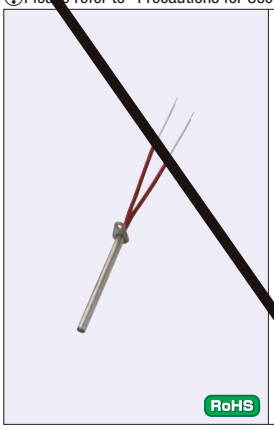
Not Available

Cartridge Heaters

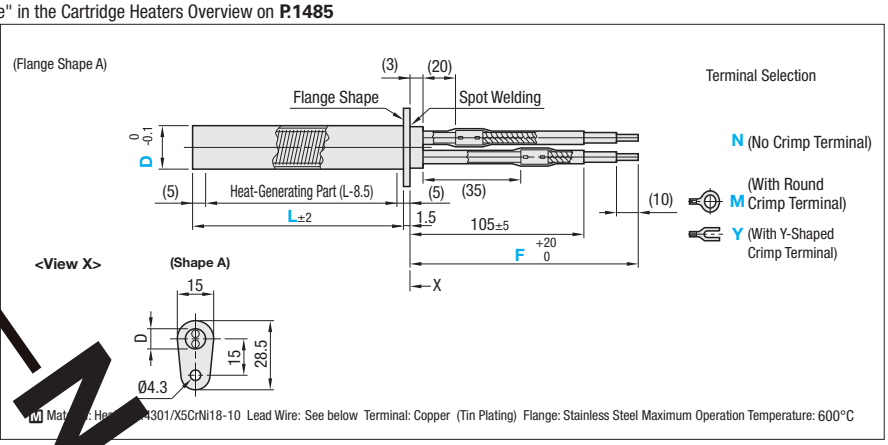
-Cartridge Heaters -Lead Wire, Flange Selectable-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on P.1485



RoHS



Material: Heater Sheath: SUS304/SUS301/X5CrNi18-10 Lead Wire: See below Terminal: Copper (Tin Plating) Flange: Stainless Steel Maximum Operation Temperature: 600°C

Lead Wire, Flange Selectable

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 1W Increment	F (Lead Wire Length) Lead Wire Type	F (Lead Wire Length) 10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)
	8	50~400	100	50~ 800	B G T M	100~1000	N M Y	2≤W/cm²≤15 ⓘW/cm²=W/{Dπ(L-8.5)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)
			200	50~1200				
	10	50~600	100	50~ 800				
			200	50~1200				
	12		100	50~ 800				
			200	50~1600				

Lead Wire Type

Symbols	Lead Wire Type	Heat Resistance Temperature	Features
B	Tin Plated Annealed Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and water resistant items
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and other resistant items
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-Shaped -	M4

Order Example

Part Number	-	L	-	V	-	W	-	F Lead Wire: Lead Wire Type	F Lead Wire: Length	-	Terminal
	-	300	-	V100	-	W350	-	M	1000	-	

Days to Ship: 13 Days

Price

Volume Discount (ⓘRound down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

ⓘFor orders larger than indicated quantity, please request a quotation.

ⓘVolume discount rate is applicable to the price of heater body only.

<Price Calculation Example>
L300-V100-W350-M1000-Y
100+3,00+3,00=114,60 EUR

D	Heater Body Price € Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	Additional Lead Wire Price (€ Body Price +) B	G	T	M	Price for Additional Terminal (€ Body Price +) N	M	Y
8													
10													
12													

Precautions for Use

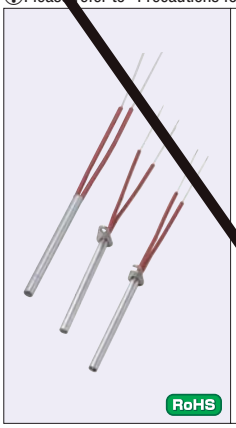
ⓘDo not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
ⓘKeep the temperature around the flange at 180°C or below.
ⓘKeep the temperature around the lead wire exit at 130°C or less.

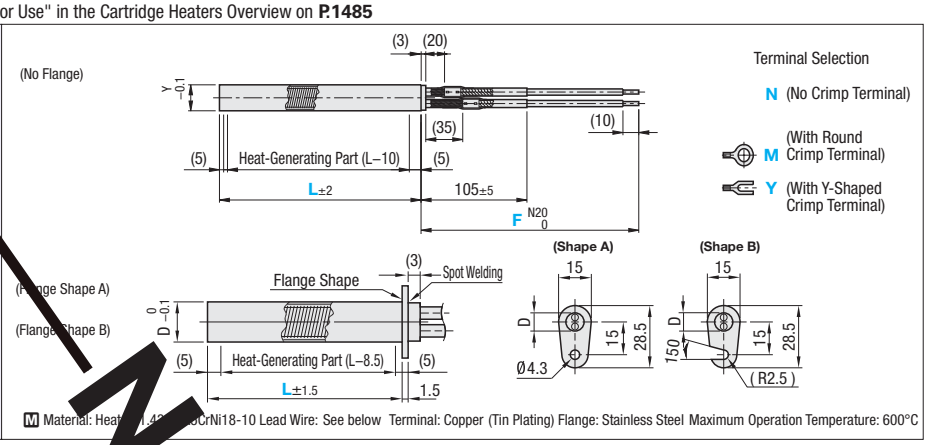
Not Available

Cartridge Heaters
-Break Resistant · Internal Connection-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on P.1485





RoHS

M Material: Heat [illegible] SCrNi18-10 Lead Wire: See below Terminal: Copper (Tin Plating) Flange: Stainless Steel Maximum Operation Temperature: 600°C

Not Available

■Break Resistant - Internal Connecti

Part Number Type	D	L 1mm Increment	V (Voltage) Selecti	W (Electrical Power) [illegible]0W Increment	F (Lead Wire Length) Lead Wire Type	F (Lead Wire Length) 10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)
	8	50~400	100	50~ 600	B G T M	100~1000	N M Y	2≤W/cm²≤15 W/cm²=W/Dπ(L-10)/100}* * For Flanged Type (L-8.5) (Calculate with the electrical power density of heat-generating part, not with the overall length.)
			200	50~1200				
	10		100	50~ 600				
			200	50~				
	12	50~600	100	50~ 800				
			200	50~1				
* D14 is for only.	* 14		100	50~ 0				
			200	100~1600				

■Lead Wire Type

Symbols	Selection	Heat Resistance Temperature	Features
B	Tin Plated Annealed Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and [illegible]esistant items
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and [illegible]er resistant items
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

■Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-Shaped -	M4

Order Example

Part Number	-	L	-	V	-	W	-	F Lead Wire Lead Wire Type	Length	Te
	-	170	-	V200	-	W200	-	b	1000	- M

Days to Ship: 13 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the price of heater body and charge for additional Flanged Type only.

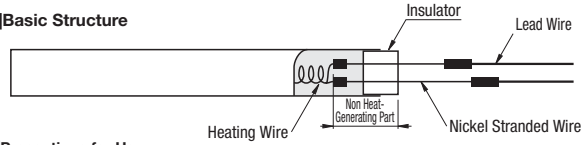
[illegible]ation Example:>
[illegible]150-V200-W200-B1000-M
[illegible]+15[illegible]00+3,00=86,40 EUR

Part Number Type	D	Heater Body Price € Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	Flanged Type Additional Price (€ Body Price +) Shape A	Shape B	Additional Lead Wire Price (€ Body Price +) B	G	T	M	Price for Additional Terminal (€ Body Price +) N	M	Y
	8															
	10															
	12															
* D14 is for only.	* 14															

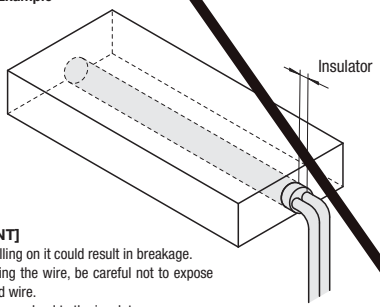
■Features of Cartridge Heaters -Break Resistant - Internal Connection-
- The wires are less prone to breakage.

-The cartridge heater (break resistant internal connection type) employs a connection with heat-generating wire and nickel stranded wire in the sheath and a connection with nickel stranded wire and lead wire outside the sheath.
- As the nickel pins are not exposed, the heater is more resistant against bending.

■Basic Structure



Example



■Precautions for Use

Do not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
Do not repeatedly bend the connection part between the nickel stranded wire and the lead wire. (Forcibly pulling on it could result in breakage.)
Do not pull the connection part between the nickel stranded wire and the lead wire. (Forcibly pulling on it could result in breakage.)
Keep the temperature around the lead wire exit at 130°C or less.

[IMPORTANT]
(1) Forcibly pulling on it could result in breakage.
(2)When bending the wire, be careful not to expose the stranded wire.
(3)Do not apply any load to the insulator.

Cartridge Heaters

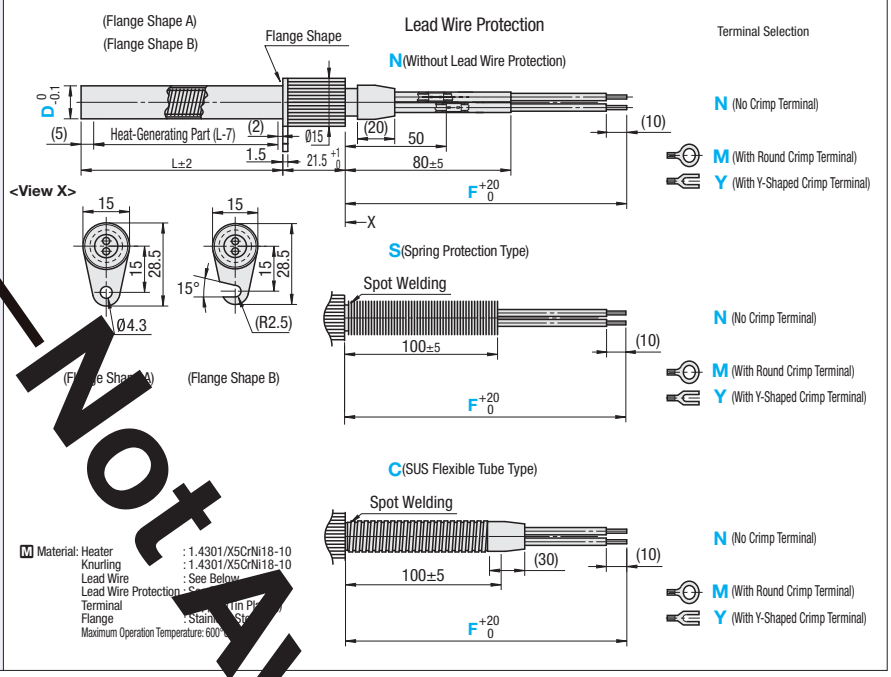
-Lead Wire Protection Type with Knurled Flange-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on P.1485

RoHS





Not Available

Lead Wire Protection Type with Knurled Flange

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) Lead Wire Type	F (Lead Wire Length) 1mm Increment	Lead Wire Protection Selection	Terminal Selection	Electrical Power Density (W/cm²)
	8	50~400	100	50~ 600	B G T M	50~1000	N S C	N M Y	2≤W/cm²≤15 ※W/cm²=W/{Dπ(L-7)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)
			200	50~1200					
	10	50~600	100	50~ 600					
			200	50~1200					
	12		100	50~ 800					
			200	50~1600					

Lead Wire Type

Symbols	Lead Wire Type	Heat Resistance Temperature	Features
B	Tin Plated Annealed Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and water resistant items
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and weather resistant items
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

Lead Wire Protection

Symbols	Lead Wire Protection	Materials	Attaching Portion
N	Without Lead Wire Protection	-	-
S	Spring Protection	Stainless Steel	Spring 100 mm
C	Stainless Steel Flexible Tube	Stainless Steel	Stainless Steel Flexible Tube 100mm

Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Terminal -Y-Shaped -	M4

Precautions for Use

- Do not let heating part exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
- Keep the temperature around the knurled head at 180°C or below.
- Do not pull or twist the lead wire, the spring, or the stainless steel flexible tube.

Order Example

Part Number	-	L	-	V	-	W	-	F Lead Wire: Lead Wire Type	F Lead Wire: Length	-	Lead Wire Protection	-	Terminal
	-	170	-	V200	-	W450	-	T	1000	-	S	-	M

<Price Calculation Example>
MCHXA10-170-V200-W450-T1000-S-M
€ 70+8,00+5,50+3,00=102,20 EUR

Days to Ship 13 Days

Price

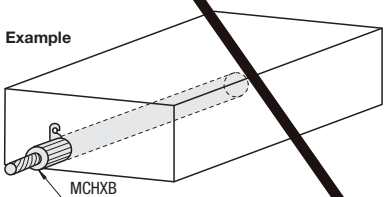
Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the price of heater body only.

Example

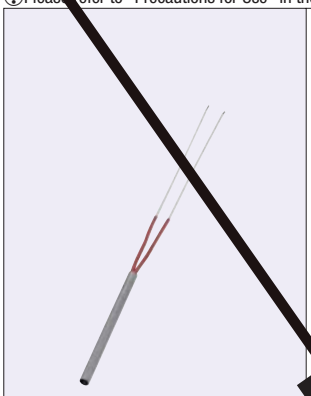


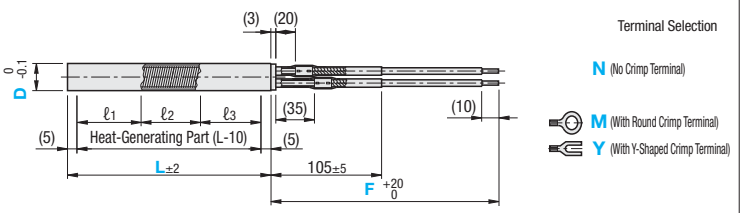
D	Heater Body Price € Unit Price: L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	Additional Lead Wire Price (€ Body Price +): b	G	T	M	Additional Price for Lead Wire Protection (€ Body Price +): N	S	C	Price for Additional Terminal (€ Body Price +): N	M	Y
8																
10																
12																

Cartridge Heaters
-Uniform Heating-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





Terminal Selection

N (No Crimp Terminal)

M (With Round Crimp Terminal)

Y (With Y-Shaped Crimp Terminal)

		ℓ1	ℓ2	ℓ3
Length		1	1	1
Winding Ratio	A	1.1	1	1.1
	B	1.3	1	1.3

* Winding Ratio: Nickel-chrome Wire

When the length of heat-generating part is not a multiple of 3, it is produced based on adjusting the length ratio to approx. 1: 1: 1.

Material: Heater : 1.4301/X5CrNi18-10
Lead Wire : See Below
Terminal : Copper (Tin Plating)
Maximum Operation Temperature: 600°C

RoHS

Uniform Heating

Part Number Type	Winding Ratio	D	L 10mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) Lead Wire Type	F (Lead Wire Length) 10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)
	(1.1:1:1.1)	8	150~300	100	70~ 600	B	100~1000	N	2≤W/cm²≤15
				200					W/cm²=W/{Dπ(L-10)/100}
		10		100		G		M	(Calculate with the electrical power density of heat-generating part, not with the overall length.)
				200					
	(1.3:1:1.3)	12		100		T		Y	
				200		M			

Winding Ratio is the winding ratio of Nickel-chrome wire. (Refer to standard diagram)

Lead Wire Type

Symbols	Selection	Heat Resistance Temperature	Features
B	Tin Plated Annealed Copper Fiber Glass Braided Wire	180°C	Gen
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical, water
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water a
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistan

Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-Shaped -	M4

Days to Ship **13 Days**

Order Example

Part Number										
Type	Winding Ratio	D	-	L	-	V	-	W	-	F Lead Wire: Lead Wire Type	Length	- Terminal
A	8		-	200	-	V100	-	W300	-	G	500	- M

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the price of heater body only.
<Price Calculation Example>MCHCA8-200-V100-W300-G500-M 71,30+4,50+3,00=78,80 EUR

D	Heater Body Price € Unit Price L150~200	Heater Body Price € Unit Price L201~300	Additional Lead Wire Price (€ Body Price +) B	G	T	M	Price for Additional Terminal (€ Body Price +) N	M	Y
8									
10									
12									

Features

- This heater has different winding ratio of Nickel-chrome wire in one cartridge heater from conventional ones.
- Compared with conventional cartridge heater, the temperature on the heated object will be more uniform.

- Comparison with Conventional Cartridge Heaters

	Conventional Cartridge Heaters	Cartridge Heaters Uniform Heating Type (MCHC)
Winding Method of the Nickel-chrome Wire of Heater on Each Part	Uniform	Low winding turns on the center part (ℓ2).
Heat Capacity Distribution	Uniform	Low capacity on the center part (ℓ2).
Temperature Distribution of Heated Object	The temperature of the center of the heater may be relatively high (temperature unevenness).*	Better balance of temperature distribution (uniform heating effect) than conventional heaters.

*The temperature of the center part increases easily because radiation is hard and the heat may accumulate.

-This heater is more effective than conventional ones when higher uniform heating is required.
(Ex.) Heating board for welding seal, engraving heating, roller heating and heating board of rubber welding machine, etc.

Selection Point

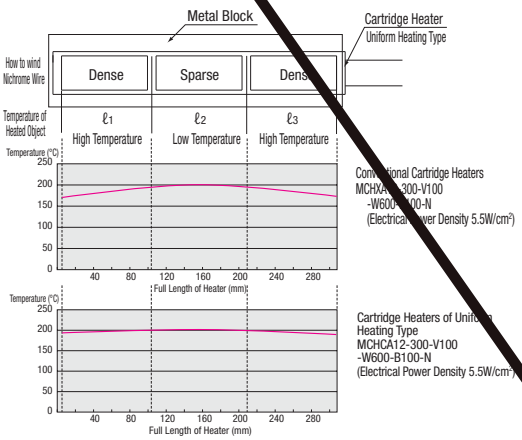
-Calculate the total wattage required for heating metal block. Refer to P.1486
-Select the distribution ratio of Nickel-chrome wire from A or B Type.
A Type: Improving the temperature consistency of heated object.
B Type: Temperature on the both ends of heated object is low obviously.
The temperature consistency may not be improved even if either type is used.

Precautions for Use

- Do not let heater run idle in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break due to abnormal heating.
- Although the temperature uniformity improves compared to the conventional cartridge heaters, completely uniform heating is not guaranteed. Uniform heating may not go into effect depending on the operating condition.
- Because the uniform heating effect varies depending on slight difference of the operating condition (such as the shape, size of the heated object and the air flow, etc.), even for the products of the same type, the stability of the uniform heating effect cannot be guaranteed.
- Keep the temperature around the lead wire end at 130°C or below.

Actual Measurements of Temperature Distribution of Cartridge Heater Uniform Heating Type

- The heat-generating part is divided into three parts and winding method of Nickel-chrome wire for each part is different.
- The balance of the temperature distribution improves because the temperature of ℓ2 becomes low compared to the conventional cartridge heaters.



Conventional Cartridge Heaters MCHA12-300-V100 -W600-B100-N (Electrical Power Density 5.5W/cm²)

Cartridge Heaters of Uniform Heating Type MCHCA12-300-V100 -W600-B100-N (Electrical Power Density 5.5W/cm²)

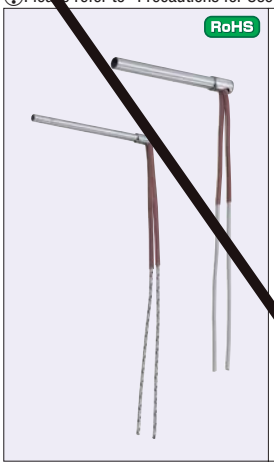
Heated Object: 1.4305/X10CrNiS18-9 (30x30x300)
Point of Temperature Measurement:ℓ1, ℓ2, ℓ3 Center Part of Each Surface

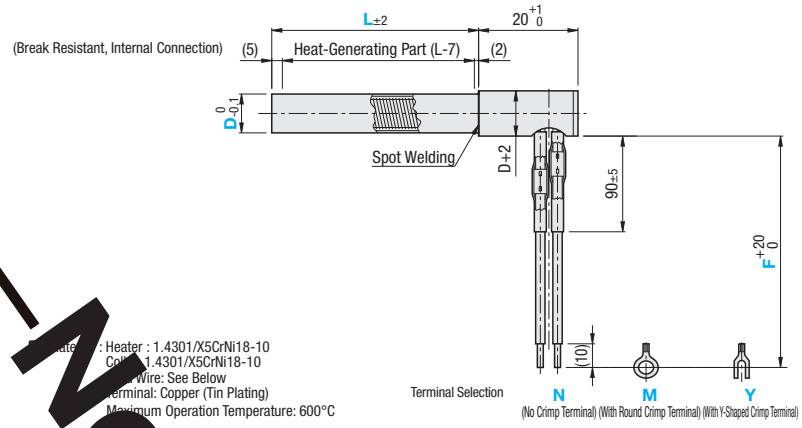
Not Available

Cartridge Heaters
-L-shaped-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





Sheath Material: Heater : 1.4301/X5CrNi18-10
Collar: 1.4301/X5CrNi18-10
Lead Wire: See Below
Terminal: Copper (Tin Plating)
Maximum Operation Temperature: 600°C

L-shaped

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 50W Increment	F (Lead Wire Length) Lead Wire Type	F (Lead Wire Length) 10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)
	*6	50~250	100	50~500	B G T M	100~1000	N M Y	2≤W/cm²≤15 W/cm²=W/{Dπ(L-7)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)
			200	100~600				
	8	50~400	100	50~[illegible]				
			200	50~[illegible]				
	10	50~600	100	50~[illegible]				
			200	50~[illegible]				
	12		100	50~800				
			200	50~16[illegible]				
	14		100	50~800				
			200	100~1600				

* D=6 is for MCHL only.

Lead Wire Type

Symbols	Lead Wire Type	Heat Resistance Temperature	Features
B	Tin Plated Annealed Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and water resistant items
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and weather resistant items
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-shaped-	M4

Order Example

Part Number	-	L	-	V	-	W	-	F Lead Wire: Lead Wire Type	F Lead Wire: Length	-	Terminal
	-	300	-	V100	-	W350	-	M	1000	-	Y

Days to Ship 13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the price of heater body only.

<Price Calculation Example>
MCHL12-3[illegible]V100-W350-M1000-Y
79,00[illegible],00+3,00=95,10 EUR

D	Heater Body Price € Unit Price											
	L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	L50~100	L101~200	L201~300	L301~400	L401~500	L501~600
6												
8												
10												
12												
14												

D	Additional Lead Wire Price (Body Price +)				Price for Additional Terminal (Body Price +)		
	B	G	T	M	N	M	Y
6							
8							
10							
12							
14							

Precautions for Use

- Do not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
- Keep the temperature around the collar at 180°C or below.
- Keep the temperature around the lead wire exit at 130°C or less.

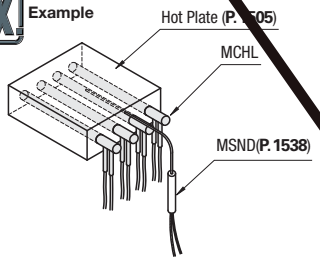
Cartridge Heaters Features of L-shaped Type

- Space-saving
  Saves space by bending the lead wire in L-shape at the exit point.
- Lead wire selection
  Lead wire can be selected depending on the operating ambient temperature.

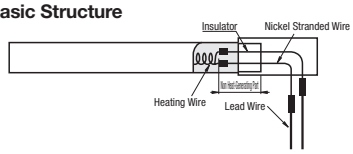
Features of Cartridge Heaters -Break Resistant - Internal Connection-

- Heater wires are less prone to breakage
  Break Resistant Internal Connection Type employs a connection with heat-generating wire and nickel stranded wire in the sheath and a connection with nickel stranded wire and lead wire outside the sheath. As the nickel pins are not exposed, the heater has more resistance against bending.

Example



Basic Structure

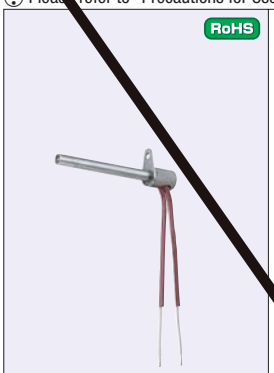


Not Available

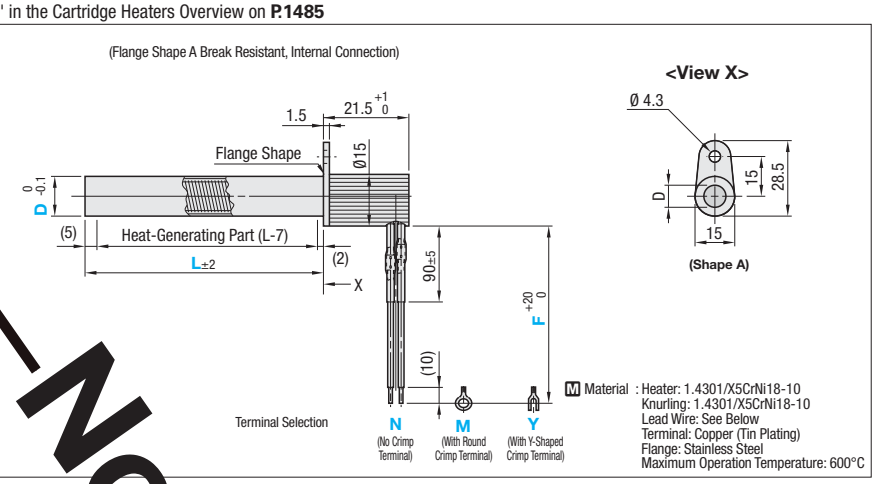
Cartridge Heaters
-L-shaped Knurled Flanged-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**



RoHS



M Material : Heater: 1.4301/X5CrNi18-10
Knurling: 1.4301/X5CrNi18-10
Lead Wire: See Below
Terminal: Copper (Tin Plating)
Flange: Stainless Steel
Maximum Operation Temperature: 600°C

■L-shaped Knurled Flanged

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electric Power) 10W Increment	F (Lead Wire Length) Lead Wire Type	F (Lead Wire Length) 10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)
	8	50~400	100	50~600	B G T M	100~1000	N M Y	2≤W/cm²≤15 W/cm²=W/{Dπ(L-7)/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)
			200	50~1200				
	10	50~600	100	50~				
			200	50~1200				
	12		100	50~800				
			200	50~1600				

■Lead Wire Type

Symbols	Lead Wire Type	Heat Resistance Temperature	
B	Tin Plated Annealed Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and wat
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

■Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-shaped-	M4

Order Example

Part Number	-	L	-	V	-	W	-	F Lead Wire: Lead Wire Type	F Lead Wire: Length	-	Term
	-	300	-	V100	-	W350	-	M	1000	-	Y

Days to Ship: **13 Days**

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the price of heater body only.

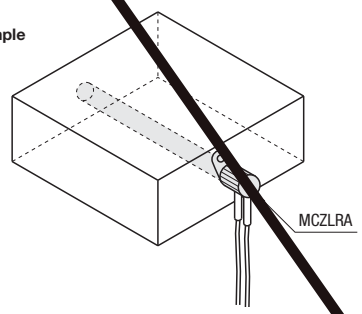
<Price Calculation Example>
M [illegible] V100-W350-M1000-Y
115,90[illegible]0=131,90 EUR

D	Heater Body Price € Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	Additional Lead Wire Price (€ Body Price +) B	G	T	M	Terminal Price for Additional Terminal (€ Body Price +) N	M	Y
8													
10													
12													

■Precautions for Use

- Do not let heater run exposed in the atmosphere. Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
- Keep the temperature around the knurled head at 180°C or below.
- Keep the temperature around the lead wire exit at 130°C or less.

Example



■Cartridge Heaters Features of L-shaped Knurled Flanged

- Space-saving
  Saves space by bending the lead wire in L-shape at the exit point.
- Lead wire selection
  Lead wire can be selected depending on the operating ambient temperature.
- The flange at the end of the heater makes it easier to mount.
- For features of Break Resistant Internal Connection Type, refer to **P.1498**

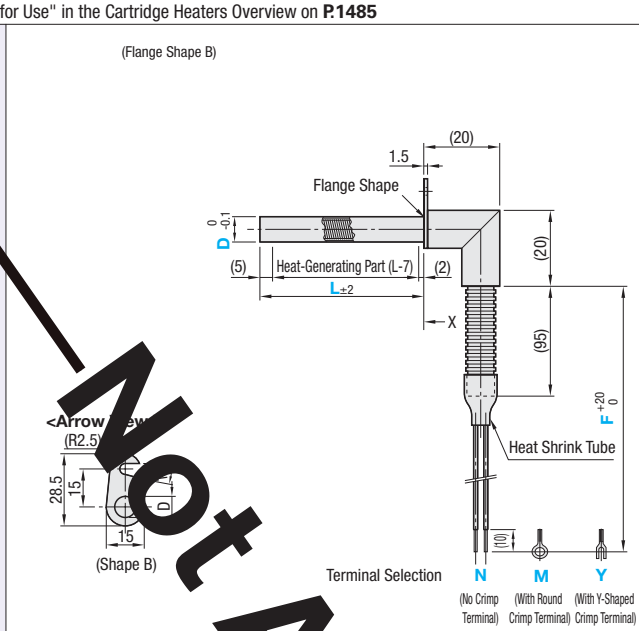
Not Available

Cartridge Heaters
-L-shaped Reinforcement (with Flexible Tube)-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





RoHS

M Material: Heater: 1.4301/X5CrNi18-10 Lead Wire: See below Terminal: Copper (Tin Plating) Flange: Stainless Steel Maximum Operation Temperature: 600°C

■L-shaped Reinforcement

Part Number Type	D	L 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) Lead Wire Type	F (Lead Wire Length) 10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)
(with Flexible Tube)	8	50~400	100	50~600	B G T M	50~1000	N M Y	2≤W/cm²≤15 W/cm²=W/{Dπ(L-7)/100} Calculate with the electrical power density of heat-generating part, not with the overall length.
			200	50~1200				
	10	50~600	100	50~600				
			200	50~1200				
	12		100	50~800				
			200	50~1600				

■Lead Wire Type

Symbols	Lead Wire Type	Heat Resist. Temp.	Features
B	Tin Plated Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and water resistant items
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and weather resistant items
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

■Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-shaped-	M4

Order Example

Part No.	-	L	-	V	-	W	-	F Lead Wire		-	Terminal
								Lead Wire Type	Length		
	-	300	-	V100	-	W350	-	M	1000	-	Y

Days to Ship 13 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the price of heater body only.

<Price Calculation Example>
MCLFB12-300-V100-W350-M1000-Y
100,00+13,00+3,00=116,00 EUR

D	Heater Body Price € Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	Additional Lead Wire Price (€ Body Price +) B	G	T	M	Price for Add. Terminal (€ Body Price +) N	M	Y
8													
10													
12													

■Precautions for Use

- Do not let heater run idle in the atmosphere.
- Operating the heater when heat-generating part is out of heated products, the wire may break due to abnormal heating.
- Keep the temperature around the flange at 180°C or less.
- Keep the temperature around the lead wire exit at 130°C or less.

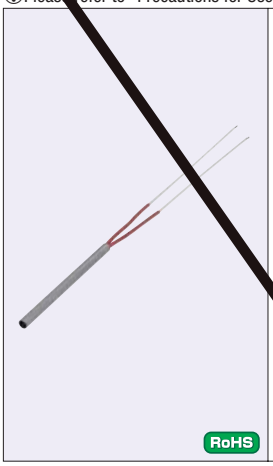
Not Available

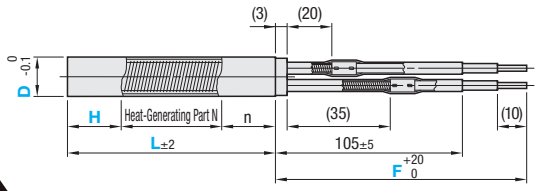
Cartridge Heaters

-Heat Generating Part and Length Configurable-

CAD Data

Please refer to "Precautions for Use" in the Cartridge Heaters Overview on **P.1485**





Terminal Selection

N (No Crimp Terminal)

M (With Round Crimp Terminal)

Y (With Y-Shaped Crimp Terminal)

n=L-H-[illegible] M[illegible]: Heater: 1.4301/X5CrNi18-10 Lead Wire: See below Terminal: Copper (Tin Plating) Maximum Operation Temperature: 600°C

Heat Generating Part, Length Configurable

Part Number Type	D	L 1mm Increment	H 1mm Increment	N 1mm Increment	V (Volume) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) Lead Wire Type	10mm Increment	Terminal Selection	Electrical Power Density (W/cm²)
	6	50~250	5~205	40~240	100	50~500	B G T M	100~1000	N M Y	2≤W/cm²≤15 W/cm²= W/{DπN/100} (Calculate with the electrical power density of heat-generating part, not with the overall length.)
					200	100~600				
	8	50~400	5~355	40~390	100	[illegible]~600				
					200	[illegible]0~1200				
	10	50~600	5~555	40~590	100	50~600				
					200	[illegible]1200				
	12				100	[illegible]0~800				
					200	[illegible]1600				
	14				100	50~[illegible]00				
					200	10[illegible]160[illegible]				

L≥H+N+5

Lead Wire Type

Symbols	Lead Wire Type	Heat Resist. Temp.	Features
B	Tin Plated Copper Fiber Glass Braided Wire	180°C	General Use
G	Silicon Rubber + Tin Plated Annealed Copper Wire	180°C	For chemical and water resistant items
T	Teflon + Nickel Plated Annealing Copper Wire	260°C	For chemical, water and weather resistant items
M	Mica Polyimide-Wound Silica + Nickel Coated Copper Wire	400°C	For heat resistant items

Type of Terminal

Symbols	Type of Terminal	Nominal Size of Screw
N	No Crimp Terminal	-
M	Crimp Terminal -Round Type-	M4
Y	Crimp Terminal -Y-shaped-	M4

Order Example

Part No.	-	L	-	H	-	N	-	V	-	W	-	F Lead Wire Lead Wire Type	Length	-	Terminal
	-	300	-	H5	-	N100	-	V100	-	W350	-	M	1000	-	Y

Days to Ship 13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Volume discount rate is applicable to the price of heater body only.

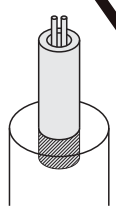
<Price Calculation Example>
MCHP12-300-H5-N100-[illegible]00-W350-M1000-Y
94,20+13,00+3,00=110,[illegible] EUR

Part No. Type	D	Heater Body Price € Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	Add. Lead Wire Price (€ Body Price +) B	G	T	M	Price for Add.Terminal (€ Body Price +) N	M	Y
	6													
	8													
	10													
	12													
	14													

Precautions for Use

- Do not let heater run exposed in the atmosphere.
  Operating the heater when heat-generating part is out of heated products, the wire may break or ignite due to abnormal heating.
  (Completely hide heat-generating part of a heater in a metal block with 5mm gap on both ends, ensuring that the heat generating part is not exposed to air.)
- Keep the temperature around the lead wire exit at 130°C or less.

Example



Usable when heating only tip portion such as spot sealing work.

Not Available

Hot Plates / Cooling Plates / Mounting Bolts for Cartridge Heaters

- This metal plate has a sensor hole and heater holes for heater insertion.

■Hot Plates

RoHS



Type	Materials Material Surface Treatment Codes	Material
HTPL (With Tap)	A	EN AW-5052/ AlMg2,5
HTPLT (No Tap)	S	1.4305/ X10CrNiS18-9

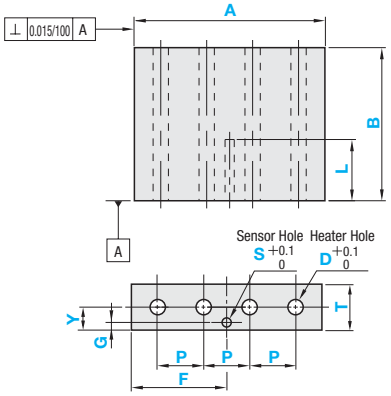
M1 Size Table

A	B	M1
50~100	50~100	M4x0.7 Depth 6
	101~200	M5x0.8 Depth 8
101~200	50~100	
	101~200	M6x1.0 Depth 10

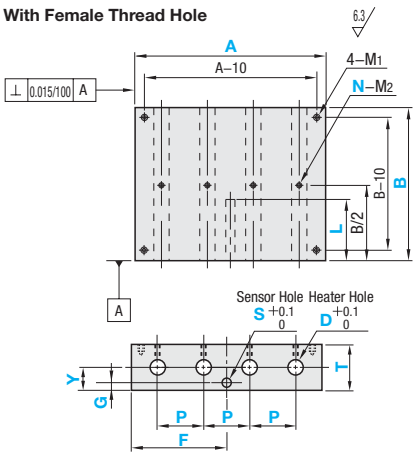
M2 Size Table

D	M2
5, 6	M3x0.5
8~16	M4x0.7
18	M5x0.8

No Female Thread Holes



With Female Thread Hole



S/2+2≤G≤T-(S/2+2) A≥(N-1)xP+D+6

Part Number Type	Materials Symbols	Plate A	Plate B	Plate T	Heater Hole D Selection	Heater Hole N Quantity	Sensor Hole S Selection	Sensor Hole L 1mm Increment	Heater Position P	Heater Position Y	Sensor Position F	Sensor Position G
		1mm Increment							1mm Increment		1mm Increment	
HTPL HTPLT	A S	50~200	50~200	10~30	5 6 8 10 12 14 16 18	1~10	1.6	10~30	8~191 When N=1,	5~25	3~197	3~27
							2.3	10~100				
							3.2					
							4.8					

The distance from plate end face to the hole and tap should be 3mm or more.
The distance between holes (between heater holes, or between heater hole and sensor hole) should be 3mm or more. M1 tapped holes may go through when T dimension is 15mm or less.
It is recommended to make the distance between heaters (P) 3 to 4 times larger of heater diameter (D). (If the distance between heaters is too small, the heating may accumulate in the plate and heating unevenness may occur.)

Order Example

Part Number	Plate A	Plate B	Plate T	Heater Hole D (Diameter)	Heater Hole N (Qty.)	Sensor Hole S (Diameter)	Sensor Hole L (Length)	Heater Position P (Pitch)	Heater Position Y (From Bottom)	Sensor Position F (From Left)	Sensor Position G (From Bottom)
HTPLA	200	200	30	D5	N6	S1.6	L30	P20	Y15	F100	G5

Days to Ship 10 Days

- Plate type terminal for water. Cool an object by running cooling water through the terminal.

■Cooling Plates

RoHS



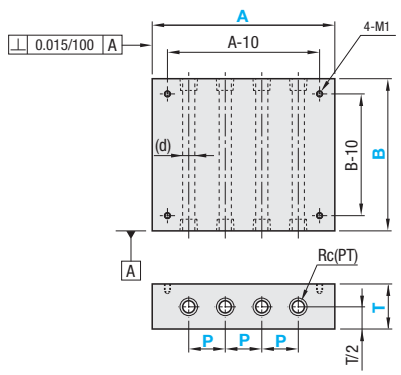
Type	Materials Material Surface Treatment Codes	Material
HTPC	S	1.4305/ X10CrNiS18-9

M1 Size Table

A	B	M1
50~100	50~100	M4x0.7 Depth 6
	101~200	M5x0.8 Depth 8
101~200	50~100	
	101~200	M6x1.0 Depth 10

(d) Size Table

RC (PT)	(d)
1(1/8)	8.5
2(1/4)	11.4



Part Number Type	Materials Code	1mm Increment A	1mm Increment B	T 5mm Increment	RC (PT)	N No. of Cooler Holes	P 1mm Increment
HTPC	S	50~200	50~200	15~30	1(1/8)	1~10	25 ~ (A-25)
				20~30	2(1/4)		

The distance from plate end face to the hole and tap should be 2mm or more.
3mm or more is required for the distance between holes.

Order Example

Part Number	Plate A	Plate B	Plate T	Rc (PT)	N (No. of Cooler Holes)	P (Pitch)
HTPCS	200	200	15	R1	N4	P30

Days to Ship 10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

Volume discount rate is applicable to the body price only.
For orders larger than indicated quantity, please request a quotation.

The body price is the price shown in the table multiplied by the material rate.
(Ex.) Hot Plates
When HTPLA100-50-22-D5-N2-S3.2-L25-P70-Y11-F50-G10
(Body Price) + (Heater Hole € Unit Price x Qty.) = (Product Price)
19,00 + (16,00x2) = 51,00 EUR

(Ex.) Cooling Plates

Part Number	-	A	-	B	-	T	-	Rc	-	N	-	P
HTPCS	-	100	-	100	-	20	-	R1	-	N4	-	P20

(€ Body Price) +(Cooling Hole € Unit Price x Qty.) = Plate Price
78,00 +(39,00 x 4) = 234,00 EUR

Body Price* HTPL and HTPLT include sensor hole drilling.

Part Number	Materials Symbols	A	B	€ Unit Price			
				HTPL		HTPLT / HTPC	
				T10~20	T21~30	T10~20	T21~30
Hot Plates HTPL HTPLT Cooling Plates HTPC	A	50~100	50~100				
			101~150				
			151~200				
		101~150	50~100				
			101~150				
			151~200				
		151~200	50~100				
			101~150				
			151~200				
	S	50~100	50~100				
			101~150				
			151~200				
		101~150	50~100				
			101~150				
			151~200				
		151~200	50~100				
			101~150				
			151~200				

Unit price of heater hole (D: 5 ~ 18) / € Unit Price of Cooling Hole (R: 1 ~ 2)

Type	Materials Code	
	A	S
HTPL		
HTPLT		
HTPC		

Precision Standards

- Thickness Parallelism 0.015 or Less per 100mm
- Flatness

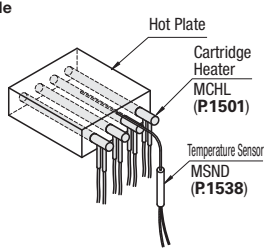
T	10~15	16~25	26 or More
Per 100 mm	0.03	0.015	0.012

- Dimension Tolerance of A and B

99 mm or Less	100~200
±0.2	±0.3

- T Dimension Tolerance ±0.1
- Circumference Chamfering C0.2~C1.0

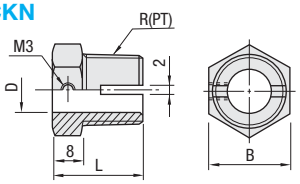
Example



Mounting Bolts for Cartridge Heaters RoHS



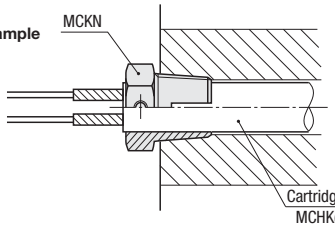
MCKN



M Material: 1.4305/X10CrNiS18-9

Part Number Type	No.	d	B	L	R (PT)	€ Unit Price
MCKN	5	5.1	14	18	1/8	
	6	6.1				
	6.25	6.4	17		1/4	
	8	8.1				
	9.42	9.5	21	20	3/8	
	10	10.1				
	12	12.1	24	25	1/2	
	12.6	12.7				
	14	14.1				
	16	16.1	29	27	3/4	
	18	18.1				

Example



MCHK(P.1487)

Use M3 set screw on the side of mounting bolt when tightening is loosened or when mounting the heater.

Avoid using Mounting Bolt with heater when power density exceeds 15W/cm².

Order Example | Part Number: MCKN8 | Days to Ship: 8 Days | Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

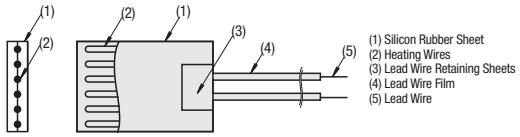
Rubber Heaters -Guide-

Feature

- Flexible and thin silicon rubber, which fits the heating plane firmly, is used.
- They are suitable for generating uniform heating over the heating plane.
- The Maximum Operation Temperature is 220˚C (250˚C for High Temperature Type)

Basic Structure

A resistance element is placed between two top and bottom sheets, and internal air is removed before the compression process, and the structure is formed from assembled thin sheet.



Mounting Method

(1) Clamp (Metal Retainer) : Sandwiches the rubber heater between a metal plate and a heating product. Allowable pressure against the heater plate is 1.47MPa {15kgf/cm²}.

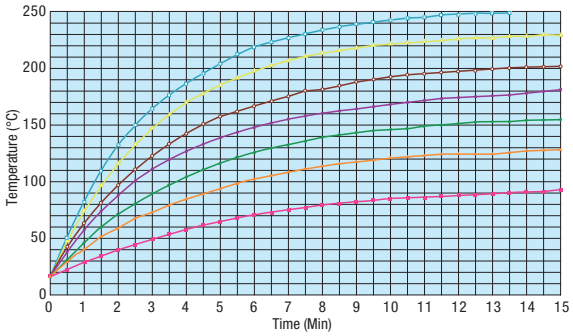
(2) Silicon Adhesive : Applies the special silicon adhesive to rubber heater and bonds with the heated object. Maximum operating temperature is 180°C.

(3) Tape Adhesive : Attaches the double-stick tapes to the rear surface of the rubber heater, and bonds with the heating product. Maximum operating temperature is 150°C.

Precautions for Use

- Do not let heater be in idle running in the atmosphere of inflammable gas or float against the heater surface, they may cause ignitions. However, idle running is available in the ordinary temperature atmosphere, when the electric density is 0.5W/cm² or less.
- When sandwiching the rubber heater between a metal plate and a heating product, prevent lead wires and lead wire retaining sheets from touching the metal plate.
- Avoid use in the atmospheres such as in steam, water and oil, or in corrosive gas.
- Not applicable for to machine holes and not usable when the rubber is damaged.
- Do not bend the heater. The minimum bending angle R (radius) is 2mm.
- Do not use over the rated voltage (V).
- When the heater is removed from the heat generating body, make sure that the power is turned off. In addition, do not touch the heater immediately after the power is turned off.
- If a gap between heated object and a heater is large, the temperature will increase abnormally. Be very careful about heater setting.
- Keep the lead wire retaining sheets free from pressure.

• Actual Measurement Data: Temperature Rise Time / Electrical Power (Electrical Power Density)



Electrical Power 60W — Electrical Power Density 0.2W/cm²
Electrical Power 90W — Electrical Power Density 0.3W/cm²
Electrical Power 120W — Electrical Power Density 0.4W/cm²
Electrical Power 150W — Electrical Power Density 0.5W/cm²
Electrical Power 180W — Electrical Power Density 0.6W/cm²
Electrical Power 210W — Electrical Power Density 0.7W/cm²
Electrical Power 240W — Electrical Power Density 0.8W/cm²

Heater Size: MRHSS (200x150)
Heated Object: Aluminum (210x150x1.5)
Heater Mounting Method: Bonds both sides with adhesives for rubber heater.
Point of temperature measurement: Measured by K thermocouple at the center of aluminum surface.
Ambient Temperature: Room Temperature 15°C

Selection Method

(1) Determine the calories(W) required for the heater.

Calculate with the following formula by using the weight of heating product, the specific heat of heating product, the increased temperature, and the heating time until the setting temperature.

$$\text{Calories Required for The Heater (kW)} = \frac{\text{Weight of Heating Product (kg)} \times \text{Specific heat of Heating Product (kcal/kg°C)} \times \text{Increased Temperature (°C)}}{860 \times \text{Heating Time (h)} \times \text{Efficiency (}\eta\text{)}}$$

It is difficult to calculate the Efficiency (η) precisely because it varies by heat retention, insulation, arrangement of heater but suitable value is generally about 0.2~0.5.

• Specific Gravity and Specific Heat of Major Materials

Materials	Specific Gravity (g/cm³)	Specific Heat (kcal/kg°C)
Aluminum (EN AW-7075/ AlZn5,5MgCu P Type)	2.80	0.230
Steel	7.85	0.113
Stainless Steel	7.82	0.110
Brass	8.70	0.100

Ex.)When the heater block of around 0.2kg, 100x100x3 (mm) is heated to 150˚C stainless steel
(It is assumed that the temperature of the heater block is 20°C, and the increasing time until the set temperature is 15 minutes.)

$$\text{Calories Required for The Heater (kW)} = \frac{0.2 \times 0.11 \times (150-20)}{860 \times 0.25 \times 0.3} = 0.04 \text{ (kW)} = 40 \text{ (W)}$$

* Efficiency is assumed to be 0.3.
*See above for data. Measurement Data: Time of Increasing Temperature for each Electrical Power (electrical power density)

• Selection of Rubber Heater

(1) Determine the shape and size of heaters.

Ex.) MRHSS - 100 (A) - 100 (B)

(2) Determine the voltage (V) to use.

Ex.) MRHSS - 100 (A) - 100 (B) - V200 (V)

(3) Determine the calories (W) required for the heating product.

Ex.) MRHSS - 100 (A) - 100 (B) - V200 (V) - W40 (W)

(4) Available when the calories (W) / the size of a heater (cm²) is between 0.2 and 0.8 (W/cm²).

$$\text{* electrical power density (W/cm2)} = \frac{\text{Electric Power (W)}}{\text{Surface Area of Rubber (cm}^2\text{)}}$$

$$\text{Ex.) electrical power density (W/cm2)} = \frac{40}{10 \times 10} = 0.4 \rightarrow \text{Available to produce}$$

(5) Determine the length of lead wires.
* Lead wire length is 1000 for square type with thermostats (**P. 1510**).

Ex.) MRHSS - 100 (A) - 100 (B) - V200 (V) - W40 (W) - F700 (F)

• Temperature Controllers

All Rubber Heaters are single-phase. Select temperature controllers (**P.1558**) for single-phase (MTCS · MTCD and MTCRM).
For the possible numbers of cartridge heaters to connect one controller, refer to the example below.
(Ex.)When connecting MTCS (Max. allowable electric current: 20A) to MRHSS-200-200-V100-W210-F1000

The electric current which streams in one cartridge heater: $\text{Electric Current (A)} = \frac{\text{Electric Power (W)}}{\text{Voltage (V)}} = \frac{210 \text{ (W)}}{100 \text{ (V)}} = 2.1 \text{ (A)}$

The possible numbers (N) of cartridge heaters to connect one temperature controller (MTCS): $N = \frac{20 \text{ (A)}}{2.1 \text{ (A)}} = 9.5 \rightarrow 9 \text{ pcs.}$

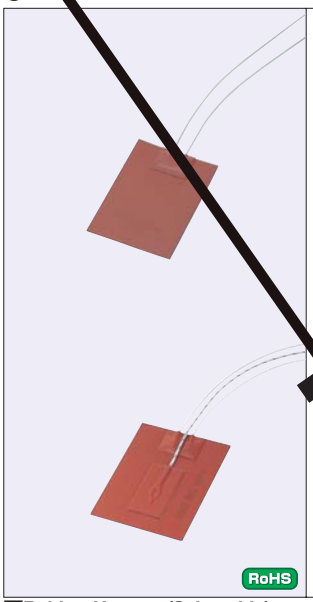
(However, only 2 cartridge heaters can be connected to a terminal. Please use terminal blocks (**P.1556**) for branching.)

Not Available

Rubber Heaters
-Square-

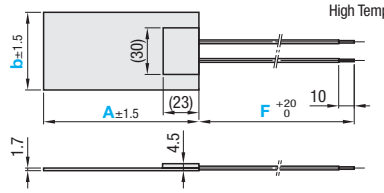
CAD Data

Be sure to refer to "cautions for use" stated in the Rubber Heaters Guide on the left page..



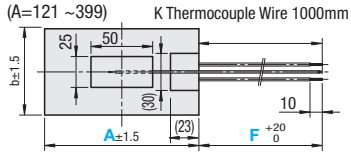
Square Type
(Standard Selectable)
(Standard Configurable)
(High Temperature Type)

High Temperature Types can be used up to 250°C.

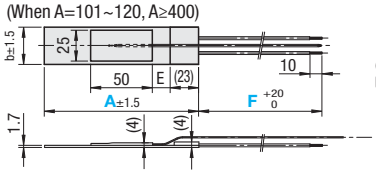


With Sensor
(Standard Configurable)
(High Temperature Type)

(A=121 ~399)



(When A=101~120, A≥400)



K Thermocouple Wire 1000mm red (+), white (–)

(Standard)
Material:
Heater: Silicon Rubber
Lead Wire: Nickel (Ni)
Lead Wire Film: Silicon (MRHSK)
: Teflon (Others)
Maximum Operation Temperature
: 220°C (MRHSK)
: 220°C (Others)
K Thermocouple Wire Film : Fluorine Resin (PFA)

(High Temperature Type)
Material:
Heater: Heat Resistant Silicon Rubber
Lead Wire: Nickel (Ni)
Lead Wire Film: Teflon
Maximum Operation Temperature: 250°C
K Thermocouple Wire Film: Fluorine Resin (PFA)

A≥B
When B≤30, the size of the lead wire retaining sheet is same as B.

When A=101~120, E=10; when A≥400, E=152.

RoHS

Not Available

Rubber Heaters (Selectable)

Part Number Type	A	B	V (Voltage) Selection	W (Electrical Power)	F (Lead Wire Length)	Electrical Power Density (W/cm²)	€ Unit Price
(Square)	50	50	100 200	20	1000	0.2≤W/cm²≤0.8 W/cm²= W/(AB/100)	
	100	50		30			
		75		60			
		100		90			
	125	100		120			
	150	100		150			

Rubber Heaters (Configurable)

Part Number Type	1mm Increment A	1mm Increment B	V (Voltage) Selection	W (Electrical Power) 10W Increment	(Lead Wire Length) 1mm Increment	Electrical Power Density (W/cm²)
	50~500	25~400	100 200	10~1600	1000	0.2≤W/cm²≤0.8 W/cm²= W/(AB/100)
	101~500					

Order Example

Part Number	A	b	V	W	F
	100	100	V200	W60	
	200	200	V200	W210	F1000

Delivery Time (Shipment)
• Selectable Type: 6 Days P.87
• Configurable Type: 10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

For orders larger than indicated quantity, please request a quotation.

A	€ Unit Price															
	B25~50	B51~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400	B25~50	B51~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400
50~100																
101~150																
151~200																
201~250																
251~300																
301~350																
351~400																
401~450																
451~500																

A	€ Unit Price															
	B25~50	B51~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400	B25~50	B51~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400
101~150																
151~200																
201~250																
251~300																
301~350																
351~400																
401~450																
451~500																

Part Number	A	b	V	W	F	(TPG · RLE)
	100	100	V200	W40	F700	TPG1
	101	100	V200	W40	F700	RLE1

Alterations	Code	Spec.	No.	Price Adder
With Double-adhesive Tapes	TPG	Attaches the double-adhesive tapes to the rear surface of the rubber heater. Shipping with tapes affixed. Tape Thickness 0.3mm. Maximum operating temperature for rubber heaters with tapes is 150°C.	1	A50~150 9,00
			2	A151~300 26,00
			3	A301~500 55,00

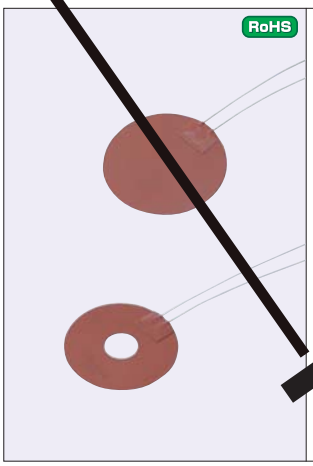
Alterations	Code	Spec.	No.	Price Adder
Length of Thermocouple Wire	RLE	Changes length of thermocouple wire from 1000mm to 2000mm.	1	8,00 * Applicable to MRHSSS.
			2	9,00 * Applicable to MHRHSS.

Rubber Heaters / Adhesives for Rubber Heater
-Round-

CAD Data

Please refer to "Precautions for Use" in the Rubber Heaters Guide on **P.1507**

RoHS

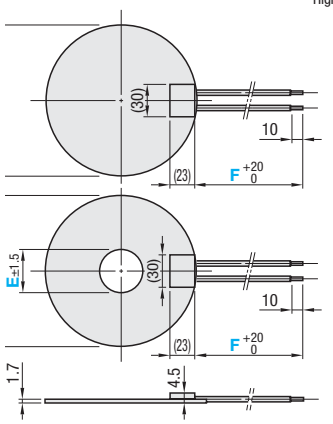


(Standard)

(Standard)

(High Temperature Type)

High Temperature Types can be used up to 250°C.



(Standard)
Material :
Heater : Silicon Rubber
Lead Wire: Nickel (Ni)
Lead Wire Film: Teflon
Max. Operation Temperature: 220°C

(High Temperature Type)
Material :
Heater : Silicon Rubber
Lead Wire: Nickel (Ni)
Lead Wire Film: Teflon
Max. Operation Temperature: 250°C

Not Available

Round Rubber Heater

Part Number Type	D 1mm Increment	V (Voltage) Selection	W (Electrical Power) 10W Increment	F (Lead Wire Length) 10mm Increment	Electrical Power Density (W/cm²)	€ Unit Price
(Standard)	60~100	100 200	10~ 60	100~1000	0.2≤W/cm²≤0.8 W/cm²=W/[π{(D/2)²/100}]	
	101~150		10~			
	151~200		~240			
	201~300		50~			
	301~400		50~ 00			
	401~500		50~80			

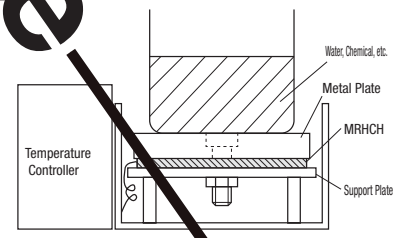
Round Rubber Heater (with Hole)

Part No. Type	D 1mm Increment	E 1mm Increment	V (Voltage) Selection	W (Electrical Pow 10W Increm	F (Lead Wire Length) 10mm Increment	Electrical Power Density (W/cm²)	€ Unit Price	
(Standard) (High Temp. Type)	70~100	3~440 E≤D-60	100 200	10~ 60	~1000	0.2≤W/cm²≤0.8 W/cm²=W/[π{(D/2)²/100}-π{(E/2)²/100}]		
	101~150			10~130				
	151~200			50~240				
	201~300			50~500				
	301~400			50~700				
	401~500			50~800				

Order Example

Part No.	-	D	-	E	-	V	-	W	-	F
	-	180			-	V200	-	W80	-	F1000
	-	100	-	E30	-	V100	-	W20	-	F600

Example



Days to Ship

10 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number	-	D	-	V	-	W	-	F	-	(TPG)
	-	180	-	V200	-	W80	-	F1000	-	TPG2

Alteration	Code	Spec.	No.	Price Adder	
With Double-adhesive Tapes	TPG	Attaches the double-adhesive tapes to the rear surface of the rubber heater. Shipping with tapes affixed. Tape Thickness 0.3mm. Maximum operating temperature for rubber heaters with tapes is 150°C.	1		
			2		
			3		

Adhesives for Rubber Heater

RoHS



Part No.	Vol. (ml)	Features	Color	Usage	Operating Temp. Range	How to use	€ Unit Price Qty. 1~10
	330	Suitable for bonding rubber with metal plates under the high temperature (180°C). Also suitable for metals with rough surfaces and curved surfaces.	Trans-parent	Adhesion of Silicon Rubber	-40°C~180°C	Apply it on the adhered surface of rubber heater uniformly. After the adhesive sets a little (approx. 10~15 minutes in summer, 35~40 minutes in winter), stick it on the fixing surface (metal block, etc.), purge air from the rubber surface, and weigh upon it uniformly. Leave it alone for one day after the affixing, then apply electrical power.	

Thermal Conductivity: 0.21 {5x10-4} W/m - K {cal/cm - sec - °C} For orders larger than indicated quantity, please request a quotation.

Order Example Part Number

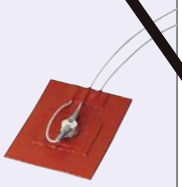
Days to Ship 10 Days

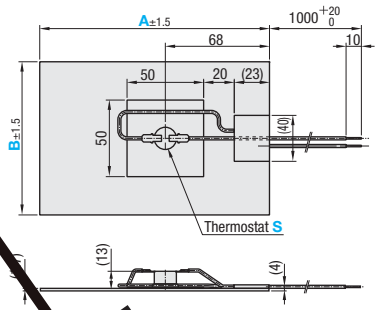
Rubber Heaters / Cast-in Heaters
-Square (Thermostat Type)-

CAD Data

Please refer to "Precautions for Use" in the Rubber Heaters Guide on **P.1507**

Rubber Heaters (Square Type) RoHS





Material :
Heater : Silicon Rubber
Lead Wire: Nickel (Ni)
Lead Wire Film: Teflon
Maximum Operation Temperature: 220°C

- Thermostats
Heater: Ceramic (Steatite Type)
Cap: Aluminum
Bimetal: Disk Bimetal

Thermostat Operation Temp. Rating

S Thermostats Op. Temp. (°C)	ON Point	OFF Point
80	(65±5)°C	(80±4)°C
120	(100±8)°C	(120±6)°C
150	(125±15)°C	(150±7)°C
180	(160±15)°C	(180±8)°C

It energizes (NC) when the power is turned on and the contact point shuts off when it reaches to the operation temperature rate (OFF) and electricity is turned off. It will automatically recover when it becomes below the operation temperature rate (ON).

(Ex.)When a thermostat operation temperature (°C) 80, contact point shuts off at (80±4)°C after electricity is supplied. It will automatically recover when it becomes (65±5)°C. In temperature adjustment, set it lower than the temperature of OFF point tolerance. (when 80°C: 80–4=76°C or lower)

Rubber Heater (Square with Thermostat)

Part No. Type	1mm Increm. A	1mm Increm. B	V (Voltage) Selection	W (Electr. Power) 10W Increment	(Thermo Op. Temp.) Selection (°C)	Electr. Power Density (W/cm²)
	120~500	80~400	100 200	10~1000	80 120 180	0.2≤W/cm²≤0.8 W/cm²=W/(AB/100)

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	10%	20%

For orders larger than indicated quantity, please request a quotation.

A	€ Unit Price						
	B80~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400
120~150							
151~200							
201~250							
251~300							
301~350							
351~400							
401~450							
451~500							

Order Example

Part No.	-	A	-	b	-	V	-	W	-	S
		200		200		V200				S120

Days to Ship: **13 Days**

Features

- The bimetal thermostat with automatic recovery system prevents overheating of rubber heaters.

(Features of Thermostats)
Principle of Operation:
Bimetal Non-energizing Type Single Pole Single Throw Operation Temperature One Point Fixed Type
Operating Method: OFF when temperature rises, and ON when temperature drops
(Electric Rating)
Resistance Load AC125V/15AAC250V/7.5A(Minimum Current: 0.1A)
(Contact Resistance)
50mΩ or less according to minute current ohmmeter (DC6V/0.1A) (initial value)
(Insulation Resistance)
10MΩ or more with DC500V mega in the charge part and non-charge part
(Insulation Resistance)
AC1500V/min or AC1800V/sec in the charge part and non-charge part (Leakage current: 10mA)
(ON/OFF life span)
The thermal ON / OFF operation is done approx. 10,000 times or less at the load of rated current and voltage.
Insulation resistance: 50M ; Contact resistance: 100m or less

Mounting Method

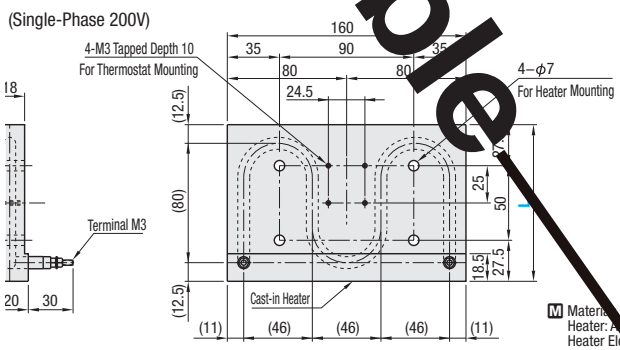
Apply Rubber Heater (left page) and attach to the heated object.

Precautions for Use

- A thermostat should not be used for temperature adjustment. Please use it as overheat protector.
- Do not apply force to thermostat.
- There are temperature gaps (about 10~40°C) between thermostat operating temperature and heat surface temperature, and between thermostat and heated object. Please check before actual use.
- Part of used terminal of thermostat is exposed. Please pay attention to short circuit.
- Do not use in inflammable atmospheres.
- To avoid burns, do not touch the heater when the power supply is on or immediately after use.

Cast-in Heaters RoHS





Material
Heater: Aluminum
Heater Element: 1.4301/X5CrNi18-10
Maximum Operation Temperature: 200°C

Part Number Type	No.	L	W (Electr. Power)	V (Voltage)	Electrical Power Density (W/cm²)	€ Unit Price
	160	105	700	200	4.0	

Order Example

Part No.	-	L	-	W
		L105		W700

Days to Ship: **10 Days** | Express B | 5,00 EUR/ piece | P.87

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.88

Quantity	1	2~4
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Feature

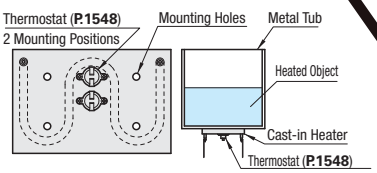
Heat will be evenly distributed since this is made of aluminum casting.
Suitable to use for heating on a flat place.

Precautions for Use

Mount it closely to heated object. If there is a gap, it might cause combustion loss or disconnection.

Connection

When use the heater alone, connect to 200V single-phase.
When use Heater by 3-phase power supply, delta connection can be applied.



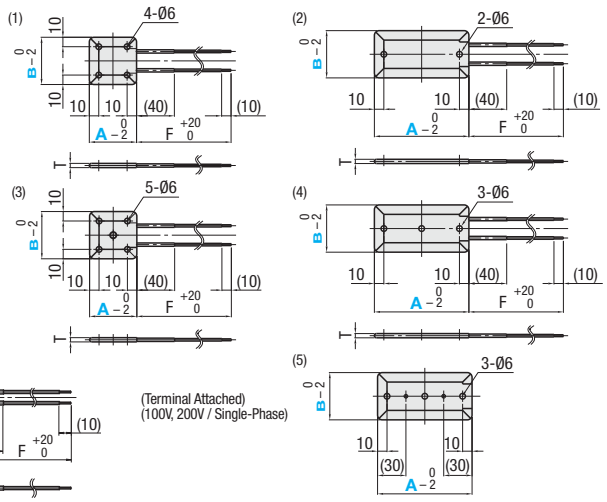
Not Available

Plate Heaters

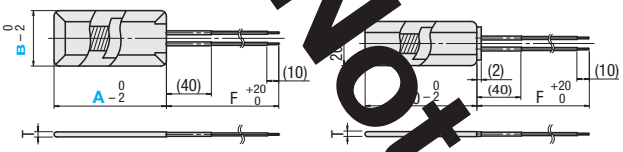
CAD Data



(Through Hole) (100V, 200V/Single-Phase)



(Lead Wire)
(100V, 200V / Single-Phase)



100-20 only

(Terminal Attached)
(100V, 200V / Single-Phase)



Not Available

Plate Heaters (with Lead Wire)

Part Number Type	A	B	V (Voltage) Selection	W (Electrical Power)	F (Lead Wire Length) mm	T	Electrical Power Density (W/cm²)	€ Unit Price
	50	50	100		1000	4.5±1	3.0	
			200					
	60	60	100	100				
			200					
	100	20	100	80				
			200					
		50	100	150				
			200					
		100	100	250				
			200					
	150	150	100	500		4.0±1		
			200					

Plate Heaters (with Through Holes)

Part Number Type	A	B	V (Voltage) Selection	W (Electrical Power)	F (Lead Wire Length) mm	T	Electrical Power Density (W/cm²)	Shapes	€ Unit Price
	100	100	100	250	1000	4.0±1	2.5	(1)	
			200						
	150	150	100	500			2.2	(3)	
			200						
	200	50	100	200			2.0	(2)	
			200						
		100	100	400				(3)	
			200						
	250	50	100	250				(4)	
			200						
	300	50	100	350			2.3	(4)	
			200						

Plate Heaters (Terminal Attached)

Part Number Type	A	B	V (Voltage) Selection	W (Electric Power)	T	Electrical Power Density (W/cm²)	Shapes	€ Unit Price
			100	200	4.0±1	1.6	(5)	
			200					
	300		100	300		2.0		
			200					

Days to Ship — Days — P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~10
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

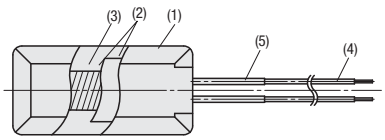
Order Example

Part Number	-	A	-	B	-	V	-	W
	-	100	-	20	-	V200	-	W80

Features of the Plate Heater

This plate type heater uses heat-resistant metal plate (430 Stainless Steel) which covers a resistance ribbon wire which is insulated with mica.
Max Operation Temperature: 300°C

Basic Structure of the Plate Heater



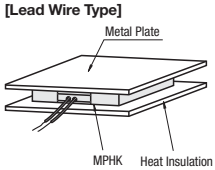
No.	Name	Material
(1)	Cover of the Heater	1.4016/X6(8)Cr17
(2)	Mica for Insulation	Synthetic Mica
(3)	Nickel-chrome Wire	Nickel-chrome Ribbon Wire
(4)	Lead Wire	Nickel Copper Glass Fiber Coated Wire
(5)	Tube	Glass Fiber

Precautions for Use

- Never operate the heater when it is empty. Doing so may result in damage to the unit.
- Apply electric power under the condition in which an object such as metal to be heated is attached to the heater.
- Attach the object so that the heater comes into close contact with the surface to be heated.
  A gap will cause premature breakage of wire.
- Make sure that the lead wire is not touching the metal plates when the heater is sandwiched between them.
- The heater is not waterproof.
  Never expose the heater to water or any other liquids.
- Do not use over the rated voltage (V).
- Use the temperature adjustment controller to ensure safe use.

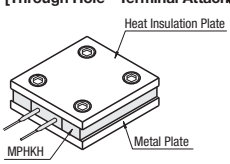
Mounting Method

[Lead Wire Type]



Sandwich it with metal plate and insulation plate.

[Through Hole - Terminal Attached Type]

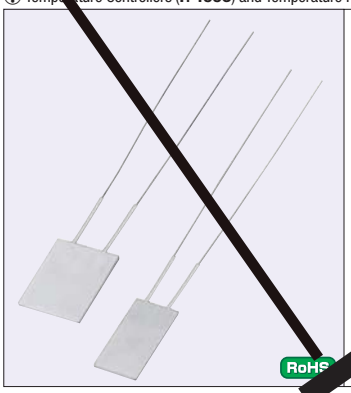


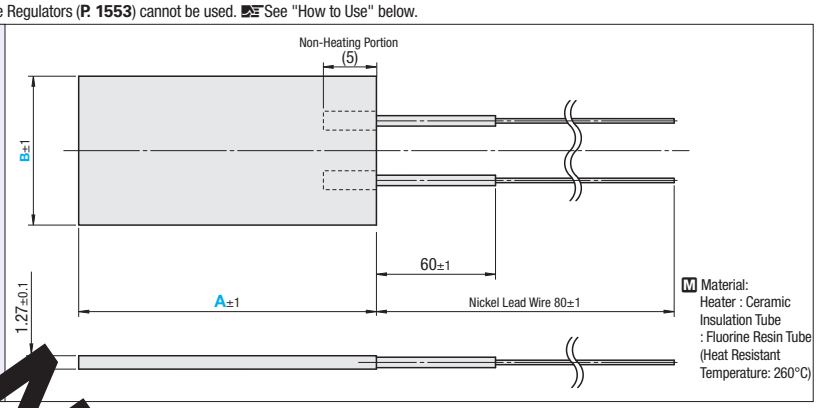
Fix the heater with screws.

Small-Size Ceramic Plate Heaters

CAD Data

Temperature Controllers (**P. 1558**) and Temperature Regulators (**P. 1553**) cannot be used. See "How to Use" below.



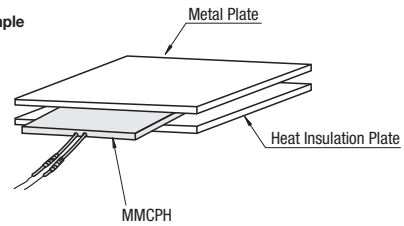


M Material:
Heater : Ceramic
Insulation Tube
: Fluorine Resin Tube
(Heat Resistant
Temperature: 260°C)

RoHS

Part Number Type	A	B	V (Voltage)	W (Electric Pow	Maximum Operation Temperature (°C)	€ Unit Price
	15	10	15~45	6~21		
		15	10~40	5~19		
	20	10	15~80	4~26		
		15	10~60	3~25		

Example



The heaters can be used within the range of the above operating voltage (V) and operating electric power (W), but please note that rapid application or temperature rise could cause damage to the heaters.

Do not use the heater at a temperature exceeding the maximum operating temperature.

[IMPORTANT]
When sandwiching the heater, be sure that the non-heating portion is protruded, by 5 mm, through the surface.

Order Example

Part Number	-	A	-	B
	-	15	-	10

Days to Ship: **6 Days** P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~10
Rate	€ Unit Price	5%

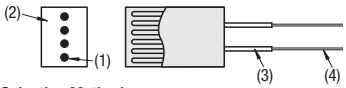
For orders larger than indicated quantity, please request a quotation.

Features of the Small-size Ceramic Heater

Misumi's small-size ceramic plate heaters are made of ceramic, which has excellent heat resistance and insulation characteristics. The heater is made of a ceramic sheet incorporating tungsten resistors.
- This small, thin plate-shaped heater can be operated in a small space.
- As the ceramic plate heater is plate-shaped, it can provide uniform heating.
- The speed at which the heater temperature changes is quite fast.
  Maximum operating temperature: 500°C
  (Never exceed the maximum operating temperature.)
- Available for both direct current and alternate current.

Basic Structure

The ceramic plate heater is composed of highly heat-resistant tungsten resistors attached to a ceramic sheet.



(1) Tungsten Resistors
(2) Ceramic
(3) Insulation Tube
(4) Nickel Lead Wire

Selection Method

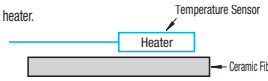
(1) Calculate the amount of heat (W) required to heat the object.
P.1486 Refer to "Selection method to determine the amount of heat required for the heater".
(2) Select the size of heater depending on the required amount of heat (W) and the size of the object, and determine the operating voltage (V) using the Table of Temperature Characteristics as a reference.

How to use

Maintain the operating voltage of the selected heater by using the following method.
(1) Operate the heater at a constant voltage by using a step-down transformer.
(2) Control the temperature by using a variable voltage transformer.
(3) Conduct precise temperature control by using a phase controller.

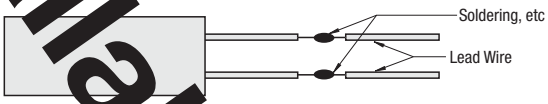
Measurement Conditions (Environmental temperature of measurement: Atmospheric temperature at 16°C in natural atmosphere)

- Surface temperature should be measured at the center of the heater.
- One side of the ceramic fiber should be insulated from heat.
Small ceramic heater is bonded on a 30x30xt10 ceramic fiber strip by Aron Ceramic adhesive.
* Please note that the temperature-rise characteristic differs significantly depending on the size of the object to be heated.



Connection Method

Attach the lead wire to the two terminals and firmly connect them by soldering, etc.



(2) After connection of the lead wire, protect them by firmly wrapping them with insulation tape.



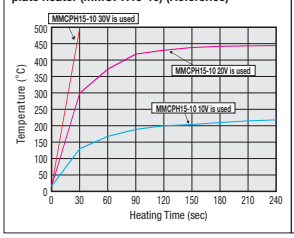
Mounting Method

Use the heater in a position sandwiched between the metal block to be heated and the insulation board. The clearance between the block and the insulation board should be as small as possible.
* The degree of contact between the heater and the object to be heated will affect the life of the heater. A large clearance will delay the temperature rise time and create a delayed response to temperature adjustments.

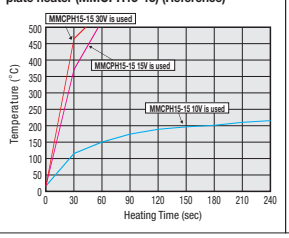
Precautions for Use

- Do not use the heater at a temperature exceeding the maximum operating temperature of 500°C.
- Never operate the heater when it is empty. Doing so may result in damage to the unit.
- Apply electric power under the condition in which an object such as metal to be heated is attached to the heater.
- Attach the object so that the heater comes into close contact with the surface to be heated. A gap will cause premature breakage of wire.
- Make sure that the lead wire is not touching the metal plates when the heater is sandwiched between them.
- Do not forcibly insert the heater between the metal plates. Doing so will cause the heater to crack.
- The heater is not waterproof. Never expose the heater to water or any other liquids.
- Use the temperature-rise data as a reference and do not heat too rapidly. Doing so will definitely result in breakage of wire.
- Do not exceed the operating voltage (V) shown below. Doing so will cause breakage of the wire in the heater.
- Do not bend fluorine resin tubes.

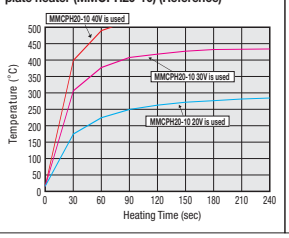
Temperature rise properties of small-size ceramic plate heater (MMCPH15-10) (Reference)



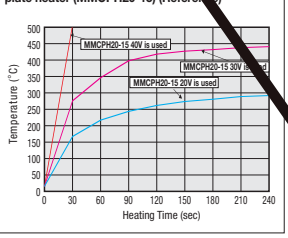
Temperature rise properties of small-size ceramic plate heater (MMCPH15-15) (Reference)



Temperature rise properties of small-size ceramic plate heater (MMCPH20-10) (Reference)



Temperature rise properties of small-size ceramic plate heater (MMCPH20-15) (Reference)



Not Available

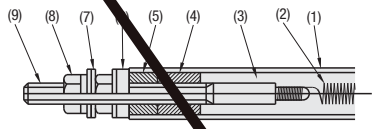
Air Sheathed Heaters -Guide-

■Features

- As all the areas exposed to air are made of stainless steel (1.4404/X2CrNiMo17-12-2, 1.4541/X6CrNiTi18-10, 1.4301/X5CrNi18-10), it is excellent for corrosion resistance.
- The maximum operating temperature is 160°C (Ambient temperature).

■Basic Structure

- In the center of the metal pipe is the heater, which is made of spiral heat generating body filled with high insulating material.



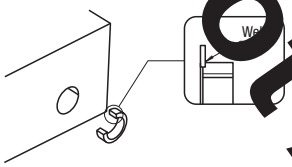
(1) Stainless Steel Hollow
(2) Heat Generator (Nickel-chrome Wire)
(3) Insulation Powder (Magnesia)
(4) Insulation Seal Material
(5) Insulation Sealing on Terminal
(6) Insulating Material on Terminal (Ceramics)
(7) Washer
(8) Nut
(9)Terminal Block

■Mounting Method

- Mounting of Plug Heaters (**P.1517**)

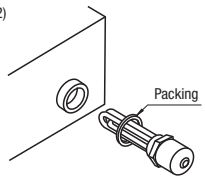
(1) Decide the location of mounting the heater, and drill a hole of Ø70~71.
(2) Insert the socket for plug heater mounting (**P.15** duct number: MSHTS) into the mounting hole, and weld it. (Fig. 1) (Commercial socket ing are also usable.)

(Fig. 1)

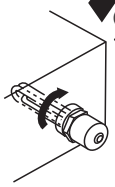


(3) Insert the included gasket into the thread part catch the hexagonal part with pl ch and screw the theater into the tank. (Fig. 2-Fig. 3)

(Fig. 2)



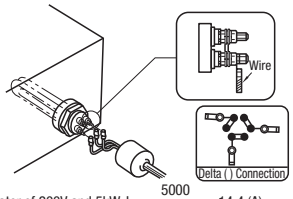
(Fig.



* After tightening it, check it for liquid leaks.

(4) **Connection Method** Connect wires with three terminals. (Fig. 4)

(Fig. 4)



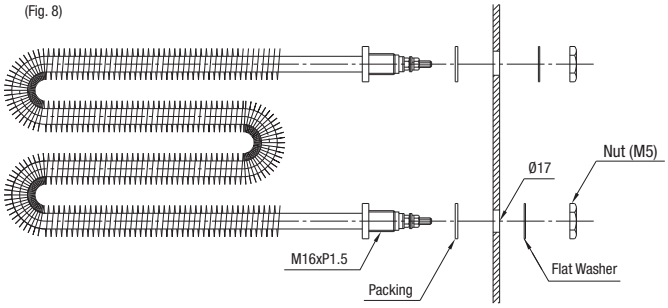
(Ex.) For Plug Heater of 200V and 5kW, $I = \frac{5000}{\sqrt{3}x200} = 14.4$ (A)

- Mounting of U, M and S Type Fin Heaters (**P.1515**- **1516**)

(1) Drill a heater-mounting hole (Ø17) on the heater mounting plate and install the heater. For every type fin heater, drill the hole with proper pitch.

(2) Insert the included gasket and washers onto the screw section, and then insert them into the mounting hole. Secure the heater with the included nuts from the other side of the heater mounting plate. (Fig. 8)

(Fig. 8)

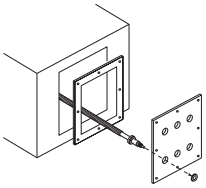


- Mounting of S Type Fin Heaters (Fixed Type)

* Refer to **P.1515** for S-shaped Configurable Type.

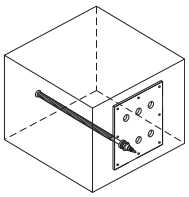
(1) Decide the location of mounting the heater, and drill a hole of Ø21.
(2) Place the bushing on the end of the heater. Insert the heater into the mounting hole and hold with a nut (Fig. 5).

(Fig. 5)



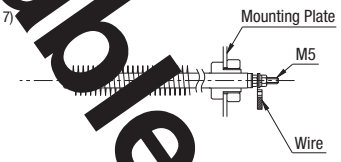
(3) Place a bushing on the other end of the heater. Insert the heater into the mounting hole and fix with a nut. (Fig. 6)

(Fig. 6)



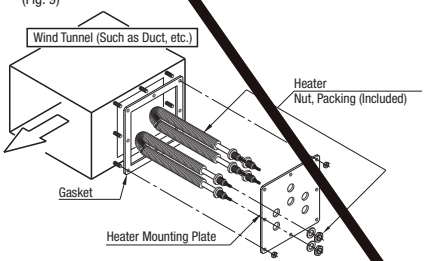
(4) **Connection Method** Connect wires with both terminals. (Fig. 7)

(Fig. 7)



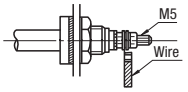
(3) Install the heater mounting plate onto the duct, etc. (Fig. 9)

(Fig. 9)



(4) **Connection Method:** Connect wires on two terminals. (Fig. 10)

(Fig. 10)



* After tightening it, check it for liquid leaks.

The heater with two terminals is single-phase. Current (I) is $I = \frac{W}{V}$

Ex.) For the heater of 100V and 500W, $I = \frac{500}{100} = 5$ (A)

Not Available

■Precautions for Use

- Avoid water splashes on the heater's wiring terminals. Electrical leakages and shorts may result.
- Make the wiring terminal connections securely while noting for the contacting conditions.
- Do not use over the rated voltage (V).
- Disconnect the power source before removing the heater unit from the heated object. Do not touch the heater immediately after the removal.
- Use the temperature controller for safety.
- The heaters will expand slightly due to heat. Design with ample space surrounding the heater to accommodate this expansion.

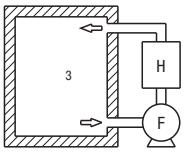
■Selection Method

(1) When heating a uniform volume of air (Fig. 11)

$$\text{Calories Required for The Heater (kW)} = \frac{\text{Volume of Air (m}^3\text{)} \times \text{Specific Gravity (kg/m}^3\text{)} \times \text{Specific Heat (kcal/kg°C)} \times \text{Increased Temperature (°C)}}{860 \times \text{Heating Time (h)} \times \text{Efficiency } (\eta)}$$

It is difficult to calculate the Efficiency precisely because it varies by heat retention, insulation, arrangement of heater but the suitable value is generally about 0.2~0.5.

(Fig. 11)
When heating a uniform volume of air
(Heating room or furnace)



m³ Volume of Air
H Heater
F Fan

Ex.1)When 5m³ of air is heated to a temperature of 60°C
(Assuming the air temperature is 20°C, and the time to reach the preset temperature to be 60 minutes.)

$$\text{Calories Required for The Heater (kW)} = \frac{5 \times 1.16 \times 0.24 \times (120-20)}{860 \times 1 \times 0.3} = 0.54 \text{ (kW)}$$

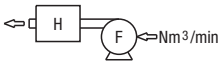
* Efficiency is assumed to be 0.3.

(2) When heating flowing air (Fig. 12)

$$\text{Calories Required for The Heater (kW)} = \frac{\text{Flow Volume of Air (Nm3/hr)} \times \text{Specific Gravity (kg/m}^3\text{)} \times \text{Specific Heat (kcal/kg°C)} \times \text{Increased Temperature (°C)}}{860 \times \text{Efficiency } (\eta)}$$

It is difficult to calculate the Efficiency precisely because it varies by heat retention, insulation, arrangement of heater but the suitable value is generally about 0.2~0.5.

(Fig. 12)
When heating flowing air
(Hot air generator etc.)



Nm³/min Air Volume
H Heater
F Fan

Ex.2)When air flowing at 2Nm³/min is heated to a temperature of 70°C
(Temperature is assumed to be 20°C)

* In the example below, convert the time unit from minute (min) to hour (hr). 2Nm³/minx60min=120Nm³/hr

$$\text{Calories Required for The Heater (kW)} = \frac{120 \times 1.16 \times 0.24 \times (70-20)}{860 \times 0.5} = 3.9 \text{ (kW)}$$

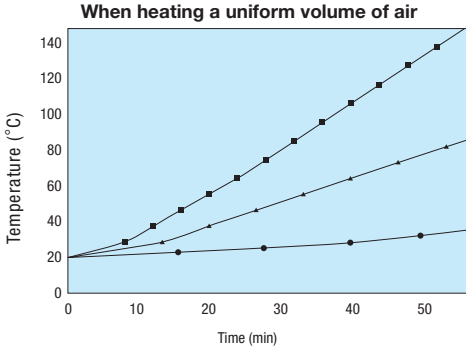
* Efficiency is assumed to be 0.5.

- Specific Heat and Specific Gravity of Air

Substance	Specific Gravity (kg/m³)	Specific Heat (kcal/kg°C)
Air	1.16	0.24

- Actual Measurement Data: Time of Increasing / Decreasing Temperature for Each Electrical Power

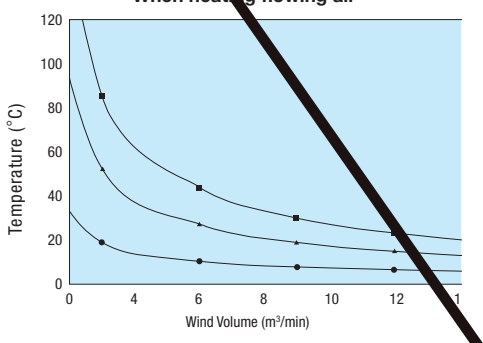
When heating a uniform volume of air



Electrical Power 1kW Electrical Power Density 2.5W/cm²
Electrical Power 2kW Electrical Power Density 2.5W/cm²
Electrical Power 3kW Electrical Power Density 2.5W/cm²

* Used Heater: MAHP
* Volume of Air: 100m³

When heating flowing air



Electrical Power 1kW Electrical Power Density 2.5W/cm²
Electrical Power 3kW Electrical Power Density 2.5W/cm²
Electrical Power 5kW Electrical Power Density 2.5W/cm²

* Used Heater: MAHP

Not Available

Air Sheathed Heaters
-Configurable U · S-

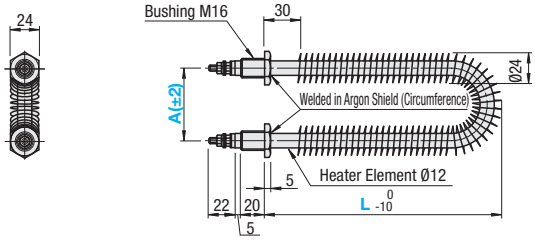
CAD Data

Be sure to refer to "cautions for use" stated in the heaters for air heating guide on **P.1513**

■Configurable



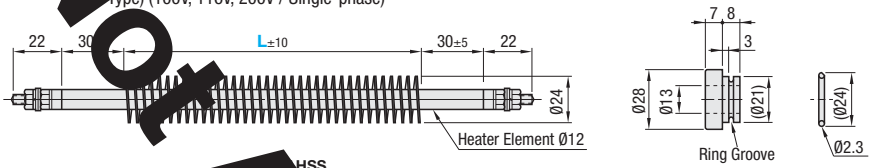
(U Type) (100V, 200V Single-phase)



MAHUS
M Material:
Element: 1.4541/X6CrNiTi18-10
Bushing:1.4301/X5CrNi18-10 (M16x1.5)

A Accessory: (2 pcs. for each)
Gasket: Non Asbestos
Flat Washers: 1.4301/X5CrNi18-10
Nut:1.4301/X5CrNi18-10 (M16x1.5) Thickness: 6,
Opposite side: 24, Opposite angle: 27.7

Type) (100V, 116V, 200V / Single-phase)



HSS
M aterial: Element: 1.4541/X6CrNiTi18-10 A Accessories: Flanged Insulator - Aluminum Ring (2 pcs. each)

RoHS

■U-shaped Configurable

Part Number		1mm Increment		V (Voltage) Selection	W (Electrical Power) 10W Increments	Electrical Power Density (W/cm²)	€ Unit Price			
Type	No.	L	A				L200~300	L301~400	L401~500	L501~600
	12	200~600	60~100	100 200	150~1750	3≤W/cm²≤4.0 W/3.77(2L+0.57A-84)/10}				

■S-shaped Configurable

Part Number		L 10mm Increment	V (Voltage) Selection	W (Electrical Power) 10 Increment	Electrical Power Density (W/cm²)
Type	No.				
	12	200~1500	100	150~2 50	0.7≤W/cm²≤4.0 W/cm²=W/3.77(L/10)
			116		
			200		

Order Example

Part Number	-	L	-	A	-	V	-	W
	-	350	-	A100	-	V200	-	W600

Part Number	-	L	-	V	-	W
	-	400	-	V200	-	W150

D s to ip 3 Days

Price

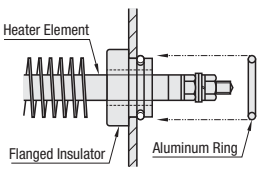
■Volume Discount (Round down to one Cent.) **P.87**

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

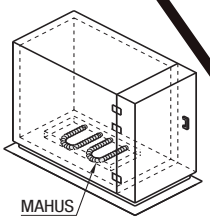
For orders larger than indicated quantity, please request a quotation.

Part Number		€ Unit Price												
Type	No.	L200~300	L310~400	L410~500	L510~600	L610~700	L710~800	L810~900	L910~1000	L1010~1100	L1110~1200	L1210~ 0	L1310~1400	L1410~1500
	12													

■Mounting Method for MAHSS
- Slit has been added to aluminum rings. Please expand rings by hand.
- Use mounting plate with thickness 3mm or less.



Example



Dryer
(Natural Convection Type)
Equipped with a rack on the top

Not Available

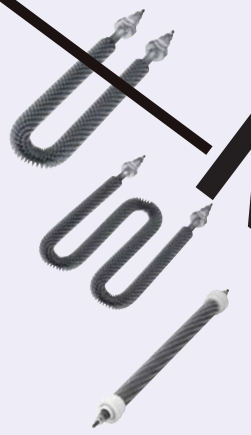
Air Sheathed Heaters / Finned Tubes

-Standard U · M · S-

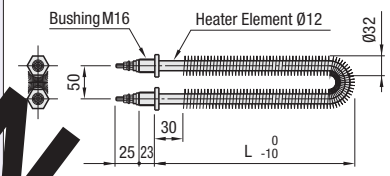
CAD Data

Be sure to refer to "cautions for use" stated in the heaters for air heating guide on **P.1513**

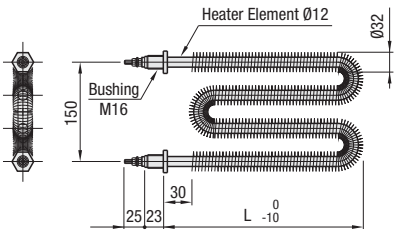
Standard



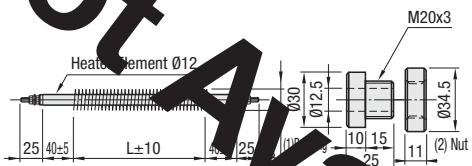
(U Type) (100V, 200V Single-phase)



(M Type) (100V, 200V Single-phase)



(S Type) (200V Single-phase)



M Material: Elements : 1.4301/X5CrNi18-10
Bushing : 1.4301/X5CrNi18-10
A Accessory: Gasket : Non Asbestos
Flat Washers: 1.4301/X5CrNi18-10
Nut : 1.4301/X5CrNi18-10
(1) Bushing for S Type: Insulator (only for S type) 2 pcs.
(2) Nut for S Type : Insulator (only for S type) 2 pcs.

RoHS

Not Available

U · M · S Type Heaters

Part Number Type	Part Number No.	L	W (Electrical Power)	V (Voltage)	Electrical Power Density (W/cm²)	€ Unit Price
	1	200	500	100	4.0	
	2	270	1000	200	5.5	
	3	400	1500			
	4	510	2000			
	1	200	500	100	2.0	
	2	250	1000	200	3.0	
	3	280	1500		4.0	
	4	330	2000		4.5	
	1	330	500	200	3.9	
	2	420	667		4.1	
	3	500	833		4.2	
	4	590	1000		4.3	

Part Number

Days

Express B 5,00 EUR/ piece P.88

A Express ... 50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

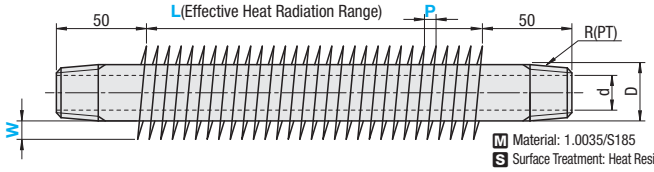
Quantity	1	2~4
Rate	€ Unit Price	5%

Finned Tubes



RoHS

FINPE <Application> Cooling (using cold water), heating, drying, liquid heating, heating source for cooling: vapor, warm water and cold water.



M Material: 1.0035/S185
S Surface Treatment: Heat Resistant Silver Coating

Part Number Type	Part Number No.	Fin Width W (mm)	Pitch P (mm)	L Selection	D	d	R (PT)	Effective Area (m²/1m) P9.5	Effective Area (m²/1m) P11	Radiation Quantity per m in L (kcal/Hr) P9.5	Radiation Quantity per m in L (kcal/Hr) P11	€ Unit Price 1 or 2 pcs. L300	L500	L750
FINPE	20A	25	9.5	300	27.2	21.6	3/4	0.94	0.83	691	610			
	25A		11	500	34.0	27.6	1	1.08	0.95	787	691			
	32A			750	42.7	35.7	1 1/4	1.25	1.10	919	809			

For orders larger than indicated quantity, please request a quotation.

Order Example

Part Number	-	W	-	P	-	L
FINPE20A	-	25	-	P9.5	-	L300

Days to Ship **10 Days**

<Selecting Method>
1.Obtain the quantity of heat radiation (kcal/Hr) per piece.
Quantity of heat radiation (kcal/Hr) = Effective area(m²/1m) x Length of effective heat radiation range (m) x 6.15 (Natural radiation transmission coefficient kcal/m² - Hr - °C) x (Steam saturated temperature (°C) - Set temperature (°C))
* The difference between the steam saturated temperature (°C) and the set temperature (°C) must be 15°C or more.
2. Obtain the heat quantity required to raise the temperature to the set temperature.
Required heat quantity (kcal/Hr) = 0.05 (Natural air volume m³/min) x 60 (min) x 1.2 (Specific gravity of air kg/m³) x 0.24 (Specific heat of air kcal/kg - °C) x 12 (Natural ventilation frequency/Hr) x Volume of drying chamber(m³) x Temperature rise (°C)
* The natural ventilation frequency is generally 10 to 12 times per hour.
3. Obtain the required number of pipes.
Pcs=Required heat quantity (kcal/Hr) /Radiation quantity per pc (kcal/Hr).
* This is a case in which the temperature is to be raised to the set level in one hour. If raising it in 30 minutes, double the number of pipes.

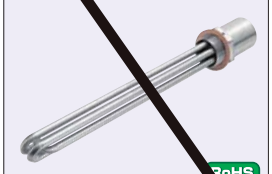
<Selection Example>
When raising the temperature of a drying chamber with a volume of 27m³ by using FINPS25A-25-P9.5-L500.
Assume that the operating steam pressure is 1kgf/cm²G (Steam saturated temperature 119.6°C).
1. Obtain the quantity of heat radiation (kcal/Hr) per piece.
Quantity of heat radiation (kcal/Hr)=1.08x0.5x6.15x (119.6°C-50°C)=231.1 (kcal/Hr)
2. Obtain the heat quantity required to raise the temperature to the set temperature.
Required Heat Quantity kcal/Hr)=0.05x60x1.2x0.24x12x27x (50-20)=8398 (kcal/Hr)
3. Obtain the required number of pipes.
Required Number of Hollows=8398/231.1=36Pcs.
[Reference] Operating Steam Pressure And Steam Saturated Temperature
1kgf/cm²G :119.6°C 2kgf/cm²G :132.9°C 3kgf/cm²G :142.9°C
4kgf/cm²G : 151.1°C 5kgf/cm²G : 158.1°C

Air Sheathed Plug Heaters / Small Hot Air Generators

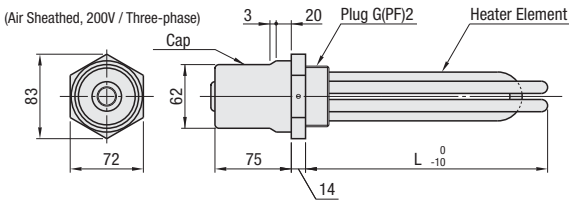
CAD Data

Be sure to refer to "cautions for use" stated in the heaters for air heating guide on **P.1513**

■Air Sheathed Plug Heaters



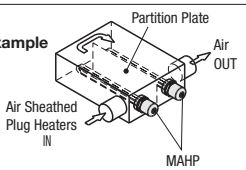
RoHS



M Material: Element: 1.4404/X2CrNiMo17-12-2
Plug: SCS14
Cap: SS + Nickel Plating
A Accessory: Gasket: Non Asbestos

Part Number Type	No.	L	W (Electrical Power)	V (Voltage)	Electrical Power Density (W/cm²)	€ Unit Price
	1	230	1000	200	2.5	
	2	400	2000			
	3	580	3000			
	4	760	4000			
	5	890	5000			

Example



Order Example: Part Number

Days to Ship: Days

Express B: 5,00 EUR/ piece — P88

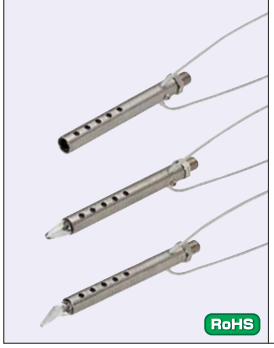
A Express Charge of 13,50 EUR for 3 or more identical pieces.

■Volume Discount (Round down to one Cent.) P.87

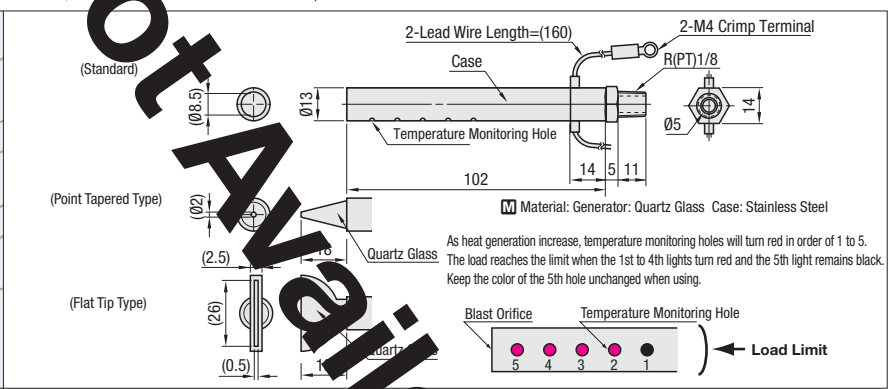
Quantity	1	2~4
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Small Hot Air Generators



RoHS

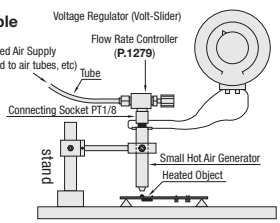


M Material: Generator: Quartz Glass Case: Stainless Steel

As heat generation increase, temperature monitoring holes will turn red in order of 1 to 5. The load reaches the limit when the 1st to 4th lights turn red and the 5th light remains black. Keep the color of the 5th hole unchanged when using.

Part Number Type	No.	V (Voltage)	W (Electrical Power)	Max. Flow (ℓ/min)	Operating Gas Pressure kgf/cm² (MPa)	Maximum Operation Temperature (°C)	€ Unit Price
	1	100	350	60	2(0.2)	800°C	
	2	200	440				

Example



Order Example: Part Number

Days to Ship: 8 Days

■Volume Discount (Round down to one Cent.) P.87

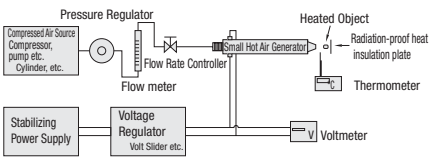
Quantity	1~5	6~10
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Features
MISUMI's small hot air generators employ quartz glass which excels in heat-resistance on the body and ceramic processed special elements on the heat generator. Compact ,safe, and clean hot air can be obtained.

■Usage
- Spot drying after workpiece cleaning
- Welding of resin products
- Soldering of electronic parts such as IC chips
- Cap Seal Shrinkage (Shrink Packaging)
- Cutting (heat cutting) of resin film etc.
- Shrinkage of Hollow Wrapping Tubes

■Usage Procedure
(1) Introduce compressed air before turning on small hot air generator.
(2) Confirm the compressed air is flowing and apply a voltage to it.
(3) Put the nozzle toward the object, and start heating.
* Temperature Regulators (**P.1553**) and Temperature Controllers (**P.1558**) cannot be used.

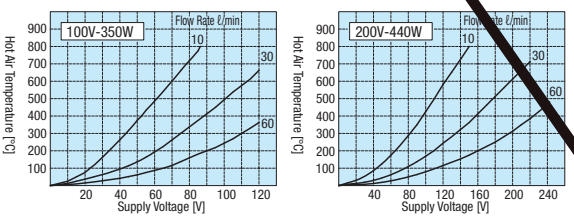


■Calculation of Hot Air Temperature
Use the following formula to estimate hot air temperature.

$$\text{Hot Air Temperature [°C]} \simeq \frac{50 \times \text{Power Consumption [W]}}{\text{Flow Rate of Compressed Air [ℓ/min]}}$$

Power consumption should be smaller than W (electric power) of each type. The above formula is for reference. If hot air temperature is high while flow rate is small, heat efficiency may decrease.
Hot air temperature must be set lower than 800°C.

- Flow Rate - Supply Voltage - Hot Air Temperature Characteristics



■Applicable / Not Applicable Gases
The list below is for reference only. Not a guarantee of the product.

Gas	Applicable or Not	Cautions / Others
Air / Oxygen	OO	Avoid large amounts of oil mist or water.
Nitrogen / Argon	△	All inert gases are applicable, but they will decrease the life span of the product.
Hydrogen	O	Igniting occurs if the gas is exposed in the air at temperature 600°C or more.
Water Vapor	△ ~ X	Letting the heat generator wet will cause breakage.
Town Gas / LPG	X	After thermal decomposition, carbon adheres to a heat generator.

[IMPORTANT] Cautions
- Check the air blasting before applying a voltage. Do not use without air blasting.
- After turning off the small hot air generator, please keep the compressed airflow for 3 min or more for the sake of safety. Then stop air blasting when the temperature of the hot air is lower than 50°C.
- Quartz glass is used on the body. Do not apply an impact.
- The body and case get high temperature during the operation. Do not touch them.It will cause burn injury.
- Voltage and electric power should be set lower than the rated values.
- Do not exceed max operating temperature (800°C).

Not Available

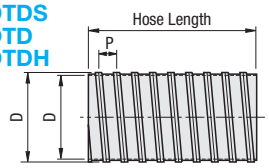
Heat Resistant Duct Hoses for Hot Air Generating Units / Piping Parts for Duct Hoses

CAD Data

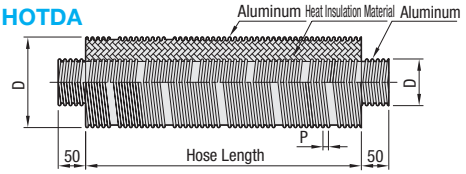


Type	Materials		
	Outside of Body	Inside of Body	Others
HOTDS	Aluminum Glass Cloth	Aluminum	Reinforcement Core: 1.0330/DC01 (Zinc Plating)
HOTD	Reinforcement Core: 1.4301/X5CrNi18-10		Reinforcement Core: 1.4301/X5CrNi18-10
HOTDH	1.4301/X5CrNi18-10		Reinforcement Core: 1.4301/X5CrNi18-10
HOTDA	Aluminum		Heat Insulating Layer: Glass Fiber

HOTDS HOTD HOTDH



HOTDA



Part Number Type	Nominal	Hose Length 0.1m Increment	D	d	P	Operating Temp. Range (°C)	Allowable Pressure Range (MPa {kgf/cm²})	Allowable Decompression (Ambient Temperature) (kPa {mmHg})	Allowable Bending Radius (mm)	Reference Weight (kg/m)	€ Unit Price / m
HOTDS (Heat Resistant Temperature 180°C Type)	50	0.5~5 * Length with hose extended.	54.5	51.5	20.0	30~180	0~0.007 {0~0.07}	-8.5{-64}	110	0.405	
HOTD (Heat Resistant Temperature 250°C Type)	50	0.5~5	54.5	51.0	20.0	30~250		-8.5{-64}	110	0.360	
	65		71.5	67.0				-8.0{-60}	140	0.480	
	75		80.0	76.0				-7.0{-53}	160	0.525	
	90		94.5	91.0	30.0			-605{-49}	190	0.545	
	100		106.0	102.5					210	0.635	
HOTDH (Heat Resistant Temperature 450°C Type)	50	0.5~2	56.6	52.5	20.0	30~450		-10.5{-79}	170	0.365	
	65		71.5	67.0				-10.0{-75}	210	0.460	
	75		80.0	76.0					240	0.525	
	90		95.0	91.5	23.0			-9.0{-68}	290	0.570	
	100		106.0	102.5				-8.0{-60}	320	0.635	
HOTDA (Heat Resistant Temperature 200°C Type)	50	0.5~2	107.0	50.9	4.1	-30~200	9.0x10⁻³ { 9.1 }	-9.0{-67.5}	200	0.47	
	75		132.0	75.9			7.2x10⁻³ { 7.3 }	-7.2{-54.0}	300	0.59	
	100		157.0	101.4			6.0x10⁻³ { 6.1 }	-6.0{-45.0}	400	0.72	

Features and use of HOTDS (For Fixed Piping)

HOTDS is elastic, and can be fixed at any angle or in any direction.
(Avoid repeated expansion and contraction.)
The aluminum glass cloth has superior flame resistance.
(Disaster prevention Class 1 accepted product)
The hose is not airtight.

Features and use of HOTD (Free Piping)

Flexible and easy to store and transport.
The special coated glass cloth has superior flexibility and flame resistance.
(Disaster prevention Class 1 accepted product)
The hose is not airtight.

Features and use of HOTDH (For Fixed Piping)

Although designed for fixed piping, this can be used for making a curved portion.
(Avoid repeated expansion and contraction.)
The hose is not airtight.

Features and use of HOTDA (For Fixed Piping)

Thermal insulation after fixing is unnecessary. It shortens the work period.

Order Example Part Number: HOTDS50 - Hose Length: 4.3

Days to Ship 8 Days — Express A: 3,00 EUR/piece

Express Service is not available for HOTDA.

A Express Charge of 8,10 EUR for 3 or more identical pieces. P.88

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

* Hose length refers to the length when the hose is stretched without tensile load. (The Allowable Pressure is the maximum pressure allowable in the design. The allowable reduction pressure is the maximum negative pressure that can be applied to the hose under normal temperature. Above range is for Hose Body only. Use data as reference.)

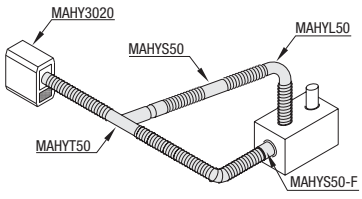
When installing, tighten two hose bands at each position.

<Price Calculation Example>
When HOTDS50-4.3
Unit price of hose: 91,00 EUR per meter.
91,00 (Unit price of Hose) x 4.3 (Hose Length) = 391,30 EUR

Piping Parts for Duct Hoses

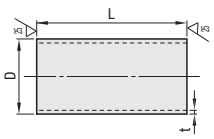


Example

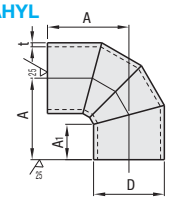


No Flange

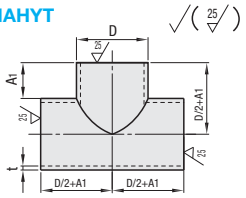
MAHYS



MAHYL

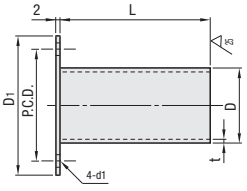


MAHYT

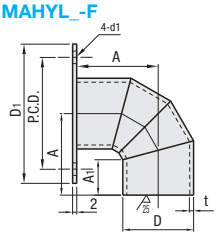


With Welded Flanges

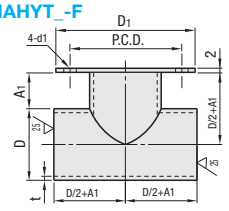
MAHYS_-F



MAHYL_-F



MAHYT_-F



Material: 1.4301/X5CrNi18-10

Part Number Type	Nominal	Welded Flange Selection	D	D1	d1	L	A	A1	t	P.C.D.	€ Unit Price Qty. 1~9 MAHYS	MAHYL	MAHYT	F(Flange Welded Charge)
MAHYS MAHYL MAHYT	50	No Flange	50.8	79	6.6	100	80	35	1.5	65				
	65		63.5	91.5	6.6	130	87	35	2.0	77.5				
	75	F	75.0	111	9	150	92	35	2.3	94				
	90	With Welded Flanges	89.1	123	9	180	110	35	2.1	106				
	100		101.6	136	9	200	122	45	2.1	119				

Material: 1.4301/X5CrNi18-10

* When connecting hoses, use appropriate hose bands on P. 1191.

For orders larger than indicated quantity, please request a quotation.

Order Example Part Number: MAHYT50 - Flange Selection: MAHYS65 - F

Days to Ship
- No Flange: 8 Days — Express A: 2,00 EUR/piece P.88
- With Flange: 10 Days

A Express Charge of 5,40 EUR for 3 or more identical pieces.

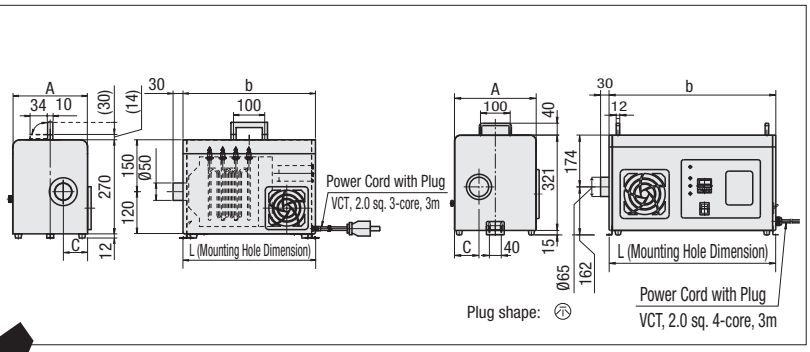
The price of Welded Flange Type is found by adding the unit price of No Flange to the welded flange charge.

<Price Calculation Example>
When MAHYS50-F
The unit price of no flange 17,50 EUR (MAHYS50)
17,50 (unit price of no flange) + 6,00 (welded flange charge) =23,50 EUR

Hot Air Generating Units

CAD Date

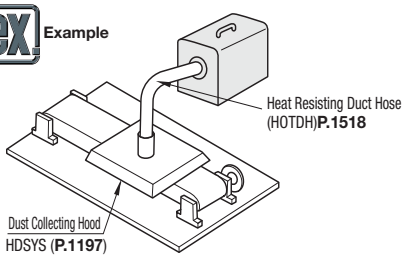




Part Number		A	B	C	L	Heater Capacity (kW)	Voltage	Frequency (Hz)	€ Unit Price
Type	No.								Qty. 1~2
		215	380	70	383	1.3		For 50 and	
		250	450	87.5	453	3.0			
		275	561	82.5	560	5.0			

For orders larger than indicated quantity, please request a quotation.

Example



Order Example

Part Number

Express B | 5,00 EUR/ piece

P.88

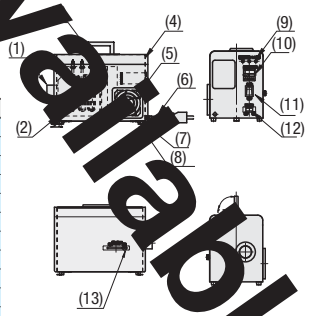
A Express Charge ... for 3 or more identical pieces.

Features

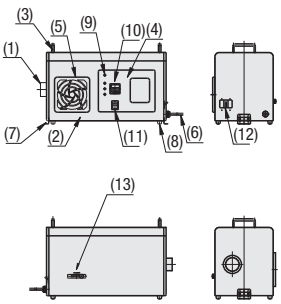
The MISUMI's Hot Air Generating Unit is a compact heater unit, incorporating a blower and a temperature controller with a built-in sheath heater for air heating. PID control method is employed for temperature controllers, which enables effective temperature control. (For details of temperature controllers, refer to **P.1551**)

Basic Structure

1310 / 3020



5020



No.	Name	No.	Name
(1)	Outlet Port	(8)	Rubber Legs
(2)	Body Case (1.0330/DC01 / Coating	(9)	Operation Indicator Lamp
(3)	Handle	(10)	Temperature Controller
(4)	Control Panel	(11)	ON/OFF Switch
(5)	Suction Port	(12)	Breaker
(6)	Power Cord with Plug	(13)	Air Volume Adjusting Knob
(7)	Metal part for fixation (1.4301/X5CrNi18-10)		

Plug type for No.3020 and 5020 is WF5320

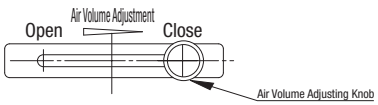
Common Specifications

Power Supply		Single-phase100V	Single-phase 200V	Three-phase 200V
Heater Capacity (kw)		1.3	3.0	5.0
Temperature Control Range (°C)		Ambient Temperature ~ 200°C	Ambient Temperature ~ 300°C	Ambient Temperature ~ 350°C
Outlet Port Dia. (mm)		Ø50		Ø65
* Max Air Volume	Full Open	1.0/1.4 (50Hz/60Hz)		2.7/3.2 (50Hz/60Hz)
	1/3 Open	0.3/0.4 (50Hz/60Hz)		1.0/1.3 (50Hz/60Hz)
Intake Air Temperature (°C)		Ambient Temperature		
Control Mechanism: Temperature Indic.		Digital Indication		
: Control Drive		SSR Drive		
: Temperature Sensors		K Thermocouple		
: Safety Circuit		Over-temperature / Interlock		
Air Volume Adjustment		Manual Damper		
Weight		10kg	13kg	27kg

* The values of maximum wind volume are for reference only.

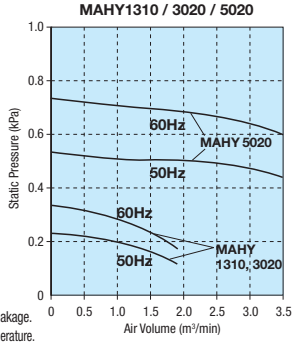
Air Volume Adjustment

Air volume can be adjusted by moving the "Air Volume Adjusting Knob" left and right on the side of the body.

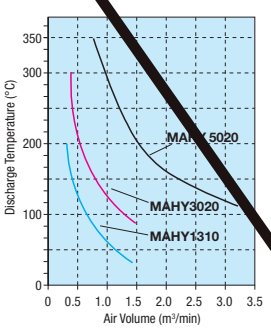


Performance Curve

- Performance characteristics of blower - MAHY1310 / 3020 / 5020

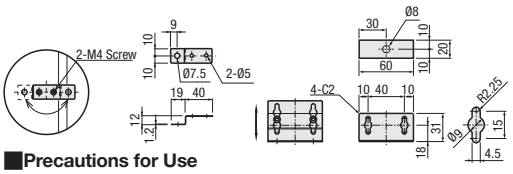


- Hot Air Temperature / Air Volume Characteristics -



Mounting Method

- Screwing with the fixing bracket
  (1)Remove the M4 bolt from the fixing bracket, and install the bracket as shown below.
  (2) Prepare two M6 bolts for securing the main body.



Precautions for Use

- Never use the unit at any temperature over the maximum operating temperature. It may result in breakage.
- Never touch the air outlet and adjacent portion during operation. A sever injury may result due to high temperature.
- The heater is not waterproof. Never expose the heater to water or any other liquids.
- Do not use over the rated voltage (V).
- Do not dismantle or remodel the body.
- Read the instruction manual thoroughly to ensure safe operation of the unit.

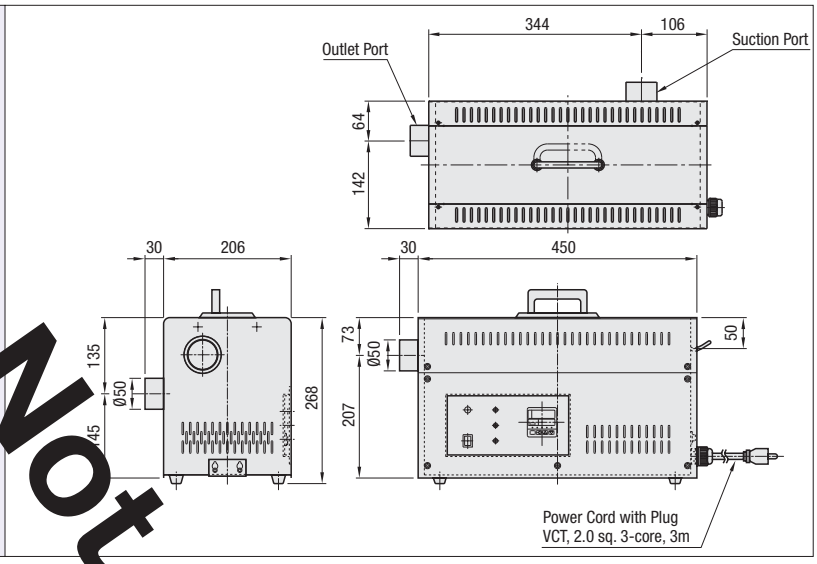
Not Available

Hot Air Generating Units

-Air Circulation-

CAD Date





Part Number		Heater Capacity (kW)	Voltage (V)	Frequency (Hz)	€ Unit Price
Type	No.				
	1010	1.0	100	For 50 and 60	

For orders larger than indicated quantity, please request a quotation.

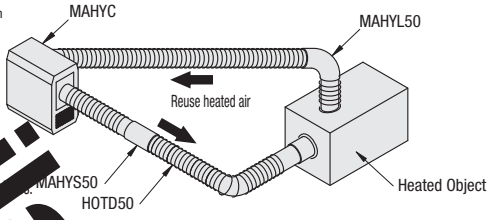
Order Example | Part Number

10 Days

Express B | 5,00 EUR/ piece

A Express Charge of 13,50 EUR for 3 or more vertical axis.

Example



Features

Heat can be effectively utilized by circulating heated air emitted from outlet port to suction port.
Higher energy efficiency operation than the conventional products (MAHY on the left page).

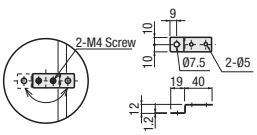
Specification

Power Supply	Single-phase100V
Heater Capacity (kW)	1.0
Temperature Control Range (°C)	Ambient Temperature ~ 200
* Maximum Air Volume (50/60Hz)	1.1/1.2 m^3/min
Maximum Static Pressure (50/60Hz)	0.2/0.3kPa
Control Mechanism: Temperature Indication	Digital Indication
: Control Drive	SSR Drive
: Temperature Sensors	K Thermocouple
: Safety Circuit	Over-temperature / Interlock
Maximum Noise (at the time of maximum air volume)	63dB
Temperature of suctioned air	Ambient Temperature ~ 150°C
Power Cord	VCTF 3-corex2sq (3m)
Weight	9kg

* The values of maximum wind volume are for reference only.

Mounting Method

- Screwing with the fixing bracket
  (1)Remove the M4 bolt from the fixing bracket, and install the bracket as shown below.
  (2) Prepare two M6 bolts for securing the main body.



Precautions for Use

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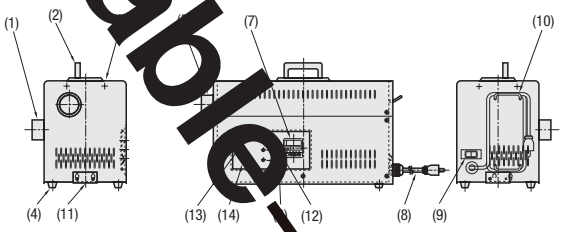
- Never touch the air outlet and adjacent portion during operation. A sever injury may result due to high temperature.
- The heater is not waterproof. Never expose the heater to water or any other liquids.
- Do not use over the rated voltage (V).
- Do not dismantle or remodel the body.
- Read the instruction manual thoroughly to ensure safe operation of the unit.

Basic Structure

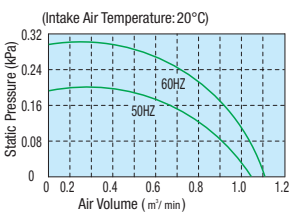


No.	Name
(1)	Suction Port
(2)	Handle
(3)	Main Body (Materials: 1.0330/DC01)
(4)	Rubber Legs
(5)	Outlet Port
(6)	Control Panel
(7)	Temperature Controller

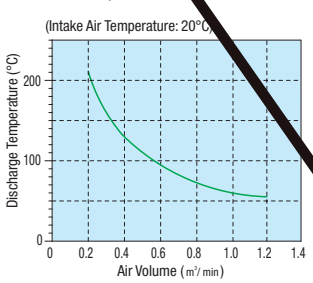
No.	Name
(8)	Power Cord
(9)	Power source breaker
(10)	Cord Hook
(11)	Metal part for fixation (1.4301/X5CrNi18-10)
(12)	Operation Indicator Lamp
(13)	Lamp for power source
(14)	ON and OFF Switch

Performance Curve

- Performance characteristics of blower -



- Hot Air Temperature / Air Volume Characteristics -



Not Available

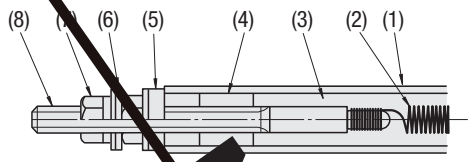
Sheathed Heaters for Liquid Heating -Guide-

■Features

- Excellent corrosion resistance because the liquid contact parts are made of 1.4404/X2CrNiMo17-12-2 and 1.4301/X5CrNi18-10.
- It is easy to mount in narrow space.
- The maximum operating temperature is 160°C (Liquid temperature).

■Basic Structure

• This is a heater with Nickel-chrome wires are filled in a stainless steel tube with magnesia.



(1) Stainless Steel Tube
(2) Heating Element (Nickel-chrome Wire)
(3) Insulation Powder (Magnesia)
(4) Insulation Seal Material
(5) Terminal Section Isolation Material (ceramic)
(6) Washer
(7) Nut
(8) Terminal

■Mounting Method

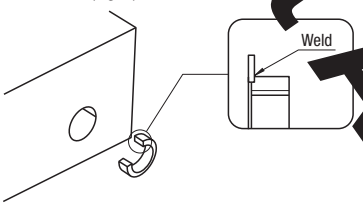
• Mounting of Sheathed Heaters for Heating Liquid (Plug (PF Thread or PT Thread) Heater, Flanged Type)

■Plug Type (PF Thread)

* For PT Thread Type, refer to **P.1523**

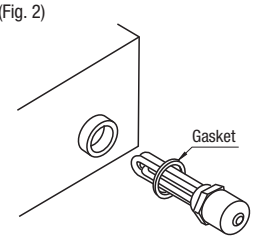
(1) Determine the mounting position of the heater on the water tank and open the hole of Ø70~71.
(2) Insert the socket for plug heater mounting (product number: HTS) into the mounting hole, and weld it. (Fig. 1)

(Fig. 1)

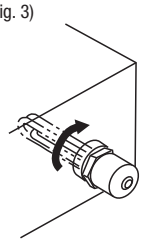


(3) Insert the included gasket onto the thread part, catch the hexagonal part with the wrench and screw the heater into the tank. (Fig.2, 3)

(Fig. 2)



(Fig. 3)

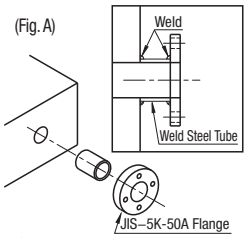


* Confirm that there is no liquid leakage after tightening.

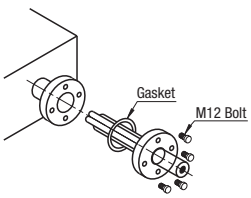
■Flanged Type

(1) Determine the mounting position of the heater on the water tank.
(2) Attach the JIS-5K-50A steel pipe inserting welding flange to 50A socket and weld it to water tank. (Fig. A)

(Fig. A)

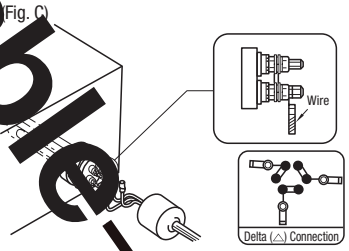


(Fig. B)



(3) Insert the included gasket into the sheathed part, and tighten the flange with M12 bolt and nut. (Fig. B)
(4) Confirm that there is no liquid leakage after tightening.
(5) Connect the wires with three terminals. (Fig. 4) (Fig. C)

(Fig. C)



The current (I) of the delta (△) connection is $I=\frac{W}{\sqrt{3}xV}$

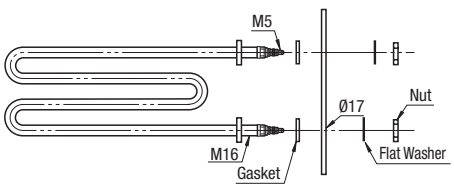
Ex.) Plug Heater of 200V and 10kW, $=\frac{10000}{\sqrt{3}x200}=28.9$ (A)

• Mounting of Heaters of Respective Shapes

(1) Determine the mounting position of the heater on the water tank, and drill Ø17 holes with proper pitch at two places.

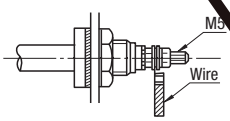
(2) Insert the included gasket and washers onto the screw section, and then insert them into the mounting hole.
Fix the heater with included nuts from outside of the tank. (Fig. 5)

(Fig. 5)



(3) Connection Method: Connect wires with two terminals. (Fig. 6)

(Fig. 6)



* Confirm that there is no liquid leakage after tightening.

The heater with two terminals is single-phase. Current (I) is $I=\frac{W}{V}$

Ex.) For the heater of 100V and 500W, $I=\frac{500}{100}=5$ (A)

Not Available

Precautions for Use

- Do not let the heaters run in open air, for that will cause fires and heater element damages.
- Avoid water splashes on the heater's wiring terminals. Electrical leakages and shorts may result.
- Heater surfaces collect mineral and carbon deposits from prolonged usage. Clean the surfaces periodically to avoid corrosions and element damages.
- Make the wiring terminal connections securely while noting for the contacting conditions.
- Use heat resistant wire.
- Do not use over the rated voltage (V).
- Disconnect the power source before removing the heater unit from the heated object. Do not touch the heater immediately after the removal.
- The heaters will expand slightly due to heat. Design with ample space surrounding the heater to accommodate this expansion.

Selection Method

(1) Determine the heat quantity (W) required for the heater. Calculate with the following formula by using the weight of heating product, the specific heat of heating product, the increased temperature, and the time to reach the preset temperature.

$$\text{Calories Required for The Heater (kW)} = \frac{\text{Weight of Heating Product (kg)} \times \text{Specific heat of Heating Product (kcal/kg°C)} \times \text{Increased temperature (°C)}}{860 \times \text{Heating Time (h)} \times \text{Efficiency } (\eta)}$$

It is difficult to calculate the Efficiency (η) precisely because it varies by heat retention, insulation, arrangement of heater but the suitable value is generally about 0.2~0.5.

• Specific Gravity and Specific Heat of Water and Oil

Substance	Specific Gravity (kg/cm³)	Specific Heat (kcal/kg°C)
Water	1.00	1.00
Lubricant	0.87	0.46
Spindle Oil	0.85	0.46
Olive Oil	0.91	0.40

- The values of oils are at 40°C.

Ex.) When 50ℓ water is heated to a temperature of 50°C.
(Assuming the water temperature is 20°C, and the time to reach the preset temperature to be 60 minutes.)

$$\text{Calories Required for The Heater (kW)} = \frac{50 \times 1.00 \times (50-20)}{860 \times 1.00 \times 0.5} = 3.5\text{(kW)} = 3500\text{(W)}$$

* Efficiency is assumed to be 0.5.
- Actual Measurement Data: Time of Increasing Temperature for Each Electrical Power (Electrical Power Density) Insulation Tube

(2) Determine the number of heaters and the quantity of heat (W) per one heater.
Determine how to mount the heater, and the number of heaters and calories per one heater when total calories is the required calorie for the heating products.

• Selection of Sheathed Heater

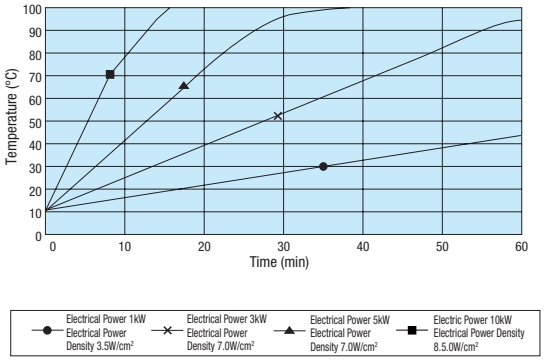
Ex.1) Use one Plug Type Heater (For Water Heating).
→MSHPW4 (4000W)

Ex.2) Use two M Type heaters for water heating.
→MSHM2 (2000W×2400W)

- In this case, because it is difficult to calculate the efficiency (η) precisely, select the heater that has larger calories (W) than the calculated value. (Check that the length of the heater (L dimension) and the operating voltage (V) are appropriate.)

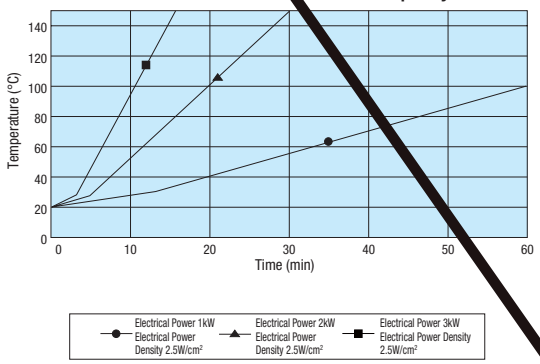
• Actual Measurement Data: Temperature Rise Time / Electrical Power (Electrical Power Density)

Relation between water and heater capacity.



* Used Heater: MSHPW
* Heated Object: Water (15ℓ)

Relation between oil and heater capacity



* Used Heater: MSHPL
* Heated Object: Olive Oil (20ℓ)

Not Available

Sheathed Heaters for Liquid Heating

-With Plug · With Overheating Prevention-

CAD Data

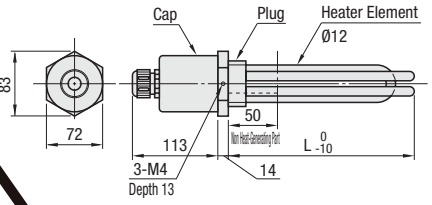
Be sure to refer to "cautions for use" stated in sheathed heaters for liquid heating guide on **P.1521**

■With Plug

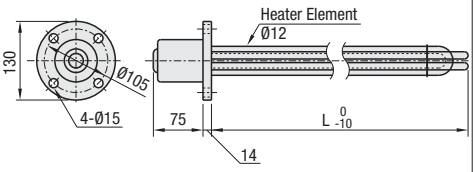


RoHS

(Water Heating · Plug Type (PF Thread), 200V / Three-phase)
(Water Heating · Plug Type (PT Thread), 200V / Three-phase)
(Oil Heating · Plug Type (PF Thread), 200V / Three-phase)



(Water Heating · Flanged Type, 200V / Three-phase)



M Material: Heater Element : 1.4404/X2CrNiMo17-12-2
Plug : SCS14
Cap : Phenol Resin
A Accessory: Gasket : Non Asbestos

M Material: Heater Element : 1.4404/X2CrNiMo17-12-2
Flange : SCS14
Cap : Phenol Resin
Power Supply Outlet: NBR
A Accessory: Gasket : Non Asbestos

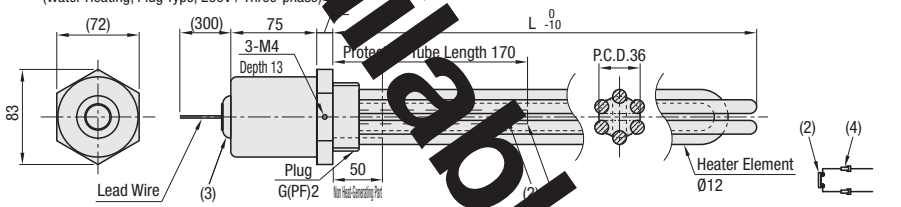
Part Number Type	No.	W (Electric Power)	V (Voltage)	Electrical Power Density (W/cm²)	L	Plug (Thread Size)	€ Unit Price
(Only * marked sizes) (The values in ( ) are for MSHFW10.)	1	1000	200	3.5	170	G(PF)2 / R(PT)2	
	2	2000		6.0	200		
	*3	3000		7.0	230		
	4	4000			300		
	*5	5000			370		
	6	6000			430		
	8	8000			500		
	*10	10000		8.5	570(700)		
	1	1000	200		230	G(PF)2	
	2	2000			400		
	3	3000			580		
	4	4000			760		
	5	5000			990		

■With Overheating Prevention



RoHS

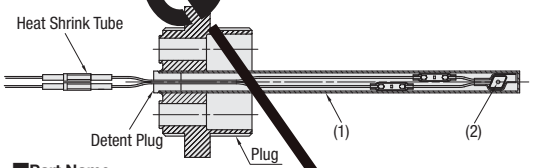
(Water Heating, Plug Type, 200V / Three-phase)



M Material: Heater Element : 1.4404/X2CrNiMo17-12-2 Cap: Phenol Resin
Protection Tube for a Bimetal Thermostat: 1.4301/X5CrNi Brass : Fluorine
A Accessory: Gasket : Non Asbestos

Part Number Type	No.	Bimetal Thermostat Operation Temperature (°C)	W (Electrical Power)	V (Voltage)	Electrical Power Density (W/cm²)	L	€ Unit Price
	35	50	3000	200	7.0	230	
	37	70					
	39	90					
	311	110					
	55	50	5000			370	
	57	70					
	59	90					
	511	110					
	105	50	10000		8.5	570	
	107	70					
	109	90					
	1011	110					

Details of Protection Tube



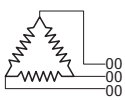
■Part Name

No.	Name	No.	Name
(1)	Protection tube for a Bimetal Thermostat	(3)	Power Supply Export (NBR)
(2)	Bimetal Thermostat	(4)	Insertion Type Connecting Terminal

■Features

This heater has both protection pipe and bimetal thermostat. It prevents overheating of a heated object.

Connecting Diagram (△)



■Precautions for Use

- Ensure a thermostat is fixed in the protection pipe before using. When it exceeds rating, use an assistant relay.
- This product is designed to prevent overheating of liquids. The thermostat does not function under dry-running condition after the liquid is gone, and it may invite unexpected trouble. Use with a monitoring system including a float switch to monitor the liquid level for boil-dry protection.
- Bimetal thermostat of water temperature plus 20°C or above is recommended.

Order Example **Part Number**

Days to Ship **10 Days**

Express **B** 5,00 EUR/piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1	2~4
Rate	€ Unit Price	5%

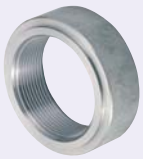
Not Available

Connecting Parts for Heater / Float Switches

-Welding Sockets- -Horizontal · Vertical-

CAD Data

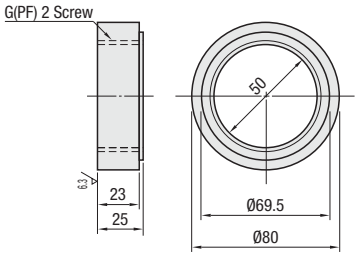
■Connecting Parts for Heater RoHS



Welding Sockets

MSHTS (PF Thread)

25 / (6.3 /)



Material: 1.4301/X5CrNi18-10

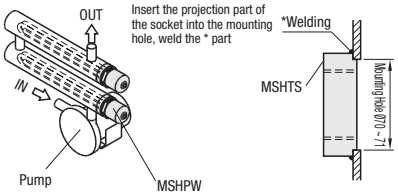
■Welding Sockets

Part Number Type	€ Unit Price
MSHTS	

Order Example — Part Number

Days to Ship — 6 Days — P.87

Example



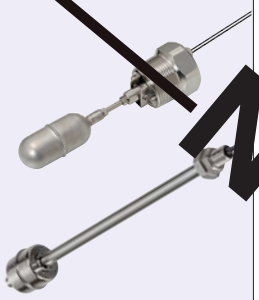
Price

■Volume Discount (Round down to one Cent.) P.87

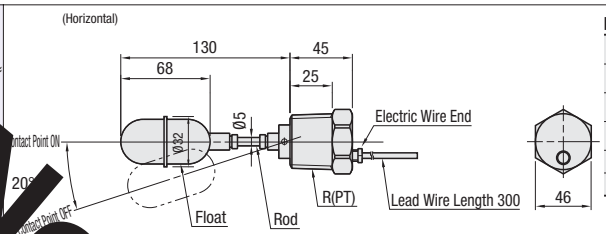
Quantity	1	2~4
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

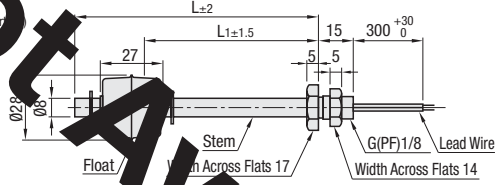
■Float Switches RoHS



(Horizontal)



(Vertical)



Material: Rod - Stem - Float Portion: 1.4301/X5CrNi18-10

■Specifications

Usage	Water · Oil · General Liquid
Operating Range (Specific Gravity)	0.8 or More
Pressure Resistance	0.49MPa
Heat Resistance Temperature	-20°C~80°C
Contact Capacity	10W DC/AC
Contact Type	Contact Point

■Specifications

Usage	For liquid such as water, oil and other
Operating Range (Specific Gravity)	0.8 or More
Pressure Resistance	1MPa
Heat Resistance Temperature	0°C ~ 120°C
Contact Capacity	50W DC/AC
Contact Type	Contact Point

Part Number Type	No.	R(PT) / G(PF)	Lead Wire Length	L	L1	Mass (g)	€ Unit Price Qty. 1~3
	80	R1 1/4	300	-	-	500	
	2	G1/8		200	170	65	
	3			300	270	85	
	4			400	370	105	

L1 dimension is the position of the lead switch mounted within the stem.

For orders larger than indicated quantity, please request a quotation.

Order Part Number

Days to Ship — 10 Days — Express B — 2,00 EUR/piece — P.88

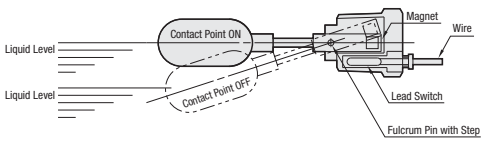
A Express Charge of 5,40 EUR for 3 or more identical pieces.

■Features

· These switches are designed as alarms or signal of water-level for liquids such as water and oil.
· By combining with a power supply, external circuit, etc., can be used as safety circuit to prevent liquid heaters from dry-running.

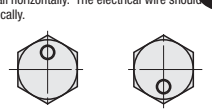
■Principle of Operation(FLOST)

The float moves according to changes in the liquid level. When the magnet comes close to the reed switch (high liquid level), the reed switch will be activated. When the liquid level falls, the contact point will be off again.



■Cautions on Installation (FLOSK)

Install horizontally. The electrical wire should vertically.



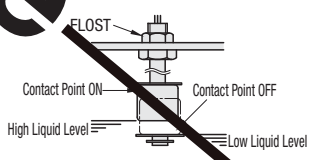
On when liquid level falls (Electronic wire at upper position)

On when liquid level rises (Electronic wire at lower position)

· Confirm that there is no liquid leakage before use.
· Avoid installing in places where the float cannot move smoothly.
· When pouring liquid, do not splash it on the body of this product.
· After the wires are connected, observe the liquid level with eyes and confirm the output before actual use.

■Cautions on Installation (FLOST)

...at may not move properly when mounted ...ontally.



Not Available

Sheathed Heaters for Liquid Heating

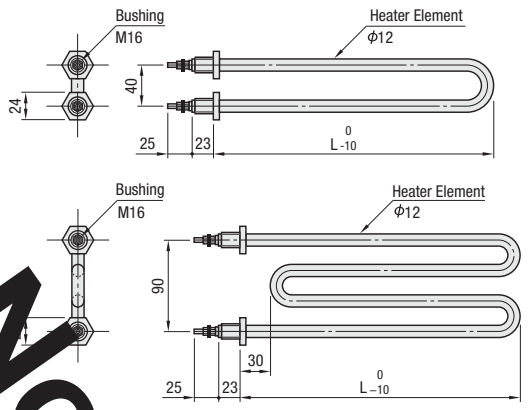
-U/M Fixed Type · Straight - One Terminal Type-

CAD Data

■Sheathed Heaters



(100V, 200V / Single-Phase)



M Material:
Heater Element: 1.4404/X2CrNiMo17-12-2
Bushing: 1.4301/X5CrNi18-10

A Accessory:
Gasket Non Asbestos
Flat Washers : 1.4301/X5CrNi18-10
Nut: 1.4301/X5CrNi18-10

Part Number Type	No.	V (Voltage) Selection	L	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price
	0.5	100	150	500	5.5	
	1	200	200	1000	8.0	
	1.5	200		1500	7.5	
	2		40	2000	7.0	
	0.5	100		500	5.0	
	1	200	50	1000	5.5	
	1.5	200	20	1500	6.0	
	2		2	2000	6.0	

Order Example: Part Number - V - V200

Days to Ship: 10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

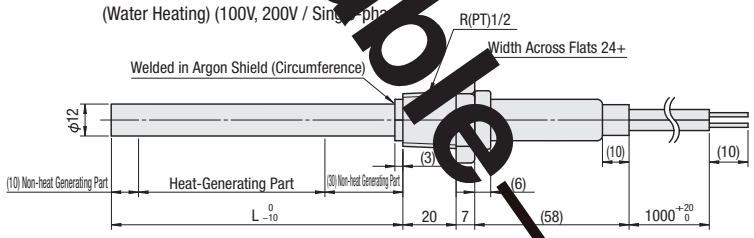
Quantity	1	2~4
Rate	€ Unit Price	5%

■Straight One Terminal



RoHS

(Water Heating) (100V, 200V / Single-Phase)

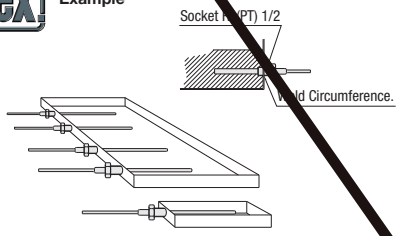


M Material:
Heater Element : 1.4404/X2CrNiMo17-12-2 (For Water)
Bushing : 1.4301/X5CrNi18-10

Lead Wire Protection Cap : Silicon Rubber (Heat Resistant Temperature: 180°C)
Lead Wire : Glass Braid Silicon Coated Wire (Heat Resistance Temperature: 180°C)

Part Number Type	No.	V (Voltage) Selection	L	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price
(Water Heating)	0.5	100	230	500	7.0	
		200				
	0.75	100	325	750		
		200				
	1	200	420	1000		
	1.5	200	610	1500		

Example



Order Example: Part Number - V - V200

Days to Ship: 13 Days

Express C 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

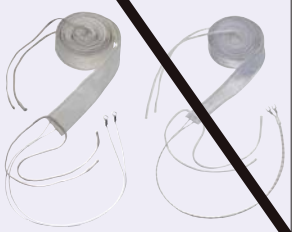
For orders larger than indicated quantity, please request a quotation.

Not Available

Ribbon Heater

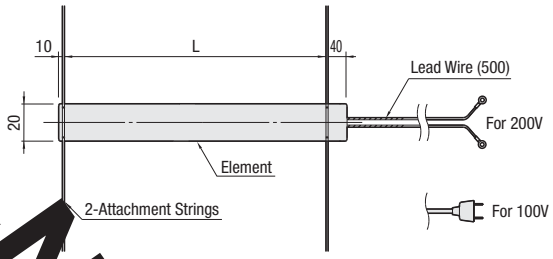
■Ribbon Heater

RoHS



(Standard Type)
(Fluorine Coating Type)
(100V,200V / Single-phase)

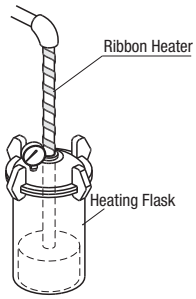
Type	Material		
	Elements	Lead Wire	Lead Wire Film
	Glass Cloth	Nickel (N)	Glass Lead
	Glass Cloth (Fluorine Coating)	Copper (Cu)	Fluorine Lead



Please inquire with MRBH, MRBHF1 - 2 (for 100V).

Part Number Type	No.	L	W(Electrical Power)	(Voltage)	Electrical Power Density (W/cm²)	€ Unit Price	
	1	1000	100				
	2	2000	200				
	3	1000	100		0.5		
	4	2000	200	2			
	5	3000	300				

Example



Order Example Part No.

Days to Ship 10 Days — Express B 5,00 EUR/ piece

A Express Charge of 13,50 EUR for 3 or more identic

Price

■Volume Discount (Round down to one Cent.) P87

Quantity	1	2~4
Rate	€ Unit Price	5%

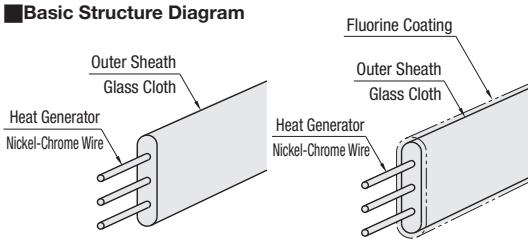
■**Features:** Belt-shaped heaters easily attachable to piping and tanks.

- Standard Type
- Excels in heat resistance as the sheathing of the heater is glass cloth.
- Maximum operating Temperature is 350°C.

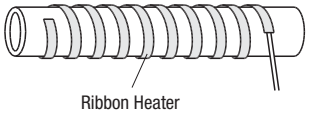
- Fluorine Coating Type
- As the fluorine coating has been applied on the glass cloth sheathing, dust raise is controlled.
- Maximum operating temperature is 200°C.

■**Basic Structure**
- This is a heater that has glass cloth covering the heat generating body. As for the fluorine coating type, the heating body is covered with glass cloth by fluorine coating.

■**Basic Structure Diagram**

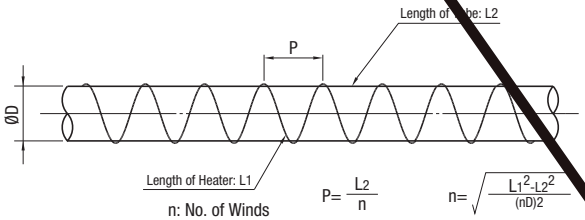


■**Mounting Method**
- After winding over a pipe, fasten the heater with the mounting strap.



■**Precautions for Use**
- Do not let the heater run in open air, for that will cause fires and heater element damages. Ensure the heater is closely contacted with a heated object when using.
- Prevent the use of heaters from getting wet by water, oil or humidity, as the surface is glass cloth sheathing.
- Do not install by overlapping the heater.
- Make the wiring terminal connections securely while noting for the contacting conditions.
- Do not use over the rated voltage (V).
- Disconnect the power source before removing the heater unit from the heated object. Do not touch the heater immediately after the removal.
- Use the temperature controller for safety.

■**Method to Determine the No. of Winding**



n: No. of Winds

$P = \frac{L_2}{n}$ $n = \sqrt{\frac{L_1^2 - L_2^2}{(nD)2}}$

Not Available

Far Infrared Ceramic Plate Heaters / Far Infrared Plate Heaters

CAD Data

Far Infrared Ceramic Plate Heaters

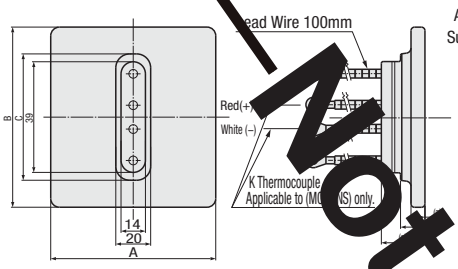


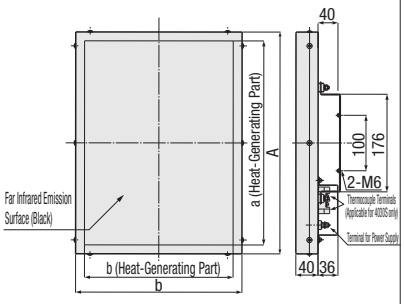
Far Infrared Plate Heaters

RoHS



Type	Material: Heater	Material: Elements	Material: Lead Wire	Accessory
(Standard)	Ceramics	NCHW2	Glass Wool Coating	Bracket (1.4301/ X5CrNi18-10)
(Heat Insulating Highly-efficient Type)	Ceramic Heat Insulation Material			
(Heat Insulating Highly-efficient Type with Built-in Temperature Sensor)				





M Material: Plate Frame: 1.4301/X5CrNi18-10
Plate Surface: Aluminum + Far Infrared Coating
Thermocouple: K Thermocouple (4030S only)

Far Infrared Ceramic Plate Heaters

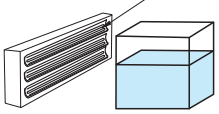
Part Number Type	No.	A	B	C	(a)	(b)	(c)	W (Electrical Power)	V (Voltage)	Max. Surface Temperature (°C)	Emission Wavelength (μm)	€ Unit Price
	1	60	245	45 (48)	20 (18)	25 (21)	35 (32)	400	200	600	2~20	
	2							600		680		
	3	122 (125)	122 (125)		23 (8)	25 (14)	38 (25)	400		600		
	4							600		680		

Values in ( ) are for MCHN.

Far Infrared Plate Heaters

Part Number Type	No.	A	B	a	b	W (Electrical Power)	V (Voltage)	Max. Surface Temperature (°C)	Thermocouple Used	Weight (kg)	€ Unit Price
	4030	400	300	368	268	1000	200	250	K Thermocouple	6.0	
	4030S										

Example MCHNN



Order Example Part Number

Price

Volume Discount (Round down to the nearest cent.)

Quantity	1	2~4
Rate	€ Unit Price	5%

For orders less than the listed quantity, please request a quotation.

are quoted at a qty. 3 or more pieces.

Days to Ship 10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Features

- MISUMI's ceramic plate heaters are highly-efficient far infrared heaters.
- The far infrared ray uniformly heats the surface and interior of the object.
- There is little deterioration with time and remain highly-efficient for a long time.
- Lightweight, clean with no particle generation, and excels in thermal response.

- Heat Insulating Highly-efficient Type

Heat insulating material is embedded in conventional ceramic plate heaters. Heat insulation effect by air and heat insulating material enables less heat transfer and conduction to the backside of the heater, which enhances heat emission from heater surfaces. (Increased Temperature Properties Graph)

- Heat Insulating Highly-efficient Type with Built-in Temperature Sensor

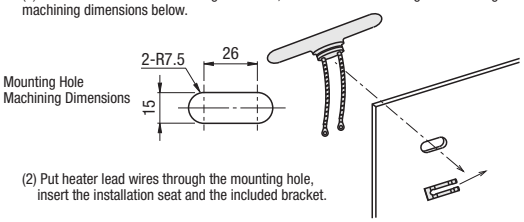
K Thermocouple is attached to measure the heater surface temperature. Suitable when the heater temperature control is required.

- Far Infrared Plate Heaters

Large plate heater of 400x300 enables uniform heating of large area surfaces.
Temperature unevenness will be smaller compared to combining conventional ceramic plate heaters.

Mounting Method (Far Infrared Ceramic Plate Heaters)

(1) Decide the location of mounting the heater, and drill a hole following the mounting hole machining dimensions below.



(2) Put heater lead wires through the mounting hole, insert the installation seat and the included bracket.

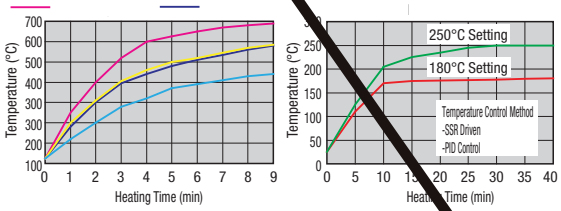
Mounting plate thickness should be within 1~2mm.

Usage

Suitable for clean heating as follows: LED industry, semiconductor industry, food industry, biotechnology industry and heating, forming, drying, softening, preheating, hardening, aging, heat retention of the plastic molding process.

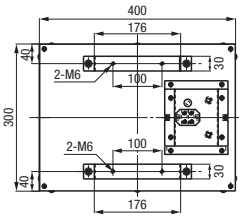
Temperature Rise Charcteristics of Far Infrared Ceramic Plate Heaters and Plate Heaters

*Temperature at 25°C in natural atmosphere



Mounting Method (Far Infrared Plate Heaters)

Back Mounting Dimension Diagram for Far Infrared Plate Heaters



Decide the location of mounting the heater, and drill a hole for M6. (Decide the exit for the heater power supply wires of and drill a hole if necessary.)

Not Available

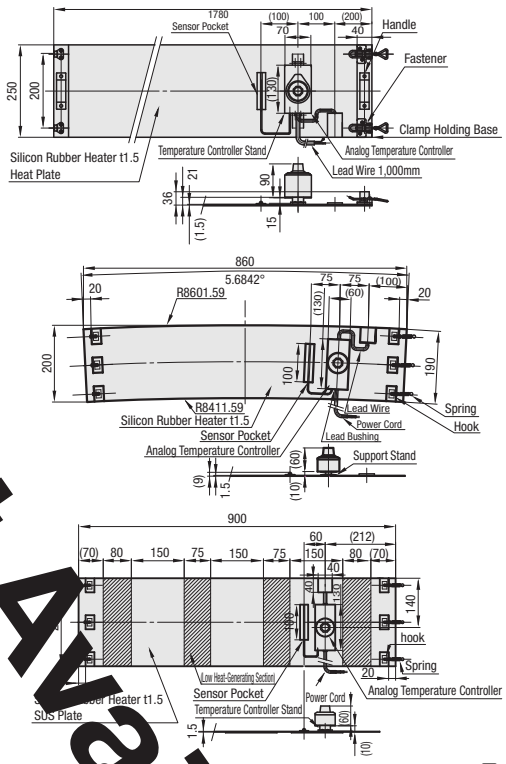
Drum Heater
-Economical Type-

CAD Data

■Drum Heater



(Single-Phase 200V)



RoHS

and don't have handles. Electrical power plug is not included.

M Material: Silicon Rubber

Part Number Type	Part Number No.	W (Electrical Power)	V (Voltage)	Mass (kg)	Attaching Object	€ Unit Price
	1	2000	200	3.0	Drums (200ℓ)	
	2	560		3.0	Pails (20ℓ)	
	3	700		4.0	18 liter metal cans (18ℓ)	

* Power Cable included (1.0m/MDRHL1: With Ground Wire, 3 conductors; MDRHL2, 3: No Ground Wire, 2 Conductors)
* The setting range of the thermostat is at 30°C ~ 110°C.

Order Example | Part Number | Days to Ship | 6 Days | P.87

■Features

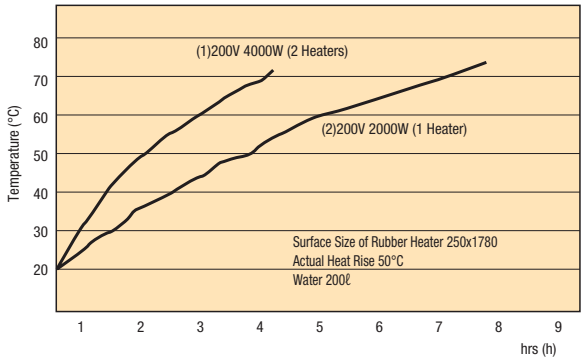
Drum Heaters are the silicon rubber heaters for drums, pails and 18 liter metal cans. Liquid viscosity and the temperature can be properly controlled by the equipped temperature controller (liquid expansion type). It is lightweight, and can be installed and removed by a single person.
Available for material preheating, viscosity control for high viscosity fluid and freeze prevention for liquid.

■Precautions for Use

(1) Do not use it in flammable atmospheres.
(2) Install the heater below the fluid level. (Installation at the bottom of the drum is recommended.)
(3) To avoid burn injury, do not touch the heater when the power supply is on or immediately after the use.
(4) Do not use in places with rain fall.

Standardized thermostat (30°C ~ 110°C) and thermal fuse (184°C) prevents unexpected accidents.

■Drum Heater Temperature Change



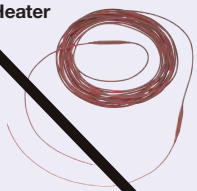
Example



Not Available

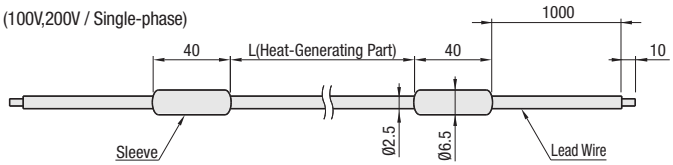
Code Heaters / Heat Resistance Tapes

Cord Heater



RoHS

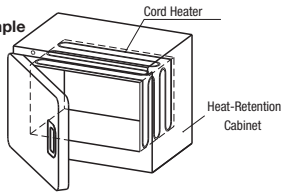
(100V,200V / Single-phase)



M Material: Elements : Silicon Rubber Lead Wire: Copper (Cu)
Sleeve : Silicon Rubber Lead Wire Film: Silicon Rubber

Part Number Type	No.	(Heat-generating Part)	W (Electrical Power)	V (Voltage)	Electrical Power Density (W/cm²)	€ Unit Price
	1	100	10	100	0.13	
	2	200	20			
	3	300	30	200		
	4	400	40			
	5	5000	50			

Ex Example



Order Example — Part Number: MCDH2

Days to Ship — 10 Days — Express B — 5,00 EUR/piece — P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

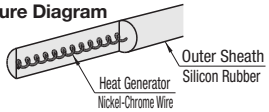
Volume Discount (Round down to one Cent.) P.87

Quantity	1	2~4
Rate	€ Unit Price	5%

Features
- Excels in heat resistance as the sheathing of the heater is silicon rubber.
- As the heater is cord shape, it can be fitted in any type of shape.
- Maximum Operation Temperature is 180°C.

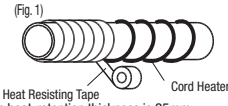
Basic Structure
- This is a heater integrating a heat generating body with the silicon rubber.

Basic Structure Diagram



Mounting Method
- Install directly onto piping.
- As an example to secure the heater, heat resistant aluminum tape can be used.

(Fig.1)



Precautions for Use
- Do not use the heater run in open air, for that will cause fires and heater element damages. Ensure the heater is closely contacted with a heated object when using.
- Do not install [illegible] the heater.
- Make the [illegible] connections securely while noting for the contacting conditions.
- Do not use over the rated voltage.
- Disconnect the power [illegible] before removing the heater unit from the heated object. Do not touch the heater immediately after the removal.

Method to Determine the Number of Winding
P.1526

Selection Method (Cord Heaters and Silicon Belt Heaters)
Calculate with the following formula by using the heat insulating thickness, size of piping, temperature of [illegible] and temperature difference with the external atmospheric temperature (refer to Fig. 2, Table 1 and 2)

Heat Quantity Required for The Heater(W)=Watts per [illegible] of Tube(W/m) × Length of Tube(m)

Ex.) For piping size 15A (1/4B) and length 1m to be 30°C (Heat-insulation thickness is 25mm and external atmospheric temperature is [illegible]
From Table 1, when the insulation thickness is 25mm, tube size is 15A (1/4B) and the temperature difference between tube temperature (30°C) and external atmospheric temperature (20°C) is 10°C, the wattage [illegible] (W/m). Therefore

Heat Quantity Required for The Heater (W)=4.0 (W/m)x1 (m)=[illegible]

(Fig. 2)

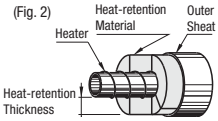


Table 1 When heat-retention thickness is 25mm — Unit: W/m (Watts per 1m of Tube)

Tube Size A	Tube Size B	Temperature Difference between Tube Temperature and External Atmospheric Temperature 10°C	20°C	30°C	40°C	60°C	80°C
15	1/4	4.0	8.1	12.1	16.1	24.4	32.6
20	1/2	4.6	9.2	13.9	18.5	27.6	36.9
25	1	5.4	10.6	16.0	21.4	32.0	42.8
32	1 1/4	6.3	12.5	18.8	24.9	37.5	50.1
40	1 1/2	6.9	13.7	20.5	27.5	41.3	54.9
50	2	8.1	16.1	24.2	32.2	48.4	64.5
65	2 1/2	9.5	19.1	28.6	38.3	57.2	76.4
80	3	10.9	21.6	32.5	43.4	65.0	86.6
100	4	13.2	26.6	39.9	53.3	79.6	126.5
150	6	18.2	36.5	54.8	73.1	109.5	145.9
200	8	23.3	46.5	69.6	92.9	139.1	185.5
250	10	28.1	56.3	84.4	112.5	168.8	225.0

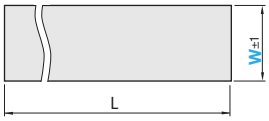
Table 2 When heat-retention thickness is 50mm — Unit: W/m (Watts per 1m of Tube)

Hollow Size A	Hollow Size B	Temperature Difference between Tube Temperature and External Atmospheric Temperature 10°C	20°C	30°C	40°C	60°C	80°C
15	1/4	2.7	5.6	8.4	11.3	16.9	22.5
20	1/2	3.1	6.2	9.4	12.5	18.8	25.5
25	1	3.5	7.0	10.6	[illegible]	21.1	28.1
32	1 1/4	4.0	8.0	12.0	16.1	24.1	32.1
40	1 1/2	4.4	8.6	13.0	17.3	26.0	34.7
50	2	5.0	9.9	14.9	19.7	29.9	39.8
65	2 1/2	5.7	11.5	17.3	23.1	[illegible]	46.0
80	3	6.4	12.9	19.2	25.6	38.5	51.2
100	4	7.6	15.4	23.0	30.8	46.0	61.4
150	6	10.2	20.4	30.6	40.9	61.1	[illegible]
200	8	12.8	25.4	38.1	50.9	76.1	101.4
250	10	15.1	30.4	45.5	60.8	91.0	121.4

Heat Resistant Tapes

RoHS





	Type	M Material: Surface	Heater	Adhesive Part	Heat Resistance Temperature
(1)	MCAT	Aluminum	Glass Cloth	Acrylic Adhesive Material	150°C
(2)	MCTF	Fluoro Resin (PTFE)		Silicon Adhesives	200°C
(3)	MCTFG	Fluoro Resin (PTFE)	Glass Cloth	Silicon Adhesives	200°C

Peel off backing paper to adhere it to an object after peeling off the backing paper. (MCAT only) Wipe off oil and dust on the mating surface before adhering.
Can be cut with a utility knife.

Part Number Type	W (mm)	L (m)	T (mm)	€ Unit Price
MCAT	20	20	0.25	
	50			
MCTF	25	10	0.23	
	50			
MCTFG	25	10	0.18	
	50			

L dimension is in meters.

Characteristic Values of Heat Resistance Tapes
(Listed values are not guaranteed values but reference values.)

Item	MCAT	MCTF	MCTFG
Operation Temperature (°C)	150	200	200
Tensile Strength (N/cm)	24	108	330
Elongation (%)	12.5	20.0	4.7
Adhesive Strength (N/25mm Width)	16	10	12.9

* The adhesive strength means the 180 degree peeling strength. (When adhered to 1.4301/X5CrNi18-10)

Order Example — Part Number: MCAT20

Days to Ship — 8 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~19	20~49
Rate	€ Unit Price	5%

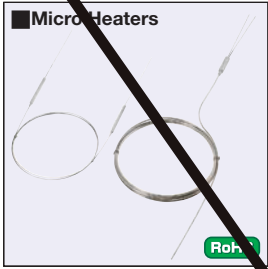
For orders larger than indicated quantity, please request a quotation.

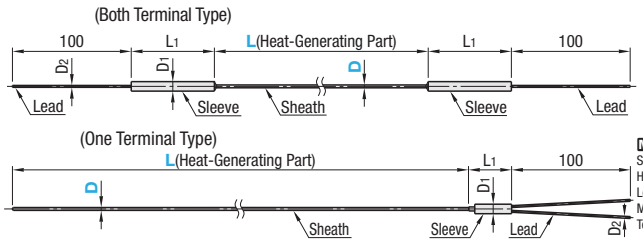
Not Available

Micro Heaters / Silicon Belt Heaters / Silicon Rubber Heaters for Tubes

CAD Data

Micro Heaters

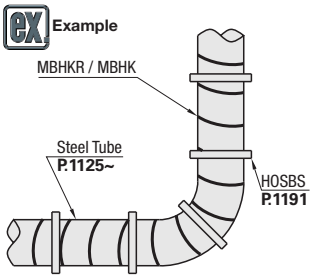




Material:
Sheath body: 1.4401/X5CrNiMo17-12-2
Heat Generator: Nickel heat generator
Lead: Nickel lead
Maximum Operation Temperature: Sleeve: 200°C, Sheath: 600°C

Part Number Type	D	V (Voltage)	W (Electrical Power)	L (Heat-generating Part)	L1	D1	D2	Electrical Power Density (W/cm²)	€ Unit Price
	1.0	100	200	1750	50	5.0	1.0	3.6	
		200	400	3500		6.4			
	1.6	100	300	3000	50	6.4	1.0	2	
		200	600	6000					
	2.4	100	600	3600	70	8.0	1.4	2.2	
		200	1200	7200					
	1.6	100	250	1750	36	6.4	1.0	3.7	
		200	500	2700				3.7	
	2.4	100	400	1900		8.0	1.0	2.7	
		200	800	3800				2.8	

Example



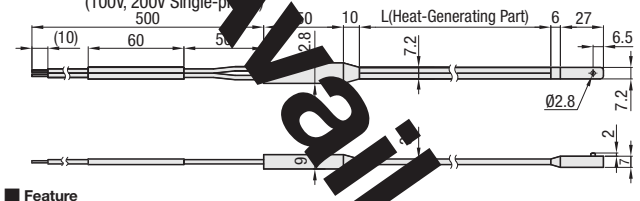
Structure
Insulating powers and a heat generator are hermetic-sealed and enclosed within sheath in the same manner as common thermocouple.

Features
The tube of the heater is extremely thin. This makes it usable for narrow and complicated places.
Enhanced flexibility enables you to change shapes as you want.
Minimum bending radius should be up to 3 times of D dimension.

Precautions for Use
Do not cross the sheath part or contact to the part.
Be sure to use Temperature Control Unit since heat tends to stay by covering with material of low thermal conductivity such as heat insulation material.

Silicon Belt Heaters





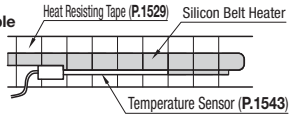
Feature
- Belt type heater with Nickel-chrome wire molded with silicon rubber
- The belt type structure enables to stick to the object closely and
- For Selection Method, refer to **P.1526**

Selection Method: Left Page

Material:
Heat Generator: Nickel-chrome Wire
Coating Material: Silicon Rubber
Lead Wire: Silicon Rubber Film Tin Plated Annealed Copper Wire
Operation Temperature: -50°C ~ 180°C

Part Number Type	No.	L (Heat-generating Part)	V (Voltage)	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price
	1050	1000	100	50	0.7	
	2050	2000	200	50	0.35	
	3100	3000	200	100	0.5	

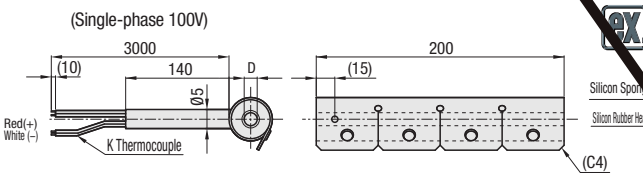
Example



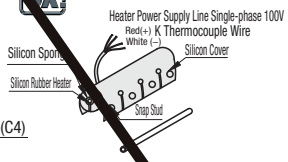
Precautions for Use
- Do not let the heaters run in open air, for that will cause fires and heater element damages.
- Do not install by overlapping the heater.
- Do not use over the rated voltage (V).
- This product is not water-proof. Do not use in places where water splashes or humidity is high.
- Wrap with heat resistant tape from top to use.
- Disconnect the power source before removing the heater unit from the heated object. Do not touch the heater immediately after the removal.
- Use Temperature Control Unit or a Temperature Controller for safety.

Silicon Rubber Heaters for Tubes





Example



Feature
- This silicon rubber heater can be wrapped directly to tubes.
- By wrapping tubes with sheet type silicon heater, the surface of tubes can be heated uniformly.
- Effective to fix the viscosity of fluid by heating the tube and retain the heat, and to prevent dust which sticks to tube surfaces.

Material:
Heat Generator: Silicon Rubber
HeaterCoating Material: Silicon Rubber
Maximum Operation Temperature: 200°C

Part Number Type	No.	D Applicable Hollow Outer Diameter Inch (mm)	V (Voltage)	W (Electrical Power)	€ Unit Price
	6A	1/8 (10.5)	100	23	
	10A	3/8 (17.3)		35	
	15A	1/2 (21.7)		38	

Precautions for Use
- Do not let the heaters run in open air, for that will cause fires and heater element damages.
- Do not use over the rated voltage (V).
- This product is not water-proof. Do not use in places where water splashes or humidity is high.
- Disconnect the power source before removing the heater unit from the heated object. Do not touch the heater immediately after the removal.

Order Example: Part Number MBHKR1.0 - V 1050 - W 100 - L 10A
Part Number MBHKR1.0 - V100 - W200 - L1750

Days to Ship: 10 Days
Express B 5,00 EUR/ piece P.88
A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1	2~4
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.
Please request a quotation for orders of 3 or more pieces of MGLH.

Not Available

Band Heaters / Quartz Far Infrared Heaters

CAD Data

Band Heaters



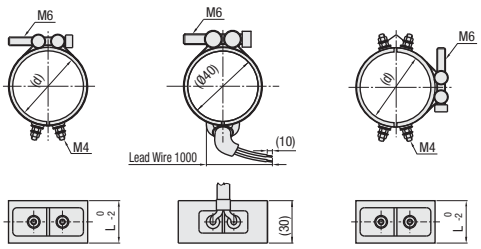


RoHS

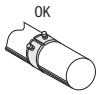
(One-piece)
(Single-Phase 200V)

MBHS40 Only

(Two-piece)
(Single-Phase 200V)

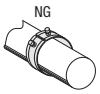


Example



OK

O The heater is closely contacting the heated object.



NG

X The heater is not touching to the heated object.

M Material: Cover of the Heater : 1.4016/X6(8)Cr17
Mica : Insulation : Synthetic Mica

Nickel-chrome Wire : Nickel Chrome Ribbon Wire
Lead Wire : Nickel Copper Coated WireLead Wire Heat Resistance Temperature: 180°C

A Accessory: Insulation Glass (MBHS: 2 pcs. / MBHD: 4 pcs.)

Part Number Type	No.	(d)	V (Voltage)	W (Electrical Power)	Electrical Power Density (W/cm²)	€ Unit Price
	40	40	200	150	4.0	
	50	50		200		
	100	100		250		
	120	120		300	4.0	
	150	150		400		

Order Example: Part Number

Days to Ship: 6 Days P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Features

- The band heater is a thin cylinder heater, coated with stainless steel plate, whose nickel-chrome wire is insulated with the heat-resistant mica board.
- One-piece type and two-piece type are available for different diameters of the heated object.
  One-piece Type: Suitable for the cylinder of small diameter. 1 unit (2 pcs.) of terminals are included.
  Two-piece Type: Suitable for the cylinders of relatively large diameter. 2 units (4 pcs.) of terminals are included.
- Max Operation Temperature: 300°C

Usage

-Band heater can be used for cylinder shaped heated objects (work).
-Principal usages are: Heating of hot nozzles, pipes and cylinder shaped metal plates

Precautions for Use

- Do not let the heaters run in open air, for that will cause fires and heater element damages.
- Apply electric power under the condition in which an object such as metal to be heated is attached to the heater.
- Attach the object so that the heater comes into close contact with the surface to be heated. A gap will cause premature breakage of wire.
- After installation, energize it for several minutes, and tighten them once more after heated. At that time, take care not to be burnt.
- The heater is not waterproof. Avoid water splashes on the heaters.
- Do not use over the rated voltage (V).
- Use the temperature controller for safety.
- Do not mount One-piece Type flat. (Put the heated object through the heater.)

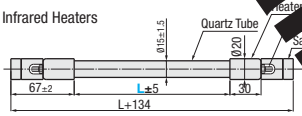
Quartz Far Infrared Heaters



RoHS

(Quartz Far Infrared Heater + Reflection Mirror + Mounting Holder 2 pcs.) Single-phase 100V/200V
(Quartz Far Infrared Heater) Single-phase 100V/200V

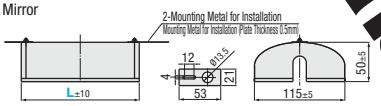
- Quartz Far Infrared Heaters



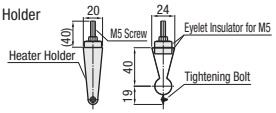
- Quartz Far Infrared Heaters
  M Materials:
  Quartz Tube : Quartz Glass
  Heater Cap : Brass + Nickel
  Plating Terminal : 1.4305/X10CrNiS18-9

- Reflection Mirror
  M Materials:
  Reflection Mirror: A1050
  Side Plate: A1050
  Holder Mounting Metal Fitting: 1.0038/S235JR + Ni Chrome Plating

- Reflection Mirror



- Mounting Holder



The customer should assemble the MPHHS (set), which is a set of quartz far infrared heater, reflection mirror and mounting holder.

How to Mount

(1) Fix the "mounting holder" to the "mounting metal" installed on the reflection mirror.
(2) Fix the reflection mirror and mounting holder to the designated place by using the screw for mounting holder or by drilling holes on reflection mirror body.
(3) Fix the "mounting holder" of quartz far infrared heater by "mounting holder". Do not fix it by "quartz tube" or "safety insulator".

Caution on Installation

- After heating, tighten the nuts once more. (By heat expansion, it may be loosened.)
- Additional tightening of the tightening bolt is recommended to only one side as Quarts Far Infrared Heater may be broken due to the different coefficient of heat expansion.

Part Number Type	L (Effective Length) 10mm Increment	V (Voltage) Selection	W (Electrical Power)	€ Unit Price	
(Set)	150~240	100	250		
	250~340	100	400		
		200	500		
	350~440	100	500		
		200	500		
(Quartz Far Infrared Heater only)	450~540	100	600		
		200	600		
	550~600	100	1000		
		200	800		

Order Example: Part Number - L - V
- 150 - V100

Days to Ship: 13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~10	11~15	16~20
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Features

- The quartz far infrared heater has Nickel-chrome wires wrapped inside the quartz glass tube, which irradiate far infrared ray to the heated objects.
- Although its function is similar to that of far infrared ceramic heaters, compared with ceramic heater it has the features as follows: (1) Rise/Drop in temperature are quick after the power is supplied (2)Relatively broad heat distribution (3) Irradiated heat direction is easily controllable
- The far infrared ray uniformly heats the surface and interior of the object.
- The temperature adjustment can be done by adjusting the distance to the heated object.
- This is a clean heater with little dust scattering. The used quartz tube has excellent chemical resistance.
- By using the reflection mirror, the irradiation direction of far infrared ray can be controlled, and more effective heat radiation can be obtained.

Notes on Use

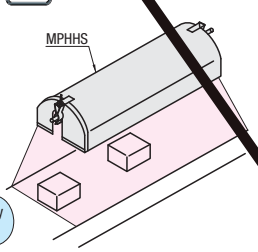
- These products are made of glass. Be extremely careful with handling, since it is easy to break. Turn off the power immediately when broke during operation.
- These products are for horizontal (lateral) use. Not usable in position of vertical (standing positioned) and slant (oblique positioned).
- This heater becomes very hot. It may result in burn injury if touched while light is on or immediately after lights-out.
- The cap part (insulators on both ends of quartz tube) should be used at the temperature lower than 100°C.
- Do not touch the glass tube by bare hand. Sodium from sweat decreases the mech. strength of quarts tubes.

Usage

- Desiccation of the Base and Material
- Baking Finish and Desiccation of the Coat
- Baking (Processing), Dehydration and Desiccation of Food

Because infrared ray heats the object directly through no air, it is more efficient.

Example



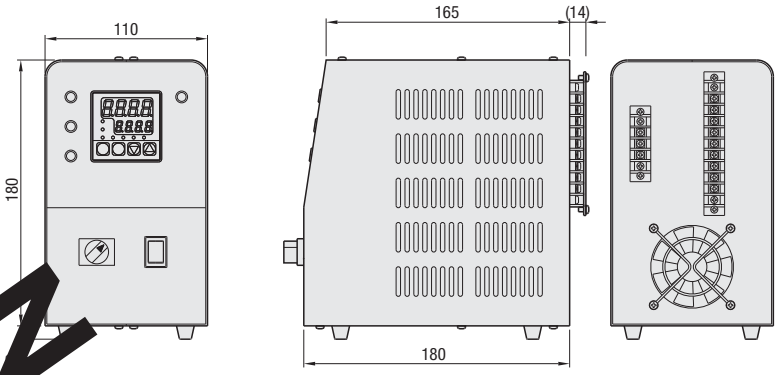
Not Available

Peltier Cooling Unit Controller

CAD Data

Features: Special controllers designed to adjust the temperature of Peltier Cooling Unit **P.1533**. Excels in high precision control.





Part Number	€ Unit Price 1 ~ 2 pcs.

For orders larger than indicated quantity, please request a quotation.

Order Example — Part Number

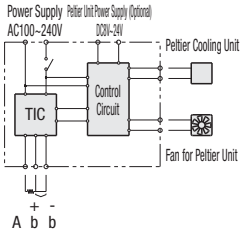
Days to Ship — 8 Days

In	Thermocouples (K · J · R · T · N · S · B) Temperature Measuring Resistor(Pt100 JPt100)
Co l Method	With auto tuning PID control, with self tuning PID control, ON/OFF control
Indication Ac (Thermocouple)	The bigger one of ±0.3% of specified value + 1 digit or ±2 Degrees (Celsius)
Indication uracy (Temp. Measuring Resistor)	The bigger one of ±0.3% of specified value +1 digit or ±0.9 Degrees (Celsius)
Indication ccuracy Maintenance Temp. Range	Ambient Temperature: 23±10°C
Display Breakdown Capabili	0.1° (Celsius)
Range of Set T ure	-30° (Celsius) ~ 120° (Celsius)
Proportional Control (	0.1~200%
Integration Time (I)	0 ~ 3,600 sec.
Derivative Time(D)	0 ~ 3,600 sec.
Peltier Driving Method	PWM driving
Power Supply	Supplied externally (DC9 ~ 24V)
Consumption Current	15VA
Peltier Driving Capability	DC24V 7A (maximum in regular time)
Operating Environment	Indoors
Operating Temp. Range	+10 ~ 40°C
Operating Humidity Range	85% or less (No condensation)
Sampling Frequency	500mS
Storage Element	EEPROM
Power Supply Voltage	00 ~ 240V (Allowable voltage change range 85 ~ 264V)
Power Consumption	15VA (maximum)
Mass	Approx. 2.7kg

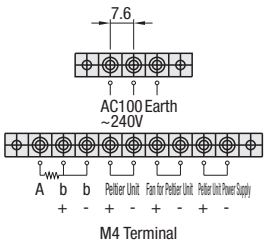
Overview

Peltier Cooling Unit (**P.1533**) Temperature adjustment controllers capable of heating/cooling control o ling Units. Suitable for not only small chiller and experiment machine but also building into device owing to the compact design specialized in control fun . (Power source needs to be obtained by customer.)

Circuit



Connection



Precautions for Use

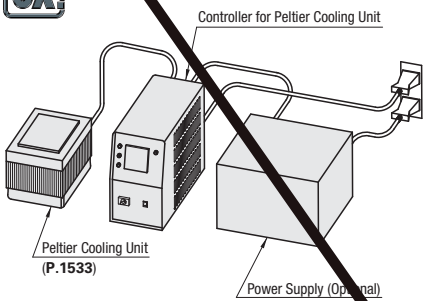
Only one Peltier Cooling Unit (**P.1533**) can be connected to one con ller.

DC power source or power plug is not included.

- Sensor Input Types and Sensor Range

	Sensors	Lower to Upper	LimitSetting of Decimal Point
00	K Thermocouple	-200~1372	-199.9~990.0
01	J Thermocouple	-200~850	-199.9~850.0
02	R Thermocouple	0~1700	
03	T Thermocouple	-200~400	-199.9~390.0
04	N Thermocouple	-200~1300	-199.9~990.0
05	S Thermocouple	0~1700	
06	B Thermocouple	0~1800	
08	Pt100Ω	-199~500	-199.9~500.0
10	JPt100Ω	-199~500	-199.9~500.0
11			

Exampl



Warranty

Warranty Period: One year from the shipping date

Warranty Condition: Please present the guarantee card included at the time of delivery.

Coverage of Warranty: Problems or damages arising through the normal usage in compliance with the instruction manual included at the time of delivery. If trouble occurs during the warranty period even though the unit has been operated in the normal manner, we will recover and repair or replace the unit.

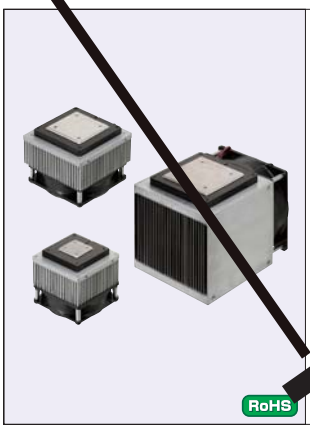
In the following cases, repairs are for consideration. We will recover the product and make an quotation.

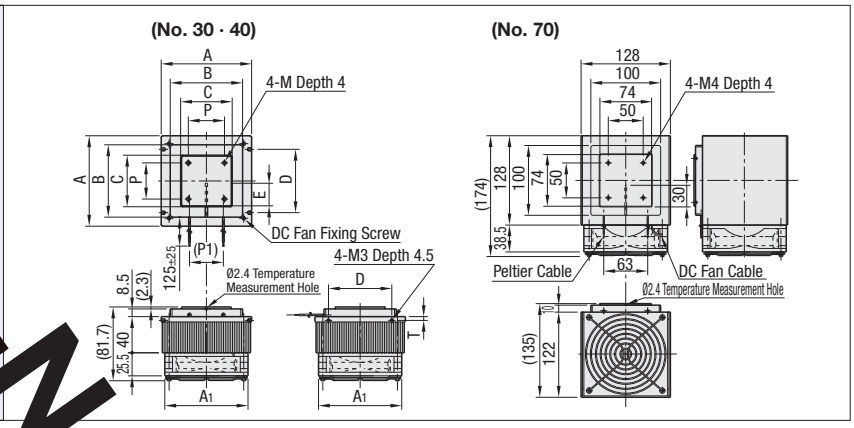
(1) When the damage caused by the factors out of warranty range and the product is repairable.

(2) When the damage has occurred beyond the warranty period and the product is repairable.

Not Available

Peltier Cooling Unit





RoHS

Part Number Type	No.	A	A1	B	C	D	P	(P1)	E	M	Mass (g)	€ Unit Price Qty. 1~3
	30	80	80	60	30	50	40	24	15	M3	450	
	40	100	92	80	55	70	40	38	25	M4	700	
	70	-	-	-	-	-	-	-	-	-	2300	

For orders [illegible] quantity, please request a quotation.

Order Example: Part Number

Days to Ship: 6 Days P.87

Specification

No.	30	40	70
Cooling Capacity [W]	18	35	[illegible]
Max. Temperature Gaps [°C]	48	45	[illegible]
Peltier Heat Resistance Temperature [°C]	120		
DC fan Allowable Temperature [°C]	70		
Heating Capacity [W]	36	70	14[illegible]
Rated Voltage [V]	12	12	24
Starting Current [A]	4	6.3	6.5
Noise [dB]	35	37	39
Allowable Load [N]	200	300	500
Operating Ambient Temperature Range [°C]	-20~+70		
Operating Ambient Humidity [%RH]	85 or Less		

(Terminology)
- Cooling capability...The amount of heat it can remove (cool) at full capacity. Please choose Unit No. so that the heat amount is at cooling capability or less. (Refer to how to select on the right page.)
- Maximum temperature difference...It is temperature difference between room temperature and the cooled surface. It might vary depending on the room temperature.
  Ex.: With No. 30, and at room temperature 25°C the maximum controllable operation temperature is 25-48= -23°C

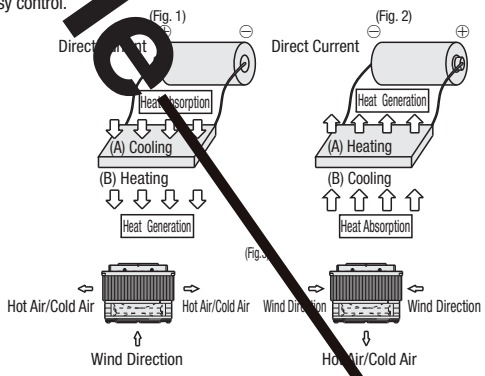
(P) The values are representative values and not guaranteed.
(P) Allowable load is a value when load is applied evenly.
Do not apply unbalanced load.
(P) When the upper temperature limit for the Peltier itself is 120°C, be sure to operate at the temperature which does not exceed the allowable temperature (70°C: temperature for continuous use) for DC fan.

Features

- A unit product has brought ease of use of a Peltier device which simultaneously provides cooling and heating by direct-current.
- Using in combination with a controller designed for Peltier Cooling Unit (**P. 1532**) enables easy control.

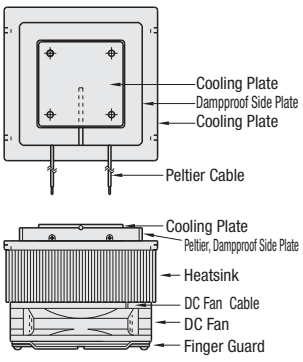
Principle

With a DC current, temperature difference occurs on the Peltier element, and A side will be cooled, and B side will be heated (Drawing 1). If the electrical polarity is reversed, A side will be heated and B side will be cooled. (Fig. 2)



Basic Structure

A unit product with DC fan and heat sink assembled in a Peltier device.



Parts	Material
Peltier	Semiconductor device having Bismuth Telluride as chief material packaged with ceramic
Heat sink	EN AW-6063/AlMg0,7Si
DC fan	ABS - PBT Synthetic-resin
Cooling plates	EN AW-5052/AlMg2,5

As for direction of the wind, as Figure 3 shows, it can be used from any direction. (heat efficiency is same.)

Precautions for Use

(P) Please do NOT stop heat radiation fan while using Peltier Cooling Units. It might cause damage because of the rise of temperature of Peltier element.
(P) Please ensure to connect power source to correct polarity. Observe the voltage remains within the rated value. If it is below the standard, the heat radiation fan might stop.
Combination use with Misumi's Cooling Peltier controller (**P. 1532**) is recommended for safety use.
(P) Be sure that impact or excess load is not applied to the Peltier device. (Please refer to allowable load of below specifications.)
(P) Apply insulation to cooling surface to prevent due condensation. Wipe off water droplet when condensation occurs. Continuous use might cause inside erosion because of the water infiltration into Peltier element.
(P) Please insert temperature sensor into Ø2.4 hole for temperature measurement and fix it with silicon adhesive bond or similar things.

Not Available

Selection Method: This is a calculation when most appropriate heat exchanger is used at a cooling side. Values change depending on performance of heat exchanger.

Ex.) To lower current temperature (Tr) = 25°C to achieving temperature inside the cooling box (Tc) = 5°C

1)Obtain the surface area S(m^2) of the box to cool.
Ex.) For a box with inner dimensions of 270x210x420(mm)
S(m^2)=(0.27x0.21+0.42x0.21+0.42x0.27)x2=0.52(m^2)

2)Calculate the heat Q_1(W) that comes in via heat insulating material by the following formula.

$$Q_1(W)=\frac{\text{(Current Temperature T(r°C) - Achieving Temperature Tc (°C)) x Heat Conductivity K (W/m-K) x Surface Area S (m}^2\text{)}}{\text{Thickness of Insulating Plate T (m)}}$$

Ex.) Urethane form used as insulator. Thermal conductivity (K) = 0.03 (W/m - K), thickness (T) = 30 (mm) = 0.03 (m).

$$Q1(W)=\frac{(25(°C)-5(°C)x0.03(W/m-K)x0.52(m^2)}{0.03(m)}$$

=10.4≈10(W)

3)Determine the heat generated by the stirring fan and the amount of loss from heat exchange Q_2(W).
Ex.) Q_2=10(W)
(Though it is difficult to obtain precise figures as these differ depending on fan type or insulating property, general value range is 5 ~ 15(W). When fan speed is decreased value of Q_2 is reduced.)

4)Determine the heat generated by the heat source in the IC Q_3(W).
Ex.) Q_3=5(W) when a motor generating 5 watts of heat is in the box.
(Applicable only when there is a heat source such as a motor or IC board. When the box is empty Q_3=0(W))

5)Calculate the total heat amount U(W). (Appropriate safety coefficient is 0.6 ~ 0.8.)

$$U(W)=\frac{(Q_1+Q_2+Q_3)}{\text{Safety factor}}=\frac{(10+10+5)}{0.7}$$

=35.7≈36(W)

6)Choose the best unit from the heat absorption property of the unit in the graph.
Ex.)Choose No.70 whose heat absorption capacity beyond 40W on the ΔT (Tr-Tc) = 20°C line.

$$Q1(W)=\frac{(25(°C)-15(°C)x0.03(W/m-K)x0.031(m^2)}{0.03(m)}$$

=0.31(W)≈0.3(W)

3)Determine the heat generated by the stirring pump and the amount of loss from heat exchange Q_2(W).
Ex.) Q_2=10(W)
(Though it is difficult to obtain precise figures as these differ depending on fan type or insulating property, general value range is 5 ~ 15(W). The values of Q2 is also lowered by decreasing the pump output.)

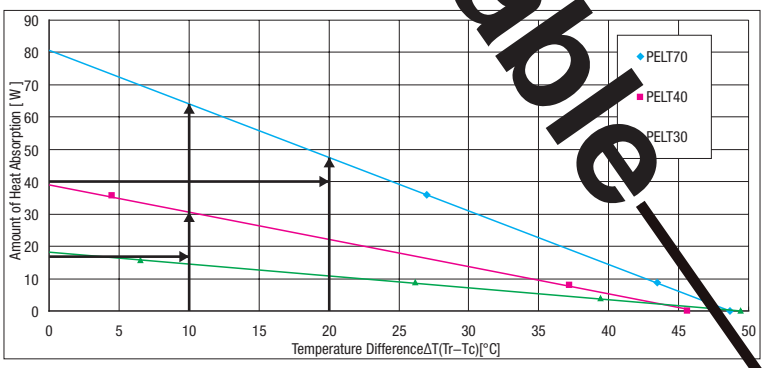
4)Determine the heat generated by the heat source in the water tank Q_3(W).
Ex.) When the water tank is empty Q_3=0(W)
(When heat source is in the water tank define its calorific value as Q_3(W).)

5)Calculate the total heat amount U(W). (Appropriate safety coefficient is 0.6 ~ 0.8.)

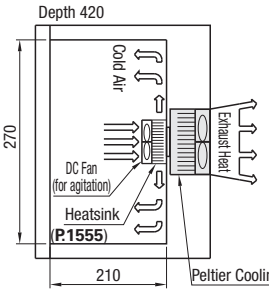
$$U(W)=\frac{(Q_1+Q_2+Q_3)}{\text{Safety factor}}=\frac{(0.3+10+0)}{0.6}$$

=17.2≈17(W)

6)Choose the best unit from the heat absorption property of the unit in the graph.
Ex.)Choose No.40 whose heat absorption capacity beyond 15W on the ΔT (Tr-Tc) = 10°C line.

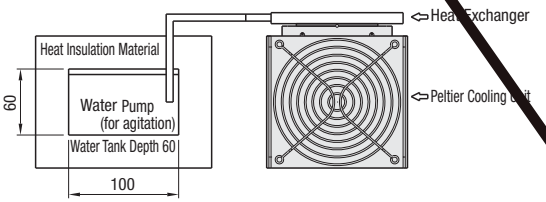


Example



(Example at the time of cooling)

*DC fan (for agitation) shall be provided at customer's end.



* Heat Exchanger will be provided at customer's end.

(At the time of cooling)

Not Available

Jet Air Coolers

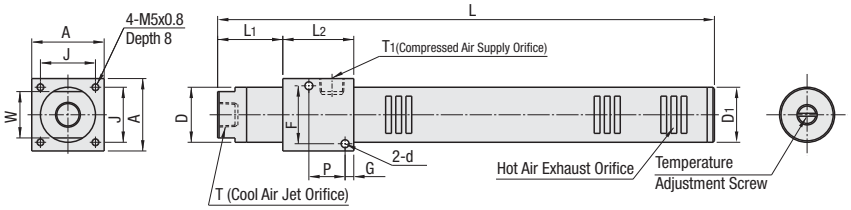
-Standard · Compact, Low Temperature-

RoHS

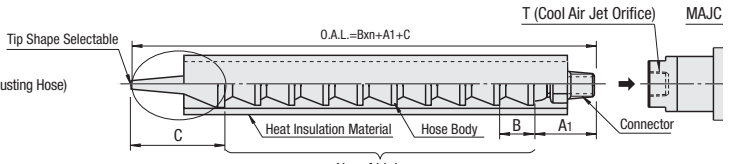




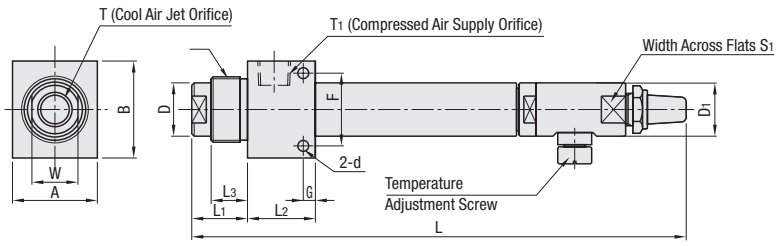
MAJC (Standard)



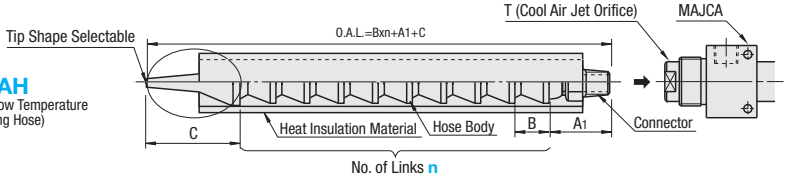
MAJCH (Standard with Adjusting Hose)



MAJCA (Compact, Low Temperature)



MAJCAH (Compact, Low Temperature with Adjusting Hose)



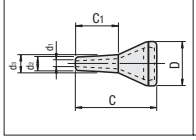
Material:

Heater: MAJC: EN AW-6063/AlMg0,7Si
EN AW-6061/EN AW-AlMg1SiCu
Heat Insulation Material: EPDM Synthetic

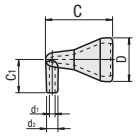
Hose Body : Polyacetal (Blue)
Connector - Tip Nozzle : Polyacetal (Orange)

Heat Resistant Temperature of Adjusting Hose -20~80°C
Jet Orifice : Polyacetal (White)
Rubber (Operation Temperature) : -50~120°C

■Tip Shape (A3)

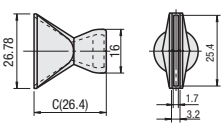


■Tip Shape (B3)

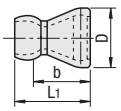


■Tip Shape (D1)

D-shape is for No.150 - 300 only.



Hose Body (1 Link)



■Hose Body and Connector Sizes

No.	D	A1	B	L1
150·300	16	23	14.5	20.7
450·600	24.5	28	17.0	30.0

■Tip Shape Diameters

No.	A3						B3				
	C	C1	D	d1	d2	d3	C	C1	D	d1	d2
150·300	35	25.5	16	6.3	9.6	11.0	26.3	12	16	6.3	9.0
450·600	37.5	24.5	24.5	12.5	17.0	19.0	39.0	19.5	24.5	12.4	15.4

Part Number Type	No.	L	D1	L1	D	W	T RC (PT)	L2	F	P	G	T1 RC (PT)	d	A	B	M	J	L3	S1	Operating Pressure (Mpa)	Pressure Resistance (Mpa)	Mass (kg)	€ Unit Price
(Standard) MAJC	150	228	25	26	22	19	1/8	31	26	12	5	1/8	4.5	35	-	-	25	-	-	0.2~0.5	1.0	0.25	
	300	315	30	31	28	24	1/4	38	33	18	5	1/4	5.5	40	-	-	30	-	-			0.45	
	600	343	38	45	38	32	3/8	49	40	25	6	3/8	5.5	50	-	-	38	-	-			0.85	
(Compact, Low Temperature) MAJCA	150	198	20	21	20	17	1/8	24	24	-	5	1/8	4.5	30	35	M24x1.5	-	13	18	0.3~0.7	1.0	0.2	
	300	204	22	23	22	19	1/4	28	30	-	5	1/4	4.5	35	40	M27x1.5	-	15	19			0.25	
	450	272	32	27	30	26	3/8	37	36	-	7	3/8	6.6	40	50	M33x1.5	-	15	27			0.55	
	600																						

Part Number Type	No.	Link No. n Configurable	Tip Shapes Selection	Hose Body Hose Inner Dia.	D	B	L1	Jet Cooler € Unit Price	Connector € Unit Price	Link € Unit Price	Tip Shapes € Unit Price A3	B3	D1
(Standard with Adjusting Hose) MAJCH	150	0~30	A3·B3·D1	1/4 Inch	16	14.5	20.7						
	300												
	600		A3·B3	1/2 Inch	24.5	17.0	30.0						
(Compact, Low Temperature with Adjusting Hose) MAJCAH	150	0~30	A3·B3·D1	1/4 Inch	16	14.5	20.7						
	300												
	450		A3·B3	1/2 Inch	24.5	17.0	30.0						
	600												

Order Example

Part Number		Link No. n		Tip Shapes
MAJC150 MAJCH300	-	10	-	D1

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

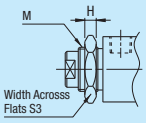
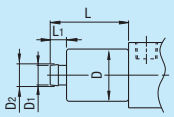
- MAJC · MAJCA: 6 Days P.87
- MAJCH · MAJCAH: 10 Days

Price Calculation Example (Ex.) For MAJCH300-10-D1
(Jet Cooler € Unit Price) + (Connector € Unit Price) + (Link € Unit Price) x (No. of Links) + (Tip Shape Price)
240,00 + 2,30 + 0,70 x 10 + 7,00 = 256,30 EUR

Alterations

Part Number	-	Link No.	-	Tip Shapes	-	(N · S)
MAJCA150					-	S
MAJCAH150	-	11	-	D1	-	N

- MAJCA: 6 Days
- MAJCAH: 10 Days

Alterations	With Hexagon Nut	With Silencer
		
Code	N	S
Spec.	Hexagon nut is included. Ordering Code N ⊗Not applicable to MAJC and MAJCH. Dimension of a Hexagon Nut	A silencer is included Ordering Code S Applicable to MAJCA (Compact, Low Temperature) only. Silencer Dimensions
Price Adder	No.150: EUR 18,00 No.300 · 450 · 600: EUR 21,00	No.150: EUR 18,00 No.300: EUR 20,00 No.450 · 600: EUR 26,00

Dimension of a Hexagon Nut

No.	M	H	S3
150	M24x1.5	7	32
300	M27x1.5	7	36
450	M33x1.5	10	46
600			

Silencer Dimensions

No.	L	L1	D	D1	D2
150	60	10	30	10	11
300	63	10	32	12	13
450	81	15	40	14	15
600					

■Features

- The jet air cooler is a cool air generating device without moving part, which applies the principle of vortex theory.
- Supplied compressed air jets out air which is up to 40°C in MAJC and up to 60°C in MAJCA cooler than the temperature of the supplied air.
- Neither refrigerant nor electricity is used.

■Precautions for Use

- In air supply, use the air filter and reducing valve.
- Use an air dryer to avoid from freezing when using at low temperature. Pay attention to the surrounding components when condensation on the tip of the hose occurs water droplet.
- Adjusting Hose Type should be used at temperature -20°C or higher.
- Please read the manual and use the product correctly.

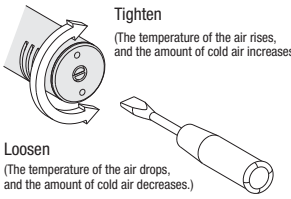
* Especially for MAJCA and MAJCAH, the temperature of parts marked with mesh may rise up to 70°C, depending on conditions of use, when air temperature at the entrance is 20°C. Be sure to avoid burn injury.



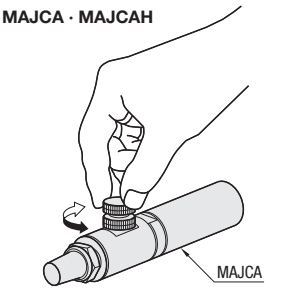
■Usage

- Forced cooling of solder
- Forced cooling of resin casting
- Cooling on plastic processing.

■Temperature Adjustment Method MAJC · MAJCH



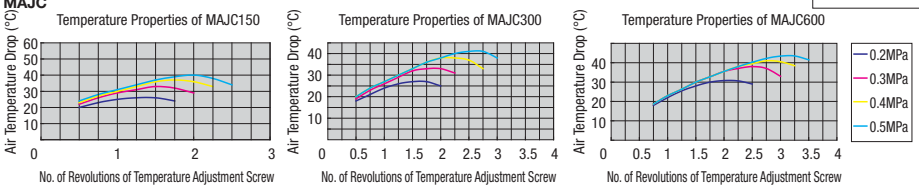
MAJCA · MAJCAH



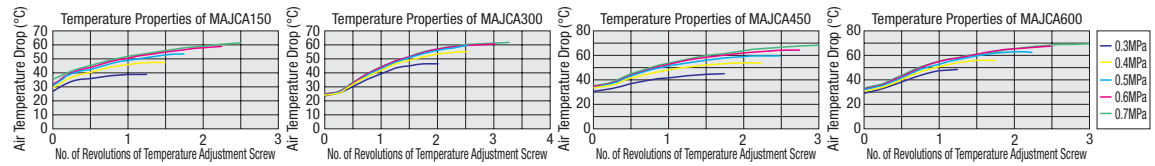
■Temperature Property

* The air descent temperature is the descent temperature against the air temperature at the entrance.

MAJC

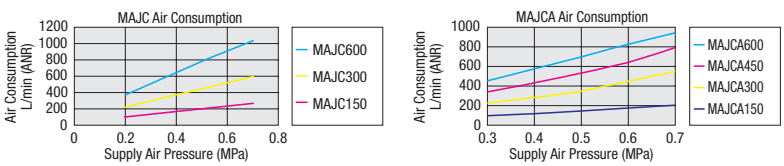


MAJCA

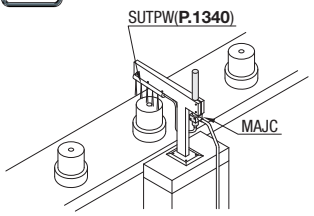


No. of Revolutions of Temperature Adjustment Screw is obtained by turning a screw from the clockwise end to the counterclockwise end.

■Air Consumption



Example



Temperature Sensor Guide / Connecting parts for Temperature Sensor

■Overview

In Misumi's Temperature Sensor line, we offer thermocouples (K Thermocouple and J Thermocouple) and temperature measuring resistors by shape and application. Refer to the following abridged temperature sensor selection list when selecting your heater.

[Abridged Table for Temperature Sensor Selection]

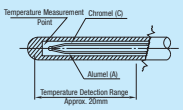
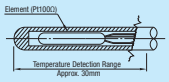
Shape - Application	Type
Sheath / Protection Tube	Standard (**P.1538**)
	Compact / Tapered Thread (**P. 1541**)
	Flange (**P. 1542**)
	Configurable Sheath · Protection Tube (**P. 1541**)
Use for a moving part	Lead Wire Protection (**P. 1540**)
	Sheath Type for Moving Parts (**P. 1542**)
	Ring Type for Moving Parts (**P. 1544**)
	Screw Mount Type for Moving Parts (**P. 1545**)

Usage	Type
For space-saving	L-shaped (**P. 1540**) / Screw Mount Type (**P. 1545**)
	With Tongue Terminals - Ring Type / Spade Type (**P. 1544**)
For specific environments	Heat Resistant Type (**P. 1540**) / Chemical Resistant Type (**P. 1543**)
For easy replacing at the time of wire breakage	Connector Type (**P. 1543**)
To take 2 temperature signals from temperature measuring point	Double Element Type (**P. 1543**)
For measuring cylindrical works	Band Type (**P. 1545**)
For close contact to a temperature measuring part	Spring Pressure Welded Type (**P. 1546**)
For measuring temperature of work surface	Surface Temperature Measurement Type / Magnet Type (**P. 1546**)

⚠Precautions for Use

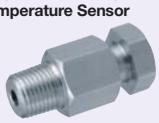
- (Bending of Sheath/Protection Tube Type) Sheath type can be bent (min. bending radius: sheath dia. x 5). However, temperature detecting part (20mm from the tip) cannot be bent. Protection Hollow Type cannot be bent. Bending prevents it from accurate temperature measurement.
- Compensation wire (**P.1547**) must be used to extend lead wires of thermocouple. For Temperature Measuring Resistor, use the same three lead wires in diameter, length and material.
- Be sure to use each part within its heat resisting temperature listed on product pages. Note that the wire might be broken if the temperature exceeds its heat resisting temperature even if it has higher maximum measurement temperature.
- Do not apply large external forces and vibrations.
- Be sure to use sleeve, silicon tube and connector within respective allowable temperatures.

- Comparison of Thermocouple and Temperature Measuring Resistor

	K Thermocouple (J Thermocouple)	Temperature Measuring Resistor
Advantage	- Excellent in heat reaction - Strong against vibrations and impacts - A wide range of measurable temperature	- High accuracy of temperature measuring - Connectable to regular wires
Disadvantage	- Accuracy of measurement temperature is slightly lower. - Compensation wire must be used.	- Expensive - Weak against vibrations and impacts
Precision	(For Class 2 (JIS)) -40°C~Less than 333°C : ±2.5°C 333°C or more : ±0.75°C (Refer to each product page for the range of temperature measurement.)	±0.3°C or ±0.5%
Structure Diagram		

(Schematic is for Sheath / Protection Tube.)

■Plugs for Mounting Temperature Sensor



■Temperature Sensors Mounting Holder



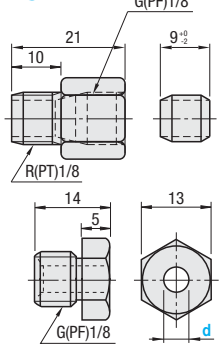
■Temperature Sensors Mounting Bolt



RoHS

Plugs for Mounting Temperature Sensor

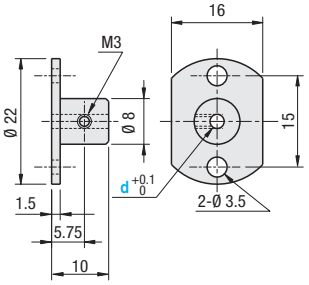
MSPL



M Material: 1.4301/X5CrNi18-10

Holders for Mounting Temperature Sensor

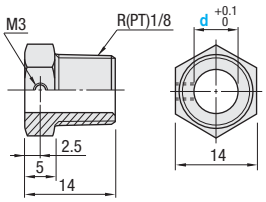
MSNFG



M Material: 1.4305/X10CrNiS18-9
A Accessory: Hexagon Socket Set Screws (1.4301/X5CrNi18-10)

Mounting Bolt for Temperature Sensor

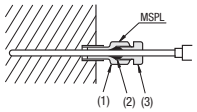
MSPB



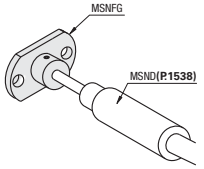
M Material: 1.4305/X10CrNiS18-9

Part Number		€ Unit Price	
Type	d	MSPL	MSNFG
MSPL MSNFG	1.0		
	1.6		
	2.3		
	3.2		
	4.8		

Example



Cut the 1/8 R (PT) thread in the heated object, fix the (1), and insert the sensor after tightening the (2) and (3) temporarily. Tighten (3), and fix (2) and (3).
*Because (2) and (3) are unified after fixing, they cannot be removed and reused after tightening.
*When air-tightness is necessary, use Taper Screw Type on **P.1541**



Highly suitable for changing the position of sensor according to the situation.

Order Example

Part Number
MSPL1.6
MSNFG2.3
MSPB3.2

Days to Ship

MSPL: 6 Days P.88

MSNFG · MSPB: 8 Days | Express A | 2,00 EUR/ piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.
Express Service is not available for MSPB.

Price

■Volume Discount (Round down to one Cent.) **P.87**

- MSPL · MSNFG

Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

- MSPB

Quantity	1~9	10~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

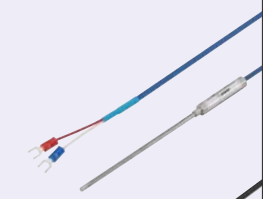
Temperature Sensors
-Standard Type-

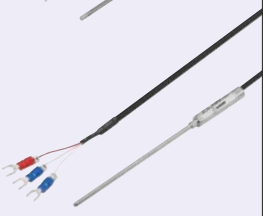
CAD Data

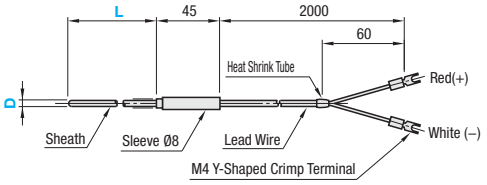
Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P.1537**

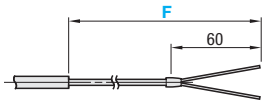
■Temperature Sensors

RoHS









Terminal Selection

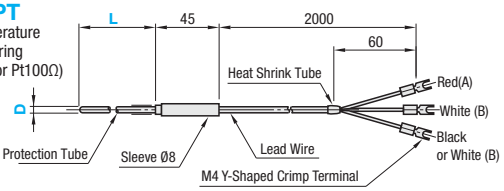
N (No Crimp Terminal)

M (With Round Crimp Terminal)

Y (With Y-Shaped Crimp Terminal

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Temperature Measurem. Range	Ø1.0, 1.6	0~650°C
	Ø2.3	0~650°C
	Ø3.2	0~750°C
	Ø4.8	0~800°C
Material	Sheath	1.4401
	Sleeve	1.4301
Heat Resistance Temp. of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)

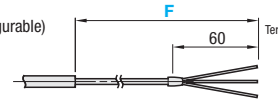
MSPT
(Temperature Measuring Resistor Pt100Ω)



MSPT / MSPTFL

Type of Device		Pt100Ω
Precision		JIS Class B
Lead Type		3-lead Type
Measurement Temp. Range		0 ~ 300°C
Material	Protection Tubes	1.4401
	Sleeve	1.4301
Heat Resistance Temp. of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Vinyl Coating (0 ~ 60°C)

MSPTFL
(Length of Lead Wire (F) Configurable)
(Temperature Measuring Resistor Pt100Ω)



Terminal Selection

N (No Crimp Terminal)

M (With Round Crimp Terminal)

Y (With Y-Shaped Crimp Termina

Part Number Type	D	L Selection	only Lead Wire Length F 0.1m Increment	only Terminal Selection	€ Unit Price	€ Unit Price Sensor Body Price € Unit Price F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	Price for Additional Terminal N	M	Y
	0.5	30, 50	-										
		100, 150											
		200, 300											
	1.0	30, 50, 100	0.3~5.0	N M Y									
		150, 200											
		300											
	1.6	30, 50, 100											
		150, 200											
		300											
	2.3	30, 50, 100											
		150, 200											
		300											
	3.2	30, 50, 100											
		150, 200											
		300											
	4.8	50, 100	-										
		150, 200											
		300											

Part Number Type	D	L Selection	MSPTFL only Lead Wire Length F 0.1m Increment	MSPTFL only Terminal Selection	MSPT € Unit Price	MSPTFL € Unit Price Sensor Body Price F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	Price for Additional Terminal N	M	Y
MSPT MSPTFL	1.6	50, 100	0.3~5.0	N M Y									
		150											
	2.3	50, 100											
		150											
	3.2	50, 100											
		150											

Order Example

Part Number	-	L	-	F	-	Terminal
	-	100				
MSPT2.3	-	50				
	-	300	-	F2.5	-	M

Days to Ship

· MSPT: 6 Days P.88

· MSPTFL: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

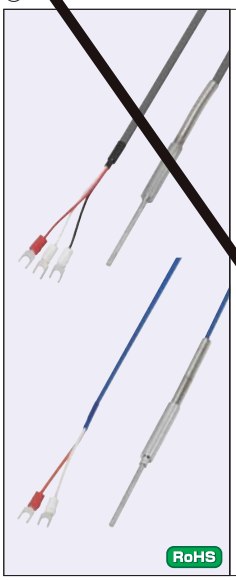
Volume discount rate is applicable to the price of sensor body only.

The upper limit temperature for measurement is the value at the temperature measurement point (the tip of sheath). When measuring, keep the sleeve temperature at or below the heat resistance temperature (80°C.) If the sleeve temperature exceeds 80°C, the thermally-expanded inside of sleeve may break the wire. Especially when a heated object temperature exceeds 100°C, a long type of sheath L length is recommended, which is used to put maximum distance between the sleeve and the heated object, or Temperature Sensor, Heat Resistant Type (**P. 1540**) is recommended.

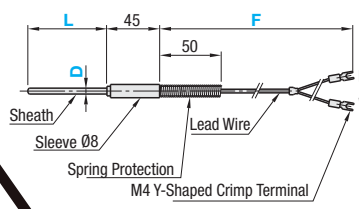
Temperature Sensors
-Sheath - Lead Wire Length Configurable Type-

CAD Data

Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P. 1537**.



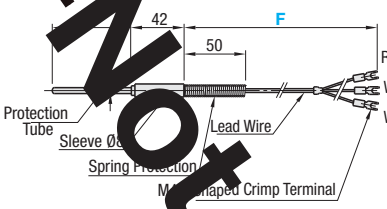
(K Thermocouple)
(J Thermocouple)



Terminal Selection
- N (No Crimp Terminal)
- M (With Round Crimp Terminal)
- Y (With Y-Shaped Crimp Terminal)

		K Thermo-couple	J Thermo-couple
Type of Thermocouple			
Precision		JIS Class 2	
Temperature Measurement Contact Point		Isolated Neutral Type	
Temperature Measurement Range	Ø1.0, 1.6	0~650°C	0 ~ 450°C
	Ø3.2	0~750°C	0~650°C
	Ø4.8	0~800°C	0~750°C
Material	Sheath	1.4401/ X5CrNiMo17-12-2	
	Sleeve	1.4301/X5CrNi18-10	
Heat Resistance Temperature of Sleeve		80°C	
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)	

(Temperature Measuring Resistor (Pt100Ω))



Terminal Selection
- N (No Crimp Terminal)
- M (With Round Crimp Terminal)
- Y (With Y-Shaped

Type of Device		Pt100Ω
Precision		JIS Class B
Lead Type		3-lead Type
Measurement Temperature Range		0 ~ 300°C
Material	Protection Tubes	1.4401/ X5CrNiMo17-12-2
	Sleeve	1.4301/X5CrNi18-10
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Vinyl Coating (-20~70°C)

RoHS

Not Available

■K Thermocouple - J Thermocouple

Part Number Type	Part Number D	L 10mm Increment	Lead Wire Length F 0.1m Increment	Terminal Selection
(K Thermocouple)		50~200	0.3~5.0	N M Y
		50~500		
(J Thermocouple)		50~1000		
		50~1500		

■(Temperature Measuring Resistor Pt100Ω)

Part Number Type	Part Number D	L 10mm Increment	Lead Wire Length F 0.1m Increment	Terminal Selection
(Temperature Measuring Resistor)		50~500	0.3~5.0	N M Y

Order Example: Part Number - L - F - Terminal
- 170 - F2.5 - M

<Price calculation example>
42,40+3.6[170-50]/10=46,72 EUR

Days to Ship: 10 Days

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~5	6~9
Rate	€ Unit Price	5%

Volume discount rate is applicable to the price of sensor body only.

The max[illegible]perature of measurement is only a value of measurement point (end of Sheath). As for the actual te[illegible]erature measurement, please be careful so that the temperature of Sheath will not excel the heat resistance [illegible] (80°C) might cause disconnection because of the swell caused by heat inside the sleeve.
Especially when a h[illegible] object's temperature exceeds 100°C, a long type of sheath L length is recommended, which is used to p[illegible] aximum distance between the sleeve and the heated object, or Temperature Sensor, Heat Resistant Type (**P.15[illegible]**) is recommended.

D	L	Sensor Body Price € Unit Price F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	Price for Additional Terminal (€ Body+) N	M	Y
	50~100						0		
	110~200								
	50~100						0		
	110~200								
	210~300								
	310~400								
	410~500								
	50~100						0		
	110~200								
	210~300								
	310~400								
	410~500								
	510~750								
	760~1000								
	50~100						0		
	110~200								
	210~300								
	310~400								
	410~500								
	510~750								
	760~1000								
	1010~1250								
	1260~1500								

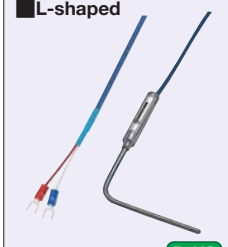
D	L	Sensor Body Price € Unit Price F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	Price for Additional Terminal (€ Body+) N	M	Y
	50~100						0		
	110~200								
	210~300								
	310~400								
	410~500								
	50~100						0		
	110~200								
	210~300								
	310~400								
	410~500								
	50~100						0		
	110~200								
	210~300								
	310~400								
	410~500								

Temperature Sensors
-L Type / Lead Wire Protection Type / Heat Resistant Type-

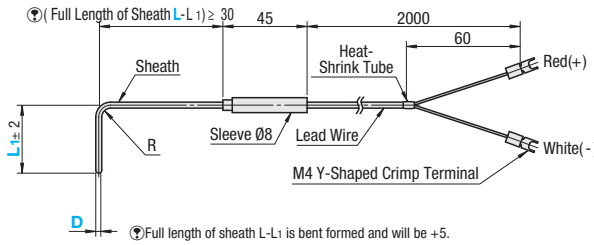
CAD Data

Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P. 1537**.

■L-shaped



MSNDL (K Thermocouple) ■**Features:** For narrow spaces

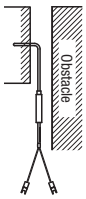


Full length of sheath L-L1 is bent formed and will be +5.

MSNDL		
Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Temperature Measurement Range	Ø1.6	0~650°C
	Ø2.3	0 ~ 700°C
	Ø3.2	0~750°C
Material	Sheath	1.4401/X5CrNiMo17-12-2
	Sleeve	1.4301/X5CrNi18-10
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)

Part Number Type	D	Full Length of Sheath L	L1 1mm Increment	R	€ Unit Price L100	L150	L200	L300
MSNDL	1.6	100 150 200 300	20~270	5				
	2.3		40~260	7				
	3.2		50~250	9				

Example



L - L1≥30

Order Example: Part Number - L - L1 → MSNDL2.3 - 150 - 70

Price

■**Volume Discount** (Round down to one Cent.) **P.87**

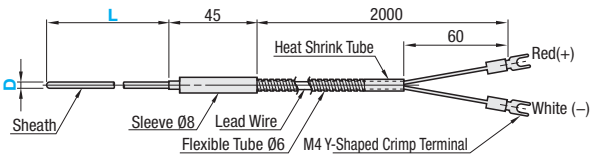
Quantity	1~4	5~7	8~9
Rate	€ Unit Price	5%	10%

Days to Ship: **10 Days**

■Lead Wire Protection

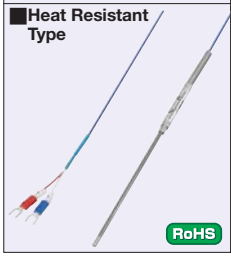


(K Thermocouple) ■**Features:** Flexible tube covers lead wires and protects them from damage.

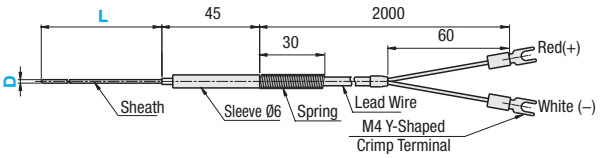


Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Measurement Temperature Range		0~750°C
Material	Sheath	1.4401/X5CrNiMo17-12-2
	Sleeve	1.4301/X5CrNi18-10
	Flexible Tube	Stainless Steel
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)

■Heat Resistant Type



MSNDHG (K Thermocouple) ■**Features:** Temperature Sensor heat resistance temperature of sleeve is 180°C (generally 80°C).



MSNDHG		
Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Temperature Measurement Range	Ø1.0, 1.6	0~650°C
	Ø2.3	0~650°C
	Ø3.2	0~750°C
Material	Sheath	1.4401/X5CrNiMo17-12-2
	Sleeve	1.4301/X5CrNi18-10
Heat Resistance Temperature of Sleeve		180°C
Lead Wire (Operation Temperature Range)		Teflon Coating (0~200°C)

Part Number Type	D	L Selection	€ Unit Price L100	L300
		100 300		

Part Number Type	D	L Selection	€ Unit Price L30	L50	L100	L150
MSNDHG	1.0	30				
	1.6	50				
	2.3	100				
	3.2	150				

Order Example: Part Number - L → MSNDHG3.2 - 100

Days to Ship: **6 Days** P.87

Price

■**Volume Discount** (Round down to one Cent.) **P.87**

Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

The maximum temperature of measurement is only a value of measurement point (end of Sheath). As for the actual temperature measurement, please be careful so that the temperature of Sheath will not excel the heat resistance temperature (80°C). It might cause disconnection because of the swell caused by heat inside the sleeve. Especially when a heated object temperature exceeds 100°C, a long type of sheath L length is recommended, which is used to put maximum distance between the sleeve and the heated object, or Temperature Sensor, Heat Resistant Type is recommended.

Temperature Sensors

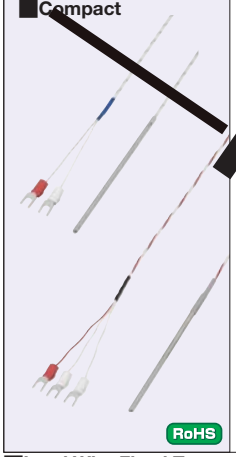
-Compact Type / Taper Screw Type / Flange Type / Sheath Type for Moving Parts-

CAD Data

Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P.1537.**

Not Available

■Compact



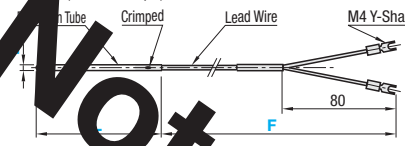
RoHS

Type		Type of Temperature Sensor
Lead Wire Fixed	Lead Wire Configurable	
	-	K Thermocouple
		(Temperature Measuring Resistor Pt100Ω)

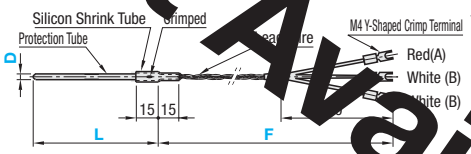
Protection pipe cannot be bent.

Features: Lead wire is directly pulled out of protection tube. Does not have a sleeve, which shortens the distance between the heater and heated object and saves space for installation.

(K Thermocouple)



(Temperature Measuring Resistor Pt100Ω)



Terminal Selection

N (No Crimp Terminal)

M (With Round Crimp Terminal)

Y (With Y-Shaped Crimp Terminal)

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Measurement Temperature Range		0 ~ 250°C
M Material	Protection Tubes	1.4301
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)

Type of Device	Pt100Ω
Precision	JIS Class B
Lead Type	3-lead Type
Measurement Temperature Range	-50 ~ 250°C
M Material / Protection Tubes	1.4301
Silicon Shrink Tube Heat-resistant Temperature	150°C
Lead Wire (Operation Temperature Range)	Teflon Coating (-50 ~ 150°C)

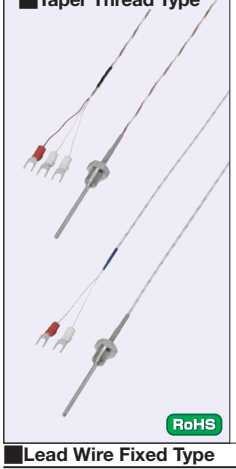
■Lead Wire Fixed Type

Part Number Type	D	L Fixed	F Fixed (Unit: m)	Type of Terminal	Unit Price
(K Thermocouple) (Temperature Measuring Resistor)	3.2	100	2	Y (M4 Y Crimp Terminal)	

■Lead Wire Configurable Type

Part Number Type	D	L Fixed	F 0.1m Increment	Terminal Selection	Sensor Body Price € Unit Price F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	Price for Additional Terminal (€ Body Price +) N	M	Y
(Temperature Measuring Resistor)	3.2	100	0.3~5.0	N M Y								

■Taper Thread Type



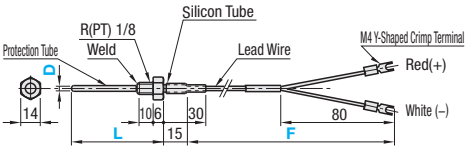
RoHS

Type		Type of Temperature Sensor
Lead Wire Fixed	Lead Wire Configurable	
TCKT		K Thermocouple
		(Temperature Measuring Resistor Pt100Ω)

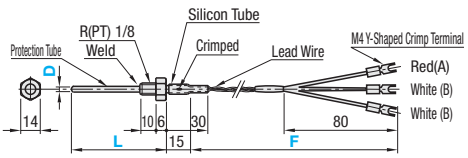
Protection pipe cannot be bent.

Features: Taper screw is welded to Compact Type. Best suited for the temperature measurement where the air-tightness for liquid is required.

TCKT (K Thermocouple)



(Temperature Measuring Resistor Pt100Ω)



Terminal Selection

N (No Crimp Terminal)

M (With Round Crimp Terminal)

Y (With Y-Shaped Crimp Terminal)

TCKT · TCKTF

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Measurement Temperature Range		0 ~ 250°C
M Material	Protection Tubes	1.4301
	Taper Screw	1.4301
Silicon Tube Heat Resistance Temperature		150°C
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)

TCPT · TCPTF

Type of Device	Pt100Ω
Precision	JIS Class B
Lead Type	3-lead Type
Measurement Temperature Range	-50 ~ 250°C
M Material / Protection Tubes	1.4301
M Material / Taper Screw	1.4301
Silicon Tube Heat Resistance Temperature	150°C
Lead Wire (Operation Temperature Range)	Teflon Coating (-50 ~ 150°C)

■Lead Wire Fixed Type

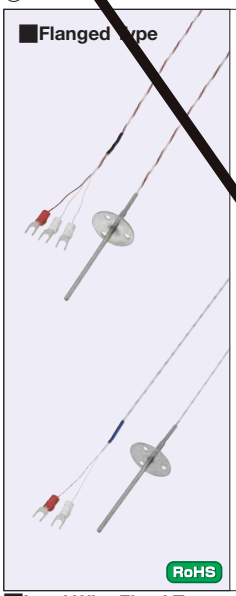
Part Number Type	D	L Fixed	F Fixed (Unit: m)	Type of Terminal	€ Unit Price TCKT	
(K Thermocouple) **TCKT** (Temperature Measuring Resistor)	3.2	65	2	Y (M4 Y-Shaped Crimp Terminal)		

■Lead Wire Configurable Type

Part Number Type	D	L Fixed	F 0.1m Increment	Terminal Selection	Sensor Body Price € Unit Price F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	Price for Additional Terminal (€ Body Price +) N	M	Y
(K Thermocouple) (Temperature Measuring Resistor)	3.2	65	0.3~5.0	N M Y								

Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P.1537.**

Flanged Type

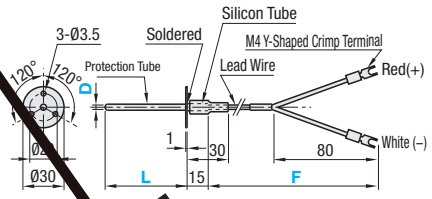


Type		Type of Temperature Sensor
Lead Wire Fixed	Lead Wire Configurable	
		K Thermocouple (Temperature Measuring Resistor Pt100Ω)

Protection pipe cannot be bent.

Features: It is a flanged compact type and easy to attach to a device.

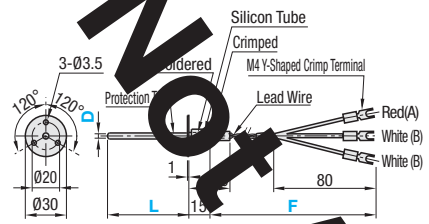
(K Thermocouple)



Terminal Selection
N (No Crimp Terminal)
M (With Round Crimp Terminal)
Y (With Y-Shaped Crimp Terminal)

TCKF / TCKFF		
Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Measurement Temperature Range		0 ~ 250°C
Material	Protection Tubes	1.4301
	Flange	1.4301
Silicon Tube Heat Resistance Temperature		150°C
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)

(Temperature Measuring Resistor Pt100Ω)



Terminal Selection
N (No Crimp Terminal)
M (With Round Crimp Terminal)
Y (With Y-Shaped Crimp Terminal)

TCPF / TCPFF		
Type of Device		Pt100Ω
Precision		JIS Class B
Lead Type		3-lead Type
Measurement Temperature Range		-50 ~ 250°C
Material	Protection Tubes	1.4301
	Flange	1.4301
Silicon Tube Heat Resistance Temperature		150°C
Lead Wire (Operation Temperature Range)		Teflon Coating (-50 ~ 150°C)

RoHS

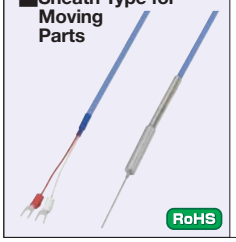
Lead Wire Fixed Type

Part Number Type	D	L Fixed	F Fixed (Unit: m)	Type of Terminal	€ Unit Price
(K Thermocouple) (Temperature Measuring Resistor)	3.2	65	2	Y (M4 Y-Shaped Terminal)	

Lead Wire Configurable Type

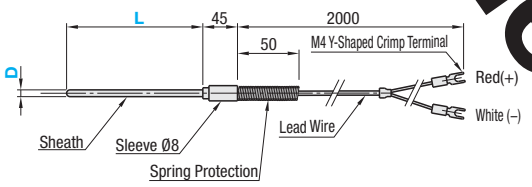
Part Number Type	D	L Fixed	F 0.1m Increment	Terminal Selection	Sensor Body Price € Unit Price										Price for Additional Terminal (€ Body Price +)		
					F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	N	M	Y
(K Thermocouple) (Temperature Measuring Resistor)	3.2	65	0.3~5.0	N M Y													

Sheath Type for Moving Parts



(K Thermocouple)

Features: Highly flexible silicon covered lead wire is usable in moving applications.



MFSK		
Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Temperature Measurement Range	Ø1.6	0~650°C
	Ø3.2	0~750°C
Material	Sheath	1.4401
	Sleeve	1.4301
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Silicon Coating (0~150°C)
Lead Wire Minimum Bending R		20

RoHS

Part Number Type	D	L Selection	€ Unit Price L50	L100	L150
	1.6	50 100 150			
	3.2				

Order Example

Part Number	-	L	-	F	-	Terminal
TCKC3.2	-	100				
TCKTF3.2	-	65	-	F2.5	-	M
	-	65				
	-	65	-	F2.5	-	M
	-	100				

Days to Ship

Lead Wire Fixed Type - Sheath Type for Moving Parts: **6 Days** P.87

Lead Wire Configurable Type: **10 Days**

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

Volume discount rate is applicable to the price of sensor body only.

<Price Calculation Example>
TCKTF3.2-65-F2.5-M
44,90+3,00=47,90 EUR

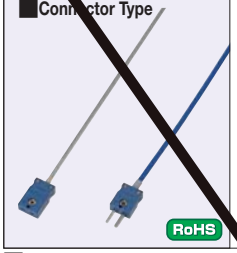
Not Available

Temperature Sensors
-Connector Type / Double Element Type / Chemical Resistant Type-

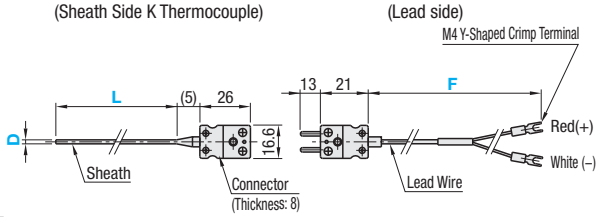
CAD Date

Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P.1537**.

Connector Type



RoHS



Features: Suitable to use in a place where removing of sheath is difficult since replacement of lead wire is only required when the wire is broken.

MCNF

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Temperature Measurement Range	Ø1.6	0~650°C
	Ø3.2	0~750°C
Material	Sheath	1.4401
	Connector	
Heat Resistance Temperature of Connector		220°C
Lead Wire (Operation Temperature Range)		Glass Wool Coating (0~150°C)

Sheath Side (K Thermocouple)

Part Number Type	D	L Selection	€ Unit Price L300	L500
	1.6	300		
	3.2	500		

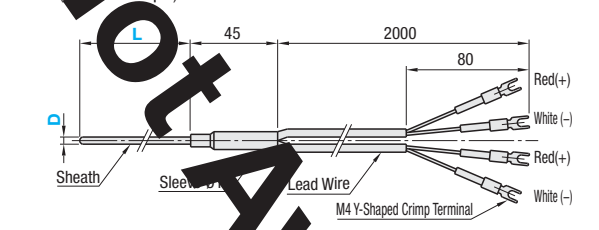
Lead Side

Part Number	F Select (Unit: m)	€ Unit Price F2	F4
	2		
	4		

Double Element Type



RoHS



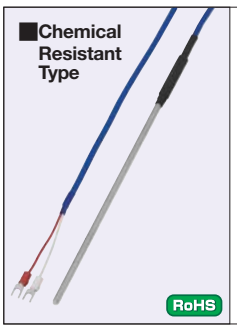
Features: Temperature measurements can be connected to two indicators, controllers, etc. Since the temperature always indicates synchronicity, one can be used for temperature control and the other for detecting abnormal high temperature.

MSWK

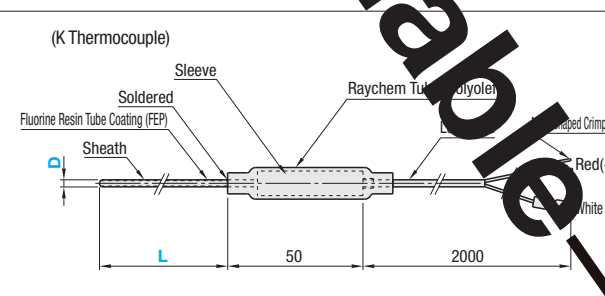
Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Temperature Measurement Range	Ø3.2	0~750°C
	Ø4.8	0~800°C
Material	Sheath	1.4401
	Sleeve	1.4301
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Vinyl Coating (-20~70°C)

Part Number Type	D	L Selection	€ Unit Price L100	L200	L300
	3.2	100 200 300			
	4.8				

Chemical Resistant Type



RoHS



Features: Sheath is coated with Fluororesin (FEP) tube, and excels in chemical resistance and corrosion resistance.

MFLS

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Measurement Temperature Range		0 ~ 180°C
Material	Protection Tubes	Sheath 1.4401 + Fluororesin (FEP) tube
	Sleeve	1.4301
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operation Temperature Range)		Vinyl Coating (-20~70°C)

Part Number Type	D	L Selection	€ Unit Price L200	L400
	5.3	200 400		

Chemical Resistance (Reference) of Fluororesin (FEP) Tube Coating

The list below is for reference only and not to guarantee.

Mineral Oil	Water	Hydrochloric Acid (10%, RT)	Ammonia Water	Gasoline	Organic Solvent
◎	◎	◎	◎	◎	◎

◎ = Excellent. Little affected.
○ = Good. Affected or swollen to some extent but usable depending on condition
(RT is for ambient temperature=20°C, % is concentration of solution.)

Order Example

Part Number	-	L
MSWK3.2	-	100
Part Number	-	F
	-	F2

Days to Ship: **6 Days** P.87

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

The upper limit temperature for measurement is the value at the temperature measurement point (the tip of sheath). When measuring, keep the sleeve temperature at or below the heat resistance temperature (80°C.) It might cause disconnection because of the swell caused by heat inside the sleeve.
Especially when a heated object temperature exceeds 100°C, a long type of sheath L length is recommended, which is used to put maximum distance between the sleeve and the heated object, or Temperature Sensor, Heat Resistant Type (**P. 1540**) is recommended.

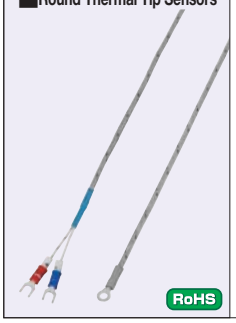
Not Available

Temperature Sensors
-Round Thermal Tip Sensors / Round Thermal Tip Sensors for Moving Part / Spade Type

CAD Date

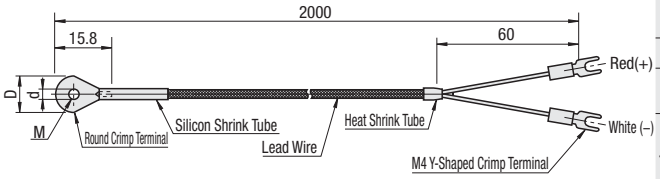
Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P.1537.**

■Round Thermal Tip Sensors



RoHS

MSNDS(K Thermocouple)

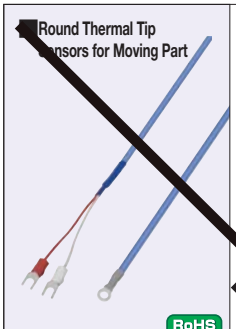


MSNDS	
Type of Thermocouple	K Thermocouple
Precision	JIS Class 2
Temperature Measurement Contact Point	Grounded Type
Measurement Temperature Range	0 ~ 150°C
Silicon Tube Heat Resistance Temperature	150°C
Lead Wire (Operation Temperature Range)	Fiberglass Wool Shield + Outer Shield Winding (0 ~ 250°C)

■**Features:** Easily attachable by cutting a tap on the heated object.

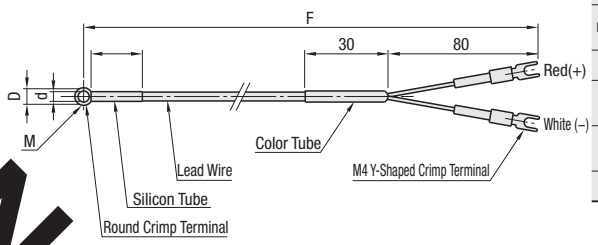
Part Number Type	No.	Terminal Size M	D	d	€ Unit Price
MSNDS	4	M4	8	4.3	
	5	M5	8	5.3	

■Round Thermal Tip Sensors for Moving Part



RoHS

(K Thermocouple)

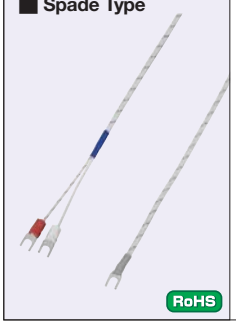


MFMT	
Type of Thermocouple	K Thermocouple
Precision	JIS Class 2
Temperature Measurement Contact Point	Grounded Type
Measurement Temperature Range	0 ~ 150°C
Silicon Tube Heat Resistance Temperature	150°C
Lead Wire (Operation Temperature Range)	Silicon Coating (0~150°C)
Lead wire minimum bending R	20

■Fe[illegible]. It is suitable for use of movable part as lead line covered by silicon, which has excellent flexibility, is applied.

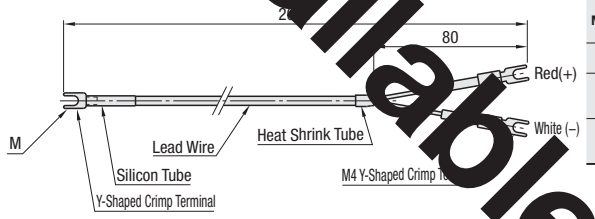
Part Number Type	No.	Terminal Size M	D	d	F (m)	€ Unit Price
	4-1	M4	8	4.3	1	
	4				2	
	4-5				5	
	5-1	M5	8	5.3	1	
	5				2	
	5-5				5	

■ Spade Type



RoHS

(K Thermocouple)

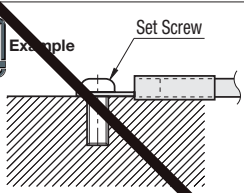


MSNY	
Type of Thermocouple	K Thermocouple
Precision	JIS Class 2
Temperature Measurement Contact Point	Grounded Type
Measurement Temperature Range	0 ~ 150°C
Silicon Tube Heat Resistance Temperature	150°C
Lead Wire (Operation Temperature Range)	Glass Wool Coating (0~150°C)

■**Features:** It can be fixed or exchanged without completely removing set screw.

Part Number Type	No.	Terminal Size M	€ Unit Price
	4	M4	
	5	M5	

Example



Order Example | Part Number: MSNDS5 | Days to Ship: 6 Days P.87

Price

■**Volume Discount** (Round down to one Cent.) P.87

Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

Not Available

Temperature Sensors
-Screw Mount Type / Screw Mount Type for Moving Parts / Band Type-

CAD Date Folder Name: 55_Heaters

Please refer to "Precautions for Use" in the Temperature Sensor Guide on **P.1537**

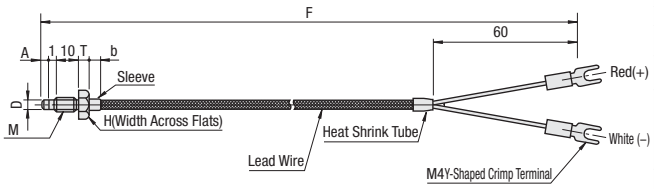
■Screw Mount Type



RoHS

MSNDM(K Thermocouple)

■**Features:** Easily attachable by cutting a tap on the heated object.



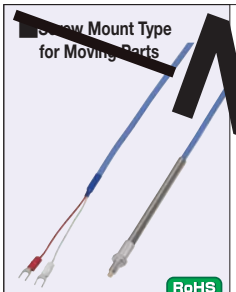
For No.6-1 and 8-1, enamel wire is wound at the end of sleeve.

MSNDM

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Grounded Type
Measurement Temperature Range		0 ~ 300°C
M Material	Tip Part	(No.6-1, 8-1): CW614N/CuZn39Pb3 (No.6, 8): 1.4301/X5CrNi18-10
	Thread Part	1.4301/X5CrNi18-10
Lead Wire (Operation Temperature Range)		Fiberglass Wool Shield + Outer Shield Winding (0 ~ 180°C)

Part Number Type	No.	Thread Size M	F (m)	A	b	d	T	H	€ Unit Price
MSNDM	6-1	M6x1.0	1	2.8	4	3.8	4	10	
	6	M6x1.0	2	4.5	4	3.5	4	10	
	6-5	M6x1.0	5	2.8	4	3.8	4	10	
	8-1	M8x1.25	1	2.8	4	3.8	5.3	13	
	8	M8x1.25	2	4.5	4	3.5	5.3	13	

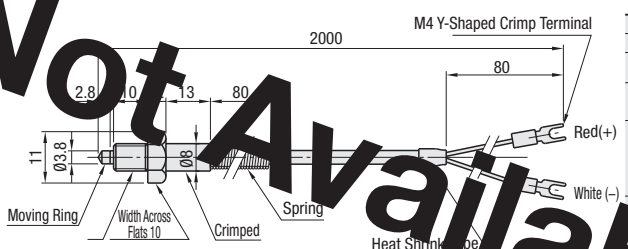
■Screw Mount Type for Moving Parts



RoHS

(K Thermocouple)

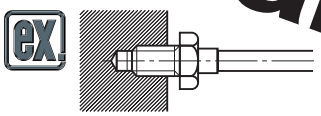
■**Features:** It is suitable for use of movable part as lead line covered by silicon, which has excellent flexibility, is applied.



Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Grounded Type
Measurement Temperature Range		0 ~ 300°C
M Material	Thread Part	1.4301/X5CrNi18-10
	Spring	1.4301/X5CrNi18-10
Lead Wire (Operation Temperature Range)		Silicon Coating (0~150°C)
Lead Wire Minimum Bending R		20

Not Available

Part Number Type	No.	Thread Size M	€ Unit Price
	6	M6x1.0	



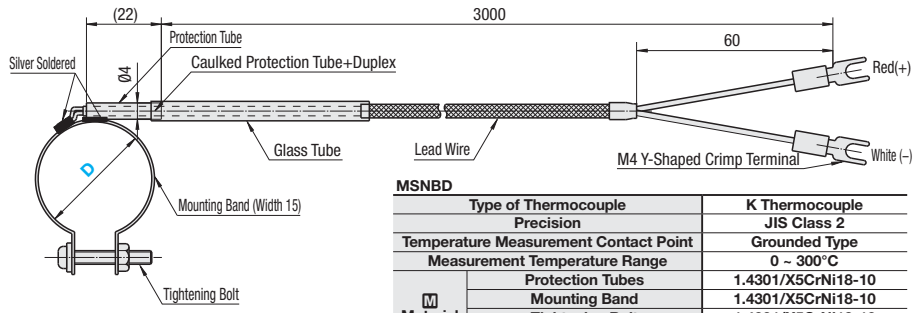
■Band Type



RoHS

MSNBD(K Thermocouple)

■**Features:** Effective in measuring cylindrical heated objects.



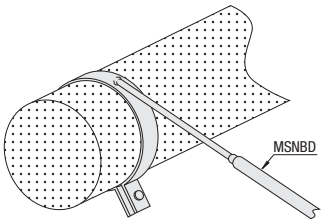
MSNBD

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Grounded Type
Measurement Temperature Range		0 ~ 300°C
M Material	Protection Tubes	1.4301/X5CrNi18-10
	Mounting Band	1.4301/X5CrNi18-10
	Tightening Bolt	1.4301/X5CrNi18-10
	Nut	1.4301/X5CrNi18-10
Lead Wire (Operation Temperature Range)		Fiberglass Wool Shield + Outer Shield Winding (0 ~ 250°C)

Part Number Type	D	€ Unit Price
MSNBD	30	
	35	
	40	

Example

■Used to heat the cylindrical heated object.



Order Example

Part Number
MSNDM6
MSNBD30

Days to Ship

6 Days

P.87

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

Temperature Sensors

-Spring Contact Type / Surface Temperature Measurement Type / Surface Temperature Measurement Magnet Type-

CAD Date Folder Name: 55_Heaters

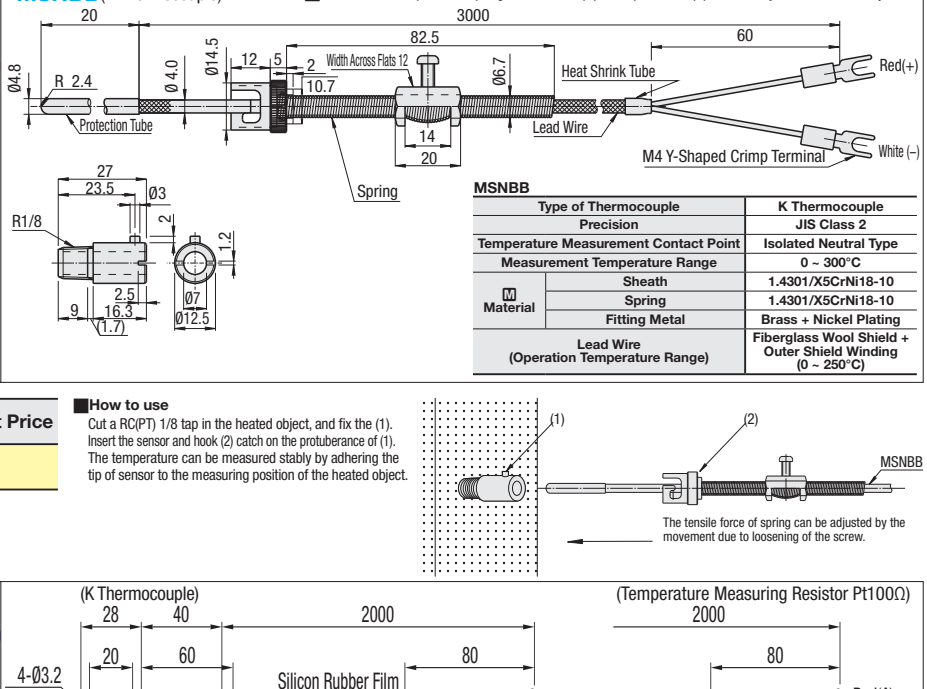
Please refer to "Precautions for Use" in the Temperature Sensor Guide on P.1537

■Spring Contact Type



MSNBB(K Thermocouple)

■**Features:** The power of spring enables the tip part of protection pipe to reliably contact heated objects.



MSNBB

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
Measurement Temperature Range		0 ~ 300°C
M Material	Sheath	1.4301/X5CrNi18-10
	Spring	1.4301/X5CrNi18-10
	Fitting Metal	Brass + Nickel Plating
Lead Wire (Operation Temperature Range)		Fiberglass Wool Shield + Outer Shield Winding (0 ~ 250°C)

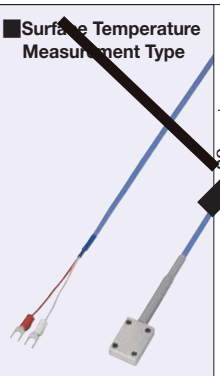
RoHS

Part Number		€ Unit Price
Type	No.	
MSNBB	4.8	

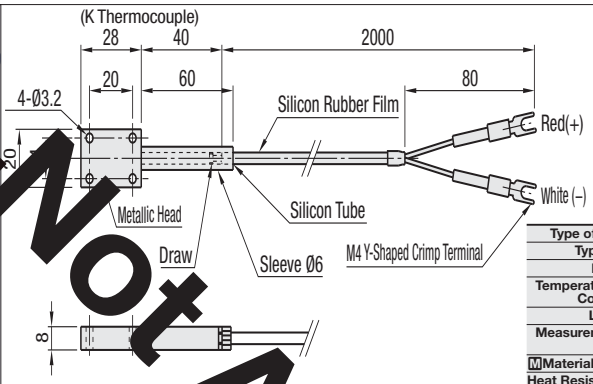
■**How to use**

Cut a RC(PT) 1/8 tap in the heated object, and fix the (1). Insert the sensor and hook (2) catch on the protuberance of (1). The temperature can be measured stably by adhering the tip of sensor to the measuring position of the heated object.

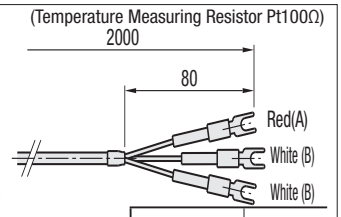
■Surface Temperature Measurement Type



(K Thermocouple)



(Temperature Measuring Resistor Pt100Ω)

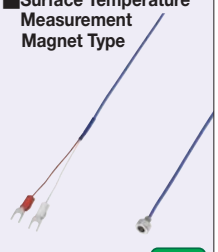


Type of Thermocouple	K Thermocouple	-
Type of Device	-	Pt100Ω
Precision	JIS Class 2	JIS Class B
Temperature Measurement Contact Point	Isolated Neutral Type	-
Lead Type	-	3-lead Type
Measurement Temperature Range	0 ~ 150°C	-50 ~ 150°C
M Material: Metallic Head	Brass + Nickel Plating	
Heat Resistance Temperature of Silicon Tube	150°C	
Lead Wire (Operation Temperature Range)	Silicon Rubber Film (-50 ~ 150°C)	

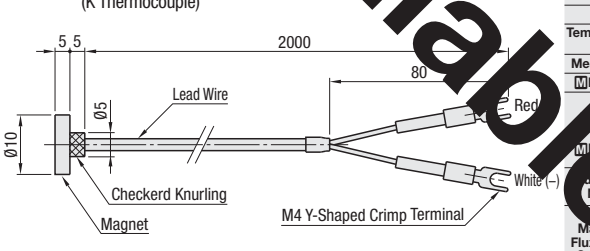
RoHS

Part Number	€ Unit Price	

■Surface Temperature Measurement Magnet Type



(K Thermocouple)



Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Grounded Type
Measurement Temperature Range		0 ~ 150°C
M Material	Hollow	1.4301/X5CrNi18-10
Lead Wire (Operation Temperature Range)		Teflon Coating (0~150°C)
M Material	Magnet	Neodymium Magnet + Nickel Plating
Absorbability	Ambient Temperature	17.7{1.8}
	120°C	15.7{1.6}
Surface Magnetic Flux Density Gauss [G]	Ambient Temperature	3600
	120°C	3200

Absorbability and Surface Flux Density are for magnet alone (reference values).

RoHS

Part Number	€ Unit Price

Order Example

Part Number

Days to Ship: 6 Days P.87

Price

■**Volume Discount** (Round down to one Cent.) P.87

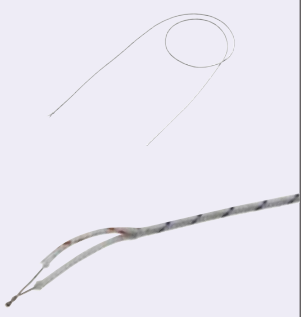
Quantity	1~4	5~14	15~
Rate	€ Unit Price	5%	10%

Not Available

Sheathed Thermocouples / Compensation Lead Wires

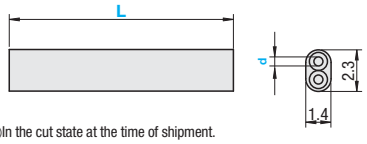
CAD Date Folder Name: 55_Heaters

■Sheathed Thermocouples

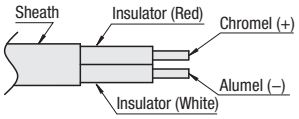


RoHS

MSEN(K Thermocouple)

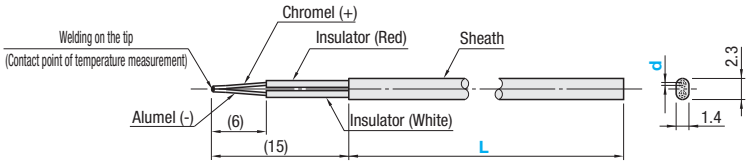


<Schematic>



In the cut state at the time of shipment.

(K Thermocouple)



- The tip of sheathed thermocouples MSEN is welded.

Operation Temperature Range: 20°C ~ 200°C

M Material: Sheath · Insulator: Glass Wool

Part Number		L 1mm Increment	€ Unit Price					
Type	Dia. of Element Wire d		MSEN					
			L200~1000	L1001~2000	L2001~3000	L200~1000	L1001~2000	L2001~3000
MSEN	0.32	200~3000						

Order Example

Part Number	-	L
MSEN0.32	-	500
	-	300

Days to Ship

- MSEN

8 Days | 10 Days

Price

- MSEN

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~7	8~9
Rate	€ Unit Price	5%	10%

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~7	8~9
Rate	€ Unit Price	5%	10%

■Features of Sheathed Thermocouples

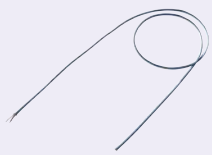
- Since the temperature measuring point is exposed, the reaction speed is faster than that of the sheathed type.
- Temperature measurement can be conducted on the tested object.

Temperature Measuring Point



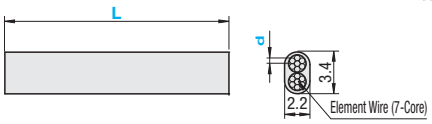
For MSEN, prepare the temperature measuring point by twisting or welding, with alumel and chromel exposed.

■Compensation Lead Wires



RoHS

DSEN



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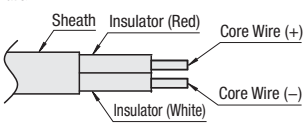


Operating Temp. Range: 0°C ~ 150°C M Material:
Sheath · Insulator: Glass Wool
+Side Element Wire: Iron
–Side Element Wire: Alloy containing copper and nickel as main components

In the cut state at the time of shipment.

Part Number		L 0.1m Increment	€ Unit Price		
Type	Dia. of Element Wire d		L1.0~3.9	L4.0~6.9	L7.0~10.0
DSEN	0.32	1.0~10.0			

Order Example

Part Number	-	L
DSEN0.32	-	2.5

Days to Ship

8 Days

Price

■Volume Discount (Round down to one Cent.) P.87

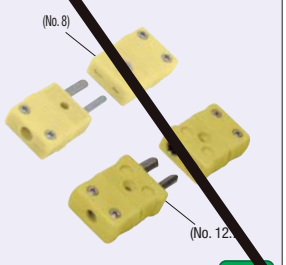
Quantity	1~4	5~7	8~9
Rate	€ Unit Price	5%	10%

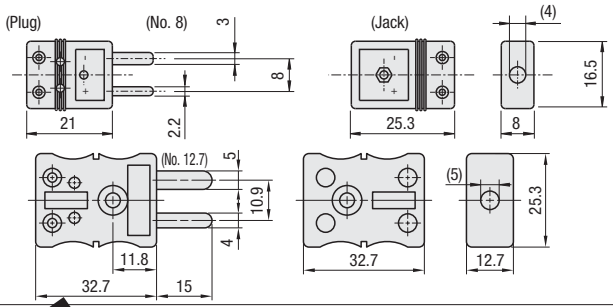
■Features of Compensation Lead Wire

- It can be used as a lead wire of sheathed thermocouples.
  Also can be used to extend temperature sensor (K thermocouple) on P.1538~1547

K Thermocouple Connectors / Bimetal Thermostats

■K Thermocouple Connectors





■Features
The compensation lead wires can easily be attached and detached by connecting them with plug and jack of the connector respectively.

Ⓜ Material: PP (Polypropylene)

Part Number Type	No.	€ Unit Price
	8	
	12.7	

■How to use
(1) Peel off the sheath of compensation lead wires. (Approx.7mm)
(2) Loosen the screw on connector by the screwdriver, and remove the cover.
(3)Loosen the screw in the connector and connect the + (Red) and - (White) of compensation lead wires respectively.
(4) Confirm the screws are securely tightened, then install the cover.

Order Example: Part Number

Days to Ship: 6 Days P.87

Price

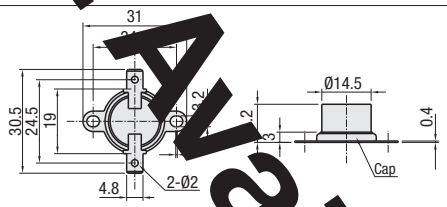
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■Bimetal Thermostats





■Features
- Bimetal of automatic return type.
- It energizes (NC) when the power is turned on and the contact point shuts off when it reaches to the operation temperature rate and electricity is turned off. It automatically recovers when it is below the rated operating temperature.

Ⓜ Material: Heater : Ceramic (Steatite Type)
Cap : Aluminum
Bimetal : Disk Bimetal

Part Number Type	No.	Rated Operation Temperature (°C)	€ Unit Price
	080	80±5	
	100	100±5	
	120	120±5	
	140	140±5	
	160	160±5	
	180	180±5	
	200	200±5	

(Structure)
Principle of Operation: Bimetal Non-ener... Type ... Pole
Single Throw Operation Temperature One Point ... Type
Operating Method: OFF when temperature ... and ON ...
temperature drops (Electric Rating)
Resistance Load AC125V/15A AC250V/7.5A
(Minimum Current: 0.1A)
(Contact Resistance)
50mΩ or less according to minute current ohmmeter ...
(initial value) (Insulation Resistance)
100MΩ or more in DC500V mega in the charge part and ...
charge part (Insulation Resistance)
AC1500V/min or AC1800V/sec in the charge part and non-charge part (Leakage current: 10mA)
(ON/OFF Life Span Test)
The thermal ON/OFF operation is done 10,000 times at the load of rated current and voltage.
Insulation resistance: 50M ; Contact resistance: 100m or less

Order Example: Part Number

Days to Ship: 6 Days P.87

Price

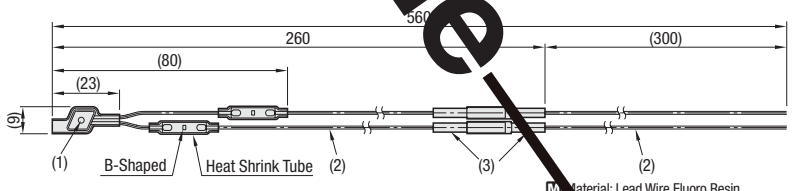
■Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~10
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■Bimetal Thermostats -Lead Wire-





Lead Wire Heat Resistance Temperature: 120°C Ⓐ Accessory: Detent Plug Silicon

Ⓜ Material: Lead Wire Fluoro Resin
Heat Shrink Tubes Fluoro Resin

Part Number Type	No.	Bimetal Thermostat Operation Temperature (°C)	€ Unit Price Qty. 1~4
	50	50	
	70	70	
	90	90	
	110	110	

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number

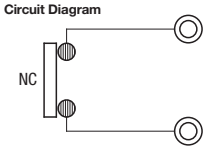
Days to Ship: 8 Days

■Specification

No.	Name
(1)	Bimetal Thermostats
(2)	Lead Wire
(3)	Insertion Type Connecting Terminal

(Structure)
Principle of Operation: Bimetal ...on-energizing Type Single Pole Double Throw Operation Temper...re One Point Fixed Type
Operating Method: OFF when tem...rature rises, and ON when temperature drops
(Electric Rating)
Resistance Load AC125V/3A AC250V/1...
(Minimum Voltage / Current: DC5V / 5mA)
(Contact Resistance)
50mΩ or less according to minute current ohm...eter (DC6V/0.1A) (initial value)
(Insulation Resistance)
100MΩ or more in DC500V mega in the charge par...d non-charge part (ON/OFF Life Span Test)
The thermal ON/OFF operation is done 10,000 times at ...e load of rated current and voltage.
Insulation resistance: 50M ; Contact resistance: 100m or le...

Circuit Diagram



■Features
- Bimetal of automatic return type.
- It energizes (NC) when the power is turned on and the contact point shuts off when it reaches to the operation temperature rate and electricity is turned off. It automatically recovers when it is below the rated operating temperature.

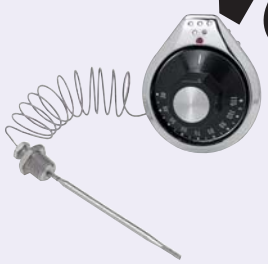
Not Available

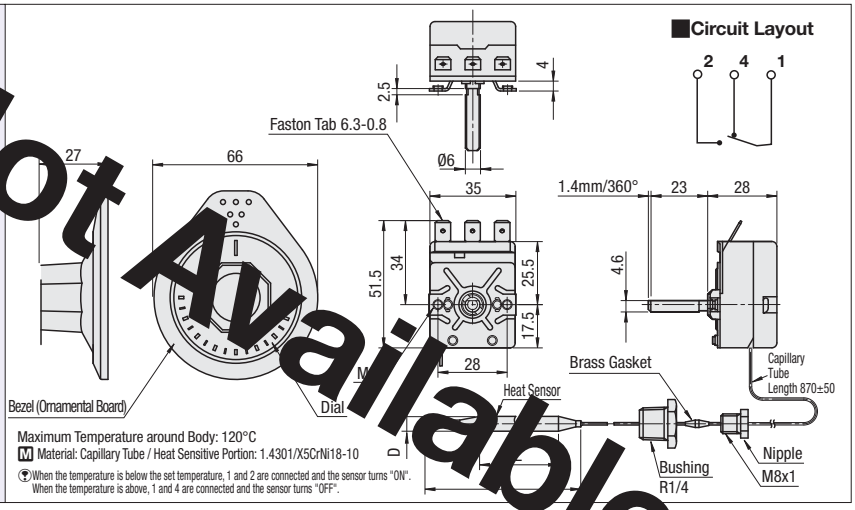
Thermostats / Boxes for Thermostats / Protection Tubes

CAD Data

Thermostats

RoHS





Maximum Temperature around Body: 120°C

M Material: Capillary Tube / Heat Sensitive Portion: 1.4301/X5CrNi18-10

When the temperature is below the set temperature, 1 and 2 are connected and the sensor turns "ON". When the temperature is above, 1 and 4 are connected and the sensor turns "OFF".

Part Number Type	No.	d	L	L1	Measurement Temperature Range	ON-OFF Temperature Difference	Sensors Min. Temp.	Sensors Max. Temp.	€ Unit Price Qty. 1~4
	L	6	78	113	30 ~ 110°C	3±1.5°C	-10°C	120°C	
	H	4	57	91	50 ~ 320°C	7±3.5°C		330°C	

Minimum bending radius of capillary tube is 5mm.

Please use a thermostat for overheat protection, not for temperature control.

Features

Temperature control is performed by turning on and off the contact with the liquid, which has a high thermal expansion coefficient, sealed in the heat sensor section.

Specification

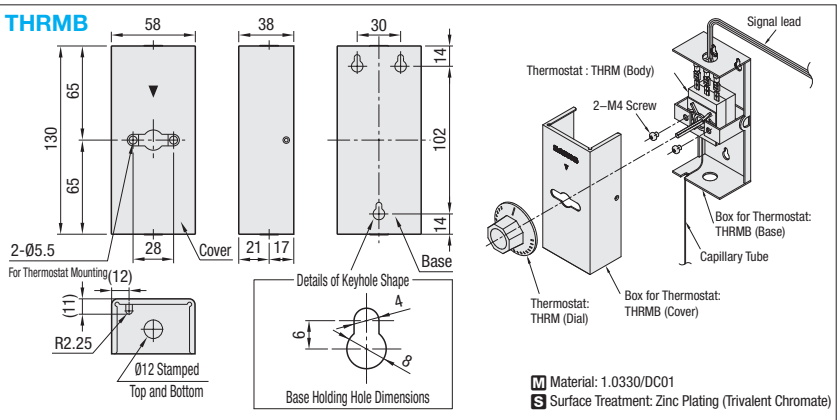
- Indicated temperature: OFF value (between terminals 1 and 2)
- Contact capacity: 1-2 Resistive Load 16A, Inductive Load 2.6A, Voltage 250V; 1-4 Resistive Load 8A, Inductive Load 0.6A, Voltage 250V

Boxes for Thermostats

RoHS



THRMB



M Material: 1.0330/DC01

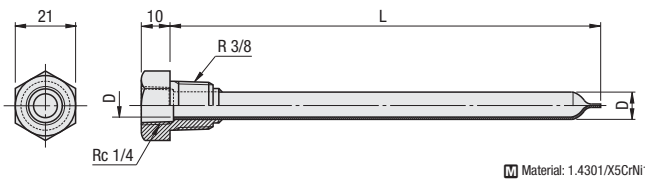
S Surface Treatment: Zinc Plating (Trivalent Chromate)

Protection Tubes

RoHS



THRMP



M Material: 1.4301/X5CrNi18-10

Boxes for Thermostats

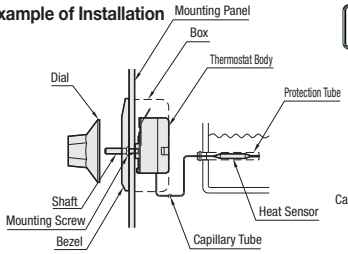
Part Number Type	No.	€ Unit Price Qty. 1~4
THRMB	1	

Protection Tubes

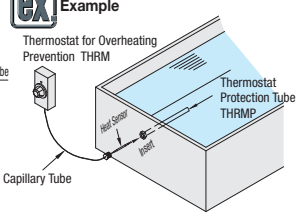
Part Number Type	No.	D	d	L	Applicable Thermostats	€ Unit Price Qty. 1~4
THRMP	H	9.5	7.5	150	THRM**L**	
	L	8	6	120	THRM**H**	

Please be careful of the combination of thermostat and NO. L/H of protection tube.

Example of Installation



ex Example



Order Example — Part Number: THRML, THRMB1, THRMPH

Days to Ship: 8 Days

Not Available

Electromagnetic Contactor

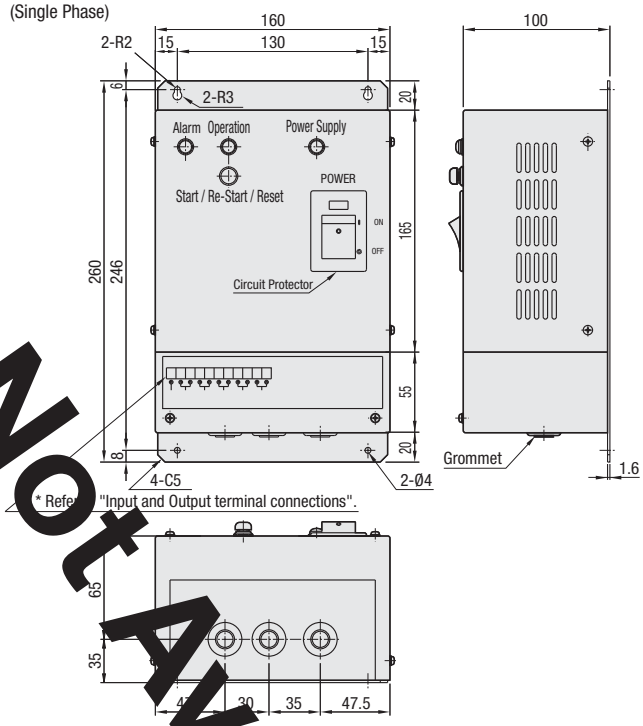
CAD Data

■Features: In combination use of this equipment and temperature controller, float switch and thermostat can prevent overheating and idle running.

RoHS



(Single Phase)



Part Number		€ Unit Price
Type	No.	Qty. 1~2
	1	

For orders larger than indicated quantity, please request a quotation.

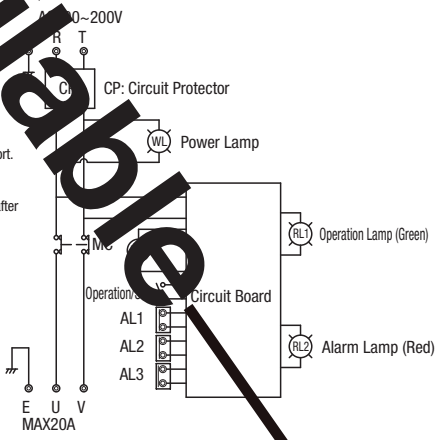
Order Example

Part Number

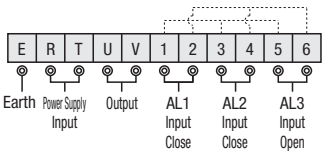
Days to Ship

8 Days

■Circuit Diagram



*** Input and output terminal connecting method**



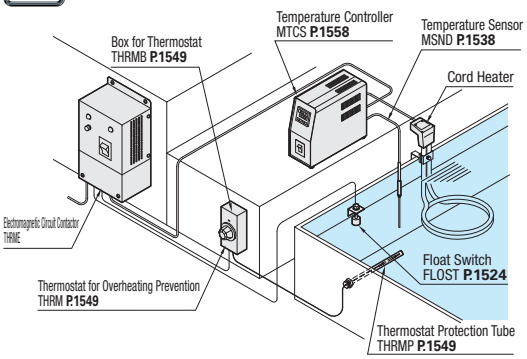
■Features

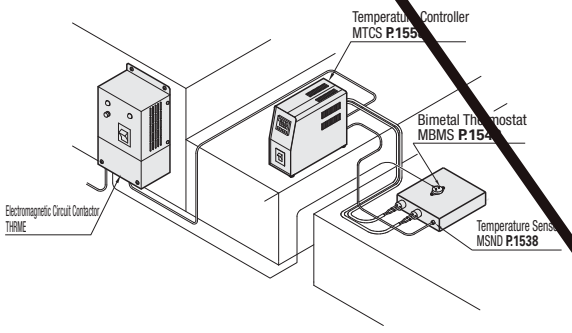
- The built-in breaker can prevent over current and short.
- When overheating signal comes in, the power supply switch remains "off".
- The function recovers when the re-set button is put after confirming the cause of the overheating.

Safety Circuit Signals: Contact Input 3 systems
(Use non-voltage contact of "Open" and "Close" all the time.)

Be careful when connecting wires as voltage is applied to between each terminal.

Example



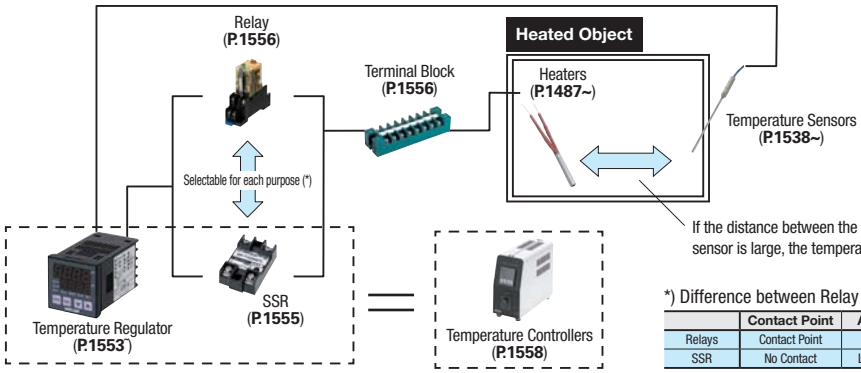


Not Available

Temperature Regulators Guide

■Example of connecting temperature controlling products

General example of connecting heaters is shown below.



*) Difference between Relay and SSR

	Contact Point	Advantages	Disadvantages
Relays	Contact Point	Low Price	Short Life Span
SSR	No Contact	Long Life Span	Expensive, Generates heat

Temperature controller is the unit of a temperature regulator and SSR.
Temperature regulators are recommended for wall-mounting, and temperature controllers are recommended for easy use as a unit.

■Overview

MISUMI's Temperature Regulator is a compact multifunctional unit permitting the selection of input types according to the sensor to be used. By operating the front face key of the regulator, the input types of the thermocouple and temperature measuring resistance can be switched. Also in conformity to "IP66".

■Features

- Self-tuning PID

Self-tuning function enables a temperature controller to automatically tunes, corrects PID constant and converge (stabilize) fluctuation of control value occurred by outer interference or when changing the setting value.

- PID with overshoot restricting function

The overshoot (a rise exceeding the set value) occurred at the start of control, or at the time of changing the setting, is restricted for stable control.

- With Upper and lower limit alarm function.

- The alarm operation can be selected from the eight kinds according to the usage. Since the controller is provided with the delay timer function (setting range: 0 to 9999 sec.), it is also possible to set the alarm operation timing.
- Utilizing EV1 and EV2, two-step alarm setting is possible.
- MTCTRD / MTCTSD has the function of breakage detection for heaters when connected to the included CT (current transformer).

■Precautions on Wire Connection

- When connecting wires, make sure to turn off the power supply in advance, or electric shock may result.
- This unit does not perform control operation for approx. 4 seconds after turning on the power. Be careful when using it as an interlock circuit since the output etc. does not function.
- Use the Crimp Terminal for wire connection that fits M3.5 thread. (Tighten the wire directly at the center portion.)
- Wire material of the wire connecting Temperature Measuring Resistor and Temperature Controller should be 5Ω or less wire resistance (per wire), wire material of the wire connecting Thermocouple and Temperature Controller should be the specified compensation lead wire or an element wire.
- When using the unit in the vicinity of a noise source, use shielded wire. Do not lay input and output lines together in the same duct or conduit tube.
- Separate the input and output signal lines 50cm or more from the power supply line and load line.

■Warranty

Warranty Period: One year from the shipping date
Warranty Condition: Please present the guarantee card included at the time of delivery.

Coverage of Warranty: Problems or damages arising through the normal usage in compliance with the instruction manual included at the time of delivery.
If trouble occurs during the warranty period even though the unit has been operated in the normal manner, we will recover and repair or replace the unit.

In the following cases, repairs are for consideration. We will recover the product and make an quotation.
(1) When the damage caused by the factors out of warranty range and the product is repairable.
(2) When the damage has occurred beyond the warranty period and the product is repairable.

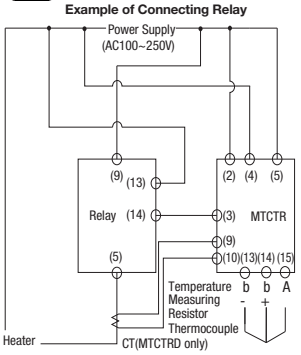
■Operating Environment

Never use in the environments with following conditions.
(1)Explosive gases, inflammable gases or corrosive gases.
(2)Either sunshine or ambient temperature (above 50°C) remarkably increases.
(3)Extremely low ambient temperature (below 0°C), such as outdoors in cold areas.
(4)Extremely high humidity (85%RH or higher).
(5)Splashing of water or chemicals.
(6)Severe vibration or shocks.
(7)Large volume of dust, iron power or black smoke.
(8)External noise, induction trouble, vibration, large shocks, and others such that can have damaging effects to the electric circuit.
(9)Violent temperature change.

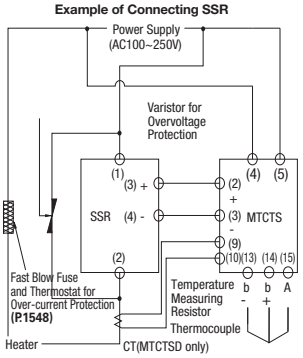
Example

Example of Connecting Temperature Regulator and Universal Relay/SSR (when 48x48)

Example of Connecting Relay



Example of Connecting SSR

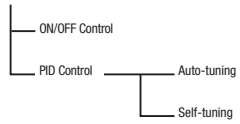


This is an example of connection reference only. Not that this connection method guarantees the each product.

Temperature Regulators / Temperature Controllers Q&A

Q1: What are the advantage and disadvantage of each temperature controlling method?

A: The following ways of temperature controlling are available.



	Advantages	Disadvantages
ON/OFF Control	Quick temperature raise	Easily overshoot
PID Control	Restrains overshooting	Slow temperature raise

	Advantages	Disadvantages
Auto-tuning	Reach to an optimum setting value for control after running.	Tuning is required when the operating condition has changed.
Self-tuning	Auto-tuning is conducted when disturbance occurs.	Does not recognize a slight change as a disturbance and the optimal control setting is not always performed.

Confirm the advantage and disadvantage of each type before selecting products. For Temperature controllers (**P.1558**), the initial value is set at PID Control with Self-tuning. However, as stated above, it doesn't always perform the optimal setting. In that case, please follow Q5 and conduct the auto-tuning.

Q2: Can we connect heaters from other manufacturers to MISUMI temperature regulators and controllers?

A: No problem at all. Beware of the rated voltage (V) and the allowable current (A).

Q3: Which temperature controller should be used?

A:Use the controller for single-phase (MTCS/MTCRM/MTCD) for single-phase heaters. Use the controller for 3-phase (MTCH) for 3-phase heaters. Cartridge heaters and rubber heaters are all single-phase. For other heaters, see the information in the diagram for each product.

Q4: Is it possible to control several heaters with one temperature controller?

A:Possible. Be sure to use them under the allowable current of the temperature controller. Up to two terminals of the heater are possible to connect to one terminal. When using 3 or more terminals, use terminal blocks on **P.1556.** For calculation examples, refer to "Temperature Controllers" on **P.1486**

Q5: The temperature ascends very slowly. Controlling is not stable.

A:For PID Control with Self-Tuning, temperature is controlled by the value of P (Proportion), I (Integral Time) and D (Derivative Time). It could cause problems when each value is not optimal for the operating environment. Please conduct self-tuning by following the procedure below. *Tuning may take from a few minutes to more than one hour. (Heat-resisting jigs may take longer because the temperature doesn't descend soon.)

1. Switching of Display

Press "MODE" key for 2 seconds to change displays.

2. Change of Display Setting Mode

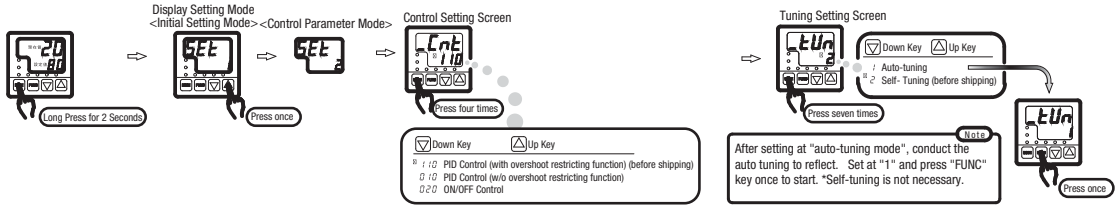
When Display Setting Mode is shown, press UP key and change from "Initial Setting Mode" to "Control Parameter Mode".

3. Setting of PID (Before shipping), ON/OFF

Set at Control Parameter Mode, press MODE key four times and the control setting screen will be on display. Use UP/DOWN keys.

4. Setting of Self-tuning (Before shipping) and Auto-tuning

Set at Control Parameter Mode, press MODE key seven times and thetuning setting screen will be on display. Use UP/DOWN keys.



Q6: We use several controllers and cannot have the same temperature.

A: Theoretically, each controller of PID control method should have the same temperature when the same value of P, I and D are input. When they have different temperatures, it might be the individual difference or malfunction of the sensor.

Q7: I cannot input the temperature higher than a certain degree.

A : Setting temperature could be limited.
(After turning the power on, press "MODE" for 2 seconds <Set 1 Screen> → press "▲" once → <Set 2 Screen> → press "MODE" once → <SLH display> is shown. The temperature shown below is set as the upper limit temperature. Press "▲" and raise the temperature.)

Q8: Temperature error is large.

A: Make sure if the distance between the sensor and the heated object is not too far. When the sensor and the power line are placed near, the sensor might be affected by the noise. Place the sensor away from the power line. Other two possibilities are as follows:

1. Make sure the type of the temperature sensor (K/J Thermocouple, Temperature Measuring Resistor, etc.) and the setting of the temperature regulator is correct.
(After turning the power on, press "MODE" for 2 seconds → <Set 1 screen> → press "MODE" once → select the type of parameter depending on the type of the temperature sensor from the followings. K Thermocouple: 00, J Thermocouple: 01, Temperature Measuring Resistor Pt100Ω: 10
2. Check whether input correction value is set.
(After turning the power on, press "MODE" for 2 seconds → <Set 1 screen> → press "MODE" three times → on <PV adjustment at 0 point screen>, set the adjustment value at "0".)

Q9: Temperature remains high and doesn't descend.

A:SSR inside of the temperature controller might be damaged. Stop using the controller immediately. Contact us at the following for repairs and send us the product. We will check if the repair is possible and inform you of the price and the days to ship.

MISUMI Corporation, Fluid Control Business Division, Fluid Control Business Team
(Address for sending products) Toyo Central Building 6F, 4-1-13, Toyo, Koto-ku, Tokyo 135-0016 (Contact us before sending products.)

Temperature Controller

CAD Data

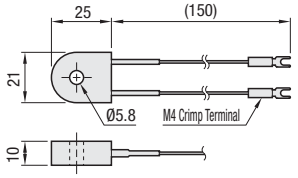
Be sure to refer to Temperature Controllers Guide on **P.1551.**

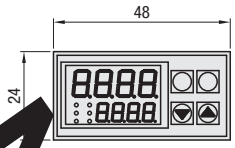


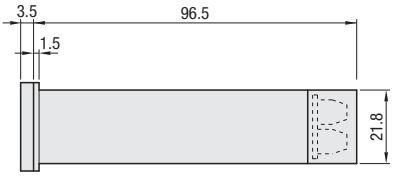
Size	Output Type		Heater wire breakage alarm function	Accessory
	Relay Contact Output	SSR Drive Voltage Output		
24x48			Not Provided	-
			Available	CT (Current Transformer)

Accessory mounting attachment is included in the box.

- **CT**(Current Transformer)







Size	Output Type	Part Number	Heater wire breakage alarm function	€ Unit Price Qty. 1 ~ 9.
24x48	Relay Contact Output		Available	
	SSR Drive Voltage Output		-	
			Available	

For orders larger than indicated quantity, please request a quotation.

Order Example **Part Number**

Days to Ship **6 Days** P.87

Specification

Size	24x48mm
Part Number	
Outer Diameter Dimension	24x48x100
Control Method	ON/OFF control, PID Control with Auto Turning, PID Control with Self-Turning
Input	Thermocouples (K · J · R · T · N · S · B) Temperature Measuring Resistor(Pt100, JPt100)
Control Output (OUT1)	Relay Contact Output (Contact Capacity AC250 V 3A Resistance Load) / SSR Drive Voltage Output (DC12 V Max. 20mA)
Alarm Output (EV1)	Relay Contact Output (AC250 V 2.4A Resistance Load) 1a Contact Point
Control/Alarm Output 2 (OUT2/EV2)	Relay Contact Output (AC250 V 2.4A Resistance Load) 1a Contact Point
Sampling Frequency	500mS
Indication Accuracy (Thermocouple)	The bigger one of ±0.3% of specified value + 1 digit or ±2 Degrees (Celsius) ±3°C for -100~0°C, ±4°C for -200~-100°C, no regulation for 400°C or less of B Thermocouple
Indication Accuracy (Temperature Measuring Resistor)	The bigger one of ±0.3% of specified value +1 digit or ±0.9 Degrees (Celsius)
Indication Accuracy Maintenance Temperature Range	Ambient Temperature: 23±10°C
Storage Element	EEPROM
Power Supply Voltage	AC 100 ~ 240V (Allowable voltage change range 85 ~ 264V)
Power Consumption	10VA(Max.)
Mass	180g or less

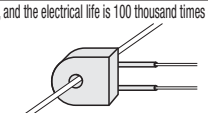
* For relay contact of OUT1 EV1 OUT2 EV2, the mechanical life is 5 million times or more, and the electrical life is 100 thousand times or more.

- **Sensor Input Types and Sensor Range**

Sensor		Lower to Upper Limit		Setting of Decimal Point
00	K Thermocouple	-200~	1372	-199.9~990.0
01	J Thermocouple	-200~	850	-199.9~850.0
02	R Thermocouple	0~	1700	
03	T Thermocouple	-200~	400	-199.9~390.0
04	N Thermocouple	-200~	1300	-199.9~990.0
05	S Thermocouple	0~	1700	
06	B Thermocouple	0~	1800	
07	Pt100Ω	-199~	500	-199.9~500.0
08	JPt100Ω	-199~	500	-199.9~500.0

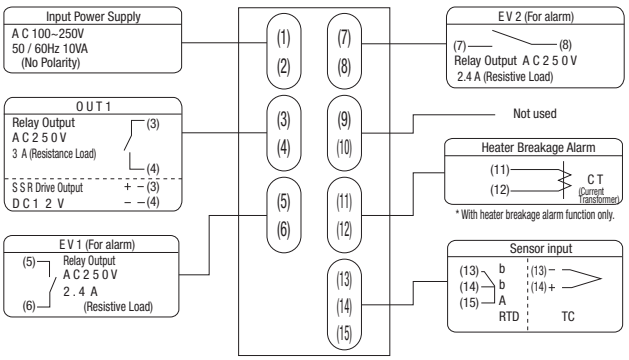
(With heater wire breakage alarm function only.)

CT Input (Current Transformer)		
	Setting Range	AC1~30A
	Precision	5% (Set Resolution 1A)
	Breakage Detection	ON Time of OUT1: 300mS or More
	Welding Detection	ON Time of OUT1: 300mS or More



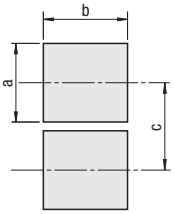
*Use the heater wire breakage alarm function included CT (Current Transformer) by threading the heater lead wire through Ø5.8 hole.

Terminal Arrangement for Wire Connection



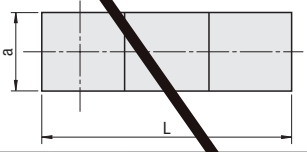
[Di...sions for panel cutting

...ngle In...llation



- **Solid Installation**

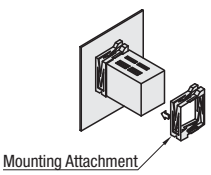
*To install, insert the body and gask... into the square hole of the panel, and insert the mounting attachment from the re... side until clearance is eliminated.



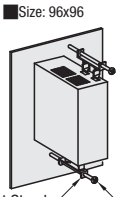
Size	a	b	c	L
24x48	$22.2^{+0.3}_{0}$	$45^{+0.6}_{0}$	60 or more	(48 x No. of regulators -3) $^{+0.6}_{0}$
48x48	$45^{+0.6}_{0}$			
96x96	$92^{+0.6}_{0}$	$92^{+0.6}_{0}$	120 or more	(96 x No. of regulators -3) $^{+1}_{0}$

Mounting Method

■Size: 24x48, 48x48



■Size: 96x96



Not Available

Temperature Controller

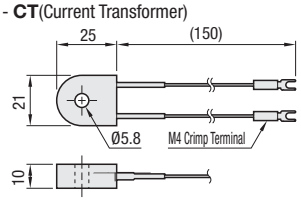
CAD Data

Be sure to refer to Temperature Controllers Guide on

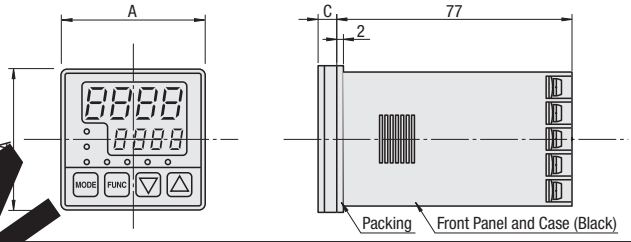


Size	Output Type: Relay Contact Output	Output Type: SSR Drive Voltage Output	Heater wire breakage alarm function	A Accessory
48x48			No Flange	-
			Available	CT (Current Transformer)
96x96			No Flange	-
			Available	CT (Current Transformer)

- **CT**(Current Transformer)



Accessory mounting attachment is included in the box.



Size	Output Type	Part Number	Heater wire breakage alarm function	A	C	€ Unit Price Qty. 1 ~ 9.
48x48	Relay Contact Output		Available	48	6	
	SSR Drive Voltage Output		-			
			Available			
96x96	Relay Contact Output		-	96	9	
			Available			
	SSR Drive Voltage Output		-			
			Available			

Order Example **Part Number**

Days to Ship **6 Days** P.87

For orders larger than indicated quantity, please request a quotation.

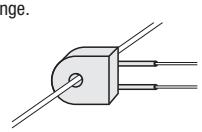
Specification

Size	48x48mm	96x96mm
Part Number		
Outer Diameter Dimension	48x48x83	96x96x86
Control Method	ON/OFF control, P control, Auto Turning, PID Control with Self-turning	
Input	Thermocouples (K, J, T, E, R, S, B), Temperature Measuring Resistor(Pt100 JPt100)	
Control Output (OUT1)	Relay Contact Output (Contact Capacity AC250 V 3A Resistance Load) / SSR Drive Voltage Output (DC12 V Max. 20mA)	Relay Contact Output (Contact Capacity AC250 V 3A Resistance Load) / SSR Drive Voltage Output (DC12 V Max. 20mA)
Alarm Output (EV1)	Relay Contact Output (AC250 V 2.4A Resistance Load) 1a Contact Point	
Control/Alarm Output2 (OUT2/EV2)	Relay Contact Output (AC250 V 2.4A Resistance Load) 1a Contact Point	
Sampling frequency	500mS	
Indication Accuracy (Thermocouple)	The bigger one of ±0.3% of specified value or ±1 Digit or ±2 Degrees (Celsius) ±3°C for -100~0°C, ±4°C for -200~-100°C, Regulation is 400°C or less of B Thermocouple	
Indication Accuracy (Temperature Measuring Resistor)	The bigger one of ±0.3% of specified value +1 Digit or ±0.5 Degrees (Celsius)	
Indication Accuracy Maintenance Temperature Range	Ambient Temperature ±10°C	
Storage Element	EEPROM	
Power Supply Voltage	AC 100 ~ 240V (Allowable voltage drop range 85~264V)	
Power Consumption	10VA(Max.)	
Mass	150g or less	380g or less

* For relay contact of OUT1 EV1 OUT2 EV2, the mechanical life is 5 million times or more, and the electrical life is 100 thousand times or more.
* Refer to the left page for sensor input type and sensor range.

(With heater wire breakage alarm function only.)

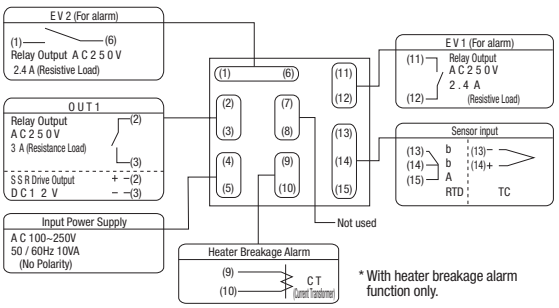
CT Input (Current Transformer)	Setting Range	AC1~30A
	Precision	5% (Set Resolution 1A)
	Breakage Detection	ON Time of OUT1: 300mS or More
	Welding Detection	ON Time of OUT1: 300mS or More



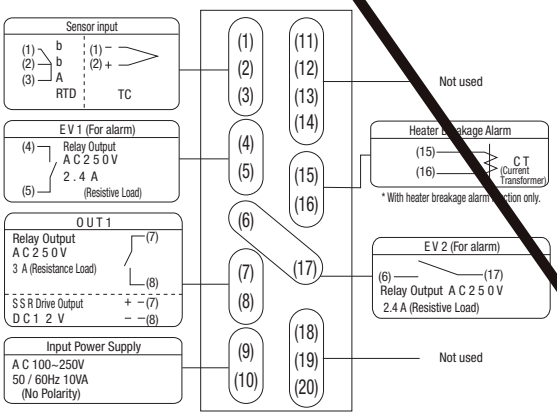
*Use the heater wire breakage alarm function included CT (Current Transformer) by threading the heater lead wire through Ø5.8 hole.

For panel cut dimensions and how to mount, refer to the previous page.

Terminal Arrangement for Wire Connection Example (48 x 48)



Terminal Arrangement for Wire Connection(Size: 96x96)



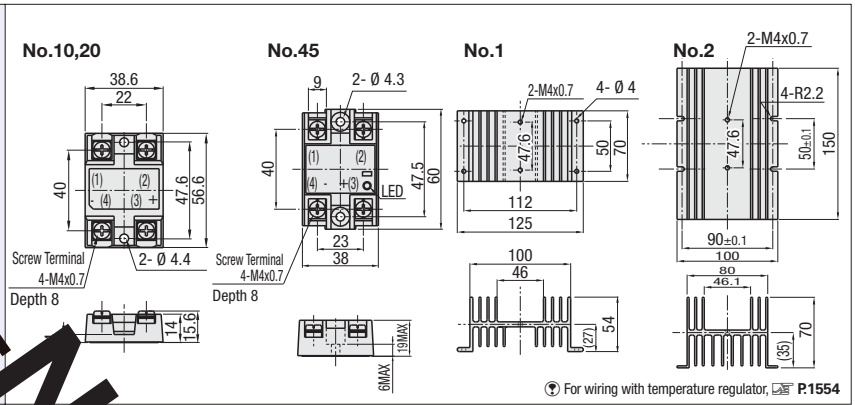
Not Available

SSR (Solid State Relays)

CAD Data



RoHS



For wiring with temperature regulator, P.1554

SSR

Part Number Type	No.	Output Side Rated Load Current	Output Side Rated Voltage	Input Voltage Range (V)	* Max. Load when Heatsink is used (reference)	Weight (g)	Applicable Heatsinks	€ Unit Price Qty. 1 ~ 9.	Vol. Discount Qty. 10~19
	10	10A Acrms	120/240 V Acrms	DC4~32	6A ((1) 10A)	50	MHS1, 2		
	20	20A Acrms			7A ((1) 13A (2) 20A)		MHS1, 2		
	45	45A Acrms		DC3~30	7A ((1) 13A (2) 30A)	53	MHS1, 2		

*The values of the maximum load current (reference) is of when 1 heater is used without a heatsink. In ( ), (1) when MHS1 is used; (2) when MHS2 is used. No. 10 and 20 are for ambient temperature 40°C or less, while No. 45 is for ambient temperature 30°C or less.(1)(2)
* Refer to the following load current characteristics.

For orders larger than indicated quantity, please request a quotation.

Order Example: Part Number 10

Days to Ship: 10 Days

Express B | 2,00 EUR/ piece | P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Heatsinks

Part Number Type	No.	Thermal Resistance (°C/W)	€ Unit Price Qty. 1 ~ 9.	Vol. Discount Qty. 10~19
	1	1.52		
	2	0.85		

For orders larger than indicated quantity, please request a quotation.

Rating

	Item	Unit			
Output	Rated Load Voltage	V Acrms	120/240		
	Rated Load Current (Resist. Load)	A Acrms	10	20	45
	Rated Frequency	Hz	50/60		
	Peak Repeatability Off Voltage	V	AC600		
Input	Maximum Input Voltage	V	DC32		DC30
	Input Current	mA	11 or less (Built-in fixed current circuit)		7.0mA or Less*
Common	Withstand Voltage	V Acrms	3k 1 minute interval or more (Input-Output-Grounding)		
	Insulation Resistance	MΩ	DC500V 100 or more (Input-Output-Grounding)		
	Operation Temperature Range	°C	-20~+80		
	Storage Temperature Range	°C	-30~+100		

* Built-in fixed current circuit

Properties

	Item	Unit		
Output	Operating Load Voltage Range	V Acrms	50~264	85~264
	Leakage Current at Open Circuit	mA Acrms	3 or less**	12 or less***
	Contact Voltage Drop	V Acrms	1.5 or less (Operation Temperature Range=25°C)	
	Minimum Load Current	mA Acrms	50	400
Input	Input Voltage Range	V	DC4~32	DC3.0~30
	Pick Up Voltage	V	DC4.0 or less	DC3.0 or less
	Drop Out Voltage	V	DC1.0 or less	DC1.0 or more
Common	Response Speed	-	1/2 cycle +1ms or Less	
	Capacitance	pF	150 or More(Input-Output)	

V0=240V*V0=200V

Input Signal of SSR

1) [illegible] correctly without altering the polarity (+, - or terminal numb[illegible]
2) For inp[illegible]e, ap[illegible] the normal starting voltage.
3) The in[illegible]pow[illegible] (signal) should be direct current. When co[illegible]ut[illegible]wn AC p[illegible]put the smoothing circuit with[illegible] and r[illegible]e the ripple so that each voltage of th[illegible] ripple[illegible]e with[illegible] operating voltage range.
4) Note that the noise near[illegible]put terminal may cause the malfunction.
5) When input line receives t[illegible]uctan[illegible]e easily, use shielded wire.

Operating Environ[illegible]

Because the SSR molding is [illegible]compl[illegible]ight, long term use in high humidity e[illegible]ent into the deterioration of SSR interior or ma[illegible]ctioning, will cause troubles from leakage betwee[illegible]e cha[illegible]parts etc
Examine the damp-proof measures as the syste[illegible]

Notes on Heat Sink Use

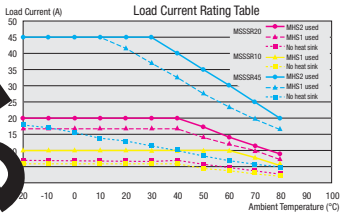
To enhance the heat radiation effect of SSR, debu[illegible]th smooth the surface of SSR, then lightly apply silic[illegible] compound. If not applied, the heat will accumulate SSR may break.

Cautions on Installation

When the ambient temperature is high, it is necessary to decrease the load current.
Please pay attention to the relation of the mounting place and the load current.
Tighten the mounting screws firmly, so that they should not be loosened from vibration, impact and etc.

Notes on Wiring

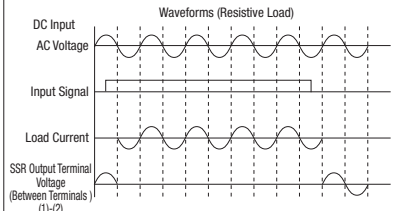
It is recommended to use round or Y-shaped crimping terminals to wire more securely, although single or stranded wires can be connected directly.



Cautions on Operation Wave and Use

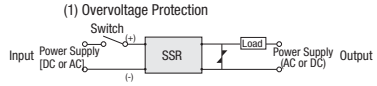
- Operation Wave

- In case of resistance load
Although the input voltage is applied near the AC power voltage, the current doesn't flow to the output side load of SSR at once, due to the effect of zero cross circuit.
When the AC power voltage decreases gradually till about zero voltage, the output side enters ON state.
And when it is not turned off immediately even though the input signal disappears and output current decreases close to zero, the effect of SSR internal element will turn it off.
When the load current reaches zero, power supply voltage appears between the terminals (1)-(2) of TRIAC.



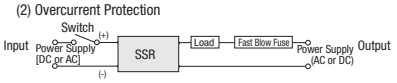
- In case of inductive load
The voltage starts quickly (Magnetic field off voltage increase rate dv/dt is large at the commutation), and it is likely to cause malfunction, when the inductive load of reactance is especially large.

(1) Overvoltage Protection



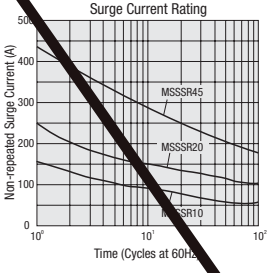
It is likely to malfunction if the noise environment on the power supply side is bad and the big surge voltage is applied to SSR. In such a case, connect varistor as figure shown above.
For varistor voltage, it is recommended to use 200 to 300V for power supply voltage 110V, and 350 to 450V for power supply voltage 220V.

(2) Overcurrent Protection



For SSR, there is a provided over-current rating. It may result in permanent breakage of SSR if current over the rated current flows. Therefore, use of fast fuse is recommended to protect SSR from surge current, when there is a possibility that a load may be short-circuited or abnormal current may flow for some causes.

Surge Current Rating



(3) Parallel Connection
SSR cannot be used by connected in parallel to increase the current. However, it can be connected in parallel to compensate the trouble of open mode.
[Important] Malfunction
It is usually in the short mode in many cases when the element of SSR is destroyed by over-voltage or over-current, although two failure modes of the open mode and the short mode may occur.
Do not use it exceeding the maximum rating even just for a moment.
Avoid SSR malfunction by taking the measure such as circuit protection.
It is recommended to use in combination of SSR protection and fail safe (safety measures for malfunction).

Not Available

Universal Relays / Terminal Blocks

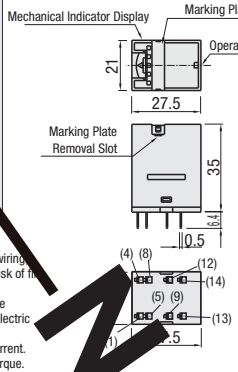
-Soldered Terminal-

CAD Data

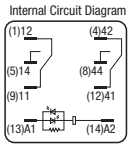
■Universal Relays-soldered Terminal-

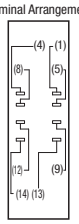


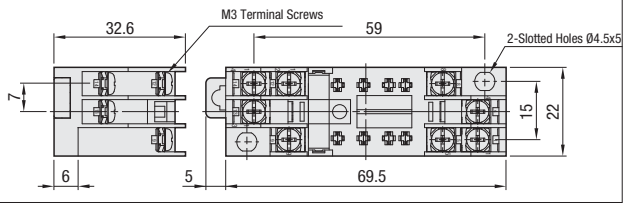
RoHS



A Accessories: Socket for Relay 1pc.
Spring Fitting 2pcs.







■Cautions for Safety

- Shut off the power before attaching, detaching, wiring, maintaining and examining. There is a possible risk of fire or electric shock.
- Comply with the rated specification range and the specification. There is a potential risk of fire or electric shock.
- Use wires suitable for the applied voltage and current. Tighten the terminal screws using appropriate torque.

Part Number		Rated Coil *1				Contact Rating					€ Unit Price	Vol. Discount
		Rated Current (mA)±15%		Rated Voltage AC (V)	Coil Resistance (Ω) ±10% (at 20°C)	Number of Poles	Allowable Contact Current	Contact Rating Voltage (V)	Allowable Contact Power (Resistance Load)	Load Current with Resistive Load		
Type	No.	50Hz	60Hz								Qty. 1 ~ 9.	Qty. 10~19
	10	9.2~11.0	7.8~9.0	100~110		2 Poles	10A	AC250 DC30	AC2500VA DC300W	10A		
	20	4.6~5.5	4.0~4.6	200~220	14,080			AC250 DC30				

* Operating properties of one rated coil (rated values at 20°C): Maximum applied voltage: 110%; Minimum rated [illegible]tion: 80% or less; Return voltage: 30% or more. Note) The rated current value includes the current of operation indicator LED.

For orders larger than indicated quantity, please request a quotation.

■Properties

Contact Material	Ag Alloy	Max. ON/OFF Frequency	Electrical: 1,800 [illegible], Mechanical: 1,8000 times/h
Contact resistance*1	50mΩ or Less	Vibration Resistance	Endurance: Fr[illegible]cy 10[illegible]z, Half Wave 0.5mm Malfunction: F[illegible]ency [illegible]Hz, Half Wave 0.5mm
Min. Operation Load*2	DC24V - 5mA (Reference Value)	Impact Resistance	Endurance: 1,000[illegible] Malfu[illegible]n: 150m/s2
Response Time*3	20ms or Less	Mechanical Durability	AC: 50 m[illegible] or more, DC: 100 million times or m[illegible]
Recovery Time*3	20ms or Less	Electrical Durability*3	AC250V: Resistance Load 5A=100,0[illegible] 5A=500,00[illegible]
Power Consumption	0.9-1.2VA (60Hz) 1.1-1.4VA (50Hz)	Operating Ambient Temp.*4	-55 ~ +60°C (No[illegible]e fro[illegible]
Insulation Resistance	100MΩ or More DC500V mega	Operating Ambient Humidity	5 ~ 85%RH (No conde[illegible]
Withstand Voltage	AC2500V, 1min (Between the same pole contact circuit. AC1000V, 1min.)	Mass (approx.)	35g

Order Example: Part Number 10

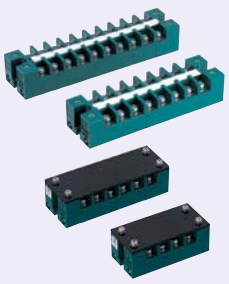
Days to Ship: 10 Days — Express B 2,00 EUR/piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

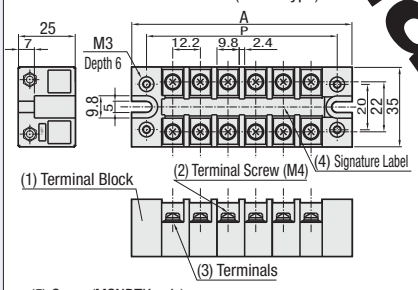
* 1 Measurement Condition: DC5V, 1A, depending on the voltage descent method.
* 2 M measurement Condition: The value at ON/OFF frequency 120 times/min. Failure [illegible]modulus P level (Reference)
* [illegible]measurement Condition: When rated voltage is applied (at 20°C), Bounce is excluded.
* 4 When 100% of rated voltage is applied.

■Terminal Blocks

RoHS



(Cover Type)



(5) Cover (MSNDTK only)

Features

Th[illegible]erminal block is made of special resin (unsaturated polyester resin), which can [illegible]ed at h[illegible] temperature.
[illegible]se it w[illegible]several heater lead wires are connected with the temperature co[illegible]
[illegible]ough u[illegible]se in atmosphere with temperature over 80°C causes signature label discolor a[illegible]the terminal block to be loosened, there is no mechanical problem.
[illegible], use[illegible]resist[illegible]res (more than 200°C) for wiring.
[illegible]Te[illegible]rmi[illegible]ew regularly.

No.	Name of [illegible]	Material	Surface Treatment	Standard
(1)	Termi[illegible]	[illegible]saturated Polyester Resin	-	UL94V-0
(2)	Termina[illegible]rew	JIS STKM	Zinc Plating (Trivalent Chromate)	-
(3)	Terminal Metal Fitting	Brass	Nickel Plating	-
(4)	Signature Label	Fiber (White)	-	-
(5)	Cover	Phe[illegible] Plate (Black)	-	-

MSNDTK (Cover Type) is include[illegible] with 4 pcs of M3 screws.

Part Number		A	P	Terminal	Mass (g)		€ Unit Price	Volume Discount	€ Unit Price	Volume Discount
Type	No.						Qty. 1 ~ 9.	Qty. 10~19	Qty. 1 ~ 9.	Qty. 10~19
	2	48.5	35.5	4	72	79				
	3	60.5	47.5	6	91	99				
	4	73	60	8	110	119				
	6	97	84	12	148	159				
	8	121.5	108.5	16	187	201				
	10	146	133	20	225	241				

No. indicates number of poles.

For orders larger than indicated quantity, please request a quotation.

■Ratings and Performances

Rated Insulation Voltage	250V	Rated Current	20A	Applicable Wire	5.5mm²	Terminal Screw	M4 (Recommended Tightening Torque: 1.4~1.8N - m)
Insulation Resistance	DC500V mega100MΩ or More					Withstand Voltage	AC2000V Normal for 1 minute
Operating Temp. / Humidity Range	-10~150°C 45~85%RH (No freezing or condensation)						
Conforming Standard	JIS C 2811 Industrial Terminal Block						

Use under atmospheric pressure (at an altitude 2000m or less)

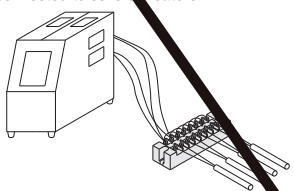
Order Example: Part Number

Days to Ship: 10 Days — Express B 2,00 EUR/piece — P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

Example

One temperature controller can be connected to seven heaters.



Two crimping terminal can be used for one terminal.

Not Available

Temperature Controllers

Please refer to FAQ on **P.1552.**

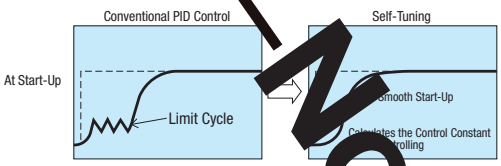
Temperature Controllers -Guide-

Misumi's Temperature Controllers can operate up to 20A in 100/200V on single phase or up to 30A in 200V on three-phase. Universal Type Temperature sensor selectable, is available, for a simple and compact line up of three kinds, such as compact, dual and high current type. And a new product "Universal and Compact Type with Alarm Function" have alarm output terminals. Specification of alarm output is same as the temperature controller (**P. 1553**).

■Features

Various types of temperature sensors and various types of input ranges can be set, therefore precise temperature control is possible. Also the control value has some fluctuations due to interference, the regulator can tune automatically and converge (stabilize) the fluctuation of control value because it has specific self-tuning function.
Moreover, when thermocouple or temperature measurement resistance burns out, protection circuit may work and prevent over-heating.

- Difference between Conventional PID Control and Self-tuning



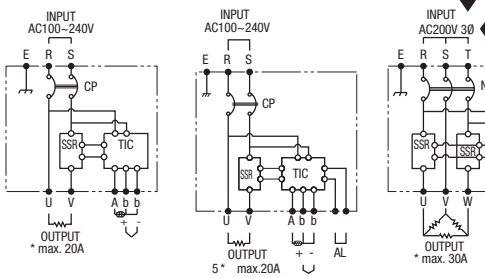
■Specification

Control PID Control (With Self-turning Function)
Rating MTCS / MTCRM AC100V/200V 1Ø *20A
MTCD AC100V/200V 1Ø *20A x 2 Circuits
MTCH AC200V 3Ø *30A
* Resistance load without inrush current (Max. Value)

Input Type Thermocouple (K · J · R · T · N · S · B)
Temperature Measuring Resistor (Pt100Ω, JPt100Ω)
Switchable depending on the panel setting
Thermocouple at the time of shipment (K)
Conditions of Operation Temperature: 0 to 30°C (No condensation)
Over Current Cut-off: Brea

■Circuit(MTCD has two identical circuits)

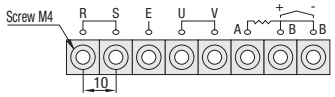
- MTCS / MTCD **- MTCRM** **- MTCH**



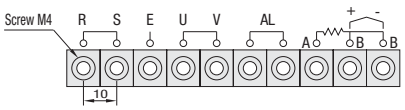
* Maximum current is heat resistance load.

■Connection

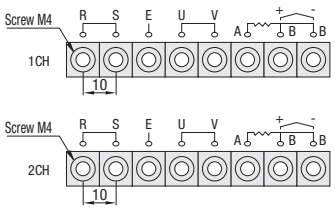
- MTCS (Universal - Compact)



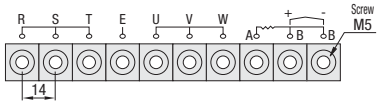
- MTCRM (Universal - Compact with Alarming Function)



- MTCD (Universal - Two-series)



- MTCH (Universal - High Electrical Current)



- Connection with Sensors

Thermocouple
\+ Red
\- White or Black
Temperature Measuring Resistor
A – Red
B – Black or White
b – White or Black
(B and b have a choice between black and white.)

- Connection with alarm operation

(MTCRM only)
AL – For alarm

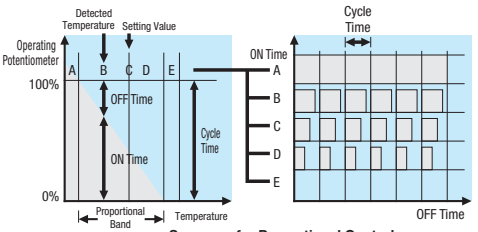
- Connection with Power Supply

Single-phase 100V/200V
R, S – Power Connection
E – Grounding Connection
U, V – Heater Connection

Three-phase 200V
R, S, T – Power Connection
E – Grounding Connection
U, V, W – Heater Connection

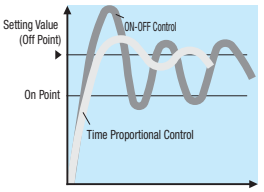
■Control by Solid State Relay (SSR)

This is the control method where using proportional control (time proportional control) in the form of ON-OFF control, change the length of ON and OFF times in proportion to the variation against the setting value in the proportional band.



Summary for Proportional Control

This one set of ON and OFF cycle is constant, and is called a Cycle Time. Suppose one cycle time is 10 seconds. If the present value is lower than the Proportional Band, the controller output will remain ON. On the other hand if the present value is higher than the Proportional Band, the controller output will remain OFF.



Comparison of Time Proportional Control and ON–OFF Control

Within the proportional band, the time proportion between ON and OFF may change in proportion to the variation against the setting value depending on the temperature. For example, when the current value is lower than the setting value and ON time is 7 sec., OFF time can be 3 sec. and ON time can be longer than OFF time.

■Warranty

Warranty Period: One year from the shipping date
Warranty Condition: Please present the guarantee card included at the time of delivery. Coverage of Warranty:Problems or damages arising through the proper usage in compliance with the instruction manual included at the time of delivery. If trouble occurs during the warranty period even though the unit has been operated in the normal manner, we will recover and repair or replace the unit.
In the following cases, repairs are for consideration. We will recover the product and make an quotation.
(1) When the damage caused by the factors out of warranty range and the product is repairable.
(2) When the damage has occurred beyond the warranty period and the product is repairable.

- Contact for Repairs

MISUMI Corporation, Fluid Control Business Division,
Fluid Control Business Team, TEL:03-3647-7300 FAX:03-3647-7481

Precautions for Safety

Although this product is designed and manufactured with safety in mind, safety cannot be guaranteed for everything about it.
For example, when the SSR (load switch) incorporated in the product is damaged, the incidents, i.e. temperature increase, can be caused in spite of being controlled by TIC (temperature controller). To ensure safety in such a case when the temperature exceeds a preset level, consideration that a safety circuit may be provided to cut off primary power of this product is necessary. The closer the current of the product approaches to the maximum rating level, the higher its temperature becomes. This can affect other equipment or shorten the service life, etc. (Expected service life can be doubled by a temperature drop of 10°C according to Arrheneius' Law.)
Be sure to keep sufficient allowance, considering each rating and safety in mind. Wire connection should be conducted by someone with expertise. Electrical power plug and cord are not included. Select them according to the capacity of the heater you use.

Safety precautions are particularly required in the following cases.
- **Use under operating conditions not specified in the instruction manual.**
- **Use in nuclear power systems, trains, motor vehicles, combustion and medical equipment.**
- **Use that may seriously affect human life or property and that particularly requires safety considerations.**

Not Available

■Universal - Compact
Universal - Compact with Alarming Function



RoHS

■Universal - Two-series

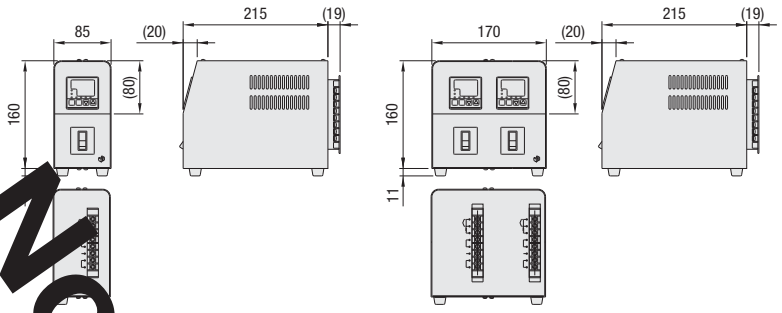


RoHS

Compact
[Single Phase, AC100V/200V]

Compact with Alarming Function
[Single Phase, AC100V/200V]

Two-series
[Single Phase, AC100V/200V]

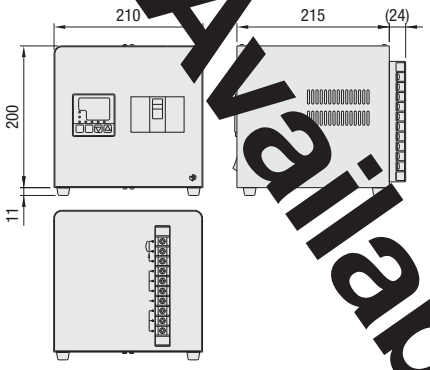


■Universal - High Electrical Current



RoHS

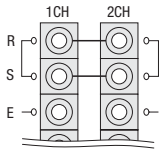
High Electrical Current
MTC [Three-phase, AC200V]



Part Number	Input Type	€ Unit Price Qty. 1~4
	Swivel	

For orders larger than indicated quantity, please request a quotation.

- MTCD (Double Type)



For power source of 1CH and 2CH, be sure to wire separately. Avoid using by shortening the space of terminals of 1CH and 2CH shown below. Heat generation and ignition may occur when power source capacity of 1CH and 2CH are added and allowable power source value exceeds.

Be sure to avoid the wiring shown above.

Order Example — Part Number

Days to Ship — 8 Days

■ Types of Sensors

Thermocouples (K, J, R, T, N, S, B) and Pt100Ω, JPt100Ω sensors can be used for the universal type.
* Thermocouple K is used before shipping.

■Methods of Changing Sensor Types

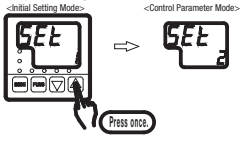
1. Switching of Display

Press "MODE" key for 2 seconds to change displays.



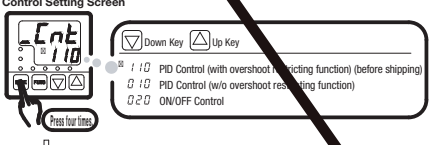
2. Change of Display Setting Mode

When Display Setting Mode is shown, press UP key and change from "Initial Setting Mode" to "Control Parameter Mode".



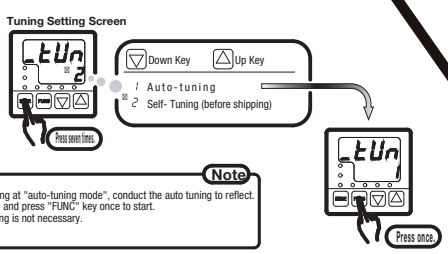
3. Setting of PID (Before Shipping) ON/OFF

Set at Control Parameter Mode, press MODE key four times and the control setting screen will be on display.
Use UP/DOWN keys.



4. Setting of Self-tuning (Before shipping) and Auto-tuning

Set at Control Parameter Mode, press MODE key seven times and the tuning setting screen will be on display.
Use UP/DOWN keys.



Note
After setting at "auto-tuning mode", conduct the auto tuning to reflect.
Set at "1" and press "FUNC" key once to start.
*Self-tuning is not necessary.

■Other Displays



Auto tuning is running.
*This message and standard display will be shown alternately.



The sensor is disconnected or above the temperature range.
*Check the connected sensor.



The temperature is below the sensor temperature range.



- Memory Error
*If the error message is displayed after reboot, temperature regulator is damaged.
It is not operational.



- Sensor type is different.
*Ex. When Temperature Measuring Resistor (Pt100Ω) is connected at the setting of thermocouple.



- Auto Tuning Error
*Try Auto Tuning Again.

Not Available

Resin Plate Characteristics

-Insulating Plates · Thermal Plates-

■Characteristics of Insulation Plates

MISUMI heat insulating plates provide excellent heat insulation. These plates are laminated heat resistance sheets which are made with glass fiber (that is forming frames) and combined material with high heat resistance.
They are asbestos-free new materials. Seven grades of heat insulating plates are available to meet various applications.

- Standard Grade: It is suitable for a use of a heat resistant structural material for heating presses and die spacers.
- Heat Resistant Grade: It can be used as heat resisting structural material in much higher temperature and is more cost-effective than the standard grade.
- High Strength Grade: It has excellent compression and bending strength properties and is suitable to use as heat insulating material for the outside of heating furnaces.
- High Temperature Resistant Grade: It maintains compression strength property under high temperature and is suitable for a use of heat resisting and insulating material for the outside of electric furnaces.
- High Temperature Insulating Grade: As both of low heat conductivity and high strength were realized, it provides excellent heat insulation effect with smaller thickness of plate.
- High Temperature Super Insulating Grade: Low temperature conductivity, lightweight and strength in high temperature provide excellent insulation.
- Very High Temperature Resistant Grade: Excellent heat resistance up to 1000°C. Usable for heating furnaces with high temperature.
- Free-cutting Grade: It has excellent mechanical strength and dimension stability. It can be used as cement board for electric insulation.

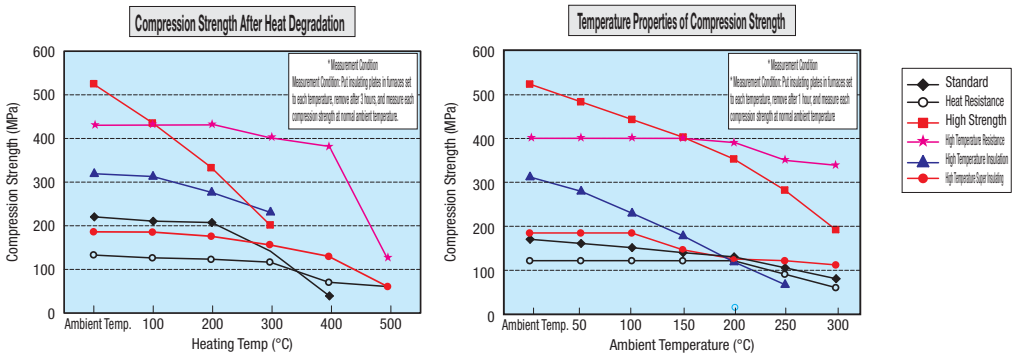
■Characteristics of Thermal Plate

MISUMI's Insulation Plates are lightweight and provide excellent heat insulation effect.
The Heat Insulation Plates make it possible to improve operational environment such as heat reservation of equipment and prevention of burns at a low cost.

Item				Part Number									
				High Temperature Insulation Plates · Sheets									Thermal Plates
				Standard	Heat Resistance	High Strength	High Temp. Resistance	High Insulation	High Temp. High Insulation	Very High Temperature Resistance	Free-cutting	
			Plate	P.1561 P.1572	P.1561 P.1572	P.1563 P.1571 P.1572	P.1563 P.1571 P.1572	P.1565 P.1572	P.1565	P.1567	P.1569	P.1569
			Products	P.1573	P.1573	P.1573	P.1573	-	-	-	-	-
			Unit	HIPA KJLHP ENJHP	HIPHA KJLHH ENJHH	HIPYA HIPYKH KJLHY ENJHY	HIPLA HIPLKH KJLHL ENJHL	HIPIA ENJHA	HIPAL	HRMB	HIPMA	HIPCA
Component	Main Base Material		-	Glass Fiber	Glass Fiber	Glass Fiber	Glass Fiber	Glass Fiber	Glass Fiber	Calcium Silicate	Glass Fiber (Small Amount)	Glass Felt
	Main Material		-	Silicic Acid Base Binder	Borate Type Binder	Super Heat Resistant Epoxy Resin	Calcium Silicate Base Binder	ISO Type Unsaturated Polyester	Calcium Silicate Base Binder		Cement	Calcium Silicate Base Binder
Electrical Characteristics	Dielectric Breakdown in Crosswise		kV/mm	6	3	27	10	10	10	-	2.9	-
	Volume Resistivity	4h/150°C	Ω·cm	$2.0x10^{14}$	$1.0x10^{12}$	$2.0x10^{15}$	$5.7x10^{16}$	$6.0x10^{16}$	$1.3x10^{15}$	-	$1.0x10^{10}$ (Note 4)	$2.4x10^{10}$
		100h/25°C/90%RH	Ω·cm	$3.0x10^{9}$	$1.0x10^{7}$	$1.0x10^{14}$	$8.2x10^{15}$	-	$7.2x10^{14}$	-	$1.0x10^{9}$	-
	Surface Resistance		Ω	-	-	$2.0x10^{15}$	$3.0x10^{16}$	$4.3x10^{16}$	$3.4x10^{15}$	-	$1.0x10^{11}$ (Note 5)	$8.0x10^{13}$
	Insulation Resistance	Ordinary Condition	Ω	-	-	$1013~10^{14}$	$1.0x10^{14}$	$3.0x10^{15}$	$1.0x10^{13}$	-	-	$3.0x10^{13}$
		After Boiling	Ω	-	-	$1011~10^{13}$	$2.0x10^{9}$	$1.3x10^{9}$	$2.0x10^{8}$	-	-	-
Mechanical Properties	Bending Strength		MPa {kgf/mm²}	100~150 {10~15}	45~55 {4.6~5.6}	390~540 {40~55}	145 {14.8}	142 {14.5}	94 {9.6}	8.8 {0.90}	19.6~29.5 (Note 5)	8.8 {0.9}
	Compression Strength	Perpendicular to Lamination	MPa {kgf/mm²}	150~200 {15~20}	120~150 {12~15}	500~588 {51~60}	439 {44.7}	313 {31.9}	182 {18.5}	4.4 {0.45}	108 {11}	1.2 (Note 3) {0.12}
		Parallel to Lamination	MPa {kgf/mm²}	-	-	270~390 {27~40}	98 {10}	235 {24}	59 {6.0}	-	-	1.8 (Note 3) {0.18}
	Izot Impact Strength		J/cm	-	-	4.6 or More	2.9	5.6	5.1	-	-	0.12
	Cleavage Strength		kN	2.6~3.4	1.8~2.4	7.8~10.8	3.1	4.2	2.6	-	-	-
Thermal Characteristics	Recommended Operation Temperature (Note 1)		°C	Normal Temp.~220	Normal Temp.~500	Normal Temp.~180	-80~400	Normal Temp.~180	Normal Temp.~400	Normal Temp.~1000	Normal Temp.~300	Normal Temp.~350
	Reference - Destructive Temp. (Note 2)		°C	-	-	-	-	230	500	-	-	450
	Expansion Coefficient		°C-1	$6.6x10^{-6}$	$9.0x10^{-6}$	$1.6x10^{-4}$	$2.6x10^{-5}$	$1.4x10^{-4}$	$7.3x10^{-5}$	-	-	$9.2x10^{-5}$
	Thermal Conductivity		W/m-K {cal/cm - sec -°C}	0.71 {$1.7x10^{-3}$}	1.21 {$2.9x10^{-3}$}	0.59 {$1.4x10^{-3}$}	0.24 {$0.58x10^{-3}$}	0.13 {$0.36x10^{-3}$}	0.08 {$0.19x10^{-3}$}	0.20 {$0.50x10^{-3}$}	0.44 {$1.22x10^{-3}$}	0.07 {$0.19x10^{-3}$}
Others	Arc Resistance		sec	180	240	180	345	75	250	-	240~370	250
	Water Absorption Ratio		%	2~5	4~6	0.03	0.05~0.06	0.06	0.09	-	15	6.3
	Specific Gravity		-	2.0~2.2	2.0~2.2	1.8~2.0	2.0	1.41	1.2	-	1.75	0.5

(Testing method conforms to JIS K6911. (Listed values are not guaranteed values but representative values.
(Note 1) "Recommended Operation Temperature" is the temperature when a long-term use does not reduce the quality rapidly. (Refer to next page "Insulation Plates Characteristics Graphs".)
(Note: 2) "Destructive Temperature" is a temperature where carbonization, collapse, and meltdown will begin.
(Note 3) "Compression Strength" of thermal plate (HIPCA) is the value for 5% deformation.
(Note 4) Condition for "Volume Resistivity" of free-cutting grade (HIPMA) is 24h/150°C.
(Note 5) Values of "Surface Resistance" and "Bending Strength" of free-cutting grade (HIPMA) are those after drying.

■Insulating Plates Properties Graphs (The following graph is an example of actual measurement. The data are reference values because of variations depending on measurement conditions.)



■Notes on Usage of Insulating Plates and Thermal Plates

(1) Be sure to use a washer with a bolt. The insulating plate may break when the bolt is tightened too hard. Especially, thermal plate (HIPCA) must be handled with care because of its softness. (Fig. A)

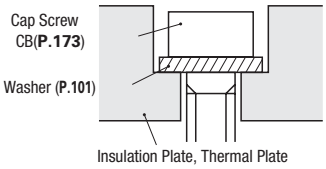
(2) Do not use in places where there may be splashes of water, chemicals, Insulation plates that have absorbed moisture may cause cracks or significant performance deterioration due to increased temperature. Especially, Free Cutting Grade (HIPMA) should be used when absolutely dry due to its water absorption.

(3) They are laminated products, so do not apply load in the direction of the layer (cleavage direction).

(4) Initial smoke and slight odor (thermal plates (HIPCA) have slight odor) may occur when using heat resisting grade (HIPHA) and thermal plates (HIPCA) at 300°C and above. Take equivalent measures for usual smoke agent such as ventilation and keep face away from it, although the smoke and odor have no especial toxicity.

(5) High Insulating Plates have a hollow to provide excellent heat insulation. They may have lines on the surface, but the lines do not affect the property and heat insulating effect.

(Fig. A)



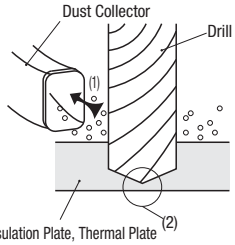
■Notes on Usage of Insulating Plates and Thermal Plates

(1) When machining, vacuum dust into a dust collector so that it may not scatter. (Fig. B-(1))
Be sure to firmly fix a High Insulating Plate on the bench because it is soft.
The dust does not contain the designated chemicals such as asbestos, but safety measures for usual works in dust, such as masks and goggles are required.
It may affect the skin such as itching, because it contains glass fiber. Wear gloves when handling the plates. In addition, when dusts adhere to the sliding parts of machine tools, there may be degradation in accuracy due to abrasion.

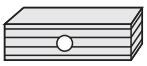
(2) Drilling of the insulating plate may cause cracks. Attention should be taken to hole pitches, hole diameters, machining conditions, etc. (Fig. B-(2))

(3) They are laminated products, and not suitable for tapping and three-dimensional machining. Especially, machining such as drilling or cutting in the direction of lamination may cause cracks and should be avoided.
(Fig.C)

(Fig. B)



(Fig.C)



Avoid the machining in the direction as shown in the above figure.

• Machinable Ceramic Machining Conditions

	Circular Cut	Milling	Drilling
Tools	Carbide (K-10)	Carbide (K-10)	Carbide (K-10)
Cutting Speed V (m/min)	Large ~Small Blades 45~200	Large ~Small Blades 100~300	Large ~Small Blades 120~350
Rotational Speed (r.p.m.)	Large ~Small Blades 50~1000	Large ~Small Blades 300~1000	Ø2 Cross-drilled 1000 ~ 1500 Ø5 Through 500 ~ 1000
Cutting Depth (mm)	0.3~0.5	0.5~2.0	-
Feed (mm/Rotation)	0.1~0.2	0.1~0.2	0.1~0.5

The above values are references only.

Heat Insulating Plates

-Standard Grade, Heat Resistant Grade-

■Standard



■Heat Resistance

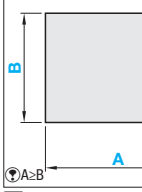
RoHS



Type	Tolerance Selection	Dim. Tolerance of A and B	Grade	Color	Operating Ambient Temperature
HIPA	Not Specified	+1.0 0	Standard	White	Normal Temperature ~ 220°C
	P	±0.3			
HIPHA	Not Specified	+1.0 0	Heat Resistance	Gray	Ambient Temperature~ 500°C
	P	±0.3			

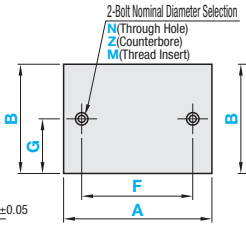
Properties and Machining Conditions P.1559

Standard

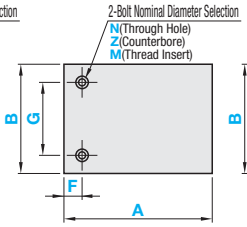


Hole, Thread Insert Machining Type

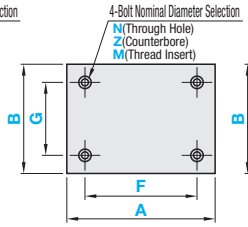
-2 Holes-2H



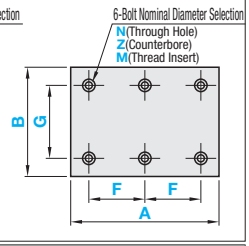
-2 Holes-2HL



-4 Holes-4H



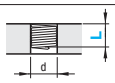
-6 Holes-6H



■Standard

Part Number		1mm Increment		Selection
Type	Tolerance Selection	A	B	T
HIPA HIPHA	Not Specified	20~800	20~600	3 5 10 15
	P	20~200	20~200	5 10

Thread Insert Machining Details

N (Through hole)	Z (Counterbore Hole)	M (Thread Insert)
		

Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	-	8	9.5	11	14	-
h	-	5	6	7	9	-

■Table 1

Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	-	-

Ordering Code Ex.) M4-L6

L≤T

For details of thread insert HLTS, refer to P.255

When L+5<T, machined holes will be blind ones.

■Hole, Thread Insert Machining Type

Part Number			1mm Increment		Selection T	0.5mm Increment		Hole Machined Bolt Nominal Diameter			
Type	Tolerance Selection	Nominal	A	B		F	G	Through Hole	Counterbore Hole	Thread Insert	
								N	Z	M	L
HIPA HIPHA	Not Specified	2H 2HL 4H 6H	20~800	20~600	3	9~791 (2-hole and 4-hole Type)	5~595 2-hole Type	3 4 5 6 8 10	-	-	-
					5	9~395 (6-hole Type)	9~591 (4-hole and 6-hole Type)		-	3 4	Select from Table 1
					10				4 5 6	3 4 5 6 8 10	
					15				4 5 6 8	3 4 5 6 8 10	
	P		20~200	20~200	5	9~191 (2-hole and 4-hole Type) 9~95 (6-hole Type)	5~195 2-hole Type 9~191 (4-hole and 6-hole Type)		-	3 4	
					10				4 5 6	3 4 5 6 8 10	

F Dimension Range: For 2H, 2HL and 4H, d (d1)+5≤F≤A-d (d1)-5; for 6H, d (d1)+5≤F≤A/2-d (d1)/2-2.5.

G Dimension Range: For 2H, 2HL, d (d1) /2+2.5≤G≤B-d (d1) /2-2.5; for 4H, 6H, d (d1) +5≤G≤B-d (d1)-5.
(d for through hole, thread insert, d1 for counterbore)

For Hole Type, select N (through hole), Z (counterbore hole), M (thread insert) and L (insertion length).

Order Example

■Standard

Part Number - A - B - T

HIPA - 100 - 80 - 5
HIPAP - 200 - 100 - 10

■Hole, Thread Insert Machining Type

Part Number - A - B - T - F - G - Bolt Nominal Dia. - L

HIPAP2H - 80 - 40 - 10 - F50 - G20 - N3
HIPA2H - 300 - 100 - 15 - F200 - G30 - M10 - L10

Days to Ship

■Standard

8 Days — Express A — 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

■Hole, Thread Insert Machining Type

10 Days — Express B — 5,00 EUR/piece — P.88

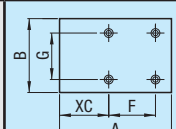
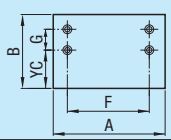
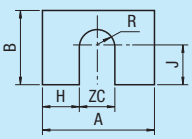
A Express Charge of 13,50 EUR for 3 or more identical pieces.

Alterations

Part Number - A - B - T - F - G - Bolt Nominal Dia. - (XC / YC / ZC)

HIPA4H - 100 - 100 - 5 - F60 - G70 - Z6 - XC10
HIPA - 100 - 100 - 5 - ZC10-H40-J50

ZC only — 10 Days

Alterations	Hole Position from Left	Hole Position from Bottom	Slot Hole			
Code	XC	YC	ZC			
Spec.	 XC=1 mm Increment 5≤XC≤786 (2H / 4H Type) d (d1)/2+2.5≤XC≤A-F-d(d1)/2-2.5 (6H Type) d(d1)/2+2.5≤XC≤A-2F-d(d1)/2-2.5 Not applicable to 2HL Type.	 YC=1mm Increment 5≤YC≤586 d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5 Not applicable to 2H and 2HL Types.	 ZC=5mm Increment H - J=1mm Increment 10≤ZC≤120 10≤H≤A-ZC-5 0≤J≤B-(ZC/2)-5 When Hole Type is specified, it is required that the distance between hole and slot hole to be 5mm or more.			
Price Adder	4,00	4,00	10≤ZC≤60		65≤ZC≤120	
			T3, 5	T10, 15	T3, 5	T10, 15
			15,00	25,00	25,00	30,00

Price

Standard Type € Unit Price (HIPA · HIPHA)

The prices of HIPAP and HIPHAP are found by adding the tolerance selection charge to the Standard Type unit price.

Part Number	T	A	HIPA € Unit Price Qty. 1~50 B											HIPHA € Unit Price Qty. 1~50 B										
			20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600	20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600
HIPA HIPHA	3	20~ 50																							
		51~100																							
		101~150																							
		151~200																							
		201~250																							
		251~300																							
		301~350																							
		351~400																							
		401~450																							
		451~500																							
		501~550																							
		551~600																							
		601~650																							
		651~700																							
		701~750																							
		751~800																							
	5	20~ 50																							
		51~100																							
		101~150																							
		151~200																							
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		451~500																							
		501~550																							
		551~600																							
		601~650																							
		651~700																							
		701~750																							
		751~800																							

Tolerance Selection Charge

Additional Price		€ Unit Price B	
		20~100	101~200
A	20~100		
	101~200		

Hole Charge

For orders larger than indicated quantity, please request a quotation.

Hole Machining Type	€ Unit Price Bolt Nominal		
	N (Through hole)	Z (Counterbore Hole)	M (Thread Insert)
2H / 2HL			
4H			
6H			

The prices of Hole Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.)

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.
HIPA2H	-	300	-	200	-	10	-	F240	-	G100	-	N8

(Standard Type € Unit Price) + (Hole Charge) = Hole Type Price

+ 3,00 = 68,30 EUR

Heat Insulating Plates

-High Strength Grade · High Temperature Resistant Grade-

■High Strength ■High Temp. Resistance RoHS



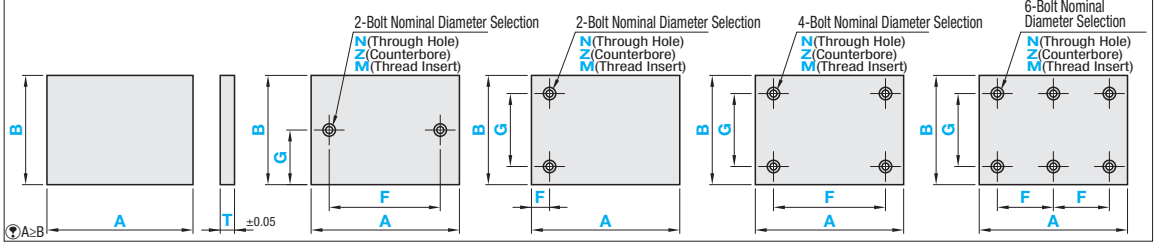


Type	Tolerance Selection	Dim. Tolerance of A and B	Grade	Color	Operating Ambient Temperature
HIPYA	Not Specified	+1.0 0	High Strength	Brown	Normal Temperature ~ 180°C
	P	±0.3			
HIPLA	Not Specified	+1.0 0	High Temp. Resistance	White	Ambient Temperature~400 °C
	P	±0.3			

Properties and Machining Conditions P.1559

Standard — **Hole, Thread Insert Machining Type**

-2 Holes-2H | -2 Holes-2HL | -4 Holes-4H | -6 Holes-6H

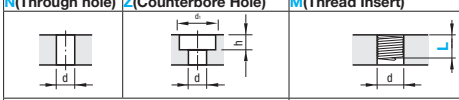


■Standard

Part Number		1mm Increment		Selection
Type	Tolerance Selection	A	B	T
HIPYA HIPLA	Not Specified	20~800	20~600	3 5 10 15
	P	20~200	20~200	5 10

Thread Insert Machining Details

N(Through hole) Z(Counterbore Hole) M(Thread Insert)



Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	-	8	9.5	11	14	-
h	-	5	6	7	9	-

■Table 1

Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	-	-
Ordering Code	Ex.) M4-L6					

L≤T

For details of thread insert HLTS, refer to P.255

■Hole, Thread Insert Machining Type

When L+5<T, machined holes will be blind ones.

Part Number			1mm Increment		Selection	0.5mm Increment		Hole Machined Bolt Nominal Diameter			
								Through Hole	Counterbore Hole	Thread Insert	
Type	Tolerance Selection	Nominal	A	B	T	F	G	N	Z	M	L
HIPYA HIPLA	Not Specified	2H 2HL 4H 6H	20~800	20~600	3	9~791 (2-hole and 4-hole Type) 9~395 (6-hole Type)	5~595 2-hole Type 9~591 (4-hole and 6-hole Type)	3 4 5 6 8 10	-	-	-
					5				-	3 4	Select from Table 1
					10				4 5 6	3 4 5 6 8 10	
					15				4 5 6 8	3 4 5 6 8 10	
	P		20~200	20~200	5	9~191 (2-hole and 4-hole Type) 9~95 (6-hole Type)	5~195 2-hole Type 9~191 (4-hole and 6-hole Type)		-	3 4	
					10				4 5 6	3 4 5 6 8 10	

F Dimension Range: For 2H - 2HL and 4H, d (d1)+5≤F≤A-d (d1)-5; for 6H, d (d1)+5≤F≤A/2-d (d1)/2-2.5.

G Dimension Range: For 2H · 2HL, d (d1) /2+2.5≤G≤B-d (d1) /2-2.5, for 4H · 6H, d (d1) +5≤G≤B-d (d1)-5.
(d for through hole, thread insert, d1 for counterbore)

For Hole Type, select N (through hole), Z (counterbore hole), M (thread insert) and L (insertion length).

Order Example

■Standard

Part Number	-	A	-	B	-	T
HIPYA	-	300	-	222	-	10
HIPYAP	-	200	-	100	-	5

■Hole, Thread Insert Machining Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.	-	L
HIPYA2H	-	200	-	170	-	15	-	F100	-	G70	-	N8		
HIPYA2H	-	300	-	185	-	10	-	F150	-	G80	-	M5	-	L10

Days to Ship

■Standard: 8 Days — Express A 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

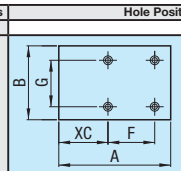
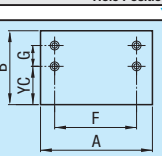
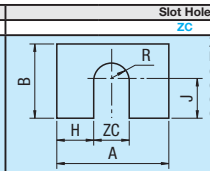
■Hole, Thread Insert Machining Type: 10 Days — Express B 5,00 EUR/piece — P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.	-	(XC · YC · ZC)
HIPYA4H	-	100	-	100	-	5	-	F60	-	G70	-	Z3		- XC10
HIPYA	-	100	-	100	-	5								- ZC10-H40-J50

ZC only — 10 Days

Alterations	Hole Position from Left	Hole Position from Bottom	Slot Hole
Code	XC	YC	ZC
Spec.	 XC=1 mm Increment 5≤XC≤786 (2H · 4H Type) d (d1)/2+2.5≤XC≤A-F-d(d1)/2-2.5 (6H Type) d(d1)/2+2.5≤XC≤A-2F d(d1)/2-2.5 Not applicable to 2HL Type.	 YC=1mm Increment 5≤YC≤586 d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5 Not applicable to 2H and 2HL Types.	 ZC=5mm Increment H - J=1mm Increment 10≤ZC≤120 10≤H≤A-ZC-5 0≤J≤B-(ZC/2)-5 When Hole Type is specified, it is required that the distance between hole and slot hole to be 5mm or more.
Price Adder	4,00	4,00	10≤ZC≤60: T3, 5 — 15,00; T10, 15 — 25,00. 65≤ZC≤120: T3, 5 — 25,00; T10, 15 — 30,00

Price

Standard Type € Unit Price (HIPYA · HIPLA)

The prices of HIPYAP and HIPLAP are found by adding the tolerance selection charge to the Standard Type unit price.

Part Number	T	A	HIPYA € Unit Price Qty. 1~50 B												HIPLA € Unit Price Qty. 1~50 B											
			20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600	20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600
HIPYA HIPLA	3	20~ 50																								
		51~100																								
		101~150																								
		151~200																								
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		701~750																								
		751~800																								

Tolerance Selection Charge

Additional Price		€ Unit Price B	
		20~100	101~200
A	20~100		
	101~200		

Hole Charge

For orders larger than indicated quantity, please request a quotation.

Hole Machining Type	€ Unit Price Bolt Nominal		
	N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H · 2HL			
4H			
6H			

The prices of Hole Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.)	Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.	(Standard Type € Unit Price)	+	(Hole Charge)	=	Hole Type Price
	HIPYA4H	-	300	-	200	-	10	-	F240	-	G160	-	Z6	117,50EUR	+	8,00EUR	=	125,50 EUR

Heat Insulating Plates

-High Temperature Insulating Grade-High Temperature Super Insulating Grade-

■High Insulation ■High Temp. High Insulation RoHS

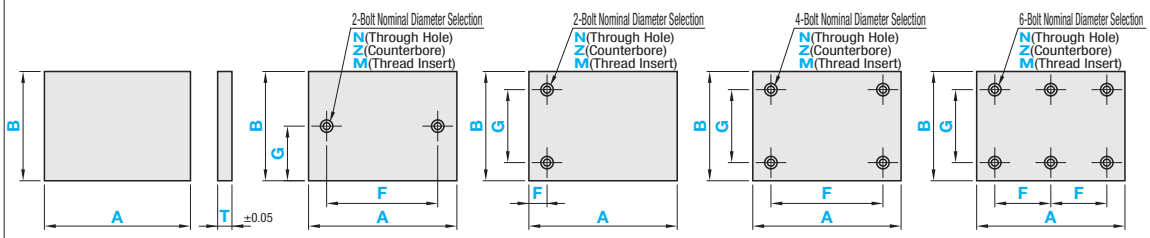


Type	Tolerance Selection	Dim. Tolerance of A and B	Grade	Color	Operating Ambient Temperature
HIPIA	Not Specified	+1.0 0	High Insulation	Natural Color	Normal Temperature ~ 180°C
	P	±0.3			
HIPAL	Not Specified	+1.0 0	High Temp. High Insulation	White	Normal Temperature~400°C
	P	±0.3			

Properties and Machining Conditions P.1559

Standard **Hole, Thread Insert Machining Type**

-2 Holes- 2H -2 Holes- 2HL -4 Holes- 4H -6 Holes- 6H



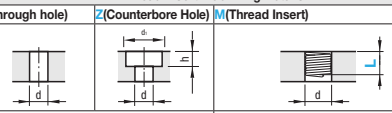
A≥B

■Standard

Part Number		1mm Increment		T	
Type	Tolerance Selection	A	B	HIPIA	HIPAL
HIPIA HIPAL	Not Specified	20~800	20~600	3 5 10 15	3 5 10
	P	20~200	20~200	5 10	5 10

Thread Insert Machining Details

N(Through hole) Z(Counterbore Hole) M(Thread Insert)



Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	-	8	9.5	11	14	-
h	-	5	6	7	9	-

■Table 1

Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3 4.5 6	4 6 8	5 7.5 10	6 9 12	8 12 -	10 15 -

Ordering Code Ex.) M4-L6

L≤T

For details of thread insert HLTS, refer to P255

When L+5<T, machined holes will be blind ones.

■Hole, Thread Insert Machining Type

Part Number			1mm Increment		T		0.5mm Increment		Hole Machined Bolt Nominal Diameter			
									Through Hole	Counterbore Hole	Thread Insert	
Type	Tolerance Selection	Nominal	A	B	HIPIA	HIPAL	F	G	N	Z	M	L
HIPIA HIPAL	Not Specified	2H 2HL 4H 6H	20~800	20~600	3	3	9~791 (2-hole and 4-hole Type)	5~595 2-hole Type	3 4 5 6 8 10	-	-	-
					5	5				-	3 4	Select from Table 1
					10	10	9~395 (6-hole Type)	9~591 (4-hole and 6-hole Type)		4 5 6	3 4 5 6 8 10	
					15	-				4 5 6 8	3 4 5 6 8 10	
	P		20~200	20~200	5	5	9~191 (2-hole and 4-hole Type)	5~195 2-hole Type		-	3 4	
					10	10	9~95 (6-hole Type)	9~191 (4-hole and 6-hole Type)		4 5 6	3 4 5 6 8 10	

F Dimension Range: For 2H - 2HL and 4H, d (d1)+5≤F≤A-d (d1)-5; for 6H, d (d1)+5≤F≤A/2-d (d1)/2-2.5.

G Dimension Range: For 2H · d (d1) /2+2.5 ≤G≤ B-d (d1) /2-2.5, for 2HL · 4H - 6H, d (d1) +5≤ G≤ B-d (d1)-5.
(d for through hole, thread insert, d1 for counterbore)

For Hole Type, select N (through hole), Z (counterbore hole), M (thread insert) and L (insertion length).

Order Example

■Standard

Part Number	-	A	-	B	-	T
HIPIA	-	300	-	222	-	10
HIPALP	-	200	-	100	-	5

■Hole, Thread Insert Machining Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.	-	L
HIPIAP2H	-	200	-	170	-	10	-	F100	-	G70	-	N8		
HIPIA4H	-	300	-	200	-	10	-	F150	-	G120	-	M5	-	L10

Days to Ship

■Standard: 8 Days

■Hole, Thread Insert Machining Type: 10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Standard Type € Unit Price (HIPIA · HIPAL)

The prices of HIPIAP and HIPALP are found by adding the tolerance selection charge to the Standard Type unit price.

Part Number	T	A	HIPIA € Unit Price 1 ~ 50 pcs. B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400	401~450	451~500	501~550	551~600	HIPAL € Unit Price 1 ~ 20 pcs. B 20~50	51~100	101~150	151~200	201~250	251~300	301~350	351~400	401~450	451~500	501~550	551~600
HIPIA HIPAL	3	20~50																								
		51~100																								
		101~150																								
		151~200																								
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		701~750																								
		751~800																								

For orders larger than indicated quantity, please request a quotation.

Alterations

Part Number - A - b - T - F - G - Bolt Nominal Dia. - (XC / YC)
HIPIA4H - 100 - 100 - 5 - F40 - G50 - N6 - XC30-YC20

Alterations	Hole Position from Left	Hole Position from Bottom
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤786 (2H · 4H Type) d (d1)/2+2.5≤XC≤A-F-d(d1)/2-2.5 (6H Type) d(d1)/2+2.5≤XC≤A-2F-d(d1)/2-2.5 Not applicable to 2HL Type.	YC=1mm Increment 5≤YC≤586 d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5 Not applicable to 2H and 2HL Types.
Price Adder	4,00	4,00

Tolerance Selection Charge

Additional Price		€ Unit Price B 20~100	101~200
A	20~100		
	101~200		

Hole Charge

Hole Machining Type	€ Unit Price Bolt Nominal N (Through hole)	Z (Counterbore Hole)	M (Thread Insert)
2H · 2HL			
4H			
6H			

The prices of Hole Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Dia.
HIPIA4H - 300 - 200 - 10 - F240 - G160 - Z6

(Standard Type € Unit Price) 82,70 + (Hole Charge) 8,00 = Hole Type Price 90,70 EUR

Heat Insulating Plates
-Very High Temperature Insulating Grade-



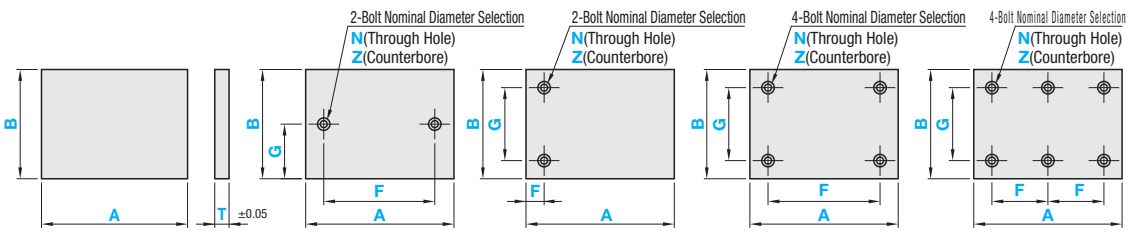
RoHS

Type	Tolerance Selection	Dim. Tolerance of A and B	Color	Operating Ambient Temperature
HRMB	Not Specified	+1.0 0	White	Ambient Temperature ~ 1000°C
	P	±0.3		

Properties and Machining Conditions P.1559

Standard **Hole, Thread Insert Machining Type**

-2 Holes- 2H -2 Holes-2HL -4 Holes-4H -6 Holes-6H



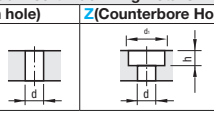
A≥B

Standard

Part Number		1mm Increment		Selection
Type	Tolerance Selection	A	B	T
HRMB	Not Specified	20~800	20~600	12.7 19.1 25.4
	P			

Thread Insert Machining Details

N(Through hole) Z(Counterbore Hole)



Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	-	8	9.5	11	14	-
h	-	5	6	7	9	-

Hole, Thread Insert Machining Type

Part Number			1mm Increment		Selection	0.5mm Increment		Hole Machined Bolt Nominal Diameter	
Type	Tolerance Selection	Nominal	A	B	T	F	G	Through Hole	Counterbore Hole
								N	Z
HRMB	Not Specified	2H 2HL 4H 6H	20~800	20~600	12.7	9~791 (2-hole and 4-hole Type) 9~395 (6-hole Type)	5~595 2-hole Type 9~591 (4-hole and 6-hole Type)	3 4 5 6 8 10	4 5 6
					19.1				4 5 6 8
					25.4				4 5 6 8
	P		20~200	20~200	12.7	9~191 (2-hole and 4-hole Type) 9~95 (6-hole Type)	5~195 2-hole Type 9~191 (4-hole and 6-hole Type)		4 5 6
					19.1				4 5 6 8
					25.4				4 5 6 8

F Dimension Range: For 2H - 2HL and 4H, d (d1)+5≤F≤A-d (d1)-5; for 6H, d (d1)+5≤F≤A/2-d (d1)/2-2.5.
G Dimension Range: For 2H, d (d1) /2+2.5 ≤G≤ B-d (d1) /2-2.5, for 2HL · 4H - 6H, d (d1) +5≤ G≤ B-d (d1)-5.
(d is for Through Hole. d1 is for Counterbore.)
For Hole type, select from N (through hole), Z (Counterbore).

Order Example

Standard

Part Number	-	A	-	B	-	T
HRMB	-	300	-	222	-	12.7
HRMBP	-	200	-	100	-	19.1

Hole, Thread Insert Machining Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.
HRMB2H	-	200	-	170	-	12.7	-	F100	-	G70	-	N8
HRMBP4H	-	200	-	150	-	12.7	-	F150	-	G120	-	Z5

Days to Ship

Standard 8 Days

Hole, Thread Insert Machining Type 10 Days

Express B 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

Standard Type € Unit Price (HRMB) Same price for HRMBP.

Part Number	T	A	HRMB · HRMBP € Unit Price 1 ~ 50 pcs. B 20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600
HRMB HRMBP	12.7	20~50												
		51~100												
		101~150												
		151~200												
		201~250												
		251~300												
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	19.1	20~50												
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		601~650												
		651~700												
		701~750												
		751~800												

Hole Charge

Hole Machining Type	€ Unit Price Bolt Nominal N(Through hole)	Z(Counterbore Hole)
2H · 2HL		
4H		
6H		

For orders larger than indicated quantity, please request a quotation.

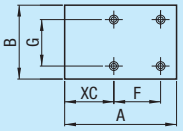
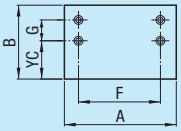
The prices of Hole Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Dia.
HRMB4H - 300 - 200 - 12.7 - F240 - G160 - Z6

(Standard Type € Unit Price) + (Hole Charge) = Hole Type Price
+ 8,00 = 56,20 EUR

Alterations

Part Number - A - B - T - F - G - Bolt Nominal Dia. - (XC · YC)
HRMBP4H - 100 - 100 - 19.1 - F40 - G50 - N6 - XC30-YC20

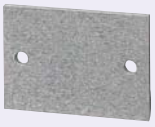
Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤786 (2H · 4H Type) d (d1)/2+2.5≤XC≤A-F-d(d1)/2-2.5 (6H Type) d(d1)/2+2.5≤XC≤A-2F-d(d1)/2-2.5 Not applicable to 2HL Type.	YC=1mm Increment 5≤YC≤586 d(d1)/2+2.5≤YC≤B-G-d(d1)/2-2.5 Not applicable to 2H and 2HL Types.
Price Adder	4,00	4,00

Heat Insulating Plates / Insulating Papers

-Free-cutting Grade · Thermal Plates-

■-Free Cutting Grade-





■Thermal Plates

RoHS

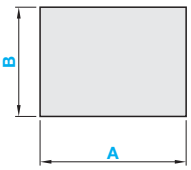




Type	Grade	Color	Operating Ambient Temperature
HIPMA	Free-cutting	White Gray	Ambient Temperature ~ 300°C
HIPCA	Heat-retention	White	Ambient Temperature ~ 350°C

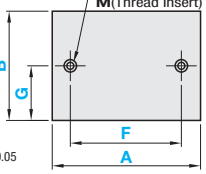
Properties and Machining Conditions P.1559

Standard

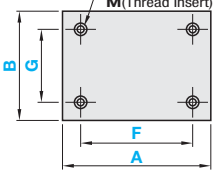


Hole, Thread Insert Machining Type

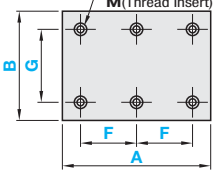
-2 Holes-**2H**



-4 Holes-**4H**



-6 Holes-**6H**



A≥B

■Standard

Part Number Type	1mm Increment A	1mm Increment B	Selection T
HIPMA HIPCA	20~800	20~600	5 10 15

■Precision Standards

- T Dimension Tolerance

(HIPMA)

T: ±0.5

(HIPCA)

T	5	10	15
	±0.8	±1.0	±1.3

- Dimension Tolerance of A and B

(HIPMA)

A / B: $^{+1}_{0}$

(HIPCA)

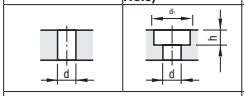
A / B	~499mm	500~
	$^{+1}_{0}$	$^{+2}_{0}$

■Rate of Camber and Torsion (HIPCA)

T Dimension	Rate of Camber and Torsion per 1000mm
5 · 10	1.3% or Less
15	0.65% or Less

Thread Insert Machining Details

N(Through hole) Z(Counterbore Hole) M(Thread Insert)



Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d_1	-	8	9.5	11	14	-
h	-	5	6	7	9	-

Table 1

Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
L	3	4	5	6	8	10
	4.5	6	7.5	9	12	15
	6	8	10	12	-	-

Ordering Code (Ex.) M4-L6

L≤T

For details of thread insert HLTS, refer to P.255

When L+5<T, machined holes will be blind ones.

■Hole, Thread Insert Machining Type

Part Number Type	Part Number Nominal	1mm Increment A	1mm Increment B	Selection T	0.5mm Increment F	0.5mm Increment G	Hole Machined Bolt Nominal Diameter: Through Hole N	Counterbore Hole Z	Thread Insert M	L
HIPMA	2H 4H 6H	20~800	20~600	5	9~791 (2-hole and 4-hole Type)	5~595 (2-hole Type)	3 4 5 6 8 10	-	3 4	Select from Table 1
				10				-	3 4 5 6 8 10	
				15	9~395 (6-hole Type)	9~591 (4-hole and 6-hole Types)		4 5 6	3 4 5 6 8 10	
HIPCA				5	9~786 (2-hole and 4-hole Type)	7~593 (2-hole Type)		-	-	-
				10				4 5 6		
				15	9~391 (6-hole Type)	9~591 (4-hole and 6-hole Types)		4 5 6 8		

Thread insert machining is not applicable to HIPCA.

F Dimension Range: For 2H and 4H, $d(d_1)+5 \leq F \leq A-d(d_1)-5$; for 6H, $d(d_1)+5 \leq F \leq A/2-d(d_1)/2-2.5$.

G Dimension Range: For 2H, $d(d_1)/2+2.5 \leq G \leq B-d(d_1)/2-2.5$, for 4H · 6H, $d(d_1)+5 \leq G \leq B-d(d_1)-5$.
(d for through hole, thread insert, d_1 for counterbore)

For Hole Type, select N (through hole), Z (counterbore hole), M (thread insert) and L (insertion length).

When machined hole of Thread Insert Type goes through, the hole periphery may peel.

Order Example

■Standard

Part Number - A - B - T

HIPMA - 300 - 222 - 10

■Hole, Thread Insert Machining Type

Part Number - A - B - T - F - G - Bolt Nominal Dia. - L

HIPCA2H - 200 - 170 - 10 - F100 - G70 - N8

HIPMA2H - 200 - 150 - 5 - F100 - G75 - M4 - L4

Days to Ship

■Standard

8 Days — Express A 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

■Hole, Thread Insert Machining Type

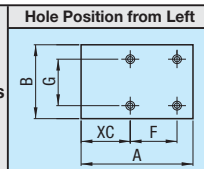
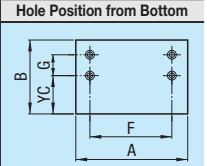
10 Days — Express B 5,00 EUR/piece — P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Alterations

Part Number - A - b - T - F - G - Bolt Nominal Dia. - (XC · YC)

HIPCA2H - 100 - 100 - 5 - F40 - G50 - N6 - XC30

Alterations	Hole Position from Left	Hole Position from Bottom
		
Code	XC	YC
Spec.	XC=1 mm Increment 5≤XC≤786 (2H · 4H Type) $d(d_1)/2+2.5 \leq XC \leq A-F-d(d_1)/2-2.5$ (6H Type) $d(d_1)/2+2.5 \leq XC \leq A-2F-d(d_1)/2-2.5$	YC=1mm Increment 5≤YC≤586 $d(d_1)/2+2.5 \leq YC \leq B-G-d(d_1)/2-2.5$ Not applicable to 2H Type.
Price Adder	4,00	4,00

Price

Standard Type € Unit Price (HIPMA · HIPCA)

T	A	HIPMA € Unit Price Qty. 1~50 — B											HIPCA € Unit Price Qty. 1~50 — B										
		20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600	20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	201 ~ 250	251 ~ 300	301 ~ 350	351 ~ 400	401 ~ 450	451 ~ 500	501 ~ 550	551 ~ 600
5	20~ 50																								
	51~100																								
	101~150																								
	151~200																								
	201~250																								
	251~300																								
	301~350																								
	351~400																								
	401~450																								
	451~500																								
	501~550																								
	551~600																								
	601~650																								
	651~700																								
	701~750																								
	751~800																								
10	20~ 50																								
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	501~550																								
	551~600																								
	601~650																								
	651~700																								
	701~750																								
	751~800																								

For orders larger than indicated quantity, please request a quotation.

Hole Charge

Hole Machining Type	€ Unit Price — Bolt Nominal		
	N(Through hole)	Z(Counterbore Hole)	M(Thread Insert)
2H / 2HL			
4H			
6H			

The prices of Hole Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.) Part Number - A - B - T - F - G - Bolt Nominal Dia.

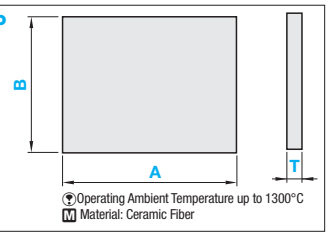
HIPMA4H - 300 - 200 - 10 - F240 - G160 - Z6

(Standard Type € Unit Price) + (Hole Charge) = Hole Type Price

\+ 8,00 = 51,50 EUR

Insulating Papers RoHS

HIFP



Operating Ambient Temperature up to 1300°C

M Material: Ceramic Fiber

Part Number Type	T	Selection A	Selection B	€ Unit Price B100	B200	B400	B600
HIFP	1	100	100 / 200 / 400 / 600				
		400					
		800					
	2	100					
		400					
		800					
	3	100					
		400					
		800					

Order Example

Part Number	-	A	-	B
HIFP3	-	100	-	400

Days to Ship

8 Days

Express A 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~19	20~34	35~49
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Features

Insulating paper product made from Ceramic Fiber has excellent flexibility and can be bent when used.
Can be cut with scissors or a utility knife.

Tolerance

T Dimension			A Dimension	B Dimension
1	2	3	4	4
±0.15	±0.25	±0.30	-2	-2

Properties

Density (kg/m3)		250
Max. Operation Temperature (°C)		1300
Thermal Conductivity (W/m-K) {kcal/m - h - °C}	400°C	0.07 {0.06}
	600°C	0.09 {0.08}
	800°C	0.13 {0.11}
	1000°C	0.16 {0.14}
Tensile Strength (N/25mm) T	1mm	14.7 or More
	2mm	29.4 or More
	3mm	44.1 or More

High Temperature Insulation Sheets

■High Temperature Insulation Sheets

RoHS

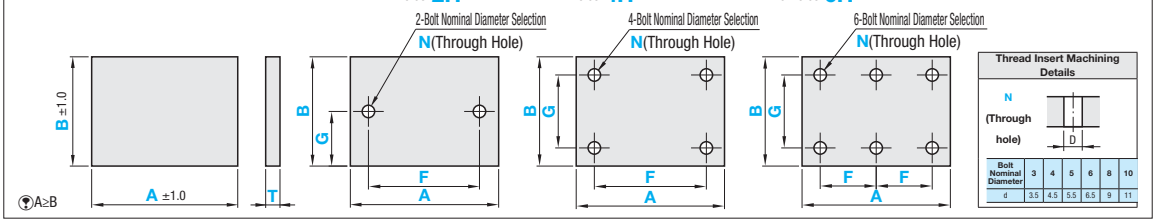


Type	Grade	Color	Operating Ambient Temperature
HIPYKH	High Strength	Brown	Normal Temperature ~ 180°C
HIPLKH	High Temp. Resistance	White	Normal Temperature~400 °C
HIPSKH	-	Gray	Ambient Temperature ~ 800°C

Standard

Hole, Thread Insert Machining Type

-2 Holes-**2H** -4 Holes-**4H** -6 Holes-**6H**



Ⓨ A≥B

■Standard

Part Number Type	1mm Increment A	1mm Increment B	Selection T
HIPYKH HIPLKH	20~500	20~500	1 2
HIPSKH			1.5 2

■Hole, Thread Insert Machining Type

Part Number Type	Nominal	1mm Increment A	1mm Increment B	Selection T	0.5mm Increment F	0.5mm Increment G	Hole Machined Bolt Nominal Diameter N (Through hole)
HIPYKH HIPLKH	2H 4H 6H	20~500	20~500	1 2	9~491 (2H · 4H Type) 9~245 (6H Type)	5~495 (2H Type) 9~491 (4H · 6H Type)	3 4 5 6 8 10
HIPSKH				1.5 2			

Ⓨ F Dimension Range: For 2H and 4H, d+5≤F≤A-d-5; for 6H, d+5≤F≤A/2-d/2-2.5.
Ⓨ G Dimension Specification Range: For 2H, d/2+2.5≤G≤B-d/2-2.5; for 4H and 6H, d+5≤G≤B-d-5.

■Characteristics of HIPSKH

Guide: Inorganic mineral, Fiber, Filler and Binding Agent are main materials. Dried after paper making formation.

Item	Unit	Characteristic Values
Density	kg/m³	900
Tensile Strength	N/mm²	2.45
Compression Rate(6.86MPa)	%	20
Recovery Rate (6.86MPa)	%	35
Thermal Conductivity	W/(m-K) {cal/cm - sec - °C}	0.11 {0.26x10⁻³}

Ⓨ Handle with care as the material is fragile.
Ⓨ Characteristics of HIPYKH and HIPLKH ☞P.1559
Ⓨ The above values are references only.

■Precision Standards

- T Dimension Tolerance

T1.0	T2.0
±0.15	±0.25

■Hole Charge

Hole Machining Type	€ Unit Price Bolt Nominal N (Through hole)
2H	
4H	
6H	

■Standard

Part Number	-	A	-	B	-	T
HIPYKH	-	300	-	200	-	1

■Hole, Thread Insert Machining Type

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.
HIPLKH2H	-	300	-	200	-	2	-	F50	-	G50	-	N4

Days to Ship

■Standard

8 Days

Express A 8,00 EUR/piece ☞P.88

Ⓨ A Express Charge of 21,60 EUR for 3 or more identical pieces.
⊗ Express Serviceis not available for HIPSKH.

■Hole, Thread Insert Machining Type

10 Days

Express B 5,00 EUR/piece ☞P.88

Ⓨ A Express Charge of 13,50 EUR for 3 or more identical pieces.

Ⓨ The prices of Hole Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.)

Part Number	-	A	-	B	-	T	-	F	-	G	-	Bolt Nominal Dia.
HIPLKH2H	-	300	-	200	-	2	-	F50	-	G50	-	N4

(Standard Type € Unit Price) + (Hole Charge) = Hole Type Price
+ 3,00 = 54,60 EUR

■Standard Type € Unit Price (HIPYKH / HIPLKH / HIPSKH)

T	A	HIPYKH € Unit Price B20~50	B51~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400	B401~450	B451~500
1	20~ 50										
	51~100										
	101~150										
	151~200										
	201~250										
	251~300										
	301~350										
	351~400										
	401~450										
	451~500										
2	20~ 50										
	51~100										
	101~150										
	151~200										
	201~250										
	251~300										
	301~350										
	351~400										
	401~450										
	451~500										

T	A	HIPLKH € Unit Price B20~50	B51~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400	B401~450	B451~500
1	20~ 50										
	51~100										
	101~150										
	151~200										
	201~250										
	251~300										
	301~350										
	351~400										
	401~450										
	451~500										
2	20~ 50										
	51~100										
	101~150										
	151~200										
	201~250										
	251~300										
	301~350										
	351~400										
	401~450										
	451~500										

T	A	HIPSKH € Unit Price B20~50	B51~100	B101~150	B151~200	B201~250	B251~300	B301~350	B351~400	B401~450	B451~500
1.5	20~ 50										
	51~100										
	101~150										
	151~200										
	201~250										
	251~300										
	301~350										
	351~400										
	401~450										
	451~500										
2	20~ 50										
	51~100										
	101~150										
	151~200										
	201~250										
	251~300										
	301~350										
	351~400										
	401~450										
	451~500										

Heat Insulating Plates
-Circular Type-

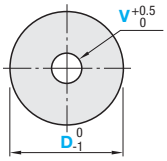
■Heat Insulating Plates -Circular Type-

RoHS

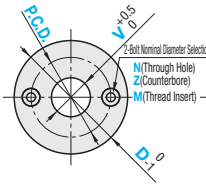


ENJHP
ENJHH
ENJHY
ENJHL
ENJHA

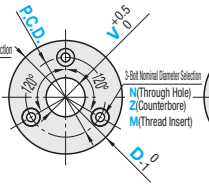
Standard



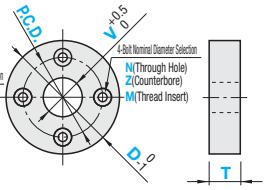
-2 Holes-2H



-3 Holes-3H



-4 Holes-4H

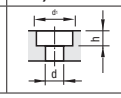
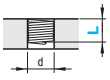


Properties P.1559~

■Standard

Part Number			1mm Increment	
Type	T	T Tolerance	D	V
ENJHP (Standard Grade)	5, 10, 15	±0.05	50~400	0~50 (V≤D-10)
ENJHH (Heat Resistant Grade)	5, 10, 15	±0.05		
ENJHY (High Strength Grade)	5, 10, 15	±0.05		
ENJHL (High Temperature Resistant Grade)	5, 10, 15	±0.05		
ENJHA (High Temperature Insulating Grade)	3, 5, 10	±0.05		

Thread Insert Machining Details

N (Through hole)	Z (Counterbore Hole)	M (Thread Insert)
		

Bolt Nominal Diameter	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11
d1	6.5	8	9.5	11	14	-
h	4	5	6	7	9	-

■Table 1

Bolt Nominal Diameter	3	4	5	6	8
d	3.5	4.5	5.5	6.5	9
L	3 4.5 6	4 6 8	5 7.5 10	6 9 12	8 12 -

Ordering Code Ex.) M4-L6

L≤T

For details of thread insert HLTS, refer to P255

When L+5<T, machined holes will be blind ones.

■Hole, Thread Insert Machining Type

Part Number			1mm Increment			Hole Machined Bolt Nominal Diameter			
						Through Hole	Counterbore Hole	Thread Insert	
Type	Hole Selection	T	D	V	P.C.D.	N	Z	M	L
ENJHP (T≥5) ENJHH (T≥5) ENJHL (T≥5) ENJHA (T≥10)	2H 3H 4H	3	50~400	0~50 (V≤D-10)	20~390*	3 4 5 6 8 10	-	-	-
		5						3 4	Select from Table 1
		10					4 5 6	3 4 5 6	
		15					4 5 6 8	3 4 5 6 8	

For Hole Type, select N (through hole) or Z (counterbore hole), for Thread Insert Type, select M (thread insert) or L (insertion length).
* P.C.D. V+5+d (d1)≤ P.C.D ≤D-5-d (d1) (d for through holes and thread insert; d1 for counterbore and countersink)

Order Example

■Standard

Part Number - D - V

ENJHP5 - 300 - 50

■Hole, Thread Insert Machining Type

Part Number - D - V - P.C.D. - Bolt Nominal Dia. - L

ENJHP2H5 - 300 - 50 - 80 - N3

ENJHP2H5 - 300 - 50 - 80 - M3 - L3

Days to Ship: 10 Days | Express B 5,00 EUR/piece P.B8

A Express Charge of 13,50 EUR for 3 or more identical pieces.

■Hole Charge

Hole Machining Type	€ Unit Price Bolt Nominal		
	N (Through hole)	Z (Counterbore Hole)	M (Thread Insert)
2H			
3H			
4H			

The prices of Hole Type and Thread Insert Type are Standard Type € Unit Price plus Hole Charge or Thread Insert Machining Charge, respectively.

(Ex.) Part Number - D - V - P.C.D. - Bolt Nominal Dia. - L

ENJHP2H10 - 350 - 50 - 200 - M5 - 7.5

(Standard Type € Unit Price) + (Hole Charge) = Hole Type Price

\+ 6,20 = 157,40 EUR

Price

■Volume Discount (Round down to one Cent.) P.87

Quantity	1~9	10~14	15~19	20~49
Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

Part Number		€ Unit Price						
Type	T	D50~100	D101~150	D151~200	D201~250	D251~300	D301~350	D351~400
ENJHP (Standard Grade)	5							
	10							
	15							
ENJHH (Heat Resistant Grade)	5							
	10							
	15							
ENJHY (High Strength Grade)	5							
	10							
	15							
ENJHL (High Temperature Resistant Grade)	5							
	10							
	15							
ENJHA (High Temperature Insulating Grade)	3							
	5							
	10							

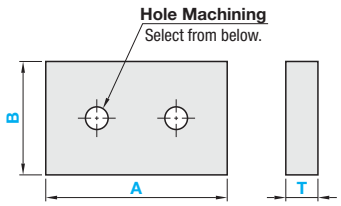
Machined Resin Plates

RoHS



Type	Material
KJLHP	Standard, White Gray
KJLHH	Heat Resistant, Gray
KJLHL	High Temperature Resistant Grade - White

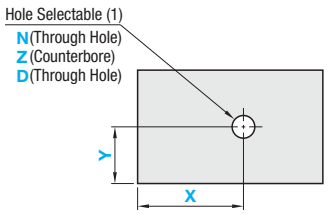
Material, Characteristic Value
Refer to P.1559



A≥B

Hole Machining Selection

S



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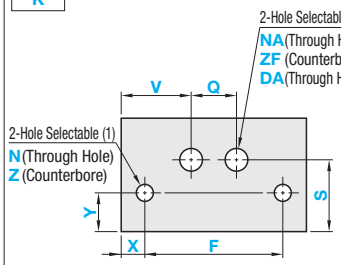
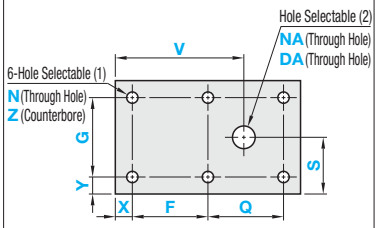


H



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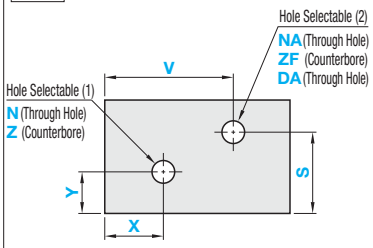

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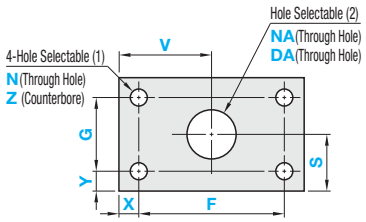
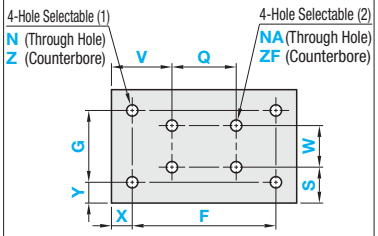
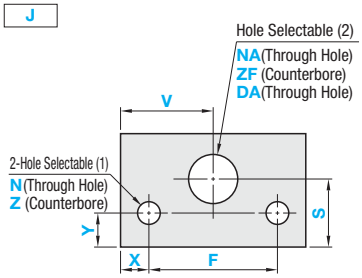


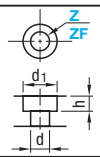
C



J



Hole Selection

Hole Type	Through Hole	Counterbore Hole	Through Hole
Code	N · NA	Z · ZF	D · DA
Shape			
Machining Specification	Dim. / Nominal Diameter: 3 4 5 6 8 10; d: 3.5 4.5 5.5 6.5 9 11	Bolt Nominal Ø: 4 5 6 8; d: 4.5 5.5 6.5 9; d1: 8 9.5 11 14; h: 5 6 7 9	3~30

Part Number			A 1mm Increment	B 1mm Increment	X	Y	F	G	V	Q	S	W	Hole Selection (1) Nominal Diameter			Hole Selection (2) Nominal Diameter		
Type	Hole Machining Selection	T											N Selection	Z (Front) Selection	D 0.5mm Increment	NA Selection	ZF (Front) Selection	DA 0.5mm Increment
KJLHP KJLHH KJLHL	S B J K V H C	3 5 10 15	20~300	20~200	1mm Increment								3 4 5 6 8 10	- - 4 5 6 4 5 6 8	3~30	3 4 5 6 8 10	- - 4 5 6 4 5 6 8	3~30

Order Example

Part Number																		
Type	Hole Machining	T	-	A	-	B	-	X	-	Y	-	F	-	G	-	V	-	Q	-	S	-	W	-	Hole Selection (1) Code, Nominal	-	Hole Selection (2) Code, Nominal
KJLHP	V	10	-	A140	-	B80	-	X15	-	Y10	-	F110	-	G60	-	V70			-	S40			-	Z6	-	DA24

Days to Ship

10 Days | Express B | 5,00 EUR/ piece | P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

The price is the main body price plus the hole machining charge.

Hole Charge

Hole Machining Type	S	B	J	K	V	H	C
€ Unit Price							

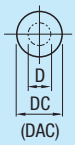
Body Price

Type	A	€ Unit Price Qty. 1~19																	
		20~50	51~100		101~150			151~200				201~250				251~300			
	B	20 ~ 50	20 ~ 50	51 ~ 100	20 ~ 50	51 ~ 100	101 ~ 150	20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200	20 ~ 50	51 ~ 100	101 ~ 150	151 ~ 200
KJLHP	3																		
	5																		
	10																		
	15																		
KJLHH	3																		
	5																		
	10																		
	15																		
KJLHL	3																		
	5																		
	10																		
	15																		

For orders larger than indicated quantity, please request a quotation.

Alterations

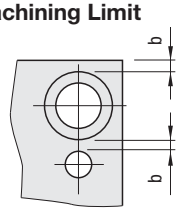
Part Number																										
Type	Hole Machining	T	-	A	-	B	-	X	-	Y	-	F	-	G	-	V	-	Q	-	S	-	W	-	Hole Selection (1) Code, Nominal	-	Hole Selection (2) Code, Nominal
KJLHP	V	10	-	A140	-	B80	-	X15	-	Y10	-	F110	-	G60	-	V70			-	S40			-	Z6	-	DAC42

Alterations	Code	Spec.	Price Adder	
D Hole Diameter 	DC DAC	Changes the diameter of D hole. DC - DAC=1 mm Increment Ordering Code Specify dimension D(DA) as DC(DAC). (Ex.) D=40···›DC40 31≤DC≤80 31≤DAC≤80	D31~40	6,00
			D41~60	8,00
			D61~80	10,00

Machining Dimension Tolerance

Type	Dimension Tolerance of A and B	T Dimension Tolerance
KJLHP	+0.1 0	±0.05
KJLHH		
KJLHL		

Machining Limit



Drill Hole Diameter (Counterbore Hole Diameter)	b (Minimum Value)
3~10	2.5

Metal Plates

Metal Plates

Added

Not Available



Dimension Selectable Plates

Added





Added



Product Name	Material Shop 24, Metal Plates	Product Name	1.0038/S235JR -6F -	1.0038/S235JR	1.1206/C50E -6F -
Pages	1581	Pages	1583	1587	1589







A Dimension Configurable Plates



1.1206/C50E	High Precision Aluminium -EN AW-5052-	Duralumin -EN AW-2017/AlCu4MgSi-	Product Name	1.0038/S235JR Plates
1593	1595 · 1596	1597	Pages	1598

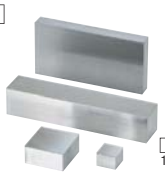
Added



Price Reduced
10% on average



Added



Price Reduced
10% on average



1.0038/S235JR -6F -	1.1206/C50E	1.1206/C50E -6F -	1.4305 · 1.4301
1599	1601	1603	1605 · 1606









High Precision Aluminum -EN AW-6063-	Duralumin -En AW-2017/AlCu4MgSi-	Tough Pitch / Oxygen Free Copper	Precision Aluminum Cut Plates -EN AW-5052-
1607 · 1608	1609	1610	1611





Configurable Plates
(Configurable for length, width and plate thickness)

Added





Price Reduced
Up to 6%

High Precision Aluminum Cut Plates -EN AW-5052-	Precision Duralumin Cut Plates -EN AW-2017-	Product Name	Premium Plates	1.0038 Configurable Plates
1613	1615	Pages	1617	1621



Price Reduced
3% on average





Price Reduced
Up to 6%



1.0038 Annealed Material Configurable Plates	1.1206/C50E Configurable Plates	1.1203 Configurable Plates	JIS-SKS93 Configurable Plates (For Oil-Quenching)
1631	1635	1643	1645

Added



Price Reduced
Up to 15%







Price Reduced
3% on average

1.2510 · 1.2379 · DC53® (Daido Steel) Configurable Plates	1.7220/34CrMo4 Configurable Plates	1.3343/S6-5-2 Configurable Plates	Pre-Hardening Steel Configurable Plates
1647	1651	1653	1655



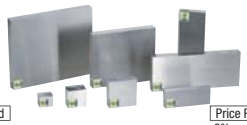
Price Reduced
Up to 6%

1.4305 Configurable Plates
1657



Price Reduced
Up to 6%

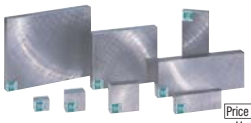
1.4301 Configurable Plates
1661



Price Reduced
3% on average

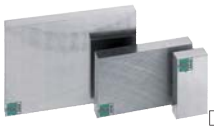
1.4305 · 1.4301 Annealed Configurable Plates
1665

Added



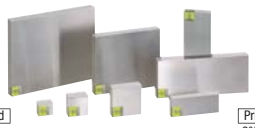
Price Reduced
Up to 3%

1.4401 · 1.4401 Configurable Plates
1667



Price Reduced
3% on average

1.4016 Configurable Plates
1669



Price Reduced
3% on average

1.4125 Configurable Plates
1671



Price Reduced
Up to 6%

Aluminum Configurable Plates -EN AW 5052-
1673

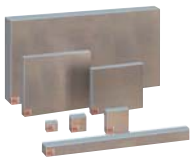


High Precision Aluminum Configurable Plates -EN AW-5052-
1679

新商品



Aluminum Configurable Plates -EN AW-6061-
1681



Price Reduced
Up to 6%

Duralumin Configurable Plates -EN AW-2017-
1683



ANP79 Configurable Plates
1689



Price Reduced
Up to 6%

Extra Super Duralumin Configurable Plates -EN AW-7075-
1691

新商品



Titanium Configurable Plates
1694



Copper / Brass Configurable Plates
1695

Blocks
(Guaranteed Perpendicularity of All Right Angles)

Product Name
Pages



High Accuracy Blocks
1698



Metal Block -Standard-
1699



Metal Block -Long-
1701



Aluminum Blocks -EN AW-5052 · EN AW-2017 · EN AW-7075-
1702

Flat Bars
Cold-rolled Flat Bars

Product Name
Pages

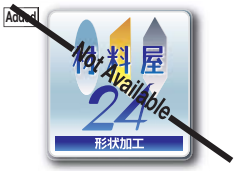
Added



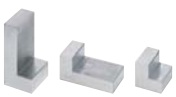
Flat Bars -Cold-rolled Flat Bars / 6F Plates / Square Steel-
1703

Shape Machined Product

Added



Product Name	Material Shop 24, Shape Machining
Pages	1707



Price Reduced
Up to 8%

L-Shaped Blocks
1709



Price Reduced
Up to 8%

U-Shaped Blocks
1711



Price Reduced
Up to 8%

T-Shaped Blocks
1712



Price Reduced
Up to 8%

Inclined Blocks
1713



Price Reduced
4% on average

Circular Plates
1714



Price Reduced
4% on average

Machined Circular Plates
1715

Notes on Metal Plate Product Transactions

(1) Condition of Product Delivery
In principle, products over 30kg will be delivered on F.O.B..
Please note that we do not provide loading and unloading equipment such as forklifts at the time of delivery.

(2) Packaging for Large Size Plates
Products over 50kg will be delivered in wooden crates.
Products weighting 50kg or less may also be delivered in wooden crates depending on the dimensions.

All prices listed here are subjected to steel price changes.

Metal Plates Guide

MISUMI Metal Plates are available in the catalog or "Material Shop 24".

[Material Shop 24 Metal Plate Website Contents]

- **Selectable from all products including products not shown on the catalog made of 51 materials such as finishing plates, Cut plates or Flat bars.**
- **Select specifications, part number, delivery date and the price are automatically displayed. Please proceed to ordering with the information.**
- **Conformed products to the specifications are displayed in price ascending order. Easy to select the most economical product.**

For "Material Shop 24" details, refer to **P.1581**



Material Shop 24 Metal Plate Website

Part number, Delivery Time and Price are displayed in just 6 seconds!

Selection Procedure

1	**Specification Selection**	Material, Finish, Size, Quantity
2	**Automatic Selection of Products**	Product number, Delivery Time and Price are displayed.
3	**How to Order**	Order on WOS
		Print a fax ordering sheet
		CSV data downloading

* Please register with "MISUMI EC Service ID Registration" and "WOS ID Registration" to use WOS.

Metal Plate Product Guide

- **Configurable Plates [Features] Surface finish methods, dimensions and dimension tolerance can be specified.**

(1) Surface Finish Method (Please refer to the finished surface comparison on the right.)
(2) 0.5mm Increment Dimension Specified (Length, Width, Plate Thickness) *For aluminum and copper rolled types, thickness should be material thickness.
(3) Dimension tolerance (length, width and plate thickness can be selected from : ++Tolerance, +Tolerance, ± Tolerance and -Tolerance.)

Comparison of 2-Surface Finish (Sample Material: 1.0038/S235JR)

* The photographs are magnified.

· Milled · Rotary Grinding · Surface Grinding



Classification			Structural Steel		JIS STKM		Specialty Steel					Pre-Hardening Steel					
Material			SS400	1.0038 Annealed Material	S50C	S55CN	SKS93	SKS3 SKD11 DC53	1.3343	1.2344	1.7220	1.2316	1.2085	NAK55®	NAK80®	JIS040F	DH2F® S-STAR® HPM1® HPM38® STAVAX®
Page			P.1621~	P.1631~	P.1635~	P.1643~	P.1645~	P.1647~	P.1653~	Material Shop 24 Exclusive	P.1651~	P.1655~	P.1655~	P.1655~	Material Shop 24 Exclusive	Material Shop 24 Exclusive	Material Shop 24 Exclusive
Finish Method	Finish Code	Size (mm) * Values in ( ) are only available in Material Shop 24.															
Upper-Lower Surface Milling (4-Side not finished)	2F	Length (A)	20~2500 (20~2500)	20~2000 (20~2500)	20~2000 (20~2500)	(20~500)	(20~500)	(20~500)	-	-	-	-	-	-	-	-	-
		Width (B)	10~1500 (10~1500)	10~1200 (10~1500)	20~1200 (10~1500)	(20~300)	(20~300)	(20~300)	-	-	-	-	-	-	-	-	-
		Thickness (T)	5~50 (3~160)	5~50 (3~160)	5~50 (3~120)	(8~30)	(5~30)	(5~30)	-	-	-	-	-	-	-	-	-
2-Surface Rotary Grinding (4-Side not finished)	2RG	Length (A)	20~1800 (15~1800)	20~1400 (20~1400)	20~1400 (20~1400)	-	-	-	-	-	-	-	-	-	-	-	-
		Width (B)	10~1200 (10~1200)	10~1000 (10~1000)	10~1000 (20~1000)	-	-	-	-	-	-	-	-	-	-	-	-
		Thickness (T)	5~50 (5~50)	5~50 (5~50)	5~50 (5~50)	-	-	-	-	-	-	-	-	-	-	-	-
6-Surface Milling	6F	Length (A)	20~2500 (10~2500)	20~2000 (15~2500)	10~2000 (10~2500)	20~500 (15~1000)	20~500 (10~1000)	20~500 (15~1000)	20~300 (20~300)	(20~300)	20~300 (20~300)	50~500 (20~500)	50~500 (50~500)	50~300 (20~500)	(20~500)	(20~300)	(20~300)
		Width (B)	10~1500 (10~1500)	20~800 (10~1500)	10~800 (10~1500)	20~300 (10~500)	20~300 (10~300)	20~300 (10~300)	20~200 (20~200)	(20~200)	20~200 (20~200)	20~200 (20~300)	20~200 (20~200)	20~200 (20~300)	(20~300)	(20~200)	(20~200)
		Thickness (T)	4~100 (1.5~160)	4~50 (3~160)	15~100 (1.5~120)	8~30 (8~80)	5~35 (5~60)	5~35 (5~60)	5~60 (5~60)	(5~60)	5~60 (5~60)	5~40 (5~100)	5~40 (5~40)	5~40 (5~100)	(5~100)	(5~60)	(5~60)
2-Surface Rotary Grinding (4-Side Milling)	4F2RG	Length (A)	20~1800 (15~1600)	20~2000 (15~2000)	20~2000 (15~2000)	20~500 (15~1000)	20~500 (10~1000)	20~500 (15~1000)	-	(20~300)	20~300 (20~300)	-	-	-	-	(20~300)	-
		Width (B)	10~1200 (10~1200)	20~800 (10~1200)	20~800 (10~1200)	20~300 (10~500)	20~300 (10~300)	20~300 (10~300)	-	(20~200)	20~200 (20~200)	-	-	-	-	(20~200)	-
		Thickness (T)	4~50 (4~160)	4~50 (4~160)	4~50 (4~160)	8~30 (8~80)	5~35 (5~60)	5~35 (5~60)	-	(5~60)	5~60 (5~60)	-	-	-	-	(5~60)	-
2-Surface Grinding (4-Side Milling)	4F2G	Length (A)	10~800 (10~1000)	20~800 (15~800)	10~800 (10~1000)	20~500 (15~1000)	20~500 (15~1000)	(15~1000)	20~300 (20~300)	-	-	(10~500)	-	(10~500)	(10~500)	-	(20~300)
		Width (B)	10~500 (10~500)	20~500 (10~500)	10~500 (10~500)	20~300 (10~500)	20~300 (10~300)	(10~300)	20~200 (20~200)	-	-	(10~300)	-	(10~300)	(10~300)	-	(20~200)
		Thickness (T)	4~60 (4~160)	4~50 (4~160)	3~60 (3~160)	8~30 (8~80)	5~35 (5~60)	(5~60)	5~60 (5~60)	-	-	(3~100)	-	(3~100)	(3~100)	-	(5~60)
6-Surface Grinding	6G	Length (A)	(15~400)	(15~400)	(15~400)	(20~100)	(20~100)	(20~100)	(20~300)	-	-	(10~500)	-	(10~500)	(10~500)	-	(20~300)
		Width (B)	(10~400)	(10~400)	(10~400)	(20~100)	(20~100)	(20~100)	(20~200)	-	-	(10~300)	-	(10~300)	(10~300)	-	(20~200)
		Thickness (T)	(5~160)	(5~160)	(5~160)	(8~30)	(5~30)	(5~30)	(5~60)	-	-	(3~100)	-	(3~100)	(3~100)	-	(5~60)

Not Available

Classification			Stainless Steel								Aluminum Alloy						Copper	Brass	Titanium
			Austenite						Ferrite	Marten-site									
M Material			1.4305	1.4301	Annealed 1.4305	1.4301 Annealed Material	1.4401	1.4568-L	1.4016	1.4125	EN AW-5052	EN AW-5052 High Precision	EN AW-2017	EN AW-6061	ANP79	EN AW-7075	Tough Pitch Copper Oxygen Free Copper Chromium Copper	Brass Board C2801	Titanium Class 2 TP340H
Page			P.1657~	P.1661~	P.1665~	P.1665~	P.1667~	P.1667~	P.1669~	P.1671~	P.1673~	P.1679~	P.1683~	P.1681~	P.1689~	P.1691~	P.1695~	P.1695~	P.1694~
Finish Method	Finish Code	Size (mm) * Values in ( ) are only available in Material Shop 24.																	
4-Side Milling (2-Surface Rolling)	4F	Length (A)	(15~1200)	(10~1200)	(10~1200)	(10~1200)	(15~500)	-	(15~500)	(15~500)	25~3000 (5~3000)	6~2500 (5~3000)	25~2500 (5~3000)	-	10~1000 (10~2500)	(5~2500)	6~300 (6~300)	6~300 (6~300)	-
		Width (B)	(8~1000)	(8~1000)	(8~1000)	(8~1000)	(10~200)	-	(20~200)	(20~200)	10~1500 (5~1500)	6~1000 (5~1500)	10~1250 (5~1250)	-	10~300 (10~1250)	(5~1250)	6~300 (6~300)	6~300 (6~300)	-
		Thickness (T)	(Select 4~65)	(Select 6~65)	(Select 4~65)	(Select 5~65)	(Select 9~28)	-	(Select 6~25)	(Select 8~28)	Select 3~50 (Select 1~85)	Select 4~50 (Select 4~50)	Select 3~50 (Select 3~100)	-	Select 8~50 (Select 8~50)	(5~81)	Select 5~30 (Select 5~30)	Select 5~30 (Select 5~30)	-
6-Surface Milling	6F	Length (A)	10~1200 (10~1200)	10~1200 (10~1200)	15~1200 (15~1200)	15~1200 (10~1200)	15~500 (15~500)	15~500 (15~500)	20~500 (15~500)	20~500 (15~500)	25~3000 (5~3000)	(5~3000)	25~2400 (5~3000)	25~500 (25~500)	10~700 (10~2495)	8~2400 (5~2497)	16~300 (16~300)	16~300 (16~300)	5~500 (5~500)
		Width (B)	10~1000 (8~1000)	10~1000 (8~1000)	10~1000 (8~1000)	10~1000 (8~1000)	10~200 (10~200)	10~200 (10~200)	20~200 (20~200)	20~200 (20~200)	10~800 (5~800)	(5~800)	8~800 (5~800)	10~300 (10~300)	10~300 (10~800)	8~800 (5~800)	6~300 (6~300)	6~300 (6~300)	5~300 (5~300)
		Thickness (T)	3~55 (3~100)	3~60 (3~60)	3~30 (3~60)	3~50 (3~60)	8~30 (8~30)	8~30 (8~30)	5~30 (5~30)	5~30 (5~30)	3~50 (2.5~150)	(3~50)	3~50 (2.5~98)	5~50 (5~50)	6~50 (6~50)	3~50 (2.5~100)	3~30 (3~30)	3~30 (3~30)	2~36 (2~36)
2-Surface Rotary Grinding (4-Side Milling)	4F2RG	Length (A)	15~500 (15~500)	15~500 (15~500)	-	15~500 (15~500)	-	-	20~500 (20~500)	20~500 (20~500)	-	-	-	-	-	-	-	-	-
		Width (B)	10~200 (10~200)	10~200 (10~200)	-	10~200 (10~200)	-	-	20~200 (20~200)	20~200 (20~200)	-	-	-	-	-	-	-	-	-
		Thickness (T)	5~50 (5~50)	5~50 (5~50)	-	6.5~30 (6.5~30)	-	-	5~30 (5~30)	5~30 (5~30)	-	-	-	-	-	-	-	-	-
2-Surface Grinding (4-Side Milling)	4F2G	Length (A)	15~500 (15~500)	-	15~500 (15~500)	-	15~500 (15~500)	-	20~500 (20~500)	20~500 (20~500)	25~500 (25~500)	-	25~500 (25~500)	-	25~500 (25~500)	25~500 (25~500)	-	-	-
		Width (B)	10~200 (10~200)	-	10~200 (10~200)	-	10~200 (10~200)	-	20~200 (20~200)	20~200 (20~200)	10~300 (10~300)	-	10~300 (10~300)	-	20~300 (20~300)	10~300 (10~300)	-	-	-
		Thickness (T)	5~50 (5~50)	-	6.5~30 (6.5~30)	-	8~30 (8~30)	-	5~30 (5~30)	5~30 (5~30)	5, 6, 7~49 (5~50)	-	5~49 (5~50)	-	7~50 (7~50)	5~50 (5~50)	-	-	-

• Dimension Selectable Plates [Features] Dimensions are fixed and more economical than Configurable Plates. (Except some sizes)

Classification	Structural Steel		JIS STKM		Aluminum Alloy		
M Material	*1.0038 (6F)	1.0038/S235JR	*1.1206 (6F)	1.1206/C50E	EN AW-A5052	EN AW-5052 High Precision	EN AW-A2017
Page	P.1583	P.1587	P.1589	P.1593	P.1595	P.1596	P.1597

* 1.0038/S235JR (6F) · 1.1206/C50E (6F): Base material is milled on top, bottom, and side surfaces for cut to precise lengths for shipments. Economical and short delivery time.

• A dimension Configurable Plates [Features] Dimensions of width and plate thickness are fixed, length can be specified in 1mm increment (0.1mm increment for Aluminum Cut Plates Standard / Precision Class). More economical than Configurable Plates. (Except some sizes)

Classification		Structural Steel		JIS STKM		Stainless Steel		Aluminum Alloy			Copper	
M Material		*1.0038 (6F)	1.0038/ S235JR	*1.1206 (6F)	1.1206/ C50E	1.4305/ X10CrNiS18-9	1.4301/ X5CrNi18-10	EN AW-A5052	High Precision	EN AW-A2017	Tough Pitch Copper	Oxygen Free Copper
Size (mm)	Length (A)	15~1200	25~1200	15~1200	25~1200	25~500	25~500	25~1200	100~1200	100~1200	25~300	25~300
Page		P.1599	P.1598	P.1603	P.1601	P.1605	P.1606	P.1607	P.1608	P.1609	P.1610	P.1610

* 1.0038/S235JR (6F) · 1.1206/C50E (6F): Base material is milled on top, bottom, and side surfaces for cut by 1mm increment for shipments. Economical and short delivery time.

• Blocks (Guaranteed Perpendicularity of All Angles) [Features] 0.1mm / 0.01mm Increment Dimension Configurable (Length, Width, Plate Thickness). Accuracy is higher than Configurable Plates.

Product Name	Finish Method	Accuracy Standards				Structural Steel	JIS STKM		Pre-Hardening Steel	Stainless Steel	Aluminum Alloy
		Dimension Increment	Dimension Tolerance	Thickness Flatness (per 100mm)	Perpen-dicularity (per 100mm)	1.0038/ S235JR	1.1206/ C50E	1.1206/C50E Thermal Refined	PX5 ~1.2316/ X36CrMo17 NAK55	1.4305/ X10CrNiS18-9 1.4301/ X5CrNi18-10	EN AW-7075/ AlZn5,5MgCu AW-2017/ AlCu4MgSi
Metal Plates		0.1mm	±0.10	0.04*	0.02 (Each Plane)	P.1699 P.1701	P.1699 P.1701	P.1699	-	P.1699	P.1702
High Precision Plates		0.01mm~	±0.01	0.01	0.02 (Each Plane)	P.1698	P.1698	-	P.1698	-	-

• Flat Bar · Square Steel

* For Stainless steel, guaranteed value of flatness varies depending on thickness.

Product Name	Structural Steel		Stainless Steel	Stainless Steel	Aluminum Alloy	Copper / Brass
	Cold-rolled	Hot-rolled	Cold-rolled	Hot-rolled	Cold-rolled	Cold-rolled
	1.0038/S235JR-D 1.1191/C45E-D	* 1.0038/S235JR (6F) * 1.1206/C50E (6F)	1.4301/ X5CrNi18-10-D	1.4404	EN AW-6063/ AlMg0,7Si-S	Free-Cutting Brass Free-Cutting Brass (cadmium-free) Tough Pitch Copper
Flat Bars	P.1703	P.1703	P.1705	Exclusive to Material Shop 24	P.1705	Exclusive to Material Shop 24
Square Steel	P.1705	-	P.1705	Exclusive to Material Shop 24	P.1705	Exclusive to Material Shop 24

* 1.0038/S235JR (6F) · 1.1206/C50E (6F): Base material is milled on top, bottom, and side surfaces for cut to precise lengths for shipments. Economical and short delivery time.

• Shape Machining

Product Name	Features	Structural Steel	JIS STKM	Specialty Steel	Stainless Steel	Aluminum Alloy
		1.0038/ S235JR	1.1206/ C50E	JIS SKS93 1.2379/ X155CrVMo12-1	1.4305/ X10CrNiS18-9	EN AW-5052/ AlMg2,5 * EN AW-2017/ AlCu4MgSi
L· U · T-shaped· Inclined Blocks	Finished in a L, U or T in 0.1mm increment.	P.1709~1713	P.1709~1713	P.1709~1713	P.1709~1713	P.1709~1713
Machined Circular Plates	Finished in flat, U or T shape.	P.1714~1716	P.1714~1716	-	P.1714~1716	P.1714~1716

EN AW-2017-P is only applicable to Circular Plates.

Metal Plates Properties Table

Property Comparison of Metal Plate Materials

* Data below are not guaranteed values but standard values.

Type	Material Code	Heat Treatment (°C)		Representative Values of Mechanical Properties				Representative Values of Physical Properties			
				Tensile Strength (N/mm²)	Proof Stress (N/mm²)	Elongation	Hardness	Specific Gravity (When 20°C) (g/cm³)	Conductivity (20°C) IACS	Thermal Conductivity (When 20°C) (CGS)	Linear Expansion Coefficient (20~100°C) (x10−6/°C)
Structural Steel	1.0038/S235JR	-		400~510	215 or more	21% or more	-	7.87	-	-	11.7
JIS STKM	1.1206/C50E	Normalized	810~860 Air-cooled	610 or more	365 or more	18% or more	179~235HB	7.87	-	-	11.7
		Annealed	Approx. 800 Furnace-cooled	-	-	-	143~187HB				
		Hardening	810~860 Water-cooled	740 or more	540 or more	15% or more	212~277HB				
		Tempered	550~650 Quenched								
	1.1203/C55E noralized	Normalized	(At the time of delivery)	700 or more	370 or more	25% or more	210HB	7.87	-	-	11.7
		Hardening	850 Oil-cooled	810 or more	540 or more	25% or more	250HB				
		Tempered	600 Air-cooled								
Specialty Steel	JIS SKS93	Hardening	820 Oil-cooled	-	-	-	63HRC or more	7.87	-	-	11.7
		Tempered	180 Air-cooled								
	1.2510/ 100MnCrW4	Hardening	800~850 Oil-cooled	-	-	-	58~63HRC	7.85	-	0.083	12.2
		Tempered	150~200 Air-cooled								
	1.2379/ X155CrVMo12-1	Hardening	1000~1050 Air-cooled	-	-	-	58~63HRC	7.8	-	0.07	12
		Tempered	150~200 Air-cooled								
	DC53® (Daido Steel)	Hardening	1020~1040 Air-cooled	-	-	-	56~63HRC	7.87	-	0.057	12.2
		Tempered	180~200 Air-cooled								
	1.7220/34CrMo4	Normalized	850~1050 Air-cooled	980 or more	835 or more	12% or more	285~352HB	7.85	-	-	-
		Annealed	830~880 Furnace-cooled								
		Hardening	830~880 Oil-cooled								
	1.3343/S6-5-2	Annealed	800~880 Slow-cooled	-	-	-	255HB or less	8.16	-	-	11.9
		Hardening	1220~1240 Oil (Hot bath)				63HRC or more				
		Tempered	550~570 Air-cooled								
Stainless Steel	1.4305/X10CrNiS18-9	Solution Treatment Heat Treatment	1010~1150 Quenched	520 or more	205 or more	40% or more	187HB or less	7.93	-	0.039	17.3
	1.4301/X5CrNi18-10	Solution Treatment Heat Treatment	1010~1150 Quenched	520 or more	205 or more	40% or more	187HB or less	7.93	-	0.039	17.3
	1.4401/X5CrNiMo17-12-2	Solution Treatment Heat Treatment	1010~1150 Quenched	520 or more	205 or more	40% or more	187HB or less	7.98	-	0.039	15.9
	1.4404/ X2CrNiMo17-12-2-L	Solution Treatment Heat Treatment	1010~1150 Quenched	481 or more	177 or more	40% or more	187HB or less	7.98	-	0.039	15.9
	1.4016/X6(8)Cr17	Annealed	780~850 Air-cooled	450 or more	205 or more	22% or more	183HB or more	7.7	-	0.063	10.4
	1.4125/X105CrMo17	Hardening	1010~1070 Oil-cooled	-	-	-	58HRC or more	7.7	-	0.058	10.2
		Tempered	100~180 Air-cooled								
Pre-Hardening Steel	G-STAR~1.2085	-		1060	855	0.16	33~37HRC	7.78	-	0.06	10.3
	PX5 ~1.2316	-		990	880	0.2	30~33HRC	7.85	-	0.101	12.7
	NAK55® (Daido Steel)	-		1255	981	0.15	37~43HRC	7.8	-	0.093	12.5
Aluminum Alloy	EN AW-5052-H112	-		225	125	0.18	65HB	2.68	0.35	0.33	23.8
	EN AW-5052-H112 (Precision Rolled Type)	-		215	120	0.21	58HB	2.68	0.35	0.33	23.8
	EN AW-6061	-		309	274	0.12	95HB	2.7	43%	0.52	23.6
	EN AW-2017-T351	-		390	250	0.13	105HB	2.79	0.34	0.32	23.6
	ANP79	-		560	500	0.12	165HB	2.77	0.32	0.31	22.1
	EN AW-7075-T651	-		550	490	0.12	160HB	2.8	0.33	0.31	23.6
Rolled Copper	Tough Pitch Copper	-		215~275	49~343	25% or more	87HB or less	8.89	97% or more	0.93	16.8
	CW004A/Cu-ETP										
	Oxygen Free Copper	-		245~315	49~343	15% or more	112HB or less	8.89	97% or more	0.93	16.8
	CW008A/Cu-OFP										
	Chromium Copper	-		380 or more	-	15% or more	125HB	8.89	70% or more	0.8	-
	Z3234										
	Brass Board	-		355~440	-	25% or more	-	8.43	-	-	-
	CW505L/CuZn30										
Pure Titanium Class 2	3.7035/Ti99.5 (Ti2)/H	Annealed		340~510	215 or more	23% or more	-	4.51	3~4%	0.04	8.4

Property Comparison of Aluminum Alloy

CGS: Cal/°C, cm, sec

Type	Material Code	Part Number	Corrosion Resistance	Weldability (Argon)	Machinability	Solderability	Anodize Finish
Al–Mg Alloy	EN AW-5052-H112	ALN_ PN_ _ _	Good	Good	Average	Average	Good
	EN AW-5052-H112 (Precision Rolled Type)	ALA_ PH_ _ _	Good	Good	Average	Average	Good
Al-Mg-Si Alloy	EN AW-6061-T6	A6061___	Average	Good	Average	Good	Good
	EN AW-6061-T651						
Al–Cu Alloy (Duralumin)	EN AW-2017-T351	ALD_ PD_ _ _	Inferior	Not for Practical Use	Good	Inferior	Inferior
Al–Zn–Mg Alloy (Extra Super Duralumin)	ANP79	P79_ _ _	Inferior	Inferior	Very Good	Inferior	Inferior
	EN AW-7075-T651	ALP_ PP_ _ _	Inferior	Not for Practical Use	Good	Inferior	Inferior

For high precision plates ALA_ · ANP79 plates P79_ _ _, internal stress is removed while rolling.
Because the remaining stress is small, the machining distortion is less than general EN AW-5052 · EN AW-7075

Metal Plates Materials

Property Comparison of Metal Plate Materials

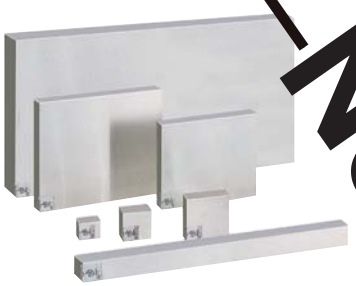
Structural Steel		1.0038/S235JR	The most general steel grade. Widely used as it has strength and high machinability and is low price.
		1.0038/S235JR Annealed Material	1.0038/S235JR is annealed to relieve its internal stress. It is effective for prevention of warp by machining.
JIS STKM		1.1206/C50E	Carbon steel with adequate level of toughness and durability
		1.1203	Normalized 1.1203/C55E, which relieves its internal stress. Added free-cutting elements enhance its machinability. It has higher mechanical strength than 1.1206/C50E.
Chrome Molybdenum Steel		1.7220/34CrMo4	Material with added small amount of Molybdenum into Chrome Steel. Improved resistance for anneal-softening, excelling in toughness.
Specialty Steel		JIS SKS93	Carbon steel for oil hardening which excels in toughness and abrasion resistance.
		1.2510/100MnCrW4	It has good machinability as spheroidizing annealing is applied. Has higher hardenability and less heat-treating distortion than JIS SKS93.
		1.2379/X155CrVMo12-1	Both air hardening and vacuum hardening are applicable due to its high hardenability. Very little heat treat distortion and has high abrasion resistance.
		DC53® (Daido Steel)	Tougher than 1.2379/X155CrVMo12-1. Good machinability and grindability. About the same strength as 1.2379/X155CrVMo12-1 after low-temperature tempering, and as 62HRC after high-temperature tempering.
		1.3343/S6-5-2	Excels in toughness and abrasion resistance. Very little heat-treatment distortion.
Stainless Steel	Austenite	1.4305/X10CrNiS18-9	Has better machinability than 1.4301/X5CrNi18-10. However, corrosion resistance is inferior. No magnetism.
		1.4301/X5CrNi18-10	The most general stainless steel. Excels in corrosion resistance and is widely used. No magnetism.
		Annealed 1.4305	1.4305/X10CrNiS18-9 is treated with stress-relief heat-treatment to relieve internal stress. It is effective for prevention of warp by machining. They have inferior corrosion resistance compared to 1.4305/X10CrNiS18-9. No magnetism.
		1.4301 Annealed Material	1.4301/X5CrNi18-10 is treated with stress-relief heat-treatment to relieve internal stress. It is effective for prevention of warp by machining. They have inferior corrosion resistance compared to 1.4301/X5CrNi18-10. No magnetism.
		1.4401/X5CrNiMo17-12-2	Stainless steel to which Molybdenum is added. Excels in corrosion resistance and acid resistance. No magnetism.
		1.4404/X2CrNiMo17-12-2-L	1.4401/X5CrNiMo17-12-2 ultra-low carbon stainless steel categorized within austenitic stainless steels. Suitable for the operations requiring corrosion resistance or good weld-ability.
	Ferrite	1.4016/X6(8)Cr17	Excels in corrosion resistance. It is effective for prevention of warp by machining. Its hardenability is poor. Has magnetism.
	Martensite	1.4125/X105CrMo17	Has high strength and hardness because of the heat treatment applied. Has high abrasion resistance and is hardest in stainless steel. Has magnetism.
Pre-Hardening Steel	Martensite Free-cutting Stainless Steel	G-STAR~1.2085	Has corrosion resistance and excels in machinability. Has high hardness because of the heat treatment applied. (1030°C Hardening Hardness 48HRC)
	SCM	PX5 ~1.2316	Excels in machinability and has toughness. Excels in weldability.
	Precipitation Hardening	NAK55® (Daido Steel)	Excels extremely in machinability. Smooth machined surfaces facilitate grinding machining afterward.
Aluminum Alloy	A5000	EN AW-5052/AlMg2,5	The most general aluminum alloy. Excels in corrosion resistance and weldability.
	A2000 (Duralumin)	EN AW-2017/AlCu4MgSi	Though it inferiors in corrosion resistance and weldability, it has high strength and forging is possible.
	A6000	EN AW-6061-P	Heat-treatable alloy, excelling in strength and corrosion resistance.
	A7000 (Extra Super Duralumin)	ANP79	Compared with Iron 15C, it is harder and its machinability is at least 10 times higher. Compared with 7075 material, it has about the same hardness, higher uniformity, and lower internal stress.
		EN AW-7075/AlZn5,5MgCu	Has the highest strength in aluminum alloy. Extremely strong and be widely used for aircrafts or mechanical parts.
Rolled Copper	Tough Pitch Copper	CW004A/Cu-ETP	The most widely used copper generally, and excellent in electrical and thermal conductivity.
	Oxygen Free Copper	CW008A/Cu-OFP	Commercially-available highest purity Copper. The oxygen free nature prevents hydrogen embrittlement.
	Chromium Copper	Z3234	Excellent in mechanical strength and abrasion resistance at high temperature.
	Brass Board	CW505L/CuZn30	Excellent in strength and ductile.
3.7035/Ti99.5 (Ti2)		3.7035/Ti99.5 (Ti2)	Most common titanium material categorized into 3.7035/Ti99.5 (Ti2), and well-balanced in machinability and strength. Lightweight (Specific gravity 4.51) and excels in corrosion resistance.

Material Shop 24 Guide

Material Shop 24 Metal Plate Site Outline

[Material Shop 24 Metal Plate Website Contents]

- Selectable from all products including products not shown on the catalog made of 51 materials such as Finishing plates, Cut plates or Flat bars.
- Select specifications, part number, delivery date and the price are automatically displayed. Please proceed to ordering with the information.
- Conformed products to the specifications are displayed in price ascending order. Easy to select the most economical product.



Material Shop 24 Metal Plate Website

Part number, Delivery Time and Price are displayed in just 6 seconds!

Selection Procedure

1	Specification Selection	Material · Finish · Size · Quantity
2	Automatic Selection of Products	Product number, Delivery Time and Price are displayed.
	How to Order	Order on WOS
		Print a fax ordering sheet
		CSV data downloading

* Please register with "MISUMI EC Service ID Registration" and "WOS ID Registration" to use WOS.

Material Shop 24 Metal Plate page Screen Image



Wider variety in materials such as Pre-harden Steel, Titanium and Copper!

Cut Plates are newly added to the lineup! (Select "Cut" for Finishing Method.)

Compatible for length, width and plate thickness at 0.1mm increment!

Available for surface treatment, corner cut or shape machining. Freely selectable depending on the intended use!

Conformed products to the specifications are displayed in price ascending order. Easy to select the most economical product.

Not Available

■Material Shop 24 Metal Plate Products Lineup

(Exclusive Merchandise for Material Shop 24)

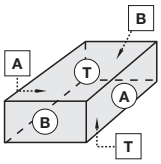
· Configurable Plates [Features] Surface finish methods, dimensions and dimension tolerance can be specified.

For Material Shop 24 Metal Plate Details, refer to **P.1581**

■Main Finish

Finish Code	Finish
2F	Upper-Lower Surface Milling (4-Side not finished)
2RG	2-Surface Rotary Grinding (4-Side not finished)
4F	4-Side Milling (upper-lower surface not finished)
6F	6-Surface Milling
4F2RG	2-Surface Rotary Grinding (4-Side Milling)
4F2G	2-Surface Grinding (4-Side Milling)
6G	6-Surface Grinding

■Milled Finish Surface Free Selection (Selectable milled finish surface)



Finish Code	Milled Surface	Accuracy Guaranteed (with or without machining accuracy warranty)				
		Reference surface Perpendicularity	Flatness * Except Aluminum	Dimension		
				Length	Width	Plate Thickness
A	Length A One-s…illing on length A	×	×	×	×	×
T	Upper Surface T…	×	×	×	×	×
AA	Length A + Length A	×	×	×	○	×
AB	Length A + Width B	○	×	×	×	×
ABTT	Length A + Width B + Upper-Lower …ce TT	○	○	×	×	○
AATT	Length AA + Upper-Lower Su…TT	×	○	×	○	○

Material Group	Material Name	2F		4F	6F (Include equivalent)	4F2RG	4F2G	6G	Milled Surface Options
Structural Steel JIS STKM	1.0038/S235JR			-	-	-	-	-	-
	1.0038/S235JR Annealed			-	-	-	-	-	-
	1.1206/C50E (1.1191/C45E)			-	-	-	-	-	-
	1.1203/C55E normalized			-	-	-	-	-	-
Chrome Molybdenum Steel	1.7220/34CrMo4				New	New			
Tool Steel Die Steel	JIS SKS93	-		-	-	-	-	-	-
	1.2510/100MnCrW4	-		-	-	-	-	-	-
	1.2379/X155CrVMo12-1	-		-	-	-	-	-	-
	DC53® (Daido Steel)	-		-	-	-	-	-	-
	1.3343/S6-5-2				New		New	New	
Press Die Pre-Hardening Steel	JIS GO40F				…w	New			
Diecast Mold Pre-Hardening Steel	1.2344/X40CrMoV5-1				New	New			
Plastic Mold Pre-Hardening Steel	PX5 ~1.2316/X36CrMo17						-	-	
	G-Star ~1.2085/X3CrMo16-1								
	NAK55® (Daido Steel)						-	-	
	NAK80® (Daido Steel)						New	New	
	DH2F ® (Daido Steel)				New		New	New	
	S-STAR® (Daido Steel)				N…		New	New	
	HPM1® (Hitachi Metals)						New	New	
	HPM38® (Hitachi Metals)				N…		New	New	
	STAVAX® (UDDEHOLM)				Ne…		New	New	
Stainless Steel	1.4305/X10CrNiS18-9			-	-	-	-		-
	1.4305/X10CrNiS18-9 Annealed			-	-		-		-
	1.4301/X5CrNi18-10			-	-				-
	1.4301/X5CrNi18-10 Annealed			-	-				-
	1.4401/X5CrNiMo17-12-2			-	-		-		
	1.4404/X2CrNiMo17-12-2				New				
	1.4016/X6(8)Cr17			-	-	-	-		
	1.4125/X105CrMo17			-	-	-	-		
Aluminum Alloy	EN AW-5052/AlMg2,5			-	-		-		-
	52 High Precision			-	-				-
	EN AW-2017/AlCu4MgSi			-	-		-		-
	EN AW-7075/AlZn5,5MgCU			-	-				-
	ANP79			-	-				-
	EN AW-6061/EN AW-AlMg1SiCu			New	New				
Copper Brass	Tough Pitch Copper			-	-				
	Oxygen Free Copper			-	-				
	Chromium Copper			-	-				
	Brass			-	-				
Titanium	Titanium Class 2				New				

* New --- Newly added steels

· Flat Bars

Material Group	Material Name	Flat Bars			
		Cold-rolled Flat Plates	Cold-rolled Square Bars	Hot-rolled Flat Bar	Hot-rolled Square Steel
Structural Steel JIS STKM	1.0038/S235JR	-	-	-	
	1.1191/C45E drawn	-	-	-	
Stainless Steel	1.4301/X5CrNi18-10	-	-	New	New
	1.4305/X10CrNiS18-9			New	New
	1.4401/X5CrNiMo17-12-2			New	New
	1.4404/X2CrNiMo17-12-2			New	New
Aluminum Alloy	EN AW-6063/AlMg0,7Si	-	-		
Copper · Brass	Tough Pitch Copper			New	New
	Free-cutting Brass			New	New
	Free-Cutting Brass Change (cadmium-free)			New	New

* New --- Newly added steels

· Cut Plates

Material Group	Material Name
Stainless Steel	1.4301/X5CrNi18-10
	1.4305/X10CrNiS18-9
Aluminum Alloy	EN AW-5052/AlMg2,5
	52 High Precision
	EN AW-5083/AlMg4,5Mn0,7
	EN AW-2017/AlCu4MgSi
	EN AW-2024/AlCu4Mg1
	EN AW-7075/AlZn5,5MgCu
	EN AW-6061/EN AW-AlMg1SiCu
Copper Brass	Tough Pitch Copper
	Oxygen Free Copper
	Chromium Copper
	Brass Change
	Free-cutting Brass Change
	Tellurium Copper
	Beryllium Copper Alloy 25
	Beryllium Copper Alloy 50
	Special Aluminum Bronze
	Gunmetal (BC6)
	Phosphor Bronze
	Naval Brass Change

Not Available

1.0038/S235JR Dimension Selectable Plates

-6F (Economy Type)-

■Features of Precision Cut Plates : Economical and Short Lead Time

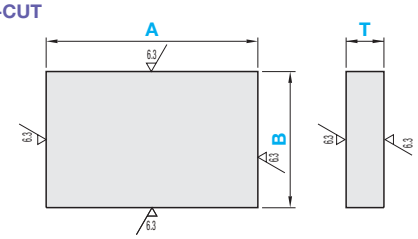
Base material is milled on top, bottom, and side surfaces for cut to precise lengths for shipments. Economical and short delivery time.



RoHS

Dimension Tolerance	Reference : Length	~600mm	601~1200mm
	Length (A)	±0.1	±0.2
	Width (B)	±0.1	
	Thickness (T)	±0.1	

SS400-CUT

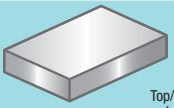


Material: 1.0038/S235JR

For length (A dimension) configurable products, refer to **P.1599**

Part Number	A \ T / B	5	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30
SS400-CUT	40	15	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	50																		
	60		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	70																		
	75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																		
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																		
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																		
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																		
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																		
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	40	20	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	50																		
	60		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	70																		
	75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																		
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																		
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																		
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																		
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																		
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	40	25	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	50																		
	60		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	70																		
	75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																		
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																		
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																		
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																		
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																		
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	40	30																	■
	50		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60																		
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																		
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																		
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																		
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																		
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																		
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																		

For Width (B dimension) 55 or more, refer to **P.1585·1586**



Order Example

Part Number	-	A	-	B	-	T
SS400-CUT	-	100	-	20	-	10

Days to Ship **6 Days**

■Accuracy Standards

(Max. Value)

Item		Conditions	Standard Value
Width Parallelism		Length Min.~200mm	0.03
		Length 201~500mm	0.05
		Length 501~Max.	0.1
Thickness Parallelism		To length 100mm and width 100mm	0.05
Flatness	T5~15		0.05
	T16~25		0.04
	T26~32		0.03
Perpendicularity (Each Plane)			0.05
Circumference Chamfering		Burr-free is required. (P)Chamfering may be about C0.1.	

Price

• 1.0038/S235JR-CUT

■Volume Discount ((P)Round down to ten Cent.) **P.88**

Quantity	1~2	3~4	5~10
Rate	€ Unit Price	5%	10%

(P)For orders larger than indicated quantity, please request a quotation.

(P)For length (A dimension) configurable products, refer to **P.1599**

SS400-CUT

For Width (B dimension) 55 or more, refer to **P.1585·1586**

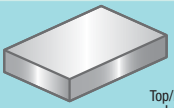
Part Number	A	B \ T	5	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
SS400-CUT	40	35	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	50																				
	60		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	70																				
	75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																				
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																				
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	40	40																			
	50		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60																				
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																				
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																				
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	50	45	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60																				
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																				
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																				
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	50	50	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60																				
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																				
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																				
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				

1.0038/S235JR Dimension Selectable Plates Price List

-6F (Economy Type)-

For length (A dimension) configurable products, refer to **P.1599**

Part Number	A	B \ T	5	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
SS400-CUT	60	55	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	70																				
	75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																				
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																				
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60	60																			
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																				
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																				
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	70	65	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																				
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																				
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	70	70	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																				
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																				
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	75	75	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																				
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																				
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80	80																			
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																				
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■



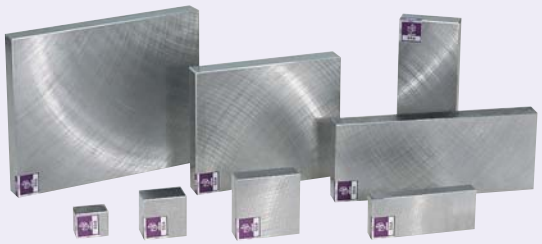
Top/Bottom · Width Milled, Length Precision Cut

For length (A dimension) configurable products, refer to **P.1599**

Part Number	A	B \ T	5	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
SS400-CUT	90	85																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	90	90	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																				
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100	95																			
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100	100																			
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125	110																			
	150				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	125	120			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	500				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125	125																			
	150				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	150	150			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																				
	200				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	200	180			■		■		■				■	■	■	■	■	■	■	■	
	250																				
	300				■		■		■				■	■	■	■	■	■	■	■	
	500																				
	200	200			■		■		■				■	■	■	■	■	■	■	■	
	250																				
	300				■		■		■				■	■	■	■	■	■	■	■	
	500																				

1.0038/S235JR Dimension Selectable Plates

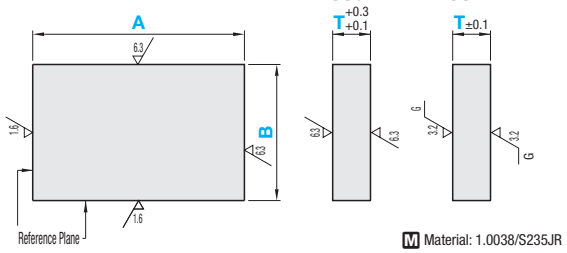
-All Surfaces Milled · All Surfaces Milled Top · Bottom Rotary Ground-



RoHS

Part Number	Finish Method
SS6F	All Surfaces Milled
SSAH	All Surfaces Milled Top / Bottom Rotary Ground

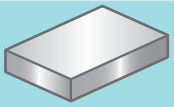
Dimension Tolerance	A · B	~99mm	100~250	251~
		±0.2	±0.25	±0.4



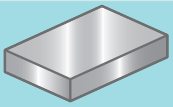
Material: 1.0038/S235JR

■All Surfaces Milled

Part Number	A	B \ T	5	6	8	9	10	12	13	15	16	19	20	22	25	28	30	34	35	40	50
SS6F	60	60	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80	80	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100	100	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125	125	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150	150	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160	160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200	200	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250	250	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300	300	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500		▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■



All Surfaces Milled



All Surfaces Milled + Top/Bottom Rotary Ground

Order Example

Part Number	-	A - B - T
SS6F	-	100 - 100 - 8
SSAH	-	100 - 100 - 8

Days to Ship

- SS6F A (Length) 300mm or less

6 Days P.88

* Some sizes have been changed from "in-stock" to "made-to-order" items. For more economical products of same size, refer to **P.1583**

- SS6F A (Length) 350mm or more

8 Days P.88

- SSAH

8 Days | Express A | 8,00 EUR/ piece P.88

■Accuracy Standards

(Max. Value)

Item			
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5 / 6	0.1	0.05
	T8~15	0.07	0.03
	T16~25	0.05	0.015
	T28~		0.012
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		C0.2~C0.5	C0.5~C1.0

Price

- SS6F

■Volume Discount (Round down to ten Cent.)

Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

- SSAH

■Volume Discount (Round down to ten Cent.)

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■All Surfaces Milled Top / Bottom Rotary Ground

Part Number	A	B \ T	5, 6	8, 9	10	12, 13	15, 16	19, 20	22	25	28	30	34, 35	40	50
SSAH	60	60													
	80														
	100														
	125														
	150														
	160														
	200														
	250														
	300														
	500														
	80	80													
	100														
	125														
	150														
	160														
	200														
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	300														
	500														
	100	100													
	125														
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	450														
	500														
	150	150													
	160														
	200														
	250														
	300														
	350														
	400														
	450														
	500														
	160	160													
	200														
	250														
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	350														
	400														
	450														
	500														
	200	200													
	250														
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	300														
	350														
	400														
	450														
	500														
	300	300													
	350														
	400														
	450														
	500														

1.1206/C50E Dimension Selectable Plates

-6F (Economy Type)-

■Features of Precision Cut Plates : Economical and Short Lead Time

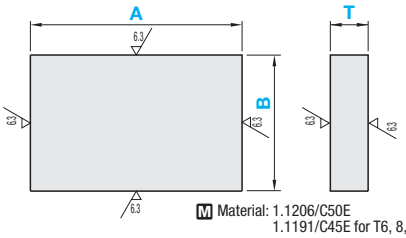
Base material is milled on top, bottom, and side surfaces for cut to precise lengths for shipments. Economical and short delivery time.



RoHS

Dimension Tolerance	Reference : Length	~600mm	601~1200mm
	Length (A)	±0.1	±0.2
	Width (B)	±0.1	
	Thickness (T)	±0.1	

S50C-CUT

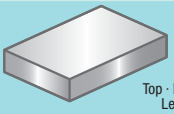


M Material: 1.1206/C50E
1.1191/C45E for T6, 8, 10 and 11

For length (A dimension) configurable products, refer to **P.1603**

Part Number	A	B \ T	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30
S50C-CUT	40	15	●	●	●	●	●	●	●	●	●								
	50																		
	60		●	●	●	●	●	●	●	●	●								
	70																		
	75		●	●	●	●	●	●	●	●	●								
	80																		
	90		●	●	●	●	●	●	●	●	●								
	100																		
	125		●	●	●	●	●	●	●	●	●								
	150																		
	160		●	●	●	●	●	●	●	●	●								
	200																		
	250		●	●	●	●	●	●	●	●	●								
	300																		
	500		●	●	●	●	●	●	●	●	●								
	40	20													●				
	50		●	●	●	●	●	●	●	●	●	●	●	●					
	60																		
	70		●	●	●	●	●	●	●	●	●	●	●	●	●				
	75																		
	80		●	●	●	●	●	●	●	●	●	●	●	●	●				
	90																		
	100		●	●	●	●	●	●	●	●	●	●	●	●	●				
	125																		
	150		●	●	●	●	●	●	●	●	●	●	●	●	●				
	160																		
	200		●	●	●	●	●	●	●	●	●	●	●	●	●				
	250																		
	300		●	●	●	●	●	●	●	●	●	●	●	●	●				
	500																		
	40	25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	50																		
	60		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	70																		
	75		●	●	●	●	●	●	●	●	●	●	●	●	●				
	80																		
	90		●	●	●	●	●	●	●	●	●	●	●	●	●				
	100																		
	125		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	150																		
	160		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	200																		
	250		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	300																		
	500		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	40	30																	
	50		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	60																		
	70		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	75																		
	80		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	90																		
	100		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	125																		
	150		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	160																		
	200		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	250																		
	300		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	500																		

For Width (B dimension) 55 or more, refer to **P.1591·1592**



Top · Bottom · Width Milled, Length Precision Cut

Order Example

Part Number	-	A	-	B	-	T
S50C-CUT	-	100	-	20	-	10

Days to Ship: **6 Days** P.88

Accuracy Standards

(Max. Value)

Item		Conditions	Standard Value
Width Parallelism		Length Min.~200mm	0.03
		Length 201~500mm	0.05
		Length 501~Max.	0.1
Thickness Parallelism		To length 100mm and width 100mm	0.05
Flatness	T6~15		0.05
	T16~25		0.04
	T26~32		0.03
Perpendicularity (Each Plane)			0.05
Circumference Chamfering		Burr-free is required. (P)Chamfering may be about C0.1.	

Price

- 1.1206/C50E-CUT

Volume Discount ((P)Round down to ten Cent.) P.88

Quantity	1~2	3~4	5~10
Rate	€ Unit Price	5%	10%

(P)For orders larger than indicated quantity, please request a quotation.

(P)For length (A dimension) configurable products, refer to **P.1603**

Part Number	A	B \ T	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
S50C-CUT	40	35	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	50																			
	60		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	70																			
	75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																			
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																			
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																			
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																			
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																			
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	40	40																		
	50		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60																			
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																			
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																			
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																			
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																			
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																			
	50	45	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60																			
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																			
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																			
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																			
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																			
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																			
	50	50	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60																			
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																			
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																			
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																			
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																			
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																			

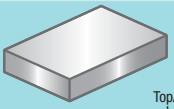
For Width (B dimension) 55 or more, refer to **P.1591·1592**

1.1206/C50E Dimension Selectable Plates Price List

-6F (Economy Type)-

For length (A dimension) configurable products, refer to **P.1603**

Part Number	A	B \ T	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
S50C-CUT	60	55	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	70																			
	75		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																			
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																			
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																			
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																			
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																			
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60	60																		
	70		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																			
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																			
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																			
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																			
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																			
	70	65	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																			
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																			
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																			
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																			
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																			
	70	70	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	75																			
	80		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	90																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																			
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160																			
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																			
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																			
	75	75	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																			
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																			
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																			
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																			
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																			
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80	80																		
	90		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100																			
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																			
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																			
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																			
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■



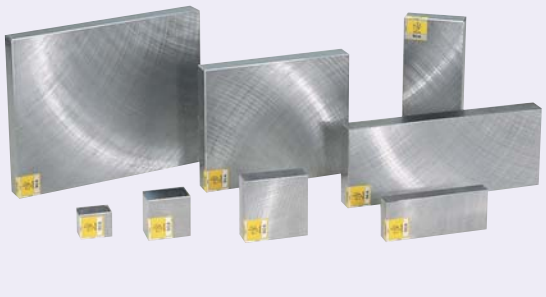
Top/Bottom/Width Milled,
Length Precision Cut

For length (A dimension) configurable products, refer to **P.1603**

Part Number	A	T / B	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
S50C-CUT	90	85	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	100																			
	125		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	150																			
	160		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	200																			
	250		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	300																			
	500		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	90	90																		
	100		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	125																			
	150		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	160																			
	200		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	250																			
	300		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	500																			
	100	95	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	125																			
	150		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	160																			
	200		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	250																			
	300		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	500																			
	100	100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	125																			
	150		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	160																			
	200		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	250																			
	300		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	500																			
	125	110		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	150																			
	160			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	200																			
	250			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	300																			
	500			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	125	120																		
	150			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	160																			
	200			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	250																			
	300			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	500																			
	125	125		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	150																			
	160			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	200																			
	250			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	300																			
	500			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	150	150																		
	160			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	200																			
	250			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	300																			
	500			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	200	180																		
	250					●		●				●	●			●				
	300																			
	500					●		●				●	●			●				
	200	200																		
	250					●		●				●	●			●				
	300																			
	500					●		●				●	●			●				

1.1206/C50E Dimension Selectable Plates

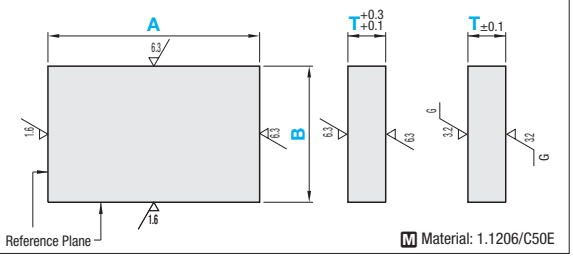
-All Surfaces Milled / All Surfaces Milled Top/Bottom Rotary Ground-



RoHS

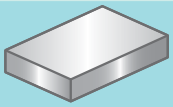
Part Number	Finish Method
SC6F	All Surfaces Milled
SCAH	All Surfaces Milled Top / Bottom Rotary Ground

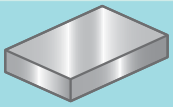
Dimension Tolerance	A / B	~99mm	100~250	251~
		±0.2	±0.25	±0.4



■All Surfaces Milled

Part Number	A	B \ T	5	6	8	9	10	12	13	15	16	19	20	22	25	28	30	34	35	40	50
SC6F	60	60	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80																				
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125																				
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	80	80																			
	100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	100	100																			
	125		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150																				
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400																				
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	125	125																			
	150		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400																				
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	150	150																			
	160		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200																				
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400																				
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	160	160																			
	200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250																				
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350																				
	400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200	200																			
	250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300																				
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400																				
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				
	250	250																			
	300		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350																				
	400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450																				
	500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300	300																			
	350		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400																				
	450		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500																				


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground

Order Example

Part Number	-	A	-	B	-	T
SC6F	-	100	-	100	-	8
SCAH	-	100	-	100	-	8

Days to Ship

6 Days P.88

* Some sizes have been changed from "in-stock" to "made-to-order" items. For more economical products of same size, refer to P.1589

8 Days P.88

8 Days Express A 8,00 EUR/piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Accuracy Standards

(Max. Value)

Item			
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5 · 6	0.1	0.05
	T8~15	0.07	0.03
	T16~25	0.05	0.015
	T28~50		0.012
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		C0.2~C0.5	C0.5~C1.0

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~10	11 or More
Rate	€ Unit Price	Quote

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

All Surfaces Milled Top / Bottom Rotary Ground

Part Number	A	B \ T	5 · 6	8 · 9	10	12 · 13	15 · 16	19 · 20	22	25	28	30	34 · 35	40	50
SCAH	60	60													
	80														
	100														
	125														
	150														
	160														
	200														
	250														
	300														
	500														
	80	80													
	100														
	125														
	150														
	160														
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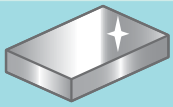
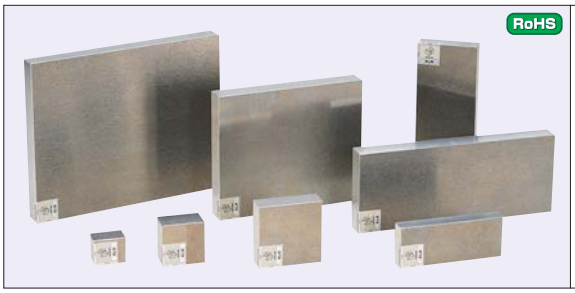
	500														
	250	250													
	300														
	350														
	400														
	450														
	500														
	300	300													
	350														
	400														
	450														
	500														

Aluminum Dimension Selectable Plates

-EN AW-5052/AlMg2,5- (Aℓ-Mg Base Aluminum Alloy)

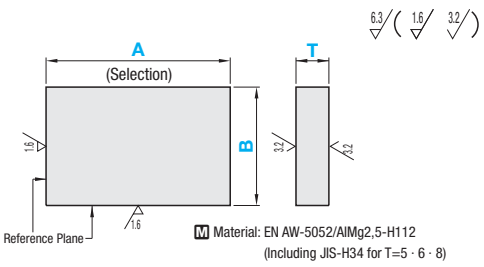


4-Surface Milling (Rolled)



RoHS

ALNH



Order Example

Part Number	-	A	-	B	-	T
ALNH	-	350	-	200	-	10

Days to Ship: **6 Days**

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

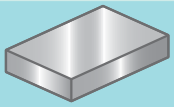
Accuracy Standards

· Flatness	1.5 or less per 1000mm
· Dimensional Tolerance of T	5 ±0.35 / 6 ±0.45 / 8 ±0.5 / 10 ±0.6 / 12 15 ±0.7 / 20 ±0.8 / 25 ±0.9 / 30 ±1.0
· A · B Dimension Tolerance	25~100 ±0.2 / 101~250 ±0.25 / 251~300 ±0.4
· Perpendicularity of Reference Plane	0.015 or less per 100mm
· Circumference Chamfering	C0.3 or less

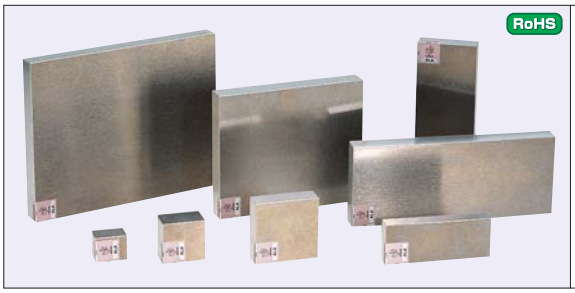
Part Number	A	B \ T	5	6	8	10	12	15	20	25	30
ALNH (Standard Size)	100	100									
	125										
	150										
	160										
	200										
	250										
	300										
	350										
	400										
	450										
	500										
	125	125									
	150										
	160										
	200										
	250										
	300										
	350										
	400										
	450										
	500										
	150	150									
	160										
	200										
	250										
	300										
	350										
	400										
	450										
	500										
	160	160									
	200										
	250										
	300										
	350										
	400										
	450										
	500										
	200	200									
	250										
	300										
	350										
	400										
	450										
	500										
	250	250									
	300										
	350										
	400										
	450										
	500										
	300	300									
	350										
	400										
	450										
	500										

High Precision Aluminum Dimension Selectable Plates

–EN AW-5052/AlMg2,5– (Aℓ–Mg Base Aluminum Alloy, Precision Rolling Products)

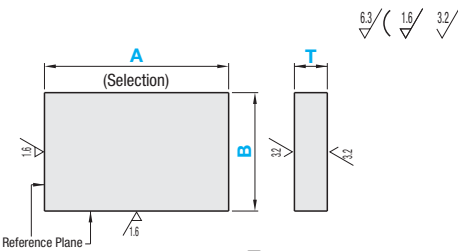


4-Surface Milling, Precision Rolled



RoHS

ALAH



Material: EN AW-5052/AlMg2,5-H112

Order Example

Part Number	-	A	-	B	-	T
ALAH	-	300	-	100	-	12

Days to Ship 8 Days

Express A 8,00 EUR/piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Accuracy Standards

· Flatness	0.4 or less per 1000mm
· Dimensional Tolerance of T	5, 6: ±0.04 / 8, 10, 12: ±0.05 / 15: ±0.08 / 20: ±0.10 / 25: ±0.12 / 30: ±0.15
· A · B Dimension Tolerance	100~250: ±0.25 / 251~500: ±0.4
· Perpendicularity of Reference Plane	0.015 or less per 100mm
· Circumference Chamfering	C0.3 or less

Part Number	A	B \ T	5	6	8	10	12	15	20	25	30
ALAH (Standard Size)	100	100									
	125										
	150										
	160										
	200										
	250										
	300										
	350										
	400										
	450										
	500										
	125	125									
	150										
	160										
	200										
	250										
	300										
	350										
	400										
	450										
	500										
	150	150									
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	300										
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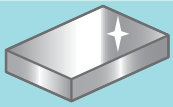
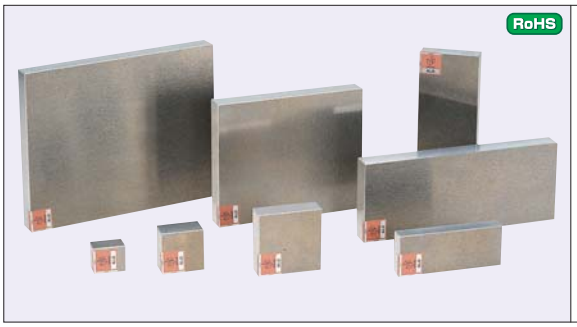
	400										
	450										
	500										
	200	200									
	250										
	300										
	350										
	400										
	450										
	500										
	250	250									
	300										
	350										
	400										
	450										
	500										
	300	300									
	350										
	400										
	450										
	500										

Duralumin Dimension Selectable Plates

-EN AW-2017/AlCu4MgSi- (Aℓ-Cu Base Aluminum Alloy)

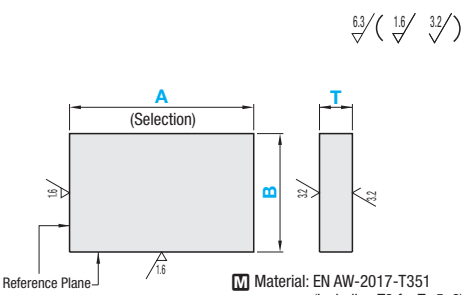


4-Surface Milling (Rolled)



RoHS

ALDH



Material: EN AW-2017-T351
(Including T3 for T=5, 6)

Order Example

Part Number	-	A	-	B	-	T
ALDH	-	160	-	100	-	10

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship 6 Days P.88

Accuracy Standards

- Flatness: 2 or less per 1000mm
- Dimensional Tolerance of T:

5	6	8	10	12, 15	20	25	30
±0.35	±0.45	±0.5	±0.6	±0.7	±0.8	±0.9	±1.0

- A, B Dimension Tolerance:

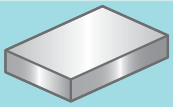
25~100	101~250	251~500
±0.2	±0.25	±0.4

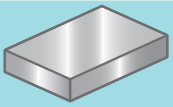
- Perpendicularity of Reference Plane: 0.015 or less per 100mm
- Circumference Chamfering: C0.3 or less

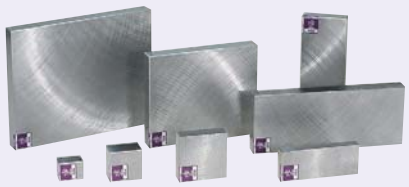
Part Number	A	B \ T	5	6	8	10	12	15	20	25	30
ALDH	100	100	●	●	●	●	●	●	●	●	●
	125										
	150		●	●	●	●	●	●	●	●	●
	160										
	200		●	●	●	●	●	●	●	●	●
	250										
	300		●	●	●	●	●	●	●	●	●
	350										
	400		●	●	●	●	●	●	●	●	●
	450										
	500		●	●	●	●	●	●	●	●	●
	125	125									
	150		●	●	●	●	●	●	●	●	●
	160										
	200		●	●	●	●	●	●	●	●	●
	250										
	300		●	●	●	●	●	●	●	●	●
	350										
	400		●	●	●	●	●	●	●	●	●
	450										
	500		●	●	●	●	●	●	●	●	●
	150	150									
	160		●	●	●	●	●	●	●	●	●
	200										
	250		●	●	●	●	●	●	●	●	●
	300										
	350		●	●	●	●	●	●	●	●	●
	400										
	450		●	●	●	●	●	●	●	●	●
	500										
	160	160	●	●	●	●	●	●	●	●	●
	200										
	250		●	●	●	●	●	●	●	●	●
	300										
	350		●	●	●	●	●	●	●	●	●
	400										
	450		●	●	●	●	●	●	●	●	●
	500										
	200	200	●	●	●	●	●	●	●	●	●
	250										
	300		●	●	●	●	●	●	●	●	●
	350										
	400		●	●	●	●	●	●	●	●	●
	450										
	500		●	●	●	●	●	●	●	●	●
	250	250									
	300		●	●	●	●	●	●	●	●	●
	350										
	400		●	●	●	●	●	●	●	●	●
	450										
	500		●	●	●	●	●	●	●	●	●
	300	300									
	350		●	●	●	●	●	●	●	●	●
	400										
	450		●	●	●	●	●	●	●	●	●
	500										

1.0038·S235JR A dimension Configurable Plates

-Standard Size · Large Size-


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground



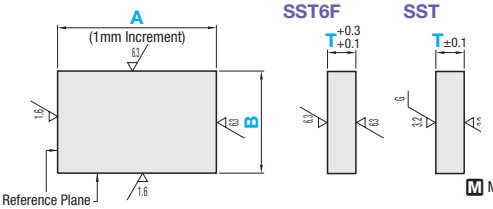
RoHS

Part Number	Finish Method	Size
SSA	All Surfaces Milled Top / Bottom Rotary	Standard Size
SST6F	All Surfaces Milled	Large Size
SST	All Surfaces Milled Top / Bottom Rotary Ground	

Dimension Tolerance	A · B	~99mm	100~250	251~
		±0.2	±0.25	±0.4

SSA
SST

SST6F



Order Example

Part Number	-	A	-	B	-	T
SSA	-	100	-	100	-	8

Days to Ship

8 Days — Express A — 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

10 Days — Express B — 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

(Ex.) When SSA-380-100-25

A Dimension	X	Area € Unit Price	=	Price (Round down to ten Cent.)
380	X	14 Cent	=	53,20€

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Accuracy Standards

(Max. Value)

Item			
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5 / 6	-	0.05
	T8~15	0.07	0.03
	T16~25	0.05	0.015
	T26~	0.05	0.012
Perpendicularity of Reference Plane		0.015 or less per 100mm	
Circumference Chamfering		C0.5~C1.0	

Standard Size
All Surfaces Milled Top / Bottom Rotary Ground

SSA

A 1mm Increment	B \ T	5, 6	8, 9	10	12, 13	15, 16	19, 20	22	25	28	30	34, 35	40	50
25~ 50	25													
51~ 75														
76~100														
101~250														
30~ 50	40													
51~ 75														
76~100														
101~200														
201~500														
30~ 50	60													
51~ 75														
76~100														
101~200														
201~500														
30~ 50	80													
51~ 75														
76~100														
101~200														
201~500														
30~ 50	100													
51~ 75														
76~100														
101~200														
201~500														
50~ 75	125													
76~100														
101~125														
126~200														
201~500														
101~200	150													
201~500														
101~200	160													
201~500														
101~200	200													
201~500														
101~200	250													
201~500														
101~200	300													
201~500														

Large Size
All Surfaces Milled

SST6F

A 1mm Increment	B \ T	10	12	13	15	16	20	22	25	30
501~ 800	125									
501~ 800	150									
501~ 800	160									
501~ 800	200									
501~ 800	250									
501~ 800	300									
301~ 800	350									
801~1200										
351~ 800	400									
801~1200										
401~ 800	450									
801~1200										
451~ 800	500									
801~1200										
501~ 800	600									
801~1200										
601~ 800	800									
801~1200										

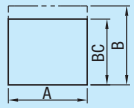
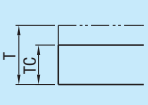
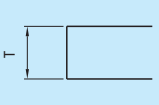
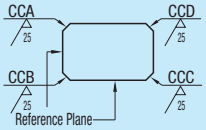
All Surfaces Milled Top / Bottom Rotary Ground

SST

A 1mm Increment	B \ T	10	12	13	15	16	20	22	25	30
501~ 800	125									
501~ 800	150									
501~ 800	160									
501~ 800	200									
501~ 800	250									
501~ 800	300									
301~ 800	350									
801~1200										
351~ 800	400									
801~1200										
401~ 800	450									
801~1200										
451~ 800	500									
801~1200										
501~ 800	600									
801~1200										
601~ 800	800									
801~1200										

Alterations

Part Number	-	A	-	B	-	T	- (BC · CNC · TC…etc.)
SSA	-	320	-	200	-	20	- BC195 - CNC

Alterations	Width (B Dimension)	Circumference Chamfering	Thickness	Thickness Tolerance		Corner Cut
						
Code	BC	CNC	TC	TKP	TKM	CCA · CCB · CCC · CCD
Spec.	Cuts B dimension. BC=1mm Increment Ordering Code BC195 SSA 26≤BC≤299 SST(6F) 126≤BC≤799	Changes the circumference chamfering dimension. C0.5~C1.0⋯› C0.1 or less Applicable to only.	Cuts T Dimension. TC=1mm Increment Ordering Code (Ex.) When T=18⋯›TC18 7≤BC≤49 Applicable to only.	Changes T Dimension to positive toleranced. T±0.1⋯›T +0.1 0 Applicable to only.	Changes T Dimension to negative toleranced. T±0.1⋯›T 0 -0.1 Applicable to only.	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code Applicable to only. (Example)When the corners of A and D are cut by C5⋯›CCA5-CCD5
Price Adder	8,00	8,00	20,00	8,00		5,00/1 Corner

1.0038/S235JR A Dimension Configurable Plates

-6F (Economy Type)-

■Features of Precision Cut Plates : Economical and Short Lead Time

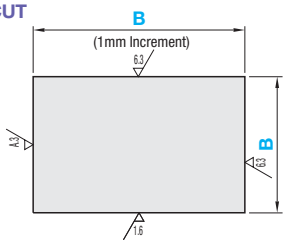
Base material is milled on top, bottom, and side surfaces for cut to precise lengths by 1mm increment for shipments. Economical and short delivery time.



RoHS

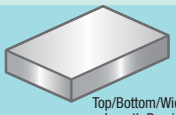
Dimension Tolerance	Reference : Length	~600mm	601~1200mm
	Length (A)	±0.1	±0.2
	Width (B)	±0.1	
	Thickness (T)	±0.1	

SS400-CUT



M Material: 1.0038/S235JR

Type	A	B \ T	5	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
SS400-CUT	15~ 50	15	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	51~ 100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~ 250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	251~ 400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	401~ 600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	16~ 50	16	■	■	■	■	■		■			■	■	■	■	■	■	■	■	■	■
	51~ 100		■	■	■	■	■		■			■	■	■	■	■	■	■	■	■	■
	101~ 250		■	■	■	■	■		■			■	■	■	■	■	■	■	■	■	■
	251~ 400		■	■	■	■	■		■			■	■	■	■	■	■	■	■	■	■
	401~ 600		■	■	■	■	■		■			■	■	■	■	■	■	■	■	■	■
	601~1000		■	■	■	■	■		■			■	■	■	■	■	■	■	■	■	■
	1001~1200		■	■	■	■	■		■			■	■	■	■	■	■	■	■	■	■
	20~ 50	20	■	■	■	■	■	■	■	■	■	■	■	■	■						
	51~ 100		■	■	■	■	■	■	■	■	■	■	■	■	■						
	101~ 250		■	■	■	■	■	■	■	■	■	■	■	■	■						
	251~ 400		■	■	■	■	■	■	■	■	■	■	■	■	■						
	401~ 600		■	■	■	■	■	■	■	■	■	■	■	■	■						
	601~1000		■	■	■	■	■	■	■	■	■	■	■	■	■						
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■						
	22~ 50	22	■	■	■	■	■		■			■	■		■						
	51~ 100		■	■	■	■	■		■			■	■		■						
	101~ 250		■	■	■	■	■		■			■	■		■						
	251~ 400		■	■	■	■	■		■			■	■		■						
	401~ 600		■	■	■	■	■		■			■	■		■						
	601~1000		■	■	■	■	■		■			■	■		■						
	1001~1200		■	■	■	■	■		■			■	■		■						
	25~ 50	25	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	51~ 100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	101~ 250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	251~ 400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	401~ 600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	601~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	30~ 50	30	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	51~100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	101~250		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	251~400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	401~600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	601~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	32~ 50	32	■	■	■	■	■		■			■	■		■	■	■	■			
	51~ 100		■	■	■	■	■		■			■	■		■	■	■	■			
	101~ 250		■	■	■	■	■		■			■	■		■	■	■	■			
	251~ 400		■	■	■	■	■		■			■	■		■	■	■	■			
	401~ 600		■	■	■	■	■		■			■	■		■	■	■	■			
	601~1000		■	■	■	■	■		■			■	■		■	■	■	■			
	1001~1200		■	■	■	■	■		■			■	■		■	■	■	■			
	35~ 50	35																			
	51~ 100																				
	101~ 250																				
	251~ 400																				
	401~ 600																				
	601~1000																				
	1001~1200																				
	38~ 50	38	■					■		■	■			■					■	■	■
	51~ 100		■					■		■	■			■					■	■	■
	101~ 250		■					■		■	■			■					■	■	■
	251~ 400		■					■		■	■			■					■	■	■
	401~ 600		■					■		■	■			■					■	■	■
	601~1000		■					■		■	■			■					■	■	■
	1001~1200		■					■		■	■			■					■	■	■
	40~ 50	40																			
	51~ 100																				
	101~ 250																				
	251~ 400																				
	401~ 600																				
	601~1000																				
	1001~1200																				
	45~ 50	45																			
	51~ 100																				
	101~ 250																				
	251~ 400																				
	401~ 600																				
	601~1000																				
	1001~1200																				
	50~ 100	50																			
	101~ 250																				
	251~ 400																				
	401~ 600																				
	601~1000																				
	1001~1200																				
	55~ 100	55																			
	101~ 250																				
	251~ 400																				
	401~ 600																				
	601~1000																				
	1001~1200																				
	60~ 100	60																			
	101~ 250																				
	251~ 400																				
	401~ 600																				
	601~1000																				
	1001~1200																				
	65~ 100	65																			
	101~ 250																				
	251~ 400																				
	401~ 600																				
	601~1000																				
	1001~1200																				



Top/Bottom/Width Milled,
Length Precision Cut

Price Reduction
10% on average

Order Example

Part Number	-	A	-	B	-	T
SS400-CUT	-	100	-	100	-	10

Days to Ship: **6 Days** P.88

Accuracy Standards

(Max. Value)

Item		Conditions	Standard Value
Width Parallelism		Length Min.~200mm	0.03
		Length 201~500mm	0.05
		Length 501~Max.	0.1
Thickness Parallelism		To length 100mm and width 100mm	0.05
Flatness	T5~15		0.05
	T16~25		0.04
	T26~32		0.03
Perpendicularity (Each Plane)			0.05
Circumference Chamfering		Burr-free is required. (P)Chamfering may be about C0.1.	

Price

- SS400-CUT

Volume Discount ((P)Round down to ten Cent.) P.88

Quantity	1~2	3~4	5~10
Rate	€ Unit Price	5%	10%

(P)For orders larger than indicated quantity, please request a quotation.

Type	A	T \ B	5	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
SS400-CUT	70~100	70																			
	101~250																				
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	75~100	75																			
	101~250																				
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	80~100	80																			
	101~250																				
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	85~100	85																			
	101~250																				
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	90~100	90																			
	101~250																				
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	95~100	95																			
	101~250																				
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	100~250	100																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	105~250	105																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	110~250	110																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	115~250	115																			
	251~400																				
	401~600																				
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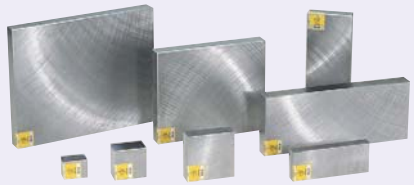
	1001~1200																				
	120~250	120																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	125~250	125																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	130~250	130																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	140~250	140																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	150~250	150																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	180~250	180																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				
	200~250	200																			
	251~400																				
	401~600																				
	601~1000																				
	1001~1200																				

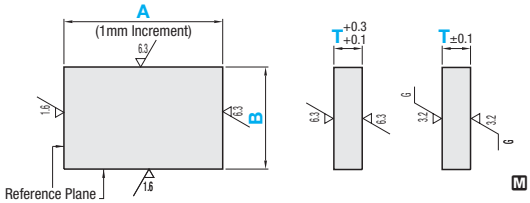
1.1206/C50E A dimension Configurable Plates

-Standard Size / Large Size-



Part Number	Finish Method	Size
SCA	All Surfaces Milled Top · Bottom Rotary Ground	Standard Size
SCG6F	All Surfaces Milled	Large Size
SCG	All Surfaces Milled Top · Bottom Rotary Ground	

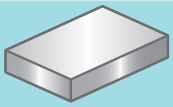
Dimension Tolerance	A · B	~99mm	100~250	251~
		±0.2	±0.25	±0.4

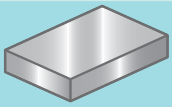


■Standard Sizes

■All Surfaces Milled Top · Bottom Rotary Ground

Part Number	A 1mm Increment	T / B	5 · 6	8 · 9	10	12 · 13	15 · 16	19 · 20	22	25	28	30	34 · 35	40	50
SCA	25~ 50	25	■	■	■	■	■	■	■	■	■	■	■	■	■
	51~ 75														
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	■
	101~250														
	30~ 50	40	■	■	■	■	■	■	■	■	■	■	■	■	■
	51~ 75														
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200														
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■
	30~ 50	60													
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100														
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500														
	30~ 50	80	■	■	■	■	■	■	■	■	■	■	■	■	■
	51~ 75														
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200														
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■
	30~ 50	100													
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100														
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500														
	50~ 75	125	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100														
	101~125		■	■	■	■	■	■	■	■	■	■	■	■	■
	126~200														
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200	150													
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200	160													
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200	200													
	201~500			■	■	■	■	■	■	■	■	■	■	■	■
	101~200	250													
	201~500			■	■	■	■	■	■	■	■	■	■	■	■
	101~200	300													
	201~500			■	■	■	■	■	■	■	■	■	■	■	■


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground

Order Example

Part Number	-	A - B - T
SCA	-	100 - 100 - 8

Days to Ship

8 Days	Express A	8,00 EUR/ piece	P.88
10 Days	Express B	8,00 EUR/ piece	P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

(Ex.) When SCA–380–100–25

A Dimension	X	Area € Unit Price	=	Price (Round down to ten Cent.)
3,80	x	14 Cent	=	53,20 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Accuracy Standards

(Max. Value)

Item			Applicable to / only.
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5, 6	-	0.05
	T 8~15	0.07	0.03
	T16~25	0.05	0.015
	T26~	0.05	0.012
Perpendicularity of Reference Plane		0.015 or less per 100mm	
Circumference Chamfering		C0.5~C1.0	

Large

All Surfaces Milled

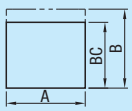
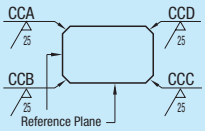
Part Number	A 1mm Increment	T B	10	12	13	15	16	20	22	25	30
SCG6F	501~ 800	125	●	●	●	●	●	●	●	●	●
	501~ 800	150									
	501~ 800	160	●	●	●	●	●	●	●	●	●
	501~ 800	200									
	501~ 800	250	●	●	●	●	●	●	●	●	●
	501~ 800	300									
	301~ 800	350	●	●	●	●	●	●	●	●	●
	801~1200										
	351~ 800	400	●	●	●	●	●	●	●	●	●
	801~1200										
	401~ 800	450	●	●	●	●	●	●	●	●	●
	801~1200										
	451~ 800	500	●	●	●	●	●	●	●	●	●
	801~1200										
	501~ 800	600	●	●	●	●	●	●	●	●	●
	801~1200										
	601~ 800	800	●	●	●	●	●	●	●	●	●
	801~1200										

All Surfaces Milled Top · Bottom Rotary Ground

Part Number	A 1mm Increment	T B	10	12	13	15	16	20	22	25	30
SCG	501~ 800	125	●	●	●	●	●	●	●	●	●
	501~ 800	150									
	501~ 800	160	●	●	●	●	●	●	●	●	●
	501~ 800	200									
	501~ 800	250	●	●	●	●	●	●	●	●	●
	501~ 800	300									
	301~ 800	350	●	●	●	●	●	●	●	●	●
	801~1200										
	351~ 800	400	●	●	●	●	●	●	●	●	●
	801~1200										
	401~ 800	450	●	●	●	●	●	●	●	●	●
	801~1200										
	451~ 800	500	●	●	●	●	●	●	●	●	●
	801~1200										
	501~ 800	600	●	●	●	●	●	●	●	●	●
	801~1200										
	601~ 800	800	●	●	●	●	●	●	●	●	●
	801~1200										

Alterations

Part Number	-	A - B - T	- (BC · CNC · TC…etc.)
SCA	-	320 - 200 - 20	- BC195-CNC

Alterations	Width (B Dimension)	Circumference Chamfering	Thickness	Thickness Tolerance		Corner Cut
						
Code	BC	CNC	TC	TKP	TKM	CCA · CCB · CCC · CCD
Spec.	Cuts B dimension. BC=1mm Increment Ordering Code BC195 SCA 26≤BC≤299 SCG(6F) 126≤BC≤799	Changes the circumference chamfering dimension. C0.5~C1.0⋯› C0.1 or less Applicable to only.	Cuts T Dimension. TC=1mm Increment Ordering Code (Ex.) When T=18⋯›TC18 7≤TC≤49 Applicable to only.	Changes T Dimension to positive toleranced. T±0.1⋯›T +0.1 0 Applicable to only.	Changes T Dimension to negative toleranced. T±0.1⋯›T 0 -0.1 Applicable to only.	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Applicable to only. Ordering Code (Example)When the corners of A and D are cut by C5 ⋯›CCA5-CCD5
Price Adder	8,00	8,00	20,00	8,00		500/1 Corner

1.1206/C50E A dimension Configurable Plates

-6F (Economy Type)-

Features of Precision Cut Plates: Economical and Short Lead Time

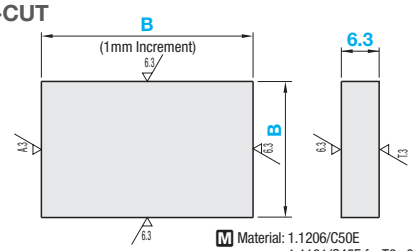
Base material is milled on top, bottom, and side surfaces for cut to precise lengths by 1mm increment for shipments. Economical and short delivery time.



RoHS

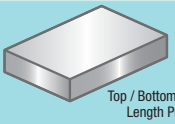
Dimension Tolerance	Reference : Length	~600mm	601~1200mm
	Length (A)	±0.1	±0.2
	Width (B)	±0.1	
	Thickness (T)	±0.1	

S50C-CUT



M Material: 1.1206/C50E
1.1191/C45E for T6 · 8 ·10 and 11

Type	A	B \ T	5	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
S50C-CUT	15~ 50	15	■	○	○	○	○	○	○	○	○	○	■	■	■	■	■	■	■	■	■
	51~ 100		■	○	○	○	○	○	○	○	○	○	■	■	■	■	■	■	■	■	■
	101~ 250		■	○	○	○	○	○	○	○	○	○	■	■	■	■	■	■	■	■	■
	251~ 400		■	○	○	○	○	○	○	○	○	○	■	■	■	■	■	■	■	■	■
	401~ 600		■	○	○	○	○	○	○	○	○	○	■	■	■	■	■	■	■	■	■
	601~1000		■	○	○	○	○	○	○	○	○	○	■	■	■	■	■	■	■	■	■
	1001~1200		■	○	○	○	○	○	○	○	○	○	■	■	■	■	■	■	■	■	■
	16~ 50	16	○	○	■	○	○	■	○	■	■	■	○	■	■	■	■	■	■	■	■
	51~ 100		○	○	■	○	○	■	○	■	■	■	○	■	■	■	■	■	■	■	■
	101~ 250		○	○	■	○	○	■	○	■	■	■	○	■	■	■	■	■	■	■	■
	251~ 400		○	○	■	○	○	■	○	■	■	■	○	■	■	■	■	■	■	■	■
	401~ 600		○	○	■	○	○	■	○	■	■	■	○	■	■	■	■	■	■	■	■
	601~1000		○	○	■	○	○	■	○	■	■	■	○	■	■	■	■	■	■	■	■
	1001~1200		○	○	■	○	○	■	○	■	■	■	○	■	■	■	■	■	■	■	■
	20~ 50	20	■	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■	■	■
	51~ 100		■	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■	■	■
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■	■	■
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■	■	■
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■	■	■
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■	■	■
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■	■	■
	22~ 50	22	○	○	■	○	○	■	○	■	■	■	○	■	○	■	■	■	■	■	■
	51~ 100		○	○	■	○	○	■	○	■	■	■	○	■	○	■	■	■	■	■	■
	101~ 250		○	○	■	○	○	■	○	■	■	■	○	■	○	■	■	■	■	■	■
	251~ 400		○	○	■	○	○	■	○	■	■	■	○	■	○	■	■	■	■	■	■
	401~ 600		○	○	■	○	○	■	○	■	■	■	○	■	○	■	■	■	■	■	■
	601~1000		○	○	■	○	○	■	○	■	■	■	○	■	○	■	■	■	■	■	■
	1001~1200		○	○	■	○	○	■	○	■	■	■	○	■	○	■	■	■	■	■	■
	25~ 50	25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■
	51~ 100		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■
	101~ 250		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■
	251~ 400		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■
	401~ 600		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■
	601~1000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■
	1001~1200		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	■	■
	30~ 50	30	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■
	51~ 100		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■
	32~ 50	32	○	○	■	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	51~ 100		○	○	■	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	101~ 250		○	○	■	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	251~ 400		○	○	■	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	401~ 600		○	○	■	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	601~1000		○	○	■	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	1001~1200		○	○	■	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	35~ 50	35	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	51~ 100		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	38~ 50	38	■	■	○	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	51~ 100		■	■	○	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	101~ 250		■	■	○	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	251~ 400		■	■	○	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	401~ 600		■	■	○	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	601~1000		■	■	○	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	1001~1200		■	■	○	○	○	■	○	■	■	■	○	■	○	■	○	○	■	■	■
	40~ 50	40	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	51~ 100		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	45~ 50	45	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	51~ 100		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	50~ 100	50	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	55~ 100	55	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	60~ 100	60	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	65~ 100	65	■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	101~ 250		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	251~ 400		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	401~ 600		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~1000		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200		■	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



Top / Bottom / Width Milled,
Length Precision Cut

Price Reduction
10% on average

Order Example

Part Number	-	A - B - T
S50C-CUT	-	100 - 100 - 10

Days to Ship: **6 Days**

Accuracy Standards

(Max. Value)

Item		Conditions	Standard Value
Width Parallelism		Length Min.~200mm	0.03
		Length 201~500mm	0.05
		Length 501~Max.	0.1
Thickness Parallelism		To length 100mm and width 100mm	0.05
Flatness	T5~15		0.05
	T16~25		0.04
	T26~32		0.03
Perpendicularity (Each Plane)			0.05
Circumference Chamfering		Burr-free is required. (?)Chamfering may be about C0.1.	

Price

· S50C-CUT

Volume Discount

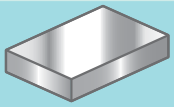
(?)Round down to ten Cent. P.88

Quantity	1~2	3~4	5~10
Rate	€ Unit Price	5%	10%

(?)For orders larger than indicated quantity, please request a quotation.

Type	A	B \ T	6	8	9	10	11	12	13	14	15	16	18	19	20	22	25	28	30	32
S50C-CUT	70~ 100	70																		
	101~ 250																			
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	75~ 100	75																		
	101~ 250																			
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	80~ 100	80																		
	101~ 250																			
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	85~ 100	85																		
	101~ 250																			
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	90~ 100	90																		
	101~ 250																			
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	95~ 100	95																		
	101~ 250																			
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	100~ 250	100																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	105~ 250	105																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	110~ 250	110																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	115~ 250	115																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	120~ 250	120																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	125~ 250	125																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	130~ 250	130																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	140~ 250	140																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	150~ 250	150																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	180~ 250	180																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			
	200~ 250	200																		
	251~ 400																			
	401~ 600																			
	601~1000																			
	1001~1200																			

1.4305/X10CrNiS18-9
A dimension Configurable Plates

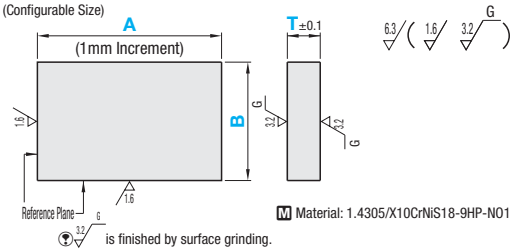


All Surfaces Milled + Top/Bottom Surfaced



RoHS

SUS (Configurable Size)



Material: 1.4305/X10CrNiS18-9HP-N01

is finished by surface grinding.

Order Example

Part Number	-	A	-	B	-	T
SUS	-	351	-	200	-	20

Days to Ship 10 Days

Express B 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

(Ex.) When

A Dimension	X	Area € Unit Price	=	€ Price (Round down to ten Cent.)
351	X	58 Cent	=	203,50 €

Volume Discount (Round down to ten Cent.) P88

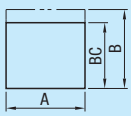
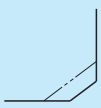
Quantity	1~4	5~19
Rate	€ Unit Price	5%

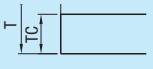
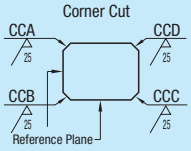
For orders larger than indicated quantity, please request a quotation.

Part Number	A 1mm Increment \ T B	5	6	8	10	12	15	20	25	30	35	40
SUS (Configurable Size)	25~ 50	25										
	51~ 75											
	76~100											
	101~250											
	30~ 50	40										
	51~ 75											
	76~100											
	101~200											
	201~500											
	30~ 50	60										
	51~ 75											
	76~100											
	101~200											
	201~500											
	30~ 50	80										
	51~ 75											
	76~100											
	101~200											
	201~500											
	30~ 50	100										
	51~ 75											
	76~100											
	101~200											
	201~500											
	50~ 75	125										
	76~100											
	101~125											
	126~200											
	201~500											
	101~200	150										
	201~500											
	101~200	160										
	201~500											
	101~200	200										
	201~500											

Alterations

Part Number	-	A	-	B	-	T	-	(BC · CNC · TC ··· etc.)
SUS	-	320	-	200	-	20	-	BC195

Alterations	Code	Spec.	Price Adder
Width (B Dimension) 	BC	Cuts B dimension. BC=1mm Increment Ordering Code BC195 26≤BC≤199	8,00
Circumference Chamfering 	CNC	Changes the circumference chamfering dimension. C0.5~C1.0··· C0.1 or less	8,00

Alterations	Code	Spec.	Price Adder
Thickness 	TC	Cuts T Dimension. TC=1mm Increment Ordering Code (Ex.) T=18··· TC18 7≤TC≤39	20,00
Corner Cut 	CCA CCB CCC CCD	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5 ··· CCA5-CCD5	5,00/ Per Corner

Accuracy Standards

· Thickness Parallelism — 0.012 or less per 100mm

· Flatness

T	Less than 8	8~15	16~25	26 or more
per 100 mm	0.05	0.03	0.015	0.012

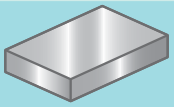
· A · B Dimension Tolerance

99mm or less	100~250	251~
±0.2	±0.25	±0.4

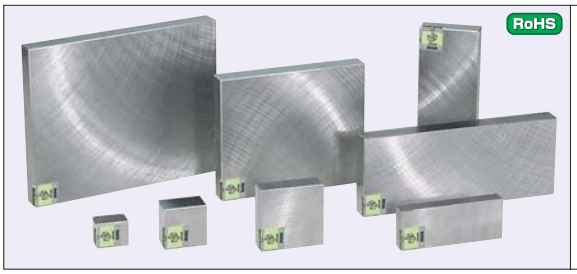
· Perpendicularity of Reference Plane — 0.015 or less per 100mm

· Circumference Chamfering — C0.5~C1.0

1.4301/X5CrNi18-10
A dimension Configurable Plates

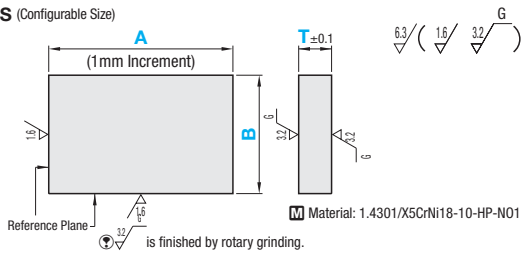


All Surfaces Milled + Top/Bottom Rotary Ground



RoHS

SUSS (Configurable Size)



Material: 1.4301/X5CrNi18-10-HP-NO1

Order Example

Part Number	-	A	-	B	-	T
SUSS	-	351	-	200	-	20

Days to Ship 10 Days

Express B 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

(Ex.) When

A Dimension	X	Area € Unit Price	=	Price (Round down to ten Cent.)
351	X	67 Cent	=	235,10 €

Volume Discount (Round down to ten Cent.) P.88

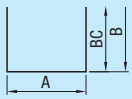
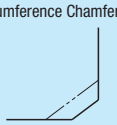
Quantity	1~4	5~19
Rate	€ Unit Price	5%

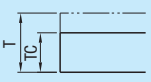
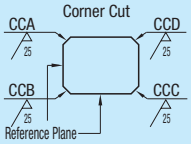
For orders larger than indicated quantity, please request a quotation.

Part Number	A 1mm Increment	T / B	5	6	8	10	12	15	20	25	30	35	40
SUSS (Configurable Size)	25~ 50	25											
	51~ 75												
	76~100												
	101~250												
	30~ 50	40											
	51~ 75												
	76~100												
	101~200												
	201~500												
	30~ 50	60											
	51~ 75												
	76~100												
	101~200												
	201~500												
	30~ 50	80											
	51~ 75												
	76~100												
	101~200												
	201~500												
	30~ 50	100											
	51~ 75												
	76~100												
	101~200												
	201~500												
	50~ 75	125											
	76~100												
	101~125												
	126~200												
	201~500												
	101~200	150											
	201~500												
	101~200	160											
	201~500												
	101~200	200											
	201~500												

Alterations

Part Number	-	A	-	B	-	T	-	(BC · CNC · TC ··· etc.)
SUSS	-	320	-	200	-	20	-	BC195

Alterations	Code	Spec.	Price Adder
Width (B Dimension) 	BC	Cuts B dimension. BC=1mm Increment Ordering Code BC195 26≤BC≤199	8,00
Circumference Chamfering 	CNC	Changes the circumference chamfering dimension. C0.5~C1.0··· C0.1 or less	8,00

Alterations	Code	Spec.	Price Adder
Thickness 	TC	Cuts T Dimension. TC=1mm Increment Ordering Code (Ex.) T=18··· TC18 7≤TC≤39	20,00
Corner Cut 	CCA CCB CCC CCD	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5 ··· CCA5-CCD5	5,00/ Per Corner

Accuracy Standards

· Thickness Parallelism 0.012 or less per 100mm

· Flatness

T	Less than 8	8~15	16~25	26 or more
per 100 mm	0.05	0.03	0.015	0.012

· A · B Dimension Tolerance

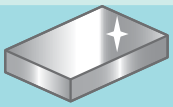
99mm or less	100~250	251~
±0.2	±0.25	±0.4

· Perpendicularity of Reference Plane 0.015 or less per 100mm

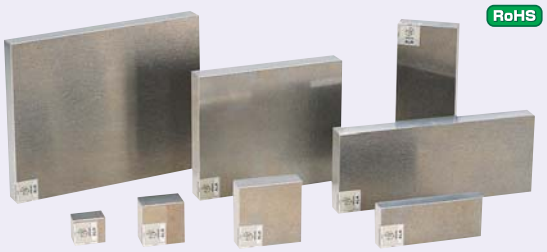
· Circumference Chamfering C0.5~C1.0

Aluminum A dimension Configurable Plates

-EN AW-5052/AlMg2,5- (Aℓ–Mg Base Aluminum Alloy)

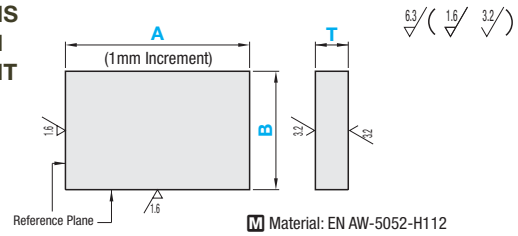


4-Surface Milling (Rolled)



RoHS

ALNS
ALN
ALNT



Material: EN AW-5052-H112
(Including JIS-H34 for T=5, 6, 8)

Order Example

Part Number	-	A	-	B	-	T
ALN	-	310	-	160	-	15

Days to Ship

- ALNS • ALN: 6 Days P.88
- ALNT: 10 Days

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

(Ex.) When ALN-350-200-10

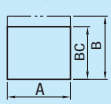
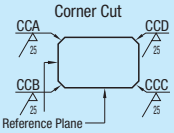
A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
3,50	x	12.7 Cent	=	44,40 €

Part Number	A 1mm Increment	B 1mm Increment	€ Unit Price T5 / 6	T8, 10	T12, 15	T20	T25	T30
ALNS (Configurable Size)	25~50	25~50						
	51~75	25~50						
		51~75						
	76~100	25~50						
		51~75						
		76~100						

Part Number	A 1mm Increment	T / B	5	6	8	10	12	15	20	25	30	35	40
ALN (Configurable Size)	100~200	100											
	201~300												
	301~500												
	101~250	125											
	251~500												
	126~300	150											
	301~500												
	151~300	160											
	301~500												
	161~500	200											
	201~500	250											
	251~500	300											
ALNT (Configurable Size)	501~800	125											
	501~800	150											
	501~800	160											
	501~800	200											
	501~800	250											
	501~800	300											
	350~1200	350											
	400~1200	400											
	450~1200	450											
	500~1200	500											
	600~1200	600											
	800~1200	800											

Alterations

Part Number	-	A	-	B	-	T	- (BC / CCA / etc.)
ALN	-	315	-	200	-	20	- BC176

Alterations	Code	Spec.	Price Adder
Width (B Dimension) 	BC	Cuts B dimension. BC=1mm Increment Ordering Code BC195 26≤BC≤B-1 126≤BC≤B-1 Applicable to and only.	8,00
Corner Cut 	CCA CCB CCC CCD	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5 ⋯›CCA5-CCD5	5,00/ Per Corner

Accuracy Standards

- Flatness: 1.5 or less per 1000mm
- Dimensional Tolerance of T

5	6	8	10	12, 15	20	25	30, 35	40
±0.35	±0.45	±0.5	±0.6	±0.7	±0.8	±0.9	±1.0	±1.1

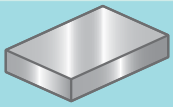
- A, B Dimension Tolerance

25~100	101~250	251~1000	1001~
±0.2	±0.25	±0.4	±1.0

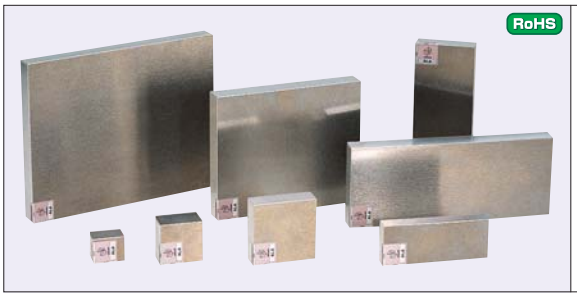
- Perpendicularity of Reference Plane: 0.015 or less per 100mm
- Circumference Chamfering: C0.3 or less

High Precision Aluminum A dimension Configurable Plates

-EN AW-5052/AlMg2,5- (Aℓ–Mg Base Aluminum Alloy, Precision Rolling Products)

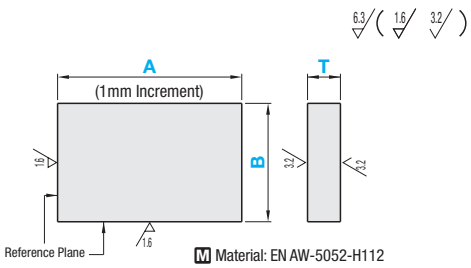


4-Surface Milling, Precision Rolled



RoHS

ALA
ALAT



Order Example

Part Number	-	A	-	B	-	T
ALA	-	430	-	100	-	15

Days to Ship

- ALA: **8 Days**
- ALAT: **10 Days**

Express A: 8,00 EUR/piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

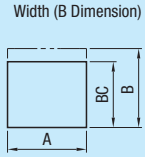
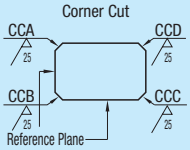
(Ex.) When ALA-320-100-12

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
3,20	x	8.8 Cent	=	28,10 €

Part Number	A 1mm Increment / B \ T	5	6	8	10	12	15	20	25	30
ALA Configurable	100~200									
	201~300	100								
	301~500									
	101~250	125								
	251~500									
	126~300	150								
	301~500									
	151~300	160								
	301~500									
	161~500	200								
	201~500	250								
	251~500	300								
ALAT (Configurable Size)	501~800	125								
	501~800	150								
	501~800	160								
	501~800	200								
	501~800	250								
	501~800	300								
	350~1200	350								
	400~1200	400								
	450~1200	450								
	500~1200	500								
	600~1200	600								
	800~1200	800								

Alterations

Part Number	-	A	-	B	-	T	- (BC / CCA / etc.)
ALA	-	430	-	300	-	15	- BC270

Alterations	Code	Spec.	Price Adder
Width (B Dimension) 	BC	Cuts B dimension. BC=1mm Increment Ordering Code BC195 ALA 26≤BC≤B-1 ALAT 126≤BC≤B-1 Applicable to ALA and ALAT only.	8,00
Corner Cut 	CCA CCB CCC CCD	Arbitrary corner can be cut. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5, ···▸CCA5-CCD5	5,00/ Per Corner

Accuracy Standards

- Flatness: 0.4 or less per 1000mm
- Dimensional Tolerance of T

5, 6	8, 10, 12	15	20	25	30
±0.04	±0.05	±0.08	±0.10	±0.12	±0.15

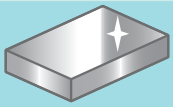
- A, B Dimension Tolerance

100~250	251~1000	1001~
±0.25	±0.4	±1.0

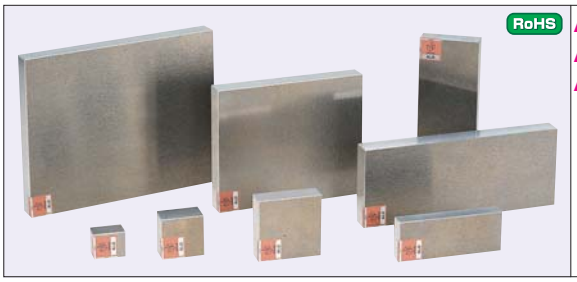
- Perpendicularity of Reference Plane: 0.015 or less per 100mm
- Circumference Chamfering: C0.3 or less

Duralumin A dimension Configurable Plates

-EN AW-2017- (Aℓ–Cu Base Aluminum Alloy)

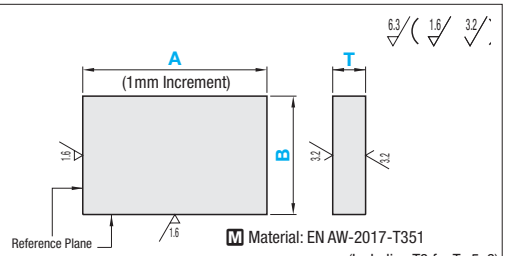


4-Surface Milling (Rolled)



RoHS

ALDS
ALD
ALDT



Material: EN AW-2017-T351
(Including T3 for T=5, 6)

Order Example

Part Number	-	A	-	B	-	T
ALD	-	300	-	100	-	15

Days to Ship

6 Days
10 Days

P.88

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

(Ex.) When –300–100–15

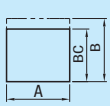
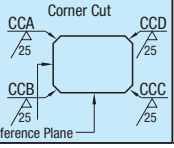
A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
300	x	13.6 Cent	=	40,80 €

Part Number	A 1mm Increment	B 1mm Increment	€ Unit Price T5 · 6	T8, 10	T12 · 15	T20	T25	T30
ALDS (Configurable Size)	25~50	25~50						
	51~75	25~50						
		51~75						
	76~100	25~50						
		51~75						
		76~100						

Part Number	A 1mm Increment	B \ T	5	6	8	10	12	15	20	25	30	35	40
ALD (Configurable Size)	100~ 200	100											
	201~ 300												
	301~ 500												
	101~ 250	125											
	251~ 500												
	126~ 300	150											
	301~ 500												
	151~ 300	160											
	301~ 500												
	161~ 500	200											
	201~ 500	250											
	251~ 500	300											
ALDT (Configurable Size)	501~ 800	125											
	501~ 800	150											
	501~ 800	160											
	501~ 800	200											
	501~ 800	250											
	501~ 800	300											
	350~1200	350											
	400~1200	400											
	450~1200	450											
	500~1200	500											
	600~1200	600											
	800~1200	800											

Alterations

Part Number	-	A	-	B	-	T	-(BC · CCA · etc.)
ALD	-	315	-	200	-	20	- BC176

Alterations	Code	Spec.	Price Adder
Width (B Dimension) 	BC	Cuts B dimension. BC=1mm Increment Ordering Code BC195 26≤BC≤B-1 126≤BC≤B-1 Applicable to and only.	8,00
Corner Cut 	CCA CCB CCC CCD	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5 ⋯›CCA5-CCD5	5,00/ Per Corner

Accuracy Standards

- Flatness: 2 or less per 1000mm
- Dimensional Tolerance of T

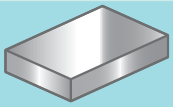
5	6	8	10	12, 15	20	25	30, 35	40
±0.35	±0.45	±0.5	±0.6	±0.7	±0.8	±0.9	±1.0	±1.1

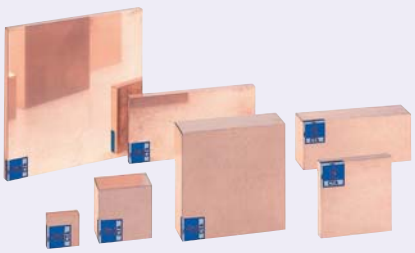
- A, B Dimension Tolerance

25~100	101~250	251~1000	1001~
±0.2	±0.25	±0.4	±1.0

- Perpendicularity of Reference Plane: 0.015 or less per 100mm
- Circumference Chamfering: C0.3 or less

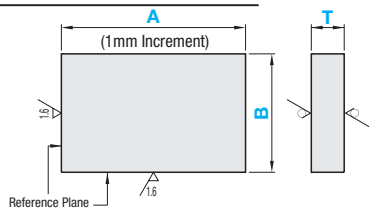
Tough Pitch Copper Plates / Oxygen Free Copper Plates


4-Surface Milling (Rolled)



RoHS

Part Number	Material
CTA	Tough Pitch Copper JIS H3100 CW004A/Cu-ETP
CJA	Oxygen Free Copper JIS H3100 CW008A/Cu-OFP



A≥B

* Upper and lower surfaces are not finished and may have scratches.

Order Example

Part Number	-	A	-	B	-	T
CTA	-	200	-	150	-	10

Price

(Ex.) When CTA–200–150–10

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
200	x	49 Cent	=	98,00 €

Days to Ship 8 Days

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Tough Pitch Copper

Part Number	A 1mm Increment	T / B	5	6	8	10	12	15	18	20	25	30
CTA (Configurable Size)	25~ 50	25	■	■	■	■	■	■	■	■	■	■
	51~ 75											
	76~100		■	■	■	■	■	■	■	■	■	■
	101~200											
	201~250		■	■	■	■	■	■	■	■	■	■
	40~ 50	40										
	51~ 75		■	■	■	■	■	■	■	■	■	■
	76~100											
	101~200		■	■	■	■	■	■	■	■	■	■
	201~300											
	60~ 75	60	■	■	■	■	■	■	■	■	■	■
	76~100											
	101~200		■	■	■	■	■	■	■	■	■	■
	201~300											
	80~100	80	■	■	■	■	■	■	■	■	■	■
	101~200											
	201~300		■	■	■	■	■	■	■	■	■	■
	100~200	100										
	201~300		■	■	■	■	■	■	■	■	■	■
	125~200	125										
	201~300		■	■	■	■	■	■	■	■	■	■
	150~200	150										
	201~300		■	■	■	■	■	■	■	■	■	■
	200~300	200										
	250~300	250	■	■	■	■	■	■	■	■	■	■

Oxygen Free Copper

Part Number	A 1mm Increment	T / B	5	6	8	10	12	15	18	20	25	30
CJA (Configurable Size)	25~ 50	25	■	■	■	■	■	■	■	■	■	■
	51~ 75											
	76~ 100		■	■	■	■	■	■	■	■	■	■
	101~ 200											
	201~ 250		■	■	■	■	■	■	■	■	■	■
	40~ 50	40										
	51~ 75		■	■	■	■	■	■	■	■	■	■
	76~ 100											
	101~ 200		■	■	■	■	■	■	■	■	■	■
	201~ 300											
	60~ 75	60	■	■	■	■	■	■	■	■	■	■
	76~ 100											
	101~ 200		■	■	■	■	■	■	■	■	■	■
	201~ 300											
	80~ 100	80	■	■	■	■	■	■	■	■	■	■
	101~ 200											
	201~ 300		■	■	■	■	■	■	■	■	■	■
	100~ 200	100										
	201~ 300		■	■	■	■	■	■	■	■	■	■
	125~ 200	125										
	201~ 300		■	■	■	■	■	■	■	■	■	■
	150~ 200	150										
	201~ 300		■	■	■	■	■	■	■	■	■	■
	200~ 300	200										
	250~ 300	250	■	■	■	■	■	■	■	■	■	■

Accuracy Standards

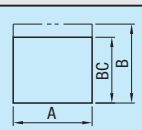
(Max. Value)

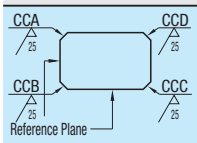
Flatness (per 1000mm)	2mm
Perpendicularity of Reference Plane	0.015 per 100mm
Circumference Chamfering	C0.3 or less

Dimension Tolerance	A · B	100mm or less			101mm or more		
		±0.2			±0.3		
	T	T5	T6, 8	T10, 12	T15~20	T25	T30
		±0.18	±0.23	±0.28	±0.35	±0.55	±0.66

Alterations

Part Number	-	A	-	B	-	T	-	(BC · CCA · etc.)
CTA	-	300	-	200	-	12	-	BC195

Alterations	Code	Spec.	Price Adder
	BC	Width (B Dimension) Cuts B dimension. BC=1mm Increment Ordering Code BC195 15≤BC≤249	8,00

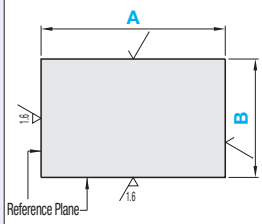
Alterations	Code	Spec.	Price Adder
	CCA CCB CCC CCD	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5 ···› CCA5-CCD5	5,00/ Per Corner

Precision Aluminum Cut Plates

-EN AW-5052- (Aℓ–Mg Base Aluminum Alloy)

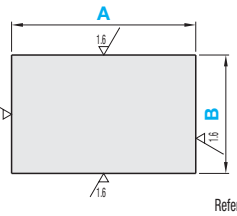


PNE (Economy)



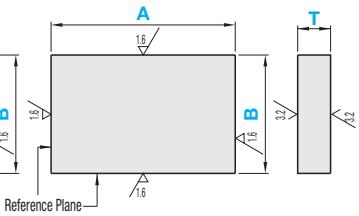
- 2-Side Sawing, 2-Side Precision Cutting
- Perpendicularity of reference plane is guaranteed.

PNX (Regular)



- 4-Side Precision Cutting
- Perpendicularity of reference plane is NOT guaranteed.
- A, B Dimension Tolerance Accuracy

PNT (Precision)



- 4-Side Precision Cutting
- Perpendicularity of reference plane is guaranteed.
- A, B Dimension Tolerance Accuracy

M Material: EN AW-5052-H112 (Including H34 for T5~6)

Part Number		A	B	T
		A≥B		Selection
Economy	PNE	500~2500 (1mm Increment)	20~1500 (1mm Increment)	3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50
Regular	PNX	500~2500 (0.1mm Increment)	20~1500 (0.1mm Increment)	
Precision	PNT			

■Dimension Tolerance

■A, B Dimension Tolerance

Part Number	A, B Dimension	Selectable Type
	20~2500	0~+1.0
PNX	20~ 199.9	±0.1
	200~ 399.9	±0.15
	400~ 799.9	±0.2
	800~2500	±0.25
PNT	20~ 199.9	±0.05
	200~ 399.9	±0.06
	400~ 799.9	±0.08
	800~1249.9	±0.1
	1250~2500	±0.12

■Plate Thickness Tolerance

T	3	4, 5	6	8	10	12, 15	20	25	30, 35	40	45, 50
Tolerance	±0.2	±0.35	±0.45	±0.5	±0.6	±0.7	±0.8	±0.9	±1.0	±1.1	±1.3

■Accuracy Standards

(Max. Value)

Item	PNX	PNE / PNT
Flatness (per 1,000mm)	3mm	
Perpendicularity of Reference Plane (per 100mm)	Reference Value (0.02)	0.015

Burr is removed.

Order Example

Part Number	-	A	-	B	-	T
PNX	-	510	-	30.5	-	10

Days to Ship

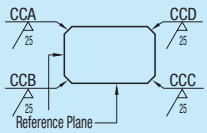
7 Days

Express A 12,00 EUR/ piece P.88

A Express Charge of 32,40 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	T	- (CCA, etc.)
PNX	-	510.2	-	30.1	-	10	- CCA20 - CCC30

Alterations	Corner Cut
	Applicable Size A, B 1000mm or less 
Code	CCA · CCB · CCC · CCD
Spec.	Cuts any corners. 1≤ Corner Cut ≤501mm Increment C≤ A/2, B/2 Ordering Code (Example)When the corners of A and D are cut by C5 ···›CCA5-CCD5
Price Adder	Refer to spec.

1mm Increment	Price Adder
1~10	1,50
11~20	2,00
21~30	3,00
31~40	3,50
41~50	4,00
51~60	4,50
61~70	5,00
71~80	6,00
81~90	7,00
91~100	8,00

Price

(When PNX)

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1560.3	x	18 Cent	=	280,80 €

(When PNE and PNT)

A Dimension	x	Area € Unit Price	x	Finishing Coefficient	=	€ Price (Round down to ten Cent.)
1560.3	x	18 Cent	x	0.86	=	241,50 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

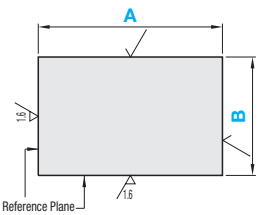
Part Number	PNE (Finishing Coefficient)	PNT (Finishing Coefficient)	A	B \ T	3	4	5	6	8	10	12	15	20	25	30	35	40	45	50
PNE (Price in Table x Coefficient) PNX (Price in Table) PNT (Price in Table x Coefficient)	0.83	1.17	500 ~700	20~30															
			700.1~1000																
			1000.1~1450																
			1450.1~1600																
			1600.1~2000																
			2000.1~2500																
	0.84	1.16	500 ~700	30.1~50															
			700.1~1000																
			1000.1~1450																
			1450.1~1600																
			1600.1~2000																
			2000.1~2500																
			500 ~950	50.1~100															
			950.1~1250																
			1250.1~1500																
			1500.1~2150																
			2150.1~2500																
	0.85	1.15	500 ~900	100.1~150															
			900.1~1400																
			1400.1~2150																
			2150.1~2500																
			500 ~850	150.1~200															
			850.1~1350																
			1350.1~2500																
	0.86	1.14	500 ~800	200.1~250															
			800.1~1300																
			1300.1~2500																
			500 ~750	250.1~300															
			750.1~1300																
			1300.1~2500																
	0.87	1.13	500 ~700	300.1~350															
			700.1~1250																
			1250.1~2500																
			500 ~650	350.1~400															
			650.1~1200																
			1200.1~2500																
	0.88	1.12	500 ~600	400.1~450															
			600.1~1100																
			1100.1~2500																
			500 ~550	450.1~500															
			550.1~1100																
			1100.1~2500																
	0.89	1.1	500.1~1050	500.1~550															
			1050.1~1550																
			1550.1~2500																
			550.1~1000	550.1~600															
			1000.1~1550																
			1550.1~2500																
	0.9	1.09	600.1~900	600.1~650															
			900.1~1700																
			1700.1~2500																
			650.1~900	650.1~700															
			900.1~1100																
			1100.1~2150																
			2150.1~2500																
	0.91	1.08	700.1~850	700.1~750															
			850.1~1100																
			1100.1~1700																
			1700.1~2500																
			750.1~1050	750.1~800															
			1050.1~1700																
			1700.1~2500																
	0.92	1.07	800.1~1200	800.1~850															
			1200.1~1950																
			1950.1~2500																
			850.1~1650	850.1~900															
			1650.1~2500																
	0.93	1.06	900.1~1650	900.1~950															
			1650.1~2500																
			950.1~1650	950.1~1000															
			1650.1~2500																
	0.94	1.05	1000.1~1650	1000.1~1050															
			1650.1~2500																
			1050.1~1650	1050.1~1100															
			1650.1~2500																
	0.95	1.04	1100.1~1650	1100.1~1150															
			1650.1~2500																
			1150.1~1650	1150.1~1200															
			1650.1~2500																
	0.96	1.03	1200.1~1750	1200.1~1250															
			1750.1~2500																
			1250.1~1800	1250.1~1300															
			1800.1~2500																
	0.97	1.02	1300.1~2000	1300.1~1350															
			2000.1~2500																
			1350.1~2000	1350.1~1400															
			2000.1~2500																
	0.98	1.01	1400.1~2000	1400.1~1450															
			2000.1~2500																
			1450.1~2000	1450.1~1500															
			2000.1~2500																

High Precision Aluminum Cut Plates

-EN AW-5052/AlMg2,5- (Aℓ–Mg Base Aluminum Alloy)

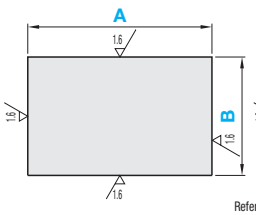


PHE (Economy)



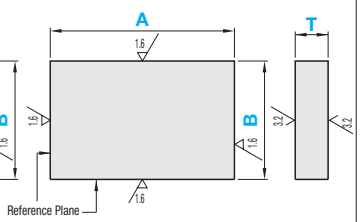
- 2-Side Sawing, 2-Side Precision Cutting
- Perpendicularity of reference plane is guaranteed.

PHX (Regular)



- 4-Side Precision Cutting
- Perpendicularity of reference plane is NOT guaranteed.
- A, B Dimension Tolerance Accuracy

PHT (Precision)



- 4-Side Precision Cutting
- Perpendicularity of reference plane is guaranteed.
- A, B Dimension Tolerance Accuracy

Material: EN AW-5052/AlMg2,5–H112

Part Number		A	B	T
		A≥B		Selection
Economy	PHE	500~2500 (1mm Increment)	20~1500 (1mm Increment)	4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50
Regular	PHX	500~2500 (0.1mm Increment)	20~1500 (0.1mm Increment)	
Precision	PHT			

Dimension Tolerance

A, B Dimension

Part Number	A, B Dimension	Selectable Type
	20~2500	0~+1.0
PHX	20~ 199.9	±0.1
	200~ 399.9	±0.15
	400~ 799.9	±0.2
	800~2500	±0.25
PHT	20~ 199.9	±0.05
	200~ 399.9	±0.06
	400~ 799.9	±0.08
	800~1249.9	±0.1
	1250~2500	±0.12

Plate Thickness Tolerance

T	4, 5, 6	8, 10, 12	15	20	25, 30, 35, 40, 45, 50
Tolerance	±0.04	±0.05	±0.08	±0.10	±0.15

Accuracy Standards

(Max. Value)

Item		
Flatness (per 1,000mm)	0.4mm	
Perpendicularity of Reference Plane (per 100mm)	Reference Value (0.02)	0.015

Burr is removed.

Order Example

Part Number	-	A	-	B	-	T
	-	630.5	-	121	-	10

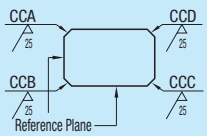
Days to Ship: 7 Days

Express A: 12,00 EUR/ piece P.88

A Express Charge of 32,40 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	T	-	(CCA, etc.)
	-	630.5	-	250.5	-	10	-	CCA30 - CCC50

Alterations	Corner Cut
	Applicable Size: A, B 1000mm or less 
Code	CCA / CCB / CCC / CCD
Spec.	Cuts any corners. 1≤Corner Cut≤10 1mm Increment C≤A/2, B/2 Ordering Code (Example)When the corners of A and D are cut by C5 ···›CCA5-CCD5
Price Adder	Refer to spec.

1mm Increment	Price Adder
1~ 10	1,50
11~ 20	2,00
21~ 30	3,00
31~ 40	3,50
41~ 50	4,00
51~ 60	4,50
61~ 70	5,00
71~ 80	6,00
81~ 90	7,00
91~100	8,00

Price

(When PHX) (Ex.) PHX–1560.3–300–10

A Dimension	x	Area € Unit Price	=	Price € (Round down to ten Cent.)
156,03	x	3.0 Cent	=	468,10 €

(When PHE and PHT) (Ex.) PHE–1560.3–300–10

A Dimension	x	Area € Unit Price	x	Finishing Coefficient	=	Price € (Round down to ten Cent.)
156,03	x	3.0 Cent	x	0.86	=	402,50 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

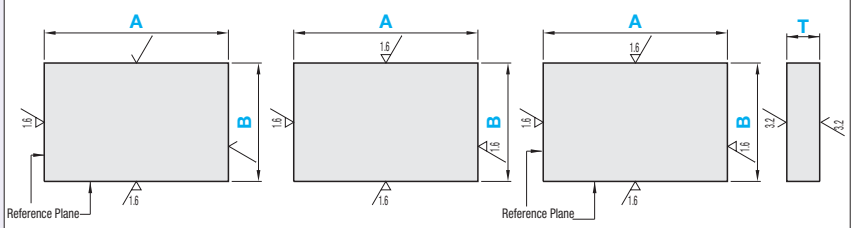
Part Number			A	B	4	5	6	8	10	12	15	20	25	30	35	40	45	50
	0.83	1.17	500 ~ 700 700.1~1000 1000.1~1450 1450.1~1600 1600.1~2000 2000.1~2500	20~30														
	0.84	1.16	500 ~ 700 700.1~1000 1000.1~1450 1450.1~1600 1600.1~2000 2000.1~2500	30.1~50														
	0.84	1.16	500 ~ 950 950.1~1250 1250.1~1500 1500.1~2150 2150.1~2500	50.1~100														
	0.85	1.15	500 ~ 900 900.1~1400 1400.1~2150 2150.1~2500	100.1~150														
	0.85	1.15	500 ~ 850 850.1~1350 1350.1~2500	150.1~200														
	0.86	1.14	500 ~ 800 800.1~1300 1300.1~2500	200.1~250														
	0.86	1.14	500 ~ 750 750.1~1300 1300.1~2500	250.1~300														
	0.87	1.13	500 ~ 700 700.1~1250 1250.1~2500	300.1~350														
	0.87	1.13	500 ~ 650 650.1~1200 1200.1~2500	350.1~400														
PHE (Price in Table x Coefficient)	0.88	1.12	500 ~ 600 600.1~1100 1100.1~2500	400.1~450														
	0.88	1.12	500 ~ 550 550.1~1100 1100.1~2500	450.1~500														
PHX (Price in Table)	0.89	1.1	500.1~1050 1050.1~1550 1550.1~2500	500.1~550														
	0.89	1.1	550.1~1000 1000.1~1550 1550.1~2500	550.1~600														
PHT (Price in Table x Coefficient)	0.9	1.09	600.1~ 900 900.1~1700 1700.1~2500	600.1~650														
	0.9	1.09	650.1~ 900 900.1~1100 1100.1~2150 2150.1~2500	650.1~700														
	0.91	1.08	700.1~ 850 850.1~1100 1100.1~1700 1700.1~2500	700.1~750														
	0.91	1.08	750.1~1050 1050.1~1700 1700.1~2500	750.1~800														
	0.92	1.07	800.1~1200 1200.1~1950 1950.1~2500	800.1~850														
	0.92	1.07	850.1~1650 1650.1~2500	850.1~900														
	0.93	1.06	900.1~1650 1650.1~2500	900.1~950														
	0.93	1.06	950.1~1650 1650.1~2500	950.1~1000														
	0.94	1.05	1000.1~1650 1650.1~2500	1000.1~1050														
	0.94	1.05	1050.1~1650 1650.1~2500	1050.1~1100														
	0.95	1.04	1100.1~1650 1650.1~2500	1100.1~1150														
	0.95	1.04	1150.1~1650 1650.1~2500	1150.1~1200														
	0.96	1.03	1200.1~1750 1750.1~2500	1200.1~1250														
	0.96	1.03	1250.1~1800 1800.1~2500	1250.1~1300														
	0.97	1.02	1300.1~2000 2000.1~2500	1300.1~1350														
	0.97	1.02	1350.1~2000 2000.1~2500	1350.1~1400														
	0.98	1.01	1400.1~2000 2000.1~2500	1400.1~1450														
	0.98	1.01	1450.1~2000 2000.1~2500	1450.1~1500														

Precision Duralumin Cut Plates

-EN AW-2017- (Aℓ–Cu Base Aluminum Alloy)



PDE(Economy) **PDX**(Regular) **PDT**(Precision)



- 2-Side Sawing, 2-Side Precision Cutting
- Perpendicularity of reference plane is guaranteed.

- 4-Side Precision Cutting
- Perpendicularity of reference plane is NOT guaranteed.
- A, B Dimension Tolerance Accuracy

- 4-Side Precision Cutting
- Perpendicularity of reference plane is guaranteed.
- A, B Dimension Tolerance Accuracy

Material: EN AW-2017-T351 (Including T3 for T5, 6)

Part Number		A	B	T Selection
		A≥B		
Economy	PDE	500~2000 (1mm Increment)	20~1000 (1mm Increment)	3 · 4 · 5 · 6 · 8 · 10 · 12 · 15 · 20 · 25 · 30 · 35 · 40 · 45 · 50
Regular	PDX	500~2000 (0.1mm Increment)	20~1000 (0.1mm Increment)	
Precision	PDT			

A· B Dimension Tolerance

Part Number	A · B Dimension	Selectable Type
PDE	20~2000	0~+1.0
PDX	20~ 199.9	±0.1
	200~ 399.9	±0.15
	400~ 799.9	±0.2
	800~2000	±0.25
PDT	20~ 199.9	±0.05
	200~ 399.9	±0.06
	400~ 799.9	±0.08
	800~1249.9	±0.1
	1250~2000	±0.12

Plate Thickness Tolerance

T	3	4 · 5	6	8	10	12·15	20	25	30·35	40	45·50
Tolerance	±0.2	±0.35	±0.45	±0.5	±0.6	±0.7	±0.8	±0.9	±1.0	±1.1	±1.3

Accuracy Standards

(Max. Value)

Item		
Flatness (per 1,000mm)	4mm	
Perpendicularity of Reference Plane (per 100mm)	Reference Value (0.02)	0.015

Burr is removed.

Order Example

Part Number	-	A	-	B	-	T
PDX	-	520.5	-	30.3	-	10

Days to Ship

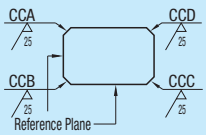
7 Days

Express A 12,00 EUR/ piece P.88

A Express Charge of 32,40 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	T	-	(CCA, etc.)
PDT	-	1000.5	-	50.2	-	10	-	CCA10-CCC20

Alterations	Corner Cut
	Applicable Size A, B 1000mm or less 
Code	CCA · CCB · CCC · CCD
Spec.	Cuts any corners. 1≤ Corner Cut ≤501mm Increment C≤$\frac{A}{2}$, $\frac{B}{2}$ Ordering Code (Example) When the corners of A and D are cut by C5 ···CCA5-CCD5
Price Adder	Refer to spec.

1mm Increment	Price Adder
1~ 10	1,50
11~ 20	2,00
21~ 30	3,00
31~ 40	3,50
41~ 50	4,00
51~ 60	4,50
61~ 70	5,00
71~ 80	6,00
81~ 90	7,00
91~100	8,00

Price

(When PDX) (Ex.) –1560.3–300–10

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1560.3	x	29 Cent	=	452,40 €

(When PDE, PDT) (Ex.) –1560.3–300–10

A Dimension	x	Area € Unit Price	x	Finishing Coefficient	=	€ Price (Round down to ten Cent.)
1560.3	x	29 Cent	x	0.8	=	389,10 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Part Number	PDE (Finishing Coefficient)	PDT (Finishing Coefficient)	A	B	3	4	5	6	8	10	12	15	20	25	30	35	40	45	50
	0.83	1.17	500 ~ 700	20 ~ 30															
			700.1~1000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1000.1~1250																
			1250.1~1600		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1600.1~2000																
	0.84	1.16	500 ~ 700	30.1~ 50															
			700.1~1000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1000.1~1250																
			1250.1~1600		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1600.1~2000																
	0.84	1.16	500 ~ 900	50.1~ 100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			900.1~1250																
			1250.1~1600		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1600.1~2000																
	0.85	1.15	500 ~ 900	100.1~ 150	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			900.1~1250																
			1250.1~1600		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1600.1~2000																
	0.85	1.15	500 ~ 850	150.1~ 200	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			850.1~1250																
			1250.1~2000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.86	1.14	500 ~ 800	200.1~ 250															
			800.1~1250		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1250.1~2000																
	0.86	1.14	500 ~ 800	250.1~ 300	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			800.1~1250																
			1250.1~2000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.87	1.13	500 ~ 800	300.1~ 350															
			800.1~1250		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1250.1~2000																
	0.87	1.13	500 ~1000	350.1~ 400	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1000.1~1500																
			1500.1~2000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.88	1.12	500 ~1000	400.1~ 450															
			1000.1~1500		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1500.1~2000																
	0.88	1.12	500 ~1000	450.1~ 500	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1000.1~1500																
			1500.1~2000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.89	1.1	500.1~1050	500.1~ 550															
			1050.1~1550		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1550.1~2000																
	0.89	1.1	550.1~1000	550.1~ 600	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1000.1~1550																
			1550.1~2000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.9	1.09	600.1~ 900	600.1~ 650															
			900.1~1700		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1700.1~2000																
	0.9	1.09	650.1~ 900	650.1~ 700	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			900.1~1100																
			1100.1~1700		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1700.1~2000																
	0.91	1.08	700.1~ 850	700.1~ 750	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			850.1~1100																
			1100.1~1700		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1700.1~2000																
	0.91	1.08	750.1~1050	750.1~ 800	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1050.1~1700																
			1700.1~2000		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	0.92	1.07	800.1~1200	800.1~ 850															
			1200.1~1700		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1700.1~2000																
	0.92	1.07	850.1~1650	850.1~ 900	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1650.1~2000																
	0.93	1.06	900.1~1650	900.1~ 950	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1650.1~2000																
	0.93	1.06	950.1~1650	950.1~1000	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
			1650.1~2000																

PDE
(Price in Table x Coefficient)

PDX
(Price in Table)

PDT
(Price in Table x Coefficient)

Add. Spec.

Premium Plates only available on Material Shop 24 website.

■Material Shop 24 Metal Plate Website Outline

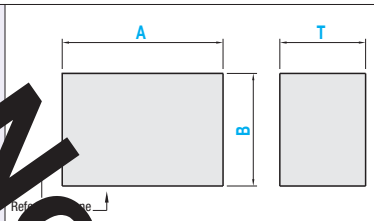
[Material Shop 24 Metal Plate Website Contents]

- Selectable from all products including products not shown on the catalog made of 51 materials such as Finishing plates, Cut plates or Flat bars.
- Select specifications, part number, delivery date and the price are automatically displayed. Please proceed to ordering with the information.
- Conformed products to the specifications are displayed in price ascending order. Easy to select the most economical product.

■Material Shop 24 Exclusive Metal Plate Website Product "Premium Plates" Outline

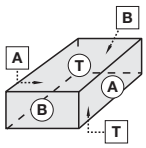
Premium Plates -- Configurable plates for finished surface and dimensional tolerance.





Finish Method		Finished Surface	Finish Surface Roughness		
			Steel, Special Steel	Stainless Steel	Aluminum
F	Milling	Side Faces	1.6a		
		Upper-Lower Surface	6.3a	6.3a	6.3a
RG	Rotary Grinding	Upper-Lower Surface	3.2a	3.2a	3.2a
G	Surface Grinding	Upper-Lower Surface	1.6a	3.2a	3.2a
-	Unfinished	Side Faces	Not guaranteed	Not guaranteed	6.3a
		Upper-Lower Surface			Not guaranteed

■Milled Finish Surface Free Selection (Selectable Milled finish surface)



Finish Code	Finished Surface	Accuracy Guaranteed (or without machining accuracy warranty)				
		Surface Perpendicularity	Flatness * Except Aluminum	Dimension		
				Length	Width	Plate Thickness
A	Length**A** One-surface milling on length A	X	X	X	X	X
T	Upper Surface **T**	X	X	X	X	X
AA	Length **A**+ Length **A**	X	X	X	0	X
AB	Length **A**+ Width **B**	X	X	X	X	X
ABTT	Length **A**+ Width **B**+ Upper-Lower Surface **TT**	0	0	X	X	0
AATT	Length **AA**+ Upper-Lower Surface **TT**	X	0	X	0	0

■Main Finish

Finish Code	Finish	
2F	Upper-Lower Surface Milling	(4-Side not finished)
2RG	2-Surface Rotary Grinding	(4-Side not finished)
4F	4-Side Milling	(Upper-lower surface not finished)
6F	6-Surface Milling	
4F2RG	2-Surface Rotary Grinding	(4-Side Milling)
4F2G	2-Surface Grinding	(4-Side Milling)
6G	6-Surface Grinding	

Order Example

Part Number												
Material Code	-	Finish	-	Control Code	-	A Tolerance	B Tolerance	T Tolerance	-	A	-	B	-	T	-	Option
	-	6F	-	xxx	-	L		S	-	131.2	-	121	-	11.3	-	Circumference Chamfering Corner Cut

(Specification of Order Example)

Part Number						Size A≥B		
Material Code	Finish Code	Control Code Code	Tolerance Selection			A	B	T
			A Tolerance	B Tolerance	T Tolerance	0.1mm Increment		
	6F	XX Automatically created.	L (Unfinished) N (Standard Tolerance) S (Precision Tolerance) T (Super Precision Tolerance)			20~2500	10~1500	4~50

■Finish Method

Material	Material Code	1-Surface Finish		2-Surface Finish				4-Surface Finish		6-Surface Finish			
		Milling		Milling			Rotary	Milling		Milling	Rotary	Surface	
		Upper Surface Lower Surface	Side Faces	Upper-Lower Surface	Side Faces	Upper Surface Side Faces	Upper-Lower Surface	Side Faces	Side Surfaces Lower Surface	6-Surface	Upper-Lower Surface RG Side F	Upper-Lower Surface G Side F	6-Surface
		Finish Code											
		T	A B	2F	AA AB BB	AT BT	2RG	4F	AA AB BB	6F	4F2RG	4F2G	6G
1.0038/S235JR		○	○	○	○	○	○	○	○	○	○	○	○
1.1206/C50E		○	○	○	○	○	○	○	○	○	○	○	○
		○	○	○	○	○	-	○	○	○	○	○	○
1.0038 Annealed Material		○	○	○	○	○	○	○	○	○	○	○	○
1.7220/34CrMo4	1.7220	-	-	-	-	-	-	-	-	○	○	-	-
		○	○	○	○	○	-	○	○	○	○	○	○
1.2510/100MnCrW4		○	○	○	○	○	-	○	○	○	○	○	○
1.2379/X155CrVMo12-1		○	○	○	○	○	-	○	○	○	○	○	○
1.2344/X40CrMoV5-1	1.2344	-	-	-	-	-	-	-	-	○	○	-	-
		○	○	○	○	○	-	○	○	○	○	○	○
1.3343/S6-5-2	1.3343	-	-	-	-	-	-	-	-	○	-	○	○
JIS GO40F*	JIS GO40F	-	-	-	-	-	-	-	-	○	○	-	-
PX5 ~1.2316/X36CrMo17	PX5	-	-	-	-	-	-	-	-	○	-	○	○
G-STAR ~1.2085	-	-	-	-	-	-	-	-	-	○	-	-	-
NAK55®(Daido Steel)	NAK55®	-	-	-	-	-	-	-	-	○	-	○	○
NAK80®(Daido Steel)*	NAK80®	-	-	-	-	-	-	-	-	○	-	○	○
DH2F®(Daido Steel)*	DH2F®	-	-	-	-	-	-	-	-	○	-	○	○
S-STAR®(Daido Steel)	S-STAR®	-	-	-	-	-	-	-	-	○	-	○	○
HPM1®(Hitachi Metals)*	HPM1®	-	-	-	-	-	-	-	-	○	-	○	○
HPM38®(Hitachi Metals)*	HPM38®	-	-	-	-	-	-	-	-	○	-	○	○
STAVAX®(UDDELHOLM)*	STAVAX®	-	-	-	-	-	-	-	-	○	-	○	○
1.4305/X10CrNiS18-9	1.4305	-	○	-	○	-	-	○	(○)	○	○	○	-
1.4301/X5CrNi18-10	1.4301	-	○	-	○	-	-	○	(○)	○	○	-	-
Annealed 1.4305	1.4305	-	○	-	○	-	-	○	(○)	○	-	○	-
1.4301 Annealed Material	1.4301	-	○	-	○	-	-	○	(○)	○	○	-	-
1.4401/X5CrNiMo17-12-2	1.4401	-	-	-	-	-	-	○	-	○	-	○	-
1.4404/X2CrNiMo17-12-2	1.4404	-	-	-	-	-	-	-	-	○	-	-	-
1.4016/X6(8)Cr17	1.4016	-	-	-	-	-	-	○	-	○	○	○	-
1.4125/X105CrMo17	1.4125	-	-	-	-	-	-	○	-	○	○	○	-
EN AW-5052/AlMg2,5	EN AW-5052	-	○	-	○	-	-	○	(○)	○	-	○	-
EN AW-5052 High Precision	EN AW-5052	-	○	-	○	-	-	○	(○)	○	-	-	-
EN AW-2017/AlCu4MgSi	EN AW-2017	-	○	-	○	-	-	○	(○)	○	-	○	-
EN AW-6061-P	EN AW-6061-P	-	-	-	-	-	-	○	-	○	-	-	-
EN AW-7075/AlZn5,5MgCu	EN AW-7075	-	○	-	○	-	-	○	(○)	○	-	○	-
ANP79	ANP79	-	-	-	-	-	-	○	-	○	-	○	-
Tough Pitch Copper	-	-	-	-	-	-	-	○	-	○	-	-	-
Oxygen Free Copper	-	-	-	-	-	-	-	○	-	○	-	-	-
Chromium Copper	-	-	-	-	-	-	-	○	-	○	-	-	-
Brass	-	-	-	-	-	-	-	○	-	○	-	-	-
Titanium Class 2	TIF	-	-	-	-	-	-	-	-	○	-	-	-

Not Available

Size Range

Classification			Structural Steel		JIS STKM		Specialty Steel					Pre-Hardening Steel				
M Material				1.0038 Annealed Material					1.3343	JIS GO40F 1.2344	1.7220	PX5~ 1.2316	G-STAR~ 1.2085	NAK55®	NAK80®	DH2F® S-STAR® HPM1® HPM38® STAVAX (PH)®
Surface Finish	Finish Code	Size (mm)														
Upper-Lower Surface Milling (4-Side not finished) Milled Finish Surface Selectable	2F A / AA / AT / AATT B / BB / BT / BBTT T / AB / ABTT	Length (A)	20~2500	20~2500	20~2500	20~500	20~500	20~500	-	-	-	-	-	-	-	-
		Width (B)	10~1500	10~1500	10~1500	20~300	20~300	20~300	-	-	-	-	-	-	-	-
		Thickness (T)	3~160	3~160	3~120	8~30	5~30	5~30	-	-	-	-	-	-	-	-
2-Surface Rotary Grinding (4-Side not finished)	2RG	Length (A)	[illegible]	20~1400	20~1400	-	-	-	-	-	-	-	-	-	-	-
		Width (B)	[illegible]	10~1000	20~1000	-	-	-	-	-	-	-	-	-	-	-
		Thickness (T)	[illegible]	5~50	5~50	-	-	-	-	-	-	-	-	-	-	-
6-Surface Milling	6F	Length (A)	[illegible]	[illegible]	10~2500	15~1000	10~1000	15~1000	20~300	20~300	20~300	10~500	50~500	20~500	20~500	20~300
		Width (B)	[illegible]	[illegible]	10~1500	10~500	10~300	10~300	20~200	20~200	20~200	10~300	20~200	20~300	20~300	20~200
		Thickness (T)	[illegible]	[illegible]	[illegible]	8~80	5~60	5~60	5~60	5~60	5~60	3~100	5~40	5~100	5~100	5~60
2-Surface Rotary Grinding (4-Side Milling)	4F2RG	Length (A)	15~1800	[illegible]	[illegible]	15~1000	10~1000	15~1000	-	20~300	20~300	-	-	-	-	-
		Width (B)	10~1200	[illegible]	10~1200	10~500	10~300	10~300	-	20~200	20~200	-	-	-	-	-
		Thickness (T)	4~160	4~160	[illegible]	[illegible]	5~60	5~60	-	5~60	5~60	-	-	-	-	-
2-Surface Grinding (4-Side Milling)	4F2G	Length (A)	10~1000	15~800	[illegible]	[illegible]	15~1000	15~1000	20~300	-	-	10~500	-	20~500	20~500	20~300
		Width (B)	10~500	10~500	[illegible]	[illegible]	10~300	10~300	20~200	-	-	10~300	-	20~300	20~300	20~200
		Thickness (T)	4~160	4~160	[illegible]	[illegible]	5~60	5~60	5~60	-	-	3~100	-	5~100	5~100	5~60
6-Surface Grinding	6G	Length (A)	15~400	15~400	15~400	[illegible]	[illegible]	20~100	20~300	-	-	20~500	-	20~500	20~500	20~300
		Width (B)	10~400	10~400	10~400	[illegible]	[illegible]	20~100	20~200	-	-	20~300	-	20~300	20~300	20~200
		Thickness (T)	5~160	5~160	5~160	[illegible]	[illegible]	5~30	5~60	-	-	5~100	-	5~100	5~100	5~60

Classification			Stainless Steel									Aluminum Alloy						Copper	Brass	Titanium
			Austenite						Ferrite	Martensite										
M Material								1.4404							EN AW -6061 P			Tough Pitch Copper Oxygen Free Copper Chromium Copper	Brass Board C2801	Titanium Class 2 TP340H
Surface Finish	Finish Code	Size (mm)																		
4-Side Milling (2-Surface Rolling) Milled Finish Surface Selectable	4F A / AA / AATT B / BB	Length (A)	15~1200	10~1200	10~1200	10~1200	15~500	-	15~500	15~500	5~3000	[illegible]	[illegible]	-	10~2500	5~2500	6~300	6~300	-
		Width (B)	8~1000	8~1000	8~1000	8~1000	10~200	-	20~200	20~200	5~1500	[illegible]	[illegible]	-	10~1250	5~1250	6~300	6~300	-
		Thickness (T)	Select 4~65	Select 6~65	Select 4~65	Select 5~65	Select 9~28	-	Select 6~25	Select 8~28	Select 1~150	Select 4~50	Select 3~100	-	Select 8~50	5~81	Select 5~30	Select 5~30	-
6-Surface Milling	6F	Length (A)	10~1200	10~1200	15~1200	10~1200	15~500	15~500	15~500	15~500	5~3000	5~3000	5~3000	[illegible]	10~1000	5~2497	16~300	16~300	5~500
		Width (B)	8~1000	8~1000	8~1000	8~1000	10~200	10~200	20~200	20~200	5~800	5~800	5~800	10~[illegible]	10~300	5~800	6~300	6~300	5~300
		Thickness (T)	3~60	3~60	3~60	3~60	8~30	8~30	5~30	5~30	2.5~150	3~50	2.5~98	5~50	6~50	2.5~100	3~30	3~30	2~36
2-Surface Rotary Grinding (4-Side Milling)	4F2RG	Length (A)	15~500	15~500	-	15~500	-	-	20~500	20~500	-	-	-	-	-	-	-	-	-
		Width (B)	10~200	10~200	-	10~200	-	-	20~200	20~200	-	-	-	-	-	-	-	-	-
		Thickness (T)	5~50	5~50	-	6.5~30	-	-	5~30	5~30	-	-	-	-	-	-	-	-	-
2-Surface Grinding (4-Side Milling)	4F2G	Length (A)	15~500	-	15~500	-	15~500	-	20~500	20~500	25~500	-	25~500	-	25~500	25~[illegible]	-	-	-
		Width (B)	10~200	-	10~200	-	10~200	-	20~200	20~200	10~300	-	10~300	-	20~300	10~300	-	-	-
		Thickness (T)	5~50	-	6.5~30	-	8~30	-	5~30	5~30	5~50	-	5~50	-	7~50	5~50		-	-

Not Available

Premium Plates only available on Material Shop 24 website.

Not Available

Selection Table of Dimension Tolerance Range

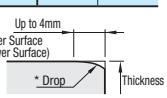
Ex.) When the tolerance range is 0.1, select from (1) (±0.05), (2) (0~+0.1), (3) (+0.1~+0.2), (4) (+0.2~+0.3) and (5) (-0.1~0).

Material	Width – Length Tolerance Range (Range)						Plate Thickness Tolerance (Range)								
	F			G			F			RG		G			
	Standard (N)	Precision Class (S)	Super Precision Class (T)	Standard (N)	Precision Class (S)	Super Precision Class (T)	Standard (N)	Precision Class (S)	Super Precision Class (T)	Standard (N)	Precision Class (S)	Standard (N)	Precision Class (S)	Super Precision Class (T)
1.0038/S235JR 1.1206/C50E 1.0038/S235JR Annealed Material	0.2	0.1	-	0.1	0.04	0.02	0.2	0.1	-	0.2	0.1	0.1	0.04	0.02
1.7220/34CrMo4	0.2	0.1	-	-	-	-	0.2	0.1	-	0.2	0.1	-		
JIS SKS93 1.2510/100MnCrW4 1.2379/X155CrVMo12-1 PX5 ~1.2316/X36CrMo17 NAK55 ®(Daido Steel) NAK80 ®(Daido Steel) DH2F ®(Daido Steel) S-STAR ®(Daido Steel) HPM1 ®(Hitachi Metals) HPM38 ®(Hitachi Metals) STAVAX (PH)®(UDDELHOLM)	0.2	0.1	-	-	0.04	0.02	0.2	0.1	-	-		0.1	0.04	0.02
G-STAR~1.2085	0.2	0.1	-	-			0.2	0.1	-	-		-		
1.2344/X40CrMoV5-1	0.2	0.1	-	0.1			0.2	0.1	-	0.2	0.1	-		
JIS GO40F	0.2	0.1	-				0.2	0.1	-	0.2	0.1	-		
1.4305/X10CrNiS18-9 1.4301/X5CrNi18-10 1.4305/X10CrNiS18-9 Annealed Material 1.4301/X5CrNi18-10 Annealed Material 1.4401/X5CrNiMo17-12-2 1.4404/X2CrNiMo17-12-2 1.4016/X6(8)Cr17 1.4125/X105CrMo17	0.2 (Length ~ 1000mm) 0.4 (Length 1000.01~ 1200mm)	0.1	0.05 (Length ~1000mm) -	-			0.1 (Width ~550mm) 0.1	0.05 (Width ~300mm) -		0.2 - 0.2 - 0.2	0.1 - 0.1 - 0.1	0.1 - 0.1 - 0.1	-	-
EN AW-5052/AlMg2,5 EN AW-5052 High Precision EN AW-2017/AlCu4MgSi EN AW-6061-P EN AW-7075/AlZn5,5MgCu	0.2 (Length ~ 1000mm) 0.4 (Length 1000.01~ 1500mm) 0.6 (Length 1500.01mm~)	0.1 (Length ~1500mm) 0.4 (Length 1500.01mm~) -	0.04 (Length ~500mm) 0.05 (Length 500.01~ 1000mm)	-			0.2	0.1	0.04 (Width ~300mm)	-		0.1 - 0.1 - 0.1	-	-

Guaranteed Accuracy by 4-Surface Finish

Finished Surface	Machining Method	Perpendicularity of Reference Plane (per 100mm)	JIS STKM, Special Steel		Stainless Steel		Aluminum	
			Dimensional Accuracy		Dimensional Accuracy		Dimensional Accuracy	
			A (Length)	B (Width)	A (Length)	B (Width)	A (Length)	B (Width)
A	Milling (F)	-	0~+5	* 0~+5	0~+2	0~+2	0~+2	0~+2
B		-	0~+5	* 0~+5	0~+2	0~+2	0~+2	0~+2
AA		-	0~+5	±0.05 (Min. Tolerance)	0~+2	±0.025 (Min. Tolerance)	0~+2	±0.02 (Min. Tolerance)
BB		-	±0.05 (Min. Tolerance)	* 0~+5	±0.025 (Min. Tolerance)	0~+2	±0.02 (Min. Tolerance)	0~+2
AB		0.015	0~+5	* 0~+5	0~+2	0~+2	0~+2	0~+2
AABB		0.015	±0.05 (Min. Tolerance)	±0.05 (Min. Tolerance)	±0.025 (Min. Tolerance)	±0.025 (Min. Tolerance)	±0.02 (Min. Tolerance)	±0.02 (Min. Tolerance)
AABB	Surface (G)	0.01	±0.01 (Min. Tolerance)	±0.01 (Min. Tolerance)	-	-	-	-

- For 1.1206/C50E with the length of 500mm or less and the width of 300mm or less, width tolerance of A, B, BB, AB, 2F and 2RG is +3~+10mm.
- For A, B, AA, BB and AB of carbon steel and special steel without 2-surface finish, shear drops may occur up to 4mm on unfinished sides.
- Finished surface A and B might be AA and BB respectively depending on the size.



Guaranteed Accuracy by Upper-Lower Surface Finish (JIS STKM, Special Steel, Stainless Steel)

Item		2-Surface Finish Method		
		Milling	Rotary Grinding	Surface Grinding
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T Min. ~7.999	0.1	0.05	0.05
	T8~15.999	0.07	0.03	0.03
	T16~25.999	0.05	0.015	0.015
	T26~Max.	0.05	0.012	0.012

(Aluminum)

Item		2-Surface Finish Method		
		Rolling	Milling	Surface Grinding
Thickness Parallelism (per 100mm)	T Min. ~6.999	-	0.05	0.012
	T7~12.999			0.03
	T13~15.999			0.05
	T16~20.999		0.07	0.03
	T21~Max.		0.1	0.1
Flatness (per 100mm)	T Min. ~7.999	EN AW A5052 0.15 52 High Precision 0.04 EN AW-7075/AlZn5,5MgCu EN AW-2017/AlCu4MgSi 0.2 ANP79 -	0.15	0.05
	T8~15.999		0.13	0.03
	T16~25.999		0.12	0.015
	T26~Max.		0.1	0.012

- Plate thickness, flatness and parallelism are not guaranteed when finish is applied only on the upper plane (Finish T).
  Cuts the convex of the warpage of the material and applies finish as a reference plane by seamless insertion. This causes variation of the plate thickness.

■Material Thickness Tolerance

* Thickness tolerance is as follows when finish is not applied on upper and lower surfaces.

- 1.0038/S235JR, Annealed

Only * marked dimensions are applicable when length is 500 or less and width is 300 or less.

Plate Thickness	*12	*14	16	*19	*22	*25	*28	30	32	35	*38	40	*45	50	*55	*60	*65	*70	*75	*80	*85	*90	*95	*100	*110	*120	*130	*140	*150	*160
Tolerance	±0.55		±0.65			±0.7						±0.8						±0.9						±1.3						

- 1.1206/C50E

Only * marked dimensions are applicable when length is 500 or less and width is 300 or less.

Plate Thickness	12	*14	*16	*19	*22	25	*28	*32	*38	*45	50	*55	*65	*75	*85	*95	*105	*115	*125
Tolerance	±1.2																		

Plate Thickness	13	16	19	22	27	32
Tolerance	±1					

JIS SKS93•1.2510/100MnCrW4•1.2379/X155CrVMo12-1•DC53®(Daido Steel)

Plate Thickness	13	16	19	22	25	28	32
Tolerance	0~+2.0						

- 1.4305/X10CrNiS18-9, Annealed

Plate Thickness	4	5	6	8	9	10	12	14	15	16	18	19	20	22	25	28	30	32	35	38	40	45	50	55	60	65
Tolerance	±0.45	±0.55	-0.65~+0.8	-0.75~+0.85		-0.7~+0.9				-0.8~+1.05					-0.9~+1.25						±1.0				±1.2

- 1.4301/X5CrNi18-10, Annealed

Plate Thickness	5	6	8	9	10	12	15	16	18	19	20	22	25	28	30	32	35	38	40	45	50	55	60	65
Tolerance	±1.1	±1.2	±1.5			±1.2				±1.3						±1.5			±1.4					±1.5

- 1.4401/X5CrNiMo17-12-2 / 1.4436/X6(8)Cr17

Plate Thickness	9	12	14	16	18	22	28	32
Tolerance	±1.2			±1.3				

Plate Thickness	6	8	12	16	18	25	32
Tolerance	±1.0	±1.2	±1.3				±1.4

- 1.4125/X105CrMo17

Plate Thickness	8	12	13	15	18	23	25	28	33
Tolerance	0~+0.7	0~+1.0			0~+2.0				

- EN AW-5052/AlMg2,5

Plate Thickness	1	1.5	2	2.5	3	4	5	6	7	8	12	15	18	20	22	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	130	150
Tolerance	±0.1	±0.13			±0.2	±0.25	±0.45	±0.6	±0.7	±0.8						±0.9	±0.10		±1.1	±1.3	±1.5	±1.9		±2.3	±2.8						±3.6			

- EN AW-5052/AlMg2,5 High Precision

Plate Thickness	4	5	6	8	10	12	15	16	18	20	22	25	30	35	40	45	50
Tolerance	±0.04			±0.05			±0.08	±0.10						±0.15			

- EN AW-2017/AlCu4MgSi

Plate Thickness	3	4	5	6	8	10	12	15	20	25	30	35	40	45	50	55	60	65	70	80	90	100
Tolerance	±0.13	±0.35		±0.45	±0.50	±0.60	±0.70		±0.80	±0.90	±1.00		±1.10	±1.30		±1.50	±1.90			±2.80		

- EN AW-7075/AlZn5,5MgCu

Plate Thickness	8.5	10.5	12.5	15.5	20.5	25.5	30.5	35.5	46	51	56	61	71	81
Tolerance	-0~+0.82	-0~+1.48		-0~+1.64	-0~+1.74	-0~+1.86	-0~+1.98		-0~+1.68	-0~+1.8	-0~+1.92	-0~+2.14		-0~+2.30

-

Plate Thickness	8	10	15	20	25	30	35	40	45	50
Tolerance	0~+0.8	0~+0.9	0~+1.2	0~+1.3	0~+1.46	0~+1.5	0~+2.0		0~+2.5	

Alterations

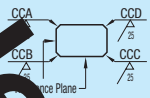
Option ⓟAlterations are ch

Circumference Chamfering



Changes the circumference chamfering dimension.

Corner Cut



Cuts any corners.
1≤ Corner Cut ≤501mm Increment
Ordering Code
(Example)When the corners of A and D are cut by C5
⋯→CCA5-CCD5

<Application Table of Circumference Chamfering>

Material	Size	Standard	No Chamfering (Deburring Only) BT_	C0.3~0.5 CA_	C0.6~1.0 CB_	C1.1~1.5 CD_	C1.6~2.0 CE_	C2.1~2.5 CF_	C2.6~3.0 CG_	C3.1~3.5 CH_	C3.6~4.0 CP_	C4.1~4.5 CJ_	C4.6~5.0 CK_
Iron	Less than 300x500	C0.1~0.2 approx.											
	300x500 or more									-	-	-	-
Stainless Steel	Less than 200x500												
	200x500 or more and Product with Super Precision Tolerance							-	-	-	-	-	-
Aluminum	All sizes							-	-	-	-	-	-

Material	Size	Standard	0.1mm Increment (C0.1~C1) 1mm Increment (C2~C60)
Iron	Length 800 or less	No Machining	C0.1~C60
Stainless Steel	Less than 200x500		C0.1~C60
	200x500 or more and Product with Super Precision Tolerance		C0.1~C20
Aluminum	All sizes		C0.1~C60

Days to Ship

Finish	Steel, Special Steel: Standard Size: Length 300mm or less and Width 300mm or less	Steel, Special Steel: Standard Size: Length≤500mm and Width 300mm or less	Steel, Special Steel: Large Size: Length 500.1mm or more or Width 300.1mm or more	Stainless Steel: Standard Size: Length 300mm or less and Width≤200mm	Stainless Steel: Standard Size: Length≤500mm and Width≤200mm	Stainless Steel: Standard Size: Standard Size Super Precision Tolerance: Length 500mm or lessand Width≤200mm	Stainless Steel: Narrow size: Length 150~1,200mm Width 10~19.9mm	Stainless Steel: Large Size: Length 500.1mm or more or Width 300.1mm or more	Aluminum: Standard Size: Length 300mm or less and Width 300mm or less	Aluminum: Standard Size: Length≤500mm and Width 300mm or less	Aluminum: Narrow size: Length 6~1,600mm Width 10~19.9mm	Aluminum: Large Size: Length 500.1mm or more or Width 300.1mm or more
	1.0038 1.2510 1.1206 JIS SKS93 1.2379	1.0038 1.2510 1.1206 JIS SKS93 1.2379	1.0038 DC 53 ® (Daido Steel) 1.1203	1.0038 1.1206	1.0038/S235JR Annealed Material	1.4305/ X10CrNiS18-9	1.4305/ X10CrNiS18-9	Others	1.4305/1.4301/X5CrNi18-10rNiS18-9 303 Annealed, 304 Annealed Material	EN AW-5052 EN AW-2017 EN AW-7075	EN AW-5052 EN AW-2017 EN AW-7075	ANP 79 High Precision	All Types	
Milling	6 Day	8 Days	8 Days Express A	9 Days Express B	13 Days	6 Day	8 Days	13 Days Express A	10 Days / 13 Days Express B	6 Day	8 Days	8 Days Express A	8 Days	
Rotary Grinding	8 Days Express A	8 Days Express A	8 Days Express A	9 Days Express B		10 Days Express B		-		-				
Surface Grinding (4-Side Milling)	8 Days	8 Days	8 Days	11 Days	14 Days					10 Days Express B			-	
6-Surface Grinding	11 Days	11 Days	11 Days			-				-				

■Note: Quotation price might be changed depending on the price fluctuation of steel. *5th Day, 8th Day, 10th Day, 11th Day, 13th Day and 14th Day indicates Days to Ship.

Not Available

1.0038/S235JR Configurable Plates



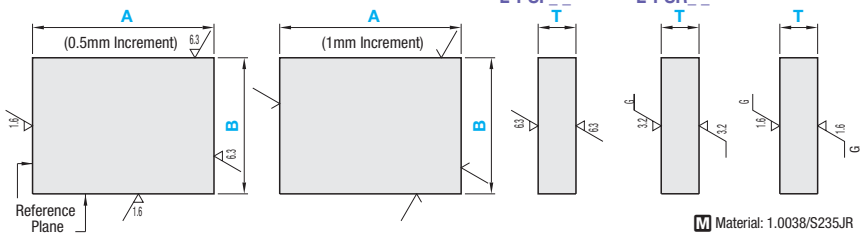
RoHS

Hot rolled, torch cutting, and saw cutting surfaces might remain on A and B surfaces of and . Also, rust might adhere.

6-Surface Finish
PS_ _ _
L-PS_ _ _

2-Surface Finish (4-side not finished)
SS2F_
L-SS2F_
SS2RG_
L-SS2RG_

2-Surface Finish Method
(Milling) SS2F_ L-SS2F_ _ PSF_ _ L-PSF_ _
(Rotary Grinding) SS2RG_ L-SS2RG_ PSR_ _ L-PSR_ _
(Surface Grinding) PSS_ _ L-PSS_ _



Material: 1.0038/S235JR

6-Surface Finish

2-Surface Finish Method		Part Number: Type	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	0.5mm Increment: A (A≥B)	B (A≥B)	T
Milling	Standard Size	PSF	P Q N M	P Q N M	20~500	20~300	4~50
	Large Size	L-PSF			250~2500	10~1500	5~50
Rotary Grinding	Standard Size	PSR			20~500	20~300	4~50
	Large Size	L-PSR			250~1600	10~1200	10~50
Surface Grinding	Standard Size	PSS			20~500	20~300	4~50
	Large Size	L-PSS			250~800	20~500	5~50

2-Surface Finish (sides not finished) Tolerance should be noted.

2-Surface Finish Method		Part Number: Type	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance	1mm Increment: A (A≥B)	B (A≥B)	0.5mm Increment: T
Milling	Standard Size	SS2F	P Q N M	A^{+5}_{0} B^{+5}_{0}	20~500	10~300	5~50
	Large Size	L-SS2F			251~2500	10~1500	
Rotary Grinding	Standard Size	SS2RG			20~500	10~300	
	Large Size	L-SS2RG			251~1600	10~1200	10~50

Not all dimensions are applicable. For details, refer to the price list.

(1) Plate Thickness Tolerance

2-Surface Finish Method	P	Q	N	M
Milling	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
Rotary Grinding	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
Surface Grinding	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance (Applicable to 6-surface finish only)

A, B Dimension	P	Q	N	M
250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Precision Standards –Standard Size–

(Max. Value)

Item		2-Surface Finish Method: Milling	Rotary Grinding	Surface Grinding
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T4~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~50	0.05	0.012	0.012
Perpendicularity of Reference Plane (Applicable to 6-Surface Finished products)		0.015 per 100mm		
Circumference Chamfering	2-Surface Finish	Deburring only		
	6-Surface Finish	C0.2~C0.5		

Precision Standards -Large Size-

Item		Milling: ~500	~1000	1000.5~	Rotary Grinding: ~500	~1000	1000.5~	Surface Grinding: ~500	500.5~
A, B Dimension									
Flatness (per 100mm)	T5~9.5	0.3	0.5	0.7	0.3	0.5	0.7	0.1	0.2
	T10~19.5	0.3	0.4	0.5	0.3	0.4	0.5	0.1	0.2
	T20~29.5	0.2	0.3	0.5	0.2	0.3	0.5	0.05	0.1
	T30~50	0.2	0.3	0.3	0.2	0.3	0.3	0.05	0.1
Thickness Parallelism (per 100mm)		0.05			0.012			0.012	
Perpendicularity of Reference Plane (Applicable to 6-Surface Finished products)		0.015 per 100mm							
Circumference Chamfering	2-Surface Finish	Deburring only							
	6-Surface Finish	C0.2~C0.5							

Order Example

Part Number: Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	A	B	T
				- 255	- 220	- 18

Alterations

Part Number - A - B - T -(CSC / CBC / CCA / etc.)
- 1200 -610-30 - CSC

Alteration is not available for 4-side not finished (L–) SS2F, SS2RG.

Days to Ship

■Standard Size

- SS2F_ A (Length) 300mm or less
- PSF_ _ 300mm or less: 6 Days P.88
- SS2F_ A (Length) 300.5mm or more
- PSF_ _ 300.5mm or more: 8 Days
- SS2RG_ _
- PSR_ _: 8 Days Express A 8,00 EUR/piece P.88

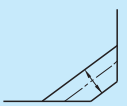
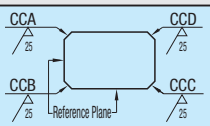
A Express Charge of 21,60 EUR for 3 or more identical pieces.

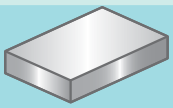
- PSS_ _: 8 Days

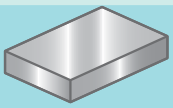
■Large Size

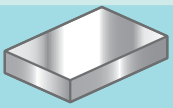
- L-SS2F_
- L-PSF_ _: 9 Days
- L-SS2RG_
- L-PSR_ _: 9 Days
- L-PSS_ _: 11 Days

Type	Price page
	P.1622
	P.1623•1624
	P.1622
	P.1624•1625
	P.1622
	P.1625
	P.1626
	P.1627•1628
	P.1626
	P.1629

	Circumference Chamfering	Corner Cut
Alterations		 Surface roughness of corner cut for large size: A>1000 or B>300✓
Code	CSC · CBC	CCA · CCB · CCC · CCD
Spec.	Changes the circumference chamfering dimension. Chamfering Dimension: Standard C0.2~0.5; CSC C0.1 or less; CBC C0.5~1.0	Arbitrary corner can be cut. 1≤Corner Cut≤50 1mm Increment. Ordering Code (Ex.) When the corners of A and D are cut by C5, ···› CCA5-CCD5. 1mm Increment: 1~5 200,00; 6~10 250,00; 11~20 4,50; 21~30 6,00; 31~40 7,00; 41~50 800,00
Price Adder	Standard size (A<500 and B<300): Free of Charge; Large Size: 8,00	Refer to spec.


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced

Price Reduction
2% on average

Price

(Example) -255.5-220.0-18.0

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255.5	x	12.4 Cent	=	316,00 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Standard Size A, B, T 0.5mm Increment

PSF_ _ (All Surfaces Milled)

PSR_ _ (All Surfaces Milled Top / Bottom Rotary Ground)

PSS_ _ (All Surfaces Milled Top / Bottom Surfaced)

For Large Size, refer to P.1623• 1624

For Large Size, refer to P.1624• 1625

For Large Size, refer to P.1625

Part Number	A	B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PSF_ _ / PSR_ _ / PSS_ _	20 ~ 50	20~25															
	50.5~ 75																
	75.5~100																
	100.5~250		■														
	25.5~ 50	25.5~40															
	50.5~ 75																
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	40.5~ 50	40.5~60															
	50.5~ 75																
	75.5~100																
	100.5~200		■														
	200.5~500																
	60.5~ 75	60.5~80															
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	80.5~100	80.5~100															
	100.5~200		■														
	200.5~500		■														
	100.5~125	100.5~125	■														
	125.5~200		■														
	200.5~500		■														
	125.5~200	125.5~150	■														
	200.5~500		■														
	150.5~200	150.5~160	■														
	200.5~500		■														
	160.5~200	160.5~200	■	■													
	200.5~500		■	■													
	200.5~500	200.5~250	■	■													
	250.5~500	250.5~300	■	■													

Part Number	A	B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PSF_ _ / PSR_ _ / PSS_ _	20 ~ 50	20~25															
	50.5~ 75																
	75.5~100																
	100.5~250		■														
	25.5~ 50	25.5~40															
	50.5~ 75																
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	40.5~ 50	40.5~60															
	50.5~ 75																
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	60.5~ 75	60.5~80															
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	80.5~100	80.5~100	■														
	100.5~200		■														
	200.5~500		■														
	100.5~125	100.5~125	■														
	125.5~200		■														
	200.5~500		■														
	125.5~200	125.5~150	■														
	200.5~500		■														
	150.5~200	150.5~160	■														
	200.5~500		■														
	160.5~200	160.5~200	■	■													
	200.5~500		■	■													
	200.5~500	200.5~250	■	■													
	250.5~500	250.5~300	■	■													

Part Number	A	B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PSF_ _ / PSR_ _ / PSS_ _	20 ~ 50	20~25															
	50.5~ 75																
	75.5~100																
	100.5~250		■														
	25.5~ 50	25.5~40															
	50.5~ 75																
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	40.5~ 50	40.5~60															
	50.5~ 75																
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	60.5~ 75	60.5~80															
	75.5~100																
	100.5~200		■														
	200.5~500		■														
	80.5~100	80.5~100	■														
	100.5~200		■														
	200.5~500		■														
	100.5~125	100.5~125	■														
	125.5~200		■														
	200.5~500		■														
	125.5~200	125.5~150	■														
	200.5~500		■														
	150.5~200	150.5~160	■														
	200.5~500		■														
	160.5~200	160.5~200	■	■													
	200.5~500		■	■													
	200.5~500	200.5~250	■	■													
	250.5~500	250.5~300	■	■													

1.0038/S235JR Configurable Plates

Price

(Ex) When –1000.5–301–20.5

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1000.5	x	23.5 Cent	=	235,10 €

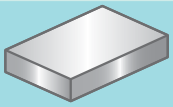
Volume Discount (Round down to ten Cent.) P.88

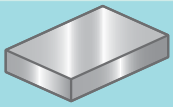
Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Large Size — All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A \ B \ T	5~7.5	8~9.5	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
L-PSF_ _	250~ 400 / 400.5~ 500 / 500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400	■	■	■		■		■		■	■	■	■	■	■	■	■	■
	10~25																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	255.5~40																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	40.5~60																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	60.5~80																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	80.5~100																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	100.5~125																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	125.5~150																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	150.5~160																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	160.5~200																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	200.5~250																	
	500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800 / 1800.5~2000 / 2000.5~2500	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	250.5~300																	
	300.5~ 500 / 500.5~ 600 / 600.5~ 800 / 800.5~1000 / 1000.5~1200 / 1200.5~1400 / 1400.5~1600 / 1600.5~1800 / 1800.5~2000 / 2000.5~2500	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	300.5~400																	


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground

Price Reduction
6% on average

■Large Size　　All Surfaces Milled A, B, T 0.5mm Increment

L-PSF_ _

Part Number	A	B \ T	5~7.5	8~9.5	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
	400.5~ 500	400.5~500																	
	500.5~ 600																		
	600.5~ 800																		
	800.5~1000																		
	1000.5~1200																		
	1200.5~1400																		
	1400.5~1600																		
	1600.5~1800																		
	1800.5~2000																		
	2000.5~2500																		
	500.5~ 600	500.5~600																	
	600.5~ 800																		
	800.5~1000																		
	1000.5~1200																		
	1200.5~1400																		
	1400.5~1600																		
	1600.5~1800																		
	1800.5~2000																		
	2000.5~2500																		
	600.5~ 800	600.5~800																	
	800.5~1000																		
	1000.5~1200																		
	1200.5~1400																		
	1400.5~1600																		
	1600.5~1800																		
	1800.5~2000																		
	2000.5~2500																		
	800.5~1000	800.5~1000																	
	1000.5~1200																		
	1200.5~1400																		
	1400.5~1600																		
	1600.5~1800																		
	1800.5~2000																		
	2000.5~2500																		
	1000.5~1200	1000.5~1200																	
	1200.5~1400																		
	1400.5~1600																		
	1600.5~1800																		
	1800.5~2000																		
	2000.5~2500																		
	1200.5~1400	1200.5~1500																	
	1400.5~1600																		
	1600.5~1800																		
	1800.5~2000																		

■Large Size　　(1) Top / Bottom Rotary Ground (Sides Milled) A, B, T 0.5 Increment

L-PSR_ _

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
	250 ~ 400	10~25															
	400.5~ 500																
	500.5~ 600																
	600.5~ 800																
	800.5~1000																
	1000.5~1200																
	1200.5~1400																
	500.5~ 600	255.5~40															
	600.5~ 800																
	800.5~1000																
	1000.5~1200																
	1200.5~1400																
	1400.5~1600																
	1600.5~1800																
	500.5~ 600	40.5~60															
	600.5~ 800																
	800.5~1000																
	1000.5~1200																
	1200.5~1400																
	1400.5~1600																
	1600.5~1800																
	500.5~ 600	60.5~80															
	600.5~ 800																
	800.5~1000																
	1000.5~1200																
	1200.5~1400																
	1400.5~1600																
	500.5~ 600	80.5~100															
	600.5~ 800																
	800.5~1000																
	1000.5~1200																
	1200.5~1400																
	1400.5~1600																
	500.5~ 600	100.5~125															
	600.5~ 800																
	800.5~1000																
	1000.5~1200																
	1200.5~1400																
	1400.5~1600																

For the price list of B dimension 125.5 or more, refer to P.1625

1.0038/S235JR Configurable Plates

Price

(Ex) When −1000.5−301−20.5

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
1000.5	x	27.3 Cent	=	273,10 €

Volume Discount (Round down to ten Cent.) P.87

Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Large Size — (2) Top / Bottom Rotary Ground (Sides Milled) A, B, T 0.5 Increment

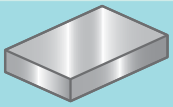
L-PSR_ _

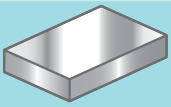
Part Number	A 0.5mm Increment	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
	500.5~ 600	125.5~150	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1200																
	1200.5~ 1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~ 1600																
	500.5~ 600	150.5~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1200																
	1200.5~ 1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~ 1600																
	500.5~ 600	160.5~200	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1200																
	1200.5~ 1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~ 1600																
	500.5~ 600	200.5~250	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1200																
	1200.5~ 1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~ 1600																
	500.5~ 600	250.5~300	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1200																
	1200.5~ 1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~ 1600																
	300.5~ 500	300.5~400	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600																
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~ 1000																
	1000.5~ 1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~ 1400																
	1400.5~ 1600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	400.5~ 500	400.5~500															
	500.5~ 600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1200		⊠														
	1200.5~ 1400		⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~ 1600		⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	500.5~600	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1200		⊠	⊠													
	1200.5~ 1400		⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■
	1400.5~ 1600		⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800	600.5~800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~ 1000																
	1000.5~ 1200		⊠	⊠			■	■	■	■	■	■	■	■	■	■	■
	1200.5~ 1400		⊠	⊠	⊠	⊠											
	1400.5~ 1600		⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■
	800.5~ 1000	800.5~1000	⊠	⊠	⊠	⊠											
	1000.5~ 1200		⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■
	1200.5~ 1400		⊠	⊠	⊠	⊠											
	1000.5~ 1200	1000.5~1200	⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■

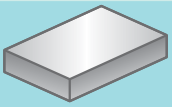
Large Size — Top / Bottom Rotary Ground (Sides Milled) A, B, T 0.5 Increment

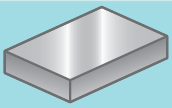
L-PSS_ _

Part Number	A 0.5mm Increment	B \ T	5~7.5	8~9.5	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
	250 ~500	20~25									⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
	500.5~800		⊠	⊠							⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
	500.5~800	255.5~40	⊠	⊠	■	■	■	■	■	■	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
	500.5~800	40.5~60	⊠	⊠															
	500.5~800	60.5~80	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800	80.5~100	⊠	⊠															
	500.5~800	100.5~125	⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800	125.5~150	⊠	⊠	⊠	⊠													
	500.5~800	150.5~160	⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800	160.5~200	⊠	⊠	⊠	⊠													
	500.5~800	200.5~250	⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800	250.5~300	⊠	⊠	⊠	⊠													
	300.5~500	300.5~400	⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800		⊠	⊠	⊠	⊠													
	400.5~500	400.5~500	⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800		⊠	⊠	⊠	⊠													


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced


Top/Bottom Milled


Top/Bottom Rotary Ground

Price Reduction
Up to 6%

Price

(Ex.) When −255−220−18

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255	x	12 Cent	=	30,60 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Standard Size Top / Bottom Milled (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A 1mm Increment	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
SS2F_	20~ 50	10~25	■	■	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	51~ 75												▨	▨	▨	▨
	76~100		■	■	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	101~250												▨	▨	▨	▨
	26~ 50	26~40	■	■	■	■	■	■	■	■	■	■	■	■	▨	▨
	51~ 75														▨	▨
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	▨	▨
	101~200														▨	▨
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	▨	▨
	41~ 50	41~60														
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	61~ 75	61~80	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	81~100	81~100	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200															
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~125	101~125														
	126~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	126~200	126~150	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	151~200	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	161~200	161~200	▨	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500		▨													
	201~500	201~250	▨	■	■	■	■	■	■	■	■	■	■	■	■	■
	251~500	251~300	▨													

For Large Size, refer to P.1627•1628

Standard Size Top / Bottom Rotary Ground (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A 1mm Increment	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
SS2RG_	20~ 50	10~25	■	■	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	51~ 75												▨	▨	▨	▨
	76~100		■	■	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	101~250												▨	▨	▨	▨
	26~ 50	26~40	■	■	■	■	■	■	■	■	■	■	■	■	▨	▨
	51~ 75														▨	▨
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	▨	▨
	101~200														▨	▨
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	▨	▨
	41~ 50	41~60														
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	61~ 75	61~80	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	81~100	81~100	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200															
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~125	101~125														
	126~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	126~200	126~150	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	151~200	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	161~200	161~200	▨	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500		▨													
	201~500	201~250	▨	■	■	■	■	■	■	■	■	■	■	■	■	■
	251~500	251~300	▨													

For Large Size, refer to P.1629•1630

1.0038/S235JR Configurable Plates

Price

(Ex.) When –1001–301–20.5

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
10,01	x	21.6 Cent	=	216,20 €

Volume Discount (Round down to ten Cent.) P.88

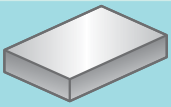
Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Large Size (1) Top / Bottom Milled (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A	T / B	5~7.5	8~9.5	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
L-SS2F_	251~ 400	10~25	■	■	■	■	■	■	■	■	▨	▨	▨	▨	▨	▨	▨	▨	▨
	401~ 500			■	■	■	■	■	■	■	▨	▨	▨	▨	▨	▨	▨	▨	▨
	501~ 600		■	■	■	■	■	■	■	■	▨	▨	▨	▨	▨	▨	▨	▨	▨
	601~ 800										▨	▨	▨	▨	▨	▨	▨	▨	▨
	801~1000		■	■	■	■	■	■	■	■	▨	▨	▨	▨	▨	▨	▨	▨	▨
	1001~1200										▨	▨	▨	▨	▨	▨	▨	▨	▨
	1201~1400		■	■	■	■	■	■	■	■	▨	▨	▨	▨	▨	▨	▨	▨	▨
	501~ 600	26~40														▨	▨	▨	▨
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	801~1000															▨	▨	▨	▨
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	1201~1400															▨	▨	▨	▨
	1401~1600		■	■	■	■	■	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	1601~1800															▨	▨	▨	▨
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	▨	▨	▨	▨
	2001~2500		▨	▨	▨	▨	▨	▨											
	501~ 600	41~60	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																		
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		▨	▨															
	1201~1400		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600		▨	▨															
	1601~1800		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	2001~2500		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	61~80																	
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																		
	1001~1200		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨															
	1401~1600		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1601~1800		▨	▨															
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	2001~2500		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	81~100																	
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																		
	1001~1200		▨	▨															
	1201~1400		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600		▨	▨															
	1601~1800		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	2001~2500		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	101~125																	
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																		
	1001~1200		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨															
	1401~1600		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1601~1800		▨	▨															
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	2001~2500		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	126~150																	
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																		
	1001~1200		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨															
	1401~1600		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1601~1800		▨	▨															
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	2001~2500		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	151~160																	
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																		
	1001~1200		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨															
	1401~1600		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1601~1800		▨	▨															
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	2001~2500		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	161~200																	
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																		
	1001~1200		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨															
	1401~1600		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1601~1800		▨	▨															
	1801~2000		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	2001~2500		▨	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■



Top/Bottom Milled

Price Reduction

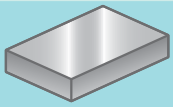
6% on average

■Large Size (2) Top / Bottom Milled (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A	B \ T	5~7.5	8~9.5	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
L-SS2F_	501~ 600	201~250	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~ 800																		
	801~1000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200																		
	1201~1400		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1401~1600																		
	1601~1800		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1801~2000																		
	2001~2500		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	501~ 600	251~300																	
	601~ 800		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	801~1000																		
	1001~1200		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1201~1400																		
	1401~1600		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1601~1800																		
	1801~2000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	2001~2500																		
	301~ 500	301~400	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	501~ 600																		
	601~ 800		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	801~1000																		
	1001~1200		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1201~1400																		
	1401~1600		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1601~1800																		
	1801~2000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	2001~2500																		
	401~ 500	401~500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	501~ 600																		
	601~ 800		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	801~1000																		
	1001~1200		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1201~1400																		
	1401~1600		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1601~1800																		
	1801~2000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	2001~2500																		
	501~ 600	501~600	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~ 800																		
	801~1000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200																		
	1201~1400		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1401~1600																		
	1601~1800		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1801~2000																		
	2001~2500		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	601~ 800	601~800																	
	801~1000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1001~1200																		
	1201~1400		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1401~1600																		
	1601~1800		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1801~2000																		
	2001~2500		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	801~1000	801~1000																	
	1001~1200		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1201~1400																		
	1401~1600		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1601~1800																		
	1801~2000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	2001~2500																		
	1001~1200	1001~1200	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1201~1400																		
	1401~1600		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1601~1800																		
	1801~2000		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	2001~2500																		
	1201~1400	1201~1500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1401~1600																		
	1601~1800		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	1801~2000																		
	2001~2500		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

1.0038/S235JR Configurable Plates



Top/Bottom Rotary Ground

Price

(Ex.) L-SS2RGM-1001-301-20.5

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
1001	x	25.4 Cent	=	254,20 €

Volume Discount (Round down to ten Cent.) P.87

Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Large Size Top / Bottom Rotary Ground (sides not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50
L-SS2RG_	251~ 400	10~25	■	■	■	■	■	■	✕	✕	✕	✕	✕	✕	✕	✕	✕
	401~ 500								✕	✕	✕	✕	✕	✕	✕	✕	✕
	501~ 600		■	■	■	■	■	■	✕	✕	✕	✕	✕	✕	✕	✕	✕
	601~ 800								✕	✕	✕	✕	✕	✕	✕	✕	✕
	801~1000		■	■	■	■	■	■	✕	✕	✕	✕	✕	✕	✕	✕	✕
	1001~1200								✕	✕	✕	✕	✕	✕	✕	✕	✕
	1201~1400		■	■	■	■	■	■	✕	✕	✕	✕	✕	✕	✕	✕	✕
	501~ 600	26~40												✕	✕	✕	✕
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	801~1000													✕	✕	✕	✕
	1001~1200		✕	✕	✕	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	1201~1400		✕	✕	✕									✕	✕	✕	✕
	1401~1600		✕	✕	✕	✕	✕	■	■	■	■	■	■	✕	✕	✕	✕
	1601~1800		✕	✕	✕	✕	✕							✕	✕	✕	✕
	501~ 600	41~60	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		✕	✕	✕	✕											
	1201~1400		✕	✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■
	1401~1600		✕	✕	✕	✕	✕	✕									
	1601~1800		✕	✕	✕	✕	✕	✕	✕	✕	■	■	■	■	■	■	■
	501~ 600	61~80															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		✕	✕	✕	✕	✕	✕	✕								
	1401~1600		✕	✕	✕	✕	✕	✕	✕	■	■	■	■	■	■	■	■
	501~ 600	81~100															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		✕	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		✕														
	1401~1600		✕	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	101~125															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400																
	1401~1600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	126~150															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400																
	1401~1600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Price Reduction
6% on average

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50
L-SS2RG_	501~ 600	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200																
	1201~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600																
	501~ 600	161~200	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200																
	1201~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600																
	501~ 600	201~250	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200																
	1201~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600																
	501~ 600	251~300	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200																
	1201~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600																
	301~ 500	301~400	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600																
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400																
	1401~1600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	401~ 500	401~500															
	501~ 600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		⊠														
	1201~1400		⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600		⊠	⊠													
	501~ 600	501~600	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		⊠	⊠													
	1201~1400		⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■
	1401~1600		⊠	⊠	⊠	⊠											
	601~ 800	601~800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		⊠	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		⊠	⊠	⊠	⊠											
	1401~1600		⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■
	801~1000	801~1000	⊠	⊠	⊠	⊠											
	1001~1200		⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		⊠	⊠	⊠	⊠											
	1001~1200	1001~1200	⊠	⊠	⊠	⊠	■	■	■	■	■	■	■	■	■	■	■

1.0038/S235JR
Annealing Material Configurable Plates

Price Reduction
3% on average



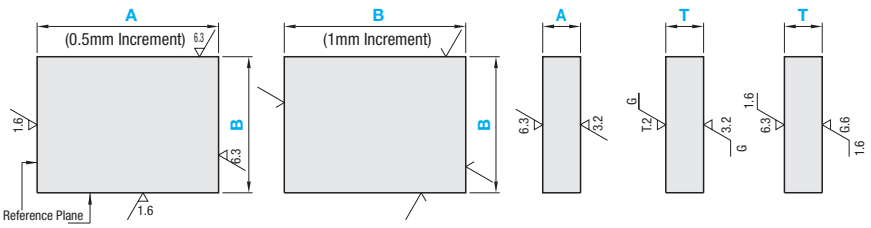
RoHS

Hot rolled, torch cutting, and saw cutting surfaces might remain on A and B surfaces of and (sides not finished).
Also, rust might adhere.

6-Surface Finish
PV_ _ _

2-Surface Finish (4-side not finished)
SV2F_

2-Surface Finish Method
(Milling) PVF_ _ SV2F_
(Rotary Grinding) PVR_ _ SV2RG_
(Surface Grinding) PVS_ _



* Large size L-PV_ _ _, L-SV2F_ and L-SV2RG_ are now available online.

M Material: 1.0038/S235JR Annealed Material

6-Surface Finish

2-Surface Finish Method	Type	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	0.5mm Increment A (A≥B)	0.5mm Increment B (A≥B)	0.5mm Increment T
Milling	PVF	P Q N M	P Q N M	20~500	20~300	4~50
Rotary Grinding	PVR			20~500	20~300	4~50
Surface Grinding	PVS			20~500	20~300	4~50

2-Surface Finish(4-Side not finished) Tolerance should be noted.

2-Surface Finish Method	Type	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance	1mm Increment A (A≥B)	1mm Increment B (A≥B)	0.5mm Increment T
Milling	SV2F	P Q N M	A^{+5}_{0} B^{+5}_{0}	20~500	10~300	5~50
Rotary Grinding	SV2RG			20~500	10~300	5~50

Not all dimensions are applicable. For details, refer to the price list.

(1) Plate Thickness Tolerance

2-Surface Finish Method	P	Q	N	M
Milling	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
Rotary Grinding	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
Surface Grinding	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance (Applicable to 6-surface finish only)

A, B Dimension	P	Q	N	M
250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Precision Standards -Standard Size-

(Max. Value)

Item		2-Surface Finish Method: Milling	Rotary Grinding	Surface Grinding
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T4~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~50	0.05	0.012	0.012
Perpendicularity of Reference Plane (Applicable to 6-Surface Finished products only.)		0.015 per 100mm		
Circumference Chamfering	2-Surface Finish	Deburring only		
	6-Surface Finish	C0.2~C0.5		

Order Example

Part Number	Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	A	B	T
	PV	F	Q	M	255	220	18

Days to Ship

Standard Size

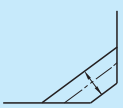
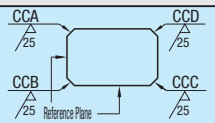
•SV2F_ •PVF_ _	8 Days	Express A	4,00 EUR/ piece
•SV2RG_ •PVR_ _	8 Days	Express A	8,00 EUR/ piece
•PVS_ _	8 Days		

A Express Charge of 10,80 EUR for 3 or more identical pieces.
A Express Charge of 21,60 EUR for 3 or more identical pieces.
P.88

Type	Price page
PVF	P.1632
PVR	P.1632
PVS	P.1632
SV2F	P.1633
SV2RG	P.1634

Alterations

Part Number - A - B - T - (CSC…etc.)
PVRNM - 200 - 100 - 30 - CSC
No alteration is applicable to (2-Surface Finished).

	Circumference Chamfering	Corner Cut
Alterations		 Surface roughness of corner cut for large size: A>1000 or B>300
Code	CSC / CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. Chamfering Dimension: Standard C0.2~0.5; CSC C0.1 or less; CBC C0.5~1.0	Arbitrary corner can be cut. 1≤Corner Cut≤50 1mm Increment. Ordering Code. (Ex.) When the corners of A & D are cut by C5⋯› CCA5-CCD5. 1mm Increment: 1~5 Price Adder 2,00; 6~10 2,50; 11~20 4,50; 21~30 6,00; 31~40 7,00; 41~50 8,00
Price Adder	Free of Charge	Refer to spec.

Features of 1.0038/S235JR

Treated with anneal heat treatment, its machining distortion is controlled, and suitable for use when warp prevention is concerned.



Price (Ex.) When −255.5−220.0−18.0

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255.5	x	15.1 Cent	=	38,50 €

Volume Discount (Round down to ten Cent.) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Standard Size A, B, T 0.5mm Increment

PVF_ _
All Surfaces Milled

Part Number	A \ B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
	20 ~ 50	20~25														
	50.5~ 75															
	75.5~100															
	100.5~250															
	25.5~ 50	25.5~40														
	50.5~ 75															
	75.5~100															
	100.5~200															
	200.5~500															
	40.5~ 50	40.5~60														
	50.5~ 75															
	75.5~100															
	100.5~200															
	200.5~500															
	60.5~ 75	60.5~80														
	75.5~100															
	100.5~200															
	200.5~500															
	80.5~100	80.5~100														
	100.5~200															
	200.5~500															
	100.5~125	100.5~125														
	125.5~200															
	200.5~500															
	125.5~200	125.5~150														
	200.5~500															
	150.5~200	150.5~160														
	200.5~500															
	160.5~200	160.5~200														
	200.5~500															
	200.5~500	200.5~250														
	250.5~500	250.5~300														

PVR_ _
All Surfaces Milled
Top / Bottom Rotary Ground

Part Number	A \ B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
	20 ~ 50	20~25														
	50.5~ 75															
	75.5~100															
	100.5~250															
	25.5~ 50	25.5~40														
	50.5~ 75															
	75.5~100															
	100.5~200															
	200.5~500															
	40.5~ 50	40.5~60														
	50.5~ 75															
	75.5~100															
	100.5~200															
	200.5~500															
	60.5~ 75	60.5~80														
	75.5~100															
	100.5~200															
	200.5~500															
	80.5~100	80.5~100														
	100.5~200															
	200.5~500															
	100.5~125	100.5~125														
	125.5~200															
	200.5~500															
	125.5~200	125.5~150														
	200.5~500															
	150.5~200	150.5~160														
	200.5~500															
	160.5~200	160.5~200														
	200.5~500															
	200.5~500	200.5~250														
	250.5~500	250.5~300														

PVS_ _
All Surfaces Milled
Top / Bottom Surfaced

Part Number	A \ B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
	20 ~ 50	20~25														
	50.5~ 75															
	75.5~100															
	100.5~250															
	25.5~ 50	25.5~40														
	50.5~ 75															
	75.5~100															
	100.5~200															
	200.5~500															
	40.5~ 50	40.5~60														
	50.5~ 75															
	75.5~100															
	100.5~200															
	200.5~500															
	60.5~ 75	60.5~80														
	75.5~100															
	100.5~200															
	200.5~500															
	80.5~100	80.5~100														
	100.5~200															
	200.5~500															
	100.5~125	100.5~125														
	125.5~200															
	200.5~500															
	125.5~200	125.5~150														
	200.5~500															
	150.5~200	150.5~160														
	200.5~500															
	160.5~200	160.5~200														
	200.5~500															
	200.5~500	200.5~250														
	250.5~500	250.5~300														

1.0038/S235JR Annealed Material Configurable Plates

Price

(Ex.) When –255–220.0–18.0

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
2,55	x	14 Cent	=	35,70 €

Volume Discount (Round down to ten Cent.) P.88

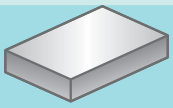
Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

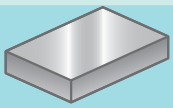
For orders larger than indicated quantity, please request a quotation.

Standard Size Top / Bottom Milled (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A 1mm Increment	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
SV2F_	20~ 50	10~25	■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	51~ 75												✕	✕	✕	✕
	76~100		■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	101~250												✕	✕	✕	✕
	26~ 50	26~40	■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	51~ 75														✕	✕
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	101~200														✕	✕
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	41~ 50	41~60														
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	61~ 75	61~80	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	81~100	81~100	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200															
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~125	101~125														
	126~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	126~200	126~150	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	151~200	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	161~200	161~200	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500		✕													
	201~500	201~250	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	251~500	251~300	✕													


Top/Bottom Milled


Top/Bottom Rotary Ground

Price Reduction
3% on average

Price (Ex.) When -500-100-15

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
5,00	x	9.9 Cent	=	€ 49,50

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Standard Size Top / Bottom Rotary Ground (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A 1 mm Increment	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
SV2RG_	20~ 50	10~25	■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	51~ 75												✕	✕	✕	✕
	76~100		■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	101~250												✕	✕	✕	✕
	26~ 50	26~40	■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	51~ 75														✕	✕
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	101~200														✕	✕
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	41~ 50	41~60													✕	✕
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	61~ 75	61~80	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	81~100	81~100	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200															
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~125	101~125														
	126~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	126~200	126~150	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	151~200	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	161~200	161~200	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500		✕													
	201~500	201~250	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	251~500	251~300	✕													

1.1206/C50E Configurable Plates

Annealed 1.1191/C45E or JIS S48C are used as materials for some large sizes.



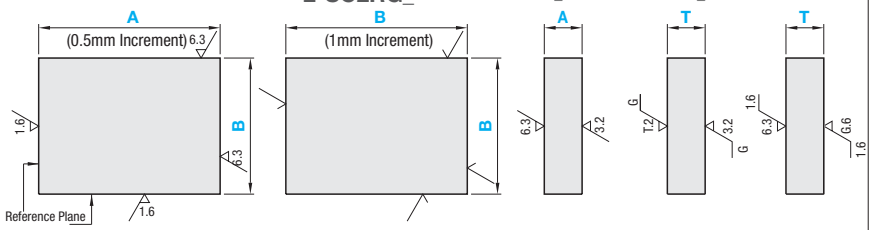
RoHS

Hot rolled, torch cutting, and saw cutting surfaces might remain on A and B surfaces of 2-Surface Finished products. Also, rust might adhere.

6-Surface Finish
PC_ _ _
L-PC_ _ _

2-Surface Finish (4-side not finished)
SC2F_
L-SC2F_
SC2RG_
L-SC2RG_

2-Surface Finish Method
(Milling) PCF_ _ / L-PCF_ _ / SC2F_ / L-SC2F_
(Rotary Grinding) PCR_ _ / L-PCR_ _ / SC2RG_ / L-SC2RG_
(Surface Grinding) PCS_ _ / L-PCS_ _



Material: Standard Size1.1206/C50E
For Large sizes, any of the followings: 1.1206/C50E, 1.1191/C45E or JIS S48C.

6-Surface Finish

2-Surface Finish Method		Type	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	0.5mm Increment A	0.5mm Increment B	0.5mm Increment T
		Part Number			A≥B		
Milling	Standard Size	PCF	P	P	20~500	20~300	4~50
	Large Size	L-PCF			300.5~2000	100~800	10~50
Rotary Grinding	Standard Size	PCR	Q	Q	20~500	20~300	4~50
	Large Size	L-PCR	N	N	300.5~1400	100~1000	10~50
Surface Grinding	Standard Size	PCS	M	M	20~500	20~300	4~50
	Large Size	L-PCS			300.5~800	100~500	10~50

2-Surface Finish (sides not finished)

Tolerance should be noted.

2-Surface Finish Method		Type	(1) Plate Thickness Tolerance Selection	A, B Dimension Tolerance		1mm Increment A	1mm Increment B	0.5mm Increment T
		Part Number				A≥B		
Milling	Standard Size	SC2F	P	A^{+5}_{0}	A^{+5}_{0}	20~500	20~300	5~50
	Large Size	L-SC2F	Q	B^{+10}_{+3}	B^{+5}_{0}	301~2000	100~1200	10~50
Rotary Grinding	Standard Size	SC2RG	N			20~500	20~300	5~50
	Large Size	L-SC2RG	M			301~1400	100~1000	10~50

Not all dimensions are applicable. For details, refer to the price list.

(1) Plate Thickness Tolerance

2-Surface Finish Method	P	Q	N	M
Milling	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
Rotary Grinding	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
Surface Grinding	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance (Applicable to 6-surface finish only)

A, B Dimension	P	Q	N	M
250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Precision Standards –Standard Size–

(Max. Value)

Item		2-Surface Finish Method: Milling	Rotary Grinding	Surface Grinding
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T4~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~50	0.05	0.012	0.012
Perpendicularity of Reference Plane (Applicable to 6-Surface Finished products only.)		0.015 per 100mm		
Circumference Chamfering	2-Surface Finish	Deburring only		
	6-Surface Finish	C0.2~C0.5		

Precision Standards –Large Size–

(Max. Value)

Item		Milling ~500	Milling ~1000	Milling 1000.5~	Rotary Grinding ~500	Rotary Grinding ~1000	Rotary Grinding 1000.5~	Surface Grinding ~500	Surface Grinding 500.5~
A, B Dimension									
Flatness (per 100mm)	T5~9.5	0.3	0.5	0.7	0.3	0.5	0.7	0.1	0.2
	T10~19.5	0.3	0.4	0.5	0.3	0.4	0.5	0.1	0.2
	T20~29.5	0.2	0.3	0.5	0.2	0.3	0.5	0.05	0.1
	T30~50	0.2	0.3	0.3	0.2	0.3	0.3	0.05	0.1
Thickness Parallelism (per 100mm)		0.05			0.012			0.012	
Perpendicularity of Reference Plane (Applicable to 6-Surface Finished products only.)		0.015 per 100mm							
Circumference Chamfering	2-Surface Finish	Deburring only							
	6-Surface Finish	C0.2~C0.5							

Order Example

Part Number	Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
	PC	F	Q	M	-	255	-	220	-	18

Days to Ship

Standard Size

- PCF_ _
- SC2F_ A (Length) 300mm or less — 6 Days
- PCF_ _
- SC2F_ A (Length) 300.5mm or more — 8 Days
- PCR_ _
- SC2RG_ — 8 Days

Express A 8,00 EUR/piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

- PCS_ _ — 8 Days

Large Size

- L-PCF_ _
- L-PCR_ _
- L-SC2F_
- L-SC2RG_ — 13 Days
- L-PCS_ _ — 14 Days

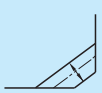
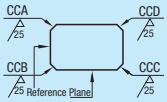
Type	Price page
PCF	P.1636
L-PCF	P.1637
PCR	P.1636
L-PCR	P.1638
PCS	P.1636
L-PCS	P.1638
SC2F	P.1639
L-SC2F	P.1639•1640
SC2RG	P.1641
L-SC2RG	P.1642

Same day shipping is available for orders received by 5pm. Orders received after 5pm will be shipped on the next business day.

Alterations

Part Number: PCFQM - A - B - T - (CSC / CBC / CCA / etc.)
Example: - 255 - 220 - 18 - CSC

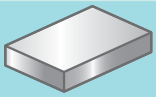
No alteration is applicable to 2-Surface Finish

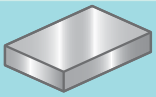
Alterations	Circumference Chamfering	Corner Cut
		 Surface roughness of corner cut for large size: A>1000 or B>300√
Code	CSC / CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension.	Arbitrary corner can be cut. 1≤Corner Cut≤50 1mm Increment Ordering Code (Ex.) When the corners of A and D are cut by C5, ···› CCA5-CCD5
Price Adder	Standard size (A<500 and B<300): Free of Charge; Large Size: 8,00	Refer to spec.

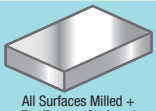
Chamfering Dimension

Standard	CSC	CBC
C0.2~0.5	C0.1 or less	C0.5~1.0

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced

Price Reduction
2% on average

Price

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
49	x	15.3 Cent	=	7,40 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Standard Size A, B, T 0.5mm Increment

PCF_ _

All Surfaces Milled

For Large Size, refer to P.1637

Part Number	A	B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
	20 ~ 50	20~25															
	50.5~ 75																
	75.5~100																
	100.5~250		×														
	25.5~ 50	25.5~40															
	50.5~ 75																
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	40.5~ 50	40.5~60															
	50.5~ 75																
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	60.5~ 75	60.5~80															
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	80.5~100	80.5~100															
	100.5~200		×														
	200.5~500		×														
	100.5~125	100.5~125	×														
	125.5~200		×														
	200.5~500		×														
	125.5~200	125.5~150	×														
	200.5~500		×														
	150.5~200	150.5~160	×														
	200.5~500		×														
	160.5~200	160.5~200	×	×													
	200.5~500		×	×													
	200.5~500	200.5~250	×	×													
	250.5~500	250.5~300	×	×													

PCR_ _

All Surfaces Milled Top / Bottom Rotary Ground

For Large Size, refer to P.1638

Part Number	A	B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
	20 ~ 50	20~25															
	50.5~ 75																
	75.5~100																
	100.5~250		×														
	25.5~ 50	25.5~40															
	50.5~ 75																
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	40.5~ 50	40.5~60															
	50.5~ 75																
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	60.5~ 75	60.5~80															
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	80.5~100	80.5~100															
	100.5~200		×														
	200.5~500		×														
	100.5~125	100.5~125	×														
	125.5~200		×														
	200.5~500		×														
	125.5~200	125.5~150	×														
	200.5~500		×														
	150.5~200	150.5~160	×														
	200.5~500		×														
	160.5~200	160.5~200	×	×													
	200.5~500		×	×													
	200.5~500	200.5~250	×	×													
	250.5~500	250.5~300	×	×													

PCS_ _

All Surfaces Milled Top / Bottom Surfaced

For Large Size, refer to P.1638

Part Number	A	B \ T	4, 4.5	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
	20 ~ 50	20~25															
	50.5~ 75																
	75.5~100																
	100.5~250		×														
	25.5~ 50	25.5~40															
	50.5~ 75																
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	40.5~ 50	40.5~60															
	50.5~ 75																
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	60.5~ 75	60.5~80															
	75.5~100																
	100.5~200		×														
	200.5~500		×														
	80.5~100	80.5~100															
	100.5~200		×														
	200.5~500		×														
	100.5~125	100.5~125	×														
	125.5~200		×														
	200.5~500		×														
	125.5~200	125.5~150	×														
	200.5~500		×														
	150.5~200	150.5~160	×														
	200.5~500		×														
	160.5~200	160.5~200	×	×													
	200.5~500		×	×													
	200.5~500	200.5~250	×	×													
	250.5~500	250.5~300	×	×													

1.1206/C50E Configurable Plates

Annealed 1.1191/C45E or JIS S48C are used as materials for some large sizes.

Price

(Ex) When L–PCFQM–1000.5–301–20.5

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
1000.5	x	30.1	=	301,10 €

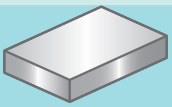
Volume Discount (Round down to ten Cent.) P.87

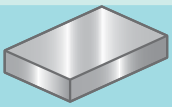
Quantity	1~10
Rate	€ Unit Price

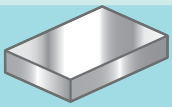
For orders larger than indicated quantity, please request a quotation.

Large Size — All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50
L-PCF_	500.5~ 600	100~125	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	125.5~150															
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	500.5~ 600	150.5~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	160.5~200															
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	500.5~ 600	200.5~250	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~1200																
	1200.5~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~1600																
	1600.5~1800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	250.5~300															
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	1000.5~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~1400																
	1400.5~1600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1600.5~1800																
	1800.5~2000		✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■	■
	300.5~ 500	300.5~400															
	500.5~ 600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~1200																
	1200.5~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~1600																
	1600.5~1800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1800.5~2000		✕	✕	✕	✕											
	400.5~ 500	400.5~500	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600																
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	1000.5~1200		✕	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~1400		✕														
	1400.5~1600		✕	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	1600.5~1800		✕	✕	✕	✕											
	1800.5~2000		✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	500.5~600															
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	1000.5~1200		✕	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~1400		✕	✕	✕	✕											
	1400.5~1600		✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■	■
	1600.5~1800		✕	✕	✕	✕											
	1800.5~2000		✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800	600.5~800															
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~1200		✕	✕													
	1200.5~1400		✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■	■
	1400.5~1600		✕	✕	✕	✕											
	1600.5~1800		✕	✕	✕	✕	■	■	■	■	■	■	■	■	■	■	■
	1800.5~2000		✕	✕	✕	✕											


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced

Price Reduction
6% on average

■Large Size　All Surfaces Milled Top/Bottom Rotary Ground A, B, T 0.5mm Increment

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
L-PCR_ _	500.5~ 600	100~125	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	125.5~150															
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	500.5~ 600	150.5~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	160.5~200															
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	500.5~ 600	200.5~250	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~1200																
	1200.5~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	250.5~300															
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	1000.5~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~1400																
	300.5~ 500	300.5~400	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600																
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	1000.5~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~1400																
	400.5~ 500	400.5~500	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600																
	600.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000																
	1000.5~1200		▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~1400		▨	▨													
	500.5~ 600	500.5~600	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800																
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~1200		▨	▨													
	1200.5~1400		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 800	600.5~800															
	800.5~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1000.5~1200		▨	▨													
	1200.5~1400		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	800.5~1000	800.5~1000	▨	▨	▨	▨											
	1000.5~1200		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1200.5~1400		▨	▨	▨	▨											

■Large Size　All Surfaces Milled Top / Bottom Surfaced A, B, T 0.5mm Increment

Part Number	A 0.5mm Increment	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
L-PCS_ _	500.5~800	100.5~125	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800	125.5~150															
	500.5~800	150.5~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800	160.5~200															
	500.5~800	200.5~250	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800	250.5~300															
	300.5~500	300.5~400	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800																
	400.5~500	400.5~500	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	500.5~800																

1.1206/C50E Configurable Plates

Annealed 1.1191/C45E or JIS S48C are used as materials for some large sizes.

Price

(Ex.) LSC2FQ-1001-301-20.5

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1001	x	29.1Cent	=	291,20 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Standard Size — Top/Bottom Milled (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

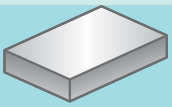
A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+10}_{+3}$

Part Number	A 1mm Increment	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
SC2F_	20~ 50	20~25	■	■	■	■	■	■	■	■	■	■	⊠	⊠	⊠	⊠
	51~ 75												⊠	⊠	⊠	⊠
	76~100		■	■	■	■	■	■	■	■	■	■	⊠	⊠	⊠	⊠
	101~250												⊠	⊠	⊠	⊠
	26~ 50	26~40	■	■	■	■	■	■	■	■	■	■	■	■	⊠	⊠
	51~ 75														⊠	⊠
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	⊠	⊠
	101~200														⊠	⊠
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	⊠	⊠
	41~ 50	41~60														
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	61~ 75	61~80	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	81~100	81~100	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200															
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~125	101~125														
	126~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	126~200	126~150	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	151~200	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	161~200	161~200	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500		⊠													
	201~500	201~250	⊠	■	■	■	■	■	■	■	■	■	■	■	■	■
	251~500	250~300	⊠													

Large Size — Top/Bottom Milled (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance $^{+5}_{0}$ B Dimension Tolerance $^{+5}_{0}$

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50
L-SC2F_	501~ 600	100~125	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	126~150															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	501~ 600	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	161~200															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	501~ 600	201~250	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200																
	1201~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600																
	1601~1800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1801~2000		⊠	⊠	⊠	⊠											


Top/Bottom Milled

Price Reduction
Up to 6%

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50
L-SC2F_	501~ 600	251~300	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200																
	1201~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600																
	1601~1800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1801~2000		▨	▨	▨	▨											
	301~ 500	301~400	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600																
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400																
	1401~1600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1601~1800																
	1801~2000		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	401~ 500	401~500															
	501~ 600		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		▨														
	1201~1400		▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1401~1600		▨	▨													
	1601~1800		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1801~2000		▨	▨	▨	▨											
	501~ 600	501~600	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		▨	▨													
	1201~1400		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1401~1600		▨	▨	▨	▨											
	1601~1800		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1801~2000		▨	▨	▨	▨											
	601~ 800	601~800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	1001~1200		▨	▨	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨	▨	▨											
	1401~1600		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1601~1800		▨	▨	▨	▨											
	1801~2000		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	801~1000	801~1000	▨	▨	▨	▨											
	1001~1200		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨	▨	▨											
	1401~1600		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1601~1800		▨	▨	▨	▨											
	1801~2000		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1001~1200	1001~1200	▨	▨	▨	▨											
	1201~1400		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1401~1600		▨	▨	▨	▨											
	1601~1800		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1801~2000		▨	▨	▨	▨											

1.1206/C50E Configurable Plates Price List

Annealed 1.1191/C45E or JIS S48C are used as materials for some large sizes.

Price

(Ex.) When L–SC2RGQ–1001–301–20.5

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
1001	x	31 Cent	=	310,30€

Volume Discount (Round down to ten Cent.) P.88

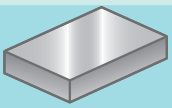
Quantity	1~10
Rate	€ Unit Price

For orders larger than indicated quantity, please request a quotation.

Standard Size Top/Bottom Rotary Ground (4-Side not finished) A · B 1mm Increment T 0.5mm Increment

A Dimension Tolerance +5 0 B Dimension Tolerance +10 +3

Part Number	A 1mm Increment	T / B	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35	35.5~40	40.5~45	45.5~50
SC2RG_	20~ 50	20~25	■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	51~ 75												✕	✕	✕	✕
	76~100		■	■	■	■	■	■	■	■	■	■	✕	✕	✕	✕
	101~250												✕	✕	✕	✕
	26~ 50	26~40	■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	51~ 75														✕	✕
	76~100		■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	101~200														✕	✕
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	✕	✕
	41~ 50	41~60														
	51~ 75		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	61~ 75	61~80	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	76~100															
	101~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	81~100	81~100	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~200															
	201~500		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	101~125	101~125														
	126~200		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	126~200	126~150	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
	151~200	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500															
For Large Size, refer to P.1642	161~200	161~200	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	201~500		✕													
	201~500	201~250	✕	■	■	■	■	■	■	■	■	■	■	■	■	■
	251~500	251~300	✕													



Top/Bottom Rotary Ground

Price Reduction

Up to 6%

L-SC2RG_

Large Size

Top/Bottom Rotary Ground (4-Side not finished) A, B 1mm Increment T 0.5mm Increment

A Dimension Tolerance +5 0

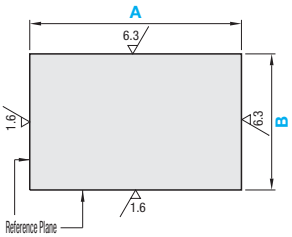
B Dimension Tolerance +10 +3

Part Number	A	B \ T	10~11.5	12~13.5	14~16.5	17~20.5	21~22.5	23~25.5	26~28.5	29~30.5	31~35.5	36~39.5	40, 40.5	41~44.5	45, 45.5	46~49.5	50.0
L-SC2RG_	501~ 600	100~125	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	126~150															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~ 1000																
	501~ 600	151~160	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	161~200															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~1000																
	501~ 600	201~250	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200																
	1201~1400		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600	251~300															
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~ 1000																
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400																
	301~ 500	301~400	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600																
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~ 1000																
	1001~1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400																
	401~ 500	401~500	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	501~ 600																
	601~ 800		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	801~ 1000																
	1001~1200		▨	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨													
	501~ 600	501~600	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	601~ 800																
	801~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		▨	▨													
	1201~1400		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	601~ 800	601~800															
	801~ 1000		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1001~1200		▨	▨													
	1201~1400		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	801~ 1000	801~1000	▨	▨	▨	▨											
	1001~1200		▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■	■
	1201~1400		▨	▨	▨	▨											

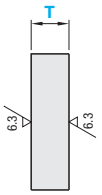
1.1203/C55E normalized Configurable Plates



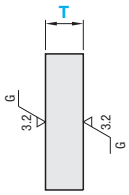
P55_ _ _



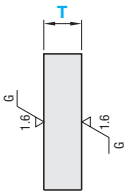
(Milling) P55F_ _



(Rotary Grinding) P55R_ _



(Surface Grinding) P55S_ _



M Material: 1.1203/C55E normalized

Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B A≥B	T
P55	F(Milling) R(Rotary Grinding) S(Surface Grinding)	P Q N M	P Q N M	20~500	20~300	8~30

(1) Plate Thickness Tolerance

2-Surface Finish	P	Q	N	M
F (Milling)	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
R (Rotary Grinding)	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
S (Surface Grinding)	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) R (Rotary Grinding) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish F (Milling)	R (Rotary Grinding)	S (Surface Grinding)
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~30	0.05	0.012	0.012
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering		C0.2~C0.5		

Order Example

Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
P55	F	Q	M	-	50	-	30	-	14

Days to Ship

•P55F_ _

8 Days — Express A 4,00 EUR/ piece — P.88

A Express Charge of 10,80 EUR for 3 or more identical pieces.

•P55R_ _

8 Days — Express A 8,00 EUR/ piece — P.88

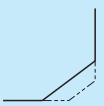
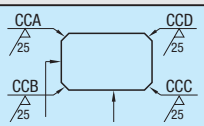
A Express Charge of 21,60 EUR for 3 or more identical pieces.

•P55S_ _

8 Days

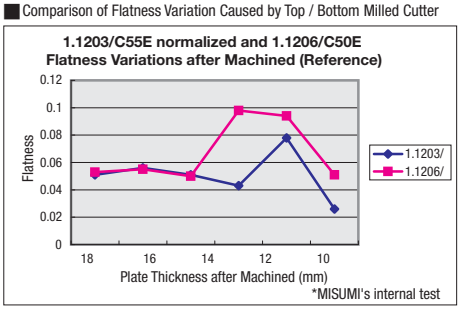
Alterations

Part Number	-	A	-	B	-	T	-(CSC / CBC / CCA / etc.)
P55RNM	-	300	-	280	-	20	- CBC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5 ···› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5 ···› C0.5~C1.0	Arbitrary corner can be cut. 1≤Corner Cut≤50 1mm Increment C≤A/2, B/2 Ordering Code (Example)(Ex.) When the corners of A and D are cut by C5, ···›CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

1mm Increment	Price Adder
1~5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

■ Comparison of Flatness Variation Caused by Top / Bottom Milled Cutter

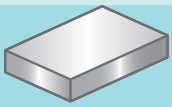


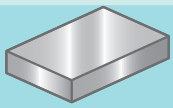
[Testing Method]1.1203/C55E normalized and 1.1206/C50E (205mmx205mmx19mm) are placed on the same table, and machined with a milling path of 2mm at the same time. Each of the flatness is then measured with a three-dimensional measuring instrument.

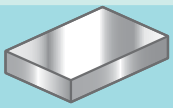
Although it is assumed that 1.1203/C55E has higher internal stress than 1.1206/C50E, the test results show that normalized 1.1203/C55E, or 1.1203/C55E normalized, has as low internal stress as 1.1206/C50E.

■ Features of 1.1203/C55E normalized

Normalized 1.1203/C55E, which relieves its internal stress.
Added free-cutting elements enhance its machinability.
It has higher mechanical strength than 1.1206/C50E.


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced

Price

(Example)P55FQM-50-30-14

A Dimension	X	Area € Unit Price	=	Price (Round down to ten Cent.)
50	X	16	=	8,00 €

■Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

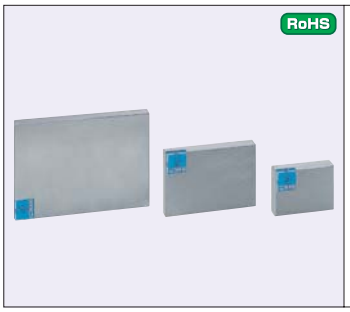
For orders larger than indicated quantity, please request a quotation.

Part Number	A	B \ T	8~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30
P55F_ _	20~ 50	20~25									
	50.5~ 75										
	75.5~100										
	100.5~250										
	25.5~ 50	255.5~40									
	50.5~ 75										
	75.5~100										
	100.5~200										
	200.5~500										
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~100										
	100.5~200										
	200.5~500										
	60.5~ 75	60.5~80									
	75.5~100										
	100.5~200										
	200.5~500										
	80.5~100	80.5~100									
	100.5~200										
	200.5~500										
	100.5~125	100.5~125									
	125.5~200										
	200.5~500										
	125.5~200	125.5~150									
	200.5~500										
	150.5~200	150.5~160									
	200.5~500										
	160.5~200	160.5~200									
	200.5~500										
	200.5~500	200.5~250									
	250.5~500	250.5~300									

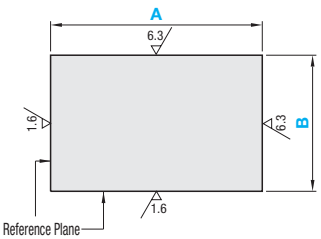
Part Number	A	B \ T	8~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30
P55R_ _	20~ 50	20~25									
	50.5~ 75										
	75.5~100										
	100.5~250										
	25.5~ 50	255.5~40									
	50.5~ 75										
	75.5~100										
	100.5~200										
	200.5~500										
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~100										
	100.5~200										
	200.5~500										
	60.5~ 75	60.5~80									
	75.5~100										
	100.5~200										
	200.5~500										
	80.5~100	80.5~100									
	100.5~200										
	200.5~500										
	100.5~125	100.5~125									
	125.5~200										
	200.5~500										
	125.5~200	125.5~150									
	200.5~500										
	150.5~200	150.5~160									
	200.5~500										
	160.5~200	160.5~200									
	200.5~500										
	200.5~500	200.5~250									
	250.5~500	250.5~300									

Part Number	A	B \ T	8~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30
P55S_	20~ 50	20~25									
	50.5~ 75										
	75.5~100										
	100.5~250										
	25.5~ 50	255.5~40									
	50.5~ 75										
	75.5~100										
	100.5~200										
	200.5~500										
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~100										
	100.5~200										
	200.5~500										
	60.5~ 75	60.5~80									
	75.5~100										
	100.5~200										
	200.5~500										
	80.5~100	80.5~100									
	100.5~200										
	200.5~500										
	100.5~125	100.5~125									
	125.5~200										
	200.5~500										
	125.5~200	125.5~150									
	200.5~500										
	150.5~200	150.5~160									
	200.5~500										
	160.5~200	160.5~200									
	200.5~500										
	200.5~500	200.5~250									
	250.5~500	250.5~300									

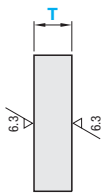
JIS-SKS93 Configurable Plates (For Oil-Quenching)



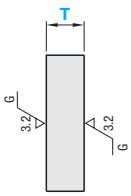
PK_ _ _



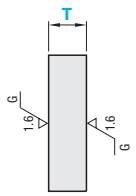
(Milling) **PKF_ _**



(Rotary Grinding) **PKR_ _**



(Surface Grinding) **PKS_ _**



M Material: JIS SKS93 (For Oil-Quenching)

Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B	T
				A≥B		
PK	F(Milling) R(Rotary Grinding) S(Surface Grinding)	H P Q N M	P Q N M	20~500	20~300	5~35

(1) Plate Thickness Tolerance

2-Surface Finish	H	P	Q	N	M
F (Milling)	+0.3~+0.5	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
R (Rotary Grinding)	+0.3~+0.5	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
S (Surface Grinding)	+0.2~+0.3	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A · B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) R (Rotary Grinding) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish		
		F	R	S
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T5~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~35	0.05	0.012	0.012
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering		C0.2~C0.5		

Order Example

Part Number									
Type	2-Surface Finish	Plate Thickness Tolerance	A · B Dimension Tolerance		A		B		T
PK	F	Q	M	-	120	-	120	-	24

Days to Ship

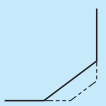
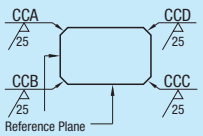
- PKF_ _ A (Length) 300mm or less: **6 Days** P.88
- PKF_ _ A (Length) 300.5mm or more: **8 Days**
- PKR_ _: **8 Days** P.88
- PKS_ _: **8 Days**

A Express Charge of 21,60 EUR for 3 or more identical pieces.

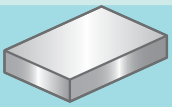
Alterations

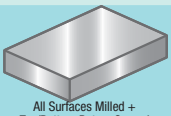
Part Number - A - B - T -(CSC · CBC · CCA,etc.)

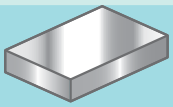
- 300 - 280 - 20 - CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.5~C1.0	Cuts any corners. 1≤ Corner Cut ≤501mm Increment $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Example)When the corners of A and D are cut by C5 ⋯›CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

1mm Increment	Price Adder
1~5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced

Price

(Ex.) When PKFQM–120–120–24

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
120	x	20 Cent	=	24,00€

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PKF_ _	20~ 50	20~25											
	50.5~ 75												
	75.5~100												
	100.5~250												
	25.5~ 50	255.5~40											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	40.5~ 50	40.5~60											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	60.5~ 75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~500												
	80.5~100	80.5~100											
	100.5~200												
	200.5~500												
	100.5~125	100.5~125											
	125.5~200												
	200.5~500												
	125.5~200	125.5~150											
	200.5~500												
	150.5~200	150.5~160											
	200.5~500												
	160.5~200	160.5~200											
	200.5~500												
	200.5~500	200.5~250											
	250.5~500	250.5~300											

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PKR_ _	20~ 50	20~25											
	50.5~ 75												
	75.5~100												
	100.5~250												
	25.5~ 50	255.5~40											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	40.5~ 50	40.5~60											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	60.5~ 75	60.5~80											
	75.5~100												
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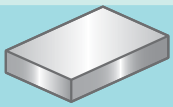
	80.5~100	80.5~100											
	100.5~200												
	200.5~500												
	100.5~125	100.5~125											
	125.5~200												
	200.5~500												
	125.5~200	125.5~150											
	200.5~500												
	150.5~200	150.5~160											
	200.5~500												
	160.5~200	160.5~200											
	200.5~500												
	200.5~500	200.5~250											
	250.5~500	250.5~300											

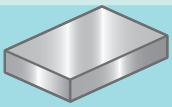
Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PKS_ _	20~ 50	20~25											
	50.5~ 75												
	75.5~100												
	100.5~250												
	25.5~ 50	255.5~40											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	40.5~ 50	40.5~60											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	60.5~ 75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~500												
	80.5~100	80.5~100											
	100.5~200												
	200.5~500												
	100.5~125	100.5~125											
	125.5~200												
	200.5~500												
	125.5~200	125.5~150											
	200.5~500												
	150.5~200	150.5~160											
	200.5~500												
	160.5~200	160.5~200											
	200.5~500												
	200.5~500	200.5~250											
	250.5~500	250.5~300											

Add. Spec.

Special Steel Configurable Plates

-1.2510/100MnCrW4 / 1.2379/X155CrVMo12-1 / DC53® (Daido Steel)


All Surfaces Milled


Top/Bottom Rotary Ground



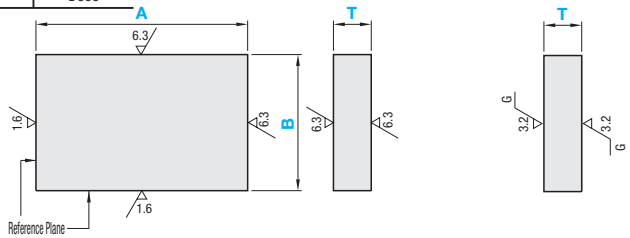
RoHS

Part Number	Material
PSKS3___	1.2510
PSKD11___	1.2379
PDC53___	DC53

PSKS3___
PSKD11___
PDC53___

(Milling)
PSKS3F_ _
PSKD11F_ _
PDC53F_ _

(Rotary Grinding)
PSKS3R__
PSKD11R__
PDC53R__



Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B	T
				A≥B		
PSKS3 PSKD11 PDC53	F(Milling) R(Rotary Grinding)	H P Q N M	P Q N M	20~500	20~300	5~35

(1) Plate Thickness Tolerance

2-Surface Finish	H	P	Q	N	M
F (Milling)	+0.3~+0.5	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
R (Rotary Grinding)	+0.3~+0.5	+0.1~+0.3	0~+0.2	±0.1	-0.2~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) R (Rotary Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Order Example

Part Number								
Type	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
PSKS3F	Q	M	-	255	-	155	-	18

Days to Ship

- PSKS3F_ _, PSKD11F_ _
- A (Length) 300mm or less

6 Days P.88

- A (Length) 300.5mm or more

8 Days

- PDC53F_ _

8 Days | Express A | 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Accuracy Standards

(Max. Value)

Item		2-Surface Finish F	2-Surface Finish R
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5~7.5	0.1	0.05
	T8~15.5	0.07	0.03
	T16~25.5	0.05	0.015
	T26~35	0.05	0.012
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		C0.2~C0.5	C0.2~C0.5

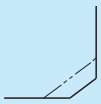
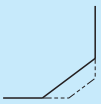
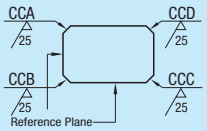
- PSKS3R_ _ / PSKD11R_ _ / PDC53R_ _

8 Days | Express A | 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alter-ations

Part Number	-	A	-	B	-	T	-(CSC / CBC / CCA / etc.)
PSKS3FNM	-	300	-	200	-	20	- CSC

Alter-ations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.5~C1.0	Cuts any corners. 1≤ Corner Cut ≤501mm Increment C≤ A/2 , B/2 Ordering Code (Example)When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

1mm Increment	Price Adder
1~5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

■Features of 1.2510/100MnCrW4
It has good machinability as spheroidizing annealing is applied.
Higher hardenability and less heat-treating distortion than JIS SKS93.

■Features of 1.2379/X155CrVMo12-1
High hardenability. Both vacuum quenching and air quenching are applicable.
Heat-treating distortion is very little.
High Abrasion Resistance.

■Features of DC53® (Daido Steel)
Tougher than 1.2379/X155CrVMo12-1.
Strength equal to 1.2379/X155CrVMo12-1 is obtained by low-temperature annealing, strength equal to 62HRC is obtained by high-temperature annealing.
Good machinability and grindability.

Price Reduction
Up to 3%
PSKS3F_ _

Price

(Ex.) When PSKS3FQM–255–165–18

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255	x	37.8 Cent	=	96,30 €

■Volume Discount (Round down to ten Cent.) P.87

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

■1.2510/100MnCrW4

For 1.2379/X155CrVMo12-1, refer to P.1649, for DC53® (Daido Steel), refer to P.1650.

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PSKS3F_ _	20~ 50	20~25											
	50.5~ 75												
	75.5~100												
	100.5~250												
	25.5~ 50	255.5~40											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	40.5~ 50	40.5~60											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	60.5~ 75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~500												
	80.5~100	80.5~100											
	100.5~200												
	200.5~500												
	100.5~125	100.5~125											
	125.5~200												
	200.5~500												
	125.5~200	125.5~150											
	200.5~500												
	150.5~200	150.5~160											
	200.5~500												
	160.5~200	160.5~200											
	200.5~500												
	200.5~500	200.5~250											
	250.5~500	250.5~300											

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PSKS3R__	20~ 50	20~25											
	50.5~ 75												
	75.5~100												
	100.5~250												
	25.5~ 50	255.5~40											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	40.5~ 50	40.5~60											
	50.5~ 75												
	75.5~100												
	100.5~200												
	200.5~500												
	60.5~ 75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~500												
	80.5~100	80.5~100											
	100.5~200												
	200.5~500												
	100.5~125	100.5~125											
	125.5~200												
	200.5~500												
	125.5~200	125.5~150											
	200.5~500												
	150.5~200	150.5~160											
	200.5~500												
	160.5~200	160.5~200											
	200.5~500												
	200.5~500	200.5~250											
	250.5~500	250.5~300											

Special Steel Configurable Plates Price List

-1.2510/100MnCrW4 / 1.2379/X155CrVMo12-1 / DC53® (Daido Steel)-

Price

(Ex.) When PSKD11FQM-255-165-18

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	45.1 Cent	=	115,00 €

Volume Discount (Round down to ten Cent.) P.88

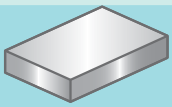
Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

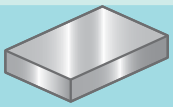
SKD11

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PSKD11_ _	20 ~50	20~25											
	50.5~75												
	75.5~100												
	100.5~250												
	25.5~50	255.5~40											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~500												
	40.5~50	40.5~60											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~500												
	60.5~75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~500												
	80.5~100	80.5~100											
	100.5~200												
	200.5~500												
	100.5~125	100.5~125											
	125.5~200												
	200.5~500												
	125.5~200	125.5~150											
	200.5~500												
	150.5~200	150.5~160											
	200.5~500												
	160.5~200	160.5~200											
	200.5~500												
	200.5~500	200.5~250											
	250.5~500	250.5~300											

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PSKD11__	20 ~50	20~25											
	50.5~75												
	75.5~100												
	100.5~250												
	25.5~50	255.5~40											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~500												
	40.5~50	40.5~60											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~500												
	60.5~75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~500												
	80.5~100	80.5~100											
	100.5~200												
	200.5~500												
	100.5~125	100.5~125											
	125.5~200												
	200.5~500												
	125.5~200	125.5~150											
	200.5~500												
	150.5~200	150.5~160											
	200.5~500												
	160.5~200	160.5~200											
	200.5~500												
	200.5~500	200.5~250											
	250.5~500	250.5~300											



All Surfaces Milled



All Surfaces Milled + Top/Bottom Rotary Ground

Price Reduction
15% on average
PSKD11F_ _

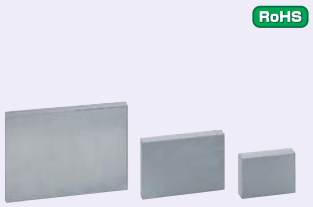
Price Reduction
3% on average
PDC53F_ _

■DC53

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PDC53F_ _	20 ~50	20~25	○	○	○	○	○	○	○	○	○	○	×
	50.5~75		○	○	○	○	○	○	○	○	○	○	×
	75.5~100		○	○	○	○	○	○	○	○	○	○	×
	100.5~250		×	×									×
	25.5~50	255.5~40	○	○	○	○	○	○	○	○	○	○	×
	50.5~75												×
	75.5~100		○	○	○	○	○	○	○	○	○	○	×
	100.5~200		×										×
	200.5~500		×	×	○	○	○	○	○	○	○	○	×
	40.5~50	40.5~60											×
	50.5~75		○	○	○	○	○	○	○	○	○	○	×
	75.5~100												×
	100.5~200		×	○	○	○	○	○	○	○	○	○	×
	200.5~500		×	×							×	×	×
	60.5~75	60.5~80	○	○	○	○	○	○	○	○	○	○	○
	75.5~100												
	100.5~200		×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	80.5~100	80.5~100	○	○	○	○	○	○	○	○	○	○	○
	100.5~200		×										
	200.5~500		×	×	○	○	○	○	○	○	○	○	○
	100.5~125	100.5~125	×										
	125.5~200		×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	125.5~200	125.5~150	×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	150.5~200	150.5~160	×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	160.5~200	160.5~200	×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×	×								
	200.5~500	200.5~250	×	×	×	○	○	○	○	○	○	○	○
	250.5~500	250.5~300	×	×	×								

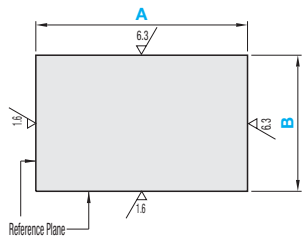
Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
PDC53R__	20 ~50	20~25	○	○	○	○	○	○	○	○	○	○	×
	50.5~75		○	○	○	○	○	○	○	○	○	○	×
	75.5~100		○	○	○	○	○	○	○	○	○	○	×
	100.5~250		×	×									×
	25.5~50	255.5~40	○	○	○	○	○	○	○	○	○	○	×
	50.5~75												×
	75.5~100		○	○	○	○	○	○	○	○	○	○	×
	100.5~200		×										×
	200.5~500		×	×	○	○	○	○	○	○	○	○	×
	40.5~50	40.5~60											×
	50.5~75		○	○	○	○	○	○	○	○	○	○	×
	75.5~100												×
	100.5~200		×	○	○	○	○	○	○	○	○	○	×
	200.5~500		×	×							×	×	×
	60.5~75	60.5~80	○	○	○	○	○	○	○	○	○	○	○
	75.5~100												
	100.5~200		×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	80.5~100	80.5~100	○	○	○	○	○	○	○	○	○	○	○
	100.5~200		×										
	200.5~500		×	×	○	○	○	○	○	○	○	○	○
	100.5~125	100.5~125	×										
	125.5~200		×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	125.5~200	125.5~150	×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	150.5~200	150.5~160	×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×									
	160.5~200	160.5~200	×	○	○	○	○	○	○	○	○	○	○
	200.5~500		×	×	×								
	200.5~500	200.5~250	×	×	×	○	○	○	○	○	○	○	○
	250.5~500	250.5~300	×	×	×								

1.7220/34CrMo4 Configurable Plates

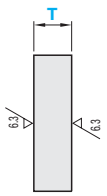


RoHS

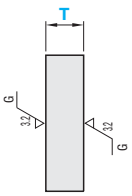
SCM440___



(Milling) **SCM440F__**



(Rotary Grinding) **SCM440R__**



Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B A≥B	T
SCM440	F(Milling) R(Rotary Grinding)	H P Q N M	P Q N M	20~300	20~300	5~35

(1) Plate Thickness Tolerance

2-Surface Finish	H	P	Q	N	M
F (Milling)	+0.3~+0.5	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
R (Rotary Grinding)	+0.3~+0.5	+0.1~+0.3	0~+0.2	±0.1	-0.2~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) R (Rotary Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

■Accuracy Standards

(Max. Value)

Item		2-Surface Finish F	2-Surface Finish R
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5~7.5	0.1	0.05
	T8~15.5	0.07	0.03
	T16~25.5	0.05	0.015
	T26~35	0.05	0.012
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		C0.2~C0.5	

Order Example

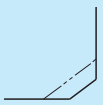
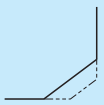
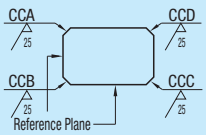
Part Number										
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
SCM440	F	Q	M	-	120	-	120	-	24

Days to Ship

8 Days

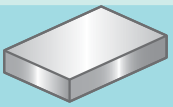
Alterations

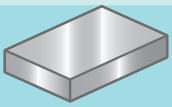
Part Number		A	-	B	-	T	-(CSC/CBC/CCA/etc.)
SCM440FNN	-	300	-	280	-	20	- CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.5~C1.0	Cuts any corners. 1≤ Corner Cut ≤501mm Increment $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Example)When the corners of A and D are cut by C5 ⋯›CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

■Features of 1.7220/34CrMo4
Tough steel alloy with Molybdenum added to Chrome Steel. Excels in toughness and abrasion resistance.


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground

Price

(Ex.) When SCM440F QM-120-120-24

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
120	x	28 Cent	=	33,60 €

■Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

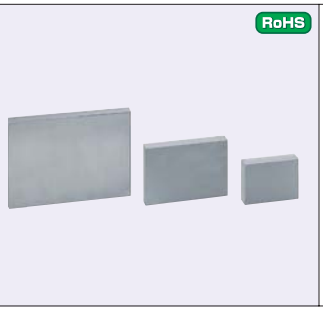
SCM440F__

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
	20 ~50	20~25											
	50.5~75												
	75.5~100												
	100.5~250												
	25.5~50	255.5~40											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~300												
	40.5~50	40.5~60											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~300												
	60.5~75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~300												
	80.5~100	80.5~100											
	100.5~125												
	125.5~200												
	200.5~300												
	100.5~125	100.5~125											
	125.5~200												
	200.5~300												
	125.5~200	125.5~150											
	200.5~300												
	150.5~200	150.5~160											
	200.5~300												
	160.5~200	160.5~200											
	200.5~300												

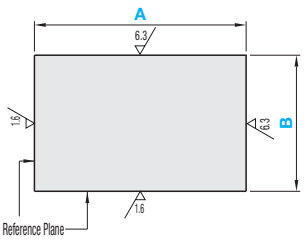
SCM440R__

Part Number	A	B \ T	5~7	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~30	30.5~35
	20 ~50	20~25											
	50.5~75												
	75.5~100												
	100.5~250												
	25.5~50	25.5~40											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~300												
	40.5~50	40.5~60											
	50.5~75												
	75.5~100												
	100.5~200												
	200.5~300												
	60.5~75	60.5~80											
	75.5~100												
	100.5~200												
	200.5~300												
	80.5~100	80.5~100											
	100.5~125												
	125.5~200												
	200.5~300												
	100.5~125	100.5~125											
	125.5~200												
	200.5~300												
	125.5~200	125.5~150											
	200.5~300												
	150.5~200	150.5~160											
	200.5~300												
	160.5~200	160.5~200											
	200.5~300												

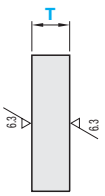
1.3343/S6-5-2 Configurable Plates



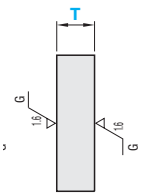
PSKH51___



(Milling) PSKH51F__



(Surface Grinding) PSKH51S__



Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B A≥B	T
PSKH51	F (Milling) S (Surface Grinding)	H P Q N M	P Q N M	15~300	10~200	5~60

(1) Plate Thickness Tolerance

2-Surface Finish	H	P	Q	N	M
F (Milling)	+0.3~+0.5	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
S (Surface Grinding)	+0.2~+0.3	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish F	2-Surface Finish S
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5~7.5	0.1	0.05
	T8~15.5	0.07	0.03
	T16~25.5	0.05	0.015
	T26~35	0.05	0.012
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		C0.2~C0.5	

Order Example

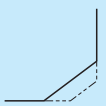
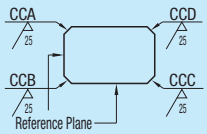
Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
PSKH51	F	Q	M	-	120	-	120	-	24
PSKH51	S	N	N	-	120	-	120	-	24

Days to Ship: 8 Days

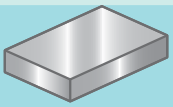
Alterations

Part Number - A - B - T -(CSC / CBC / CCA / etc.)

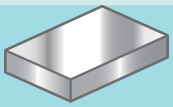
PSKH51FNM - 300 - 100 - 20 - CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.5~C1.0	Cuts any corners. 1≤ Corner Cut ≤501mm Increment $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Example)When the corners of A and D are cut by C5 ⋯›CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00



All Surfaces Milled



All Surfaces Milled + Top/Bottom Surfaced

Price

(Ex.) When PSKH51FQN-120-120-24

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
120	x	101 Cent	=	121,20 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Part Number	A	B	T	5	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~29.5	30~34.5	35~35.5	40~44.5	45~49.5	50~54.5	55~60
PSKH51 F_	15 ~50	10~25																	
	50.5~75																		
	75.5~100																		
	100.5~150																		
	25.5~50	25.5~40																	
	50.5~75																		
	75.5~100																		
	100.5~200																		
	200.5~300																		
	40.5~50	40.5~60																	
	50.5~75																		
	75.5~100																		
	100.5~200																		
	200.5~300																		
	60.5~75	60.5~80																	
	75.5~100																		
	100.5~200																		
	200.5~300																		
	80.5~100	80.5~100																	
	100.5~125																		
	125.5~200																		
	200.5~300																		
	100.5~125	100.5~125																	
	125.5~200																		
	200.5~300																		
	125.5~200	125.5~150																	
	200.5~300																		
	150.5~200	150.5~160																	
	200.5~300																		
	160.5~200	160.5~200																	
	200.5~300																		

Part Number	A	B	T	5	7.5~9	9.5~11	11.5~13	13.5~16	16.5~20	20.5~22	22.5~25	25.5~28	28.5~29.5	30~34.5	35~35.5	40~44.5	45~49.5	50~54.5	55~60
PSKH51 S_	15 ~50	10~25																	
	50.5~75																		
	75.5~100																		
	100.5~150																		
	25.5~50	25.5~40																	
	50.5~75																		
	75.5~100																		
	100.5~200																		
	200.5~300																		
	40.5~50	40.5~60																	
	50.5~75																		
	75.5~100																		
	100.5~200																		
	200.5~300																		
	60.5~75	60.5~80																	
	75.5~100																		
	100.5~200																		
	200.5~300																		
	80.5~100	80.5~100																	
	100.5~125																		
	125.5~200																		
	200.5~300																		
	100.5~125	100.5~125																	
	125.5~200																		
	200.5~300																		
	125.5~200	125.5~150																	
	200.5~300																		
	150.5~200	150.5~160																	
	200.5~300																		
	160.5~200	160.5~200																	
	200.5~300																		

Pre-Hardening Steel Configurable Plates

-PX5 ~1.2316/X36CrMo17 / PX5 (PXA30) / NAK55-

Price Reduction
3% on average
PG-STARF_ _ / PPX5F_ _ / PNAK55F_ _

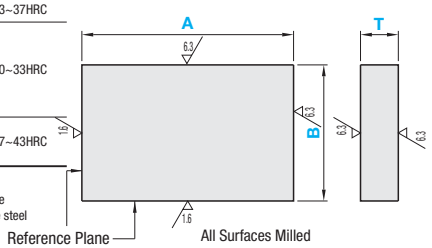


RoHS

※NAK55 Plate has no ID label for a datum plane for perpendicularity is guaranteed for each plane.

Part Number	M Material	H Hardness
PG-STARF	G-STAR	33~37HRC
PPX5F	PX5 ~1.2316/ X36CrMo17 ~1.2316/ X36CrMo17 ~1.2316/ X36CrMo17 (PXA30)	30~33HRC
PNAK55F	NAK55® Daido Steel	37~43HRC

※PX5 ~1.2316/X36CrMo17 ~1.2316/ X36CrMo17 ~1.2316/X36CrMo17 will be replaced with PXA30 in order, due to the steel grade shift of the manufacturer.



Part Number			1mm Increment		
Type	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B A≥B	T
PG-STARF PPX5F	P Q N M	P Q N M	50~500	20~200	5~40
PNAK55F			50~300		

(1) Plate Thickness Tolerance

P	Q	N	M
+0.1~+0.3	0~+0.2	±0.1	-0.2~0

(2) A, B Dimension Tolerance

Type	PG-STARF / PPX5F				PNAK55F			
A, B Dimension	P	Q	N	M	P	Q	N	M
250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0				

Accuracy Standards

(Max. Value)

Item		Standard Value
Thickness Parallelism (per 100mm)		0.05
Flatness (per 100mm)	T5~7	0.1
	T8~15	0.07
	T16~25	0.05
	T26~	0.05
G-STAR PX5 ~1.2316/ X36CrMo17	Perpendicularity of Reference Plane	0.015 per 100mm
NAK55® Daido Steel	Each Plane Perpendicularity	0.015 per 100mm
Circumference Chamfering		C0.2~C0.5

Order Example

Part Number								
Type	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
PG-STARF	Q	M	-	255	-	155	-	18

Days to Ship

8 Days

8 Days | Express A | 8,00 EUR/ piece | P.88

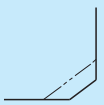
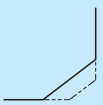
※A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alterations

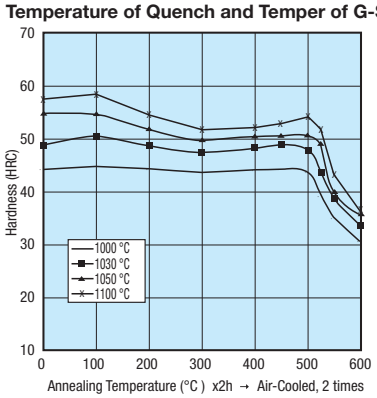
Part Number		A	-	B	-	T	- (CSC / CBC)
PPX5FNN	-	300	-	155	-	20	- CSC

Corrosion Resistance (Reference)

Material	1%HNO3 24h at Room Temperature	Distilled Water 24h at Room Temperature
G-STAR	9.2g/m²h	0g/m²h
PX5 ~1.2316/ X36CrMo17 ~1.2316/ X36CrMo17	16.2g/m²h	0.01g/m²h
NAK55® Daido Steel	18.2g/m²h	0.01g/m²h

Alterations	Circumference Chamfering	
		
Code	CSC	CBC
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.5~C1.0
Price Adder	8,00	8,00

Temperature of Quench and Temper of G-STAR



■Features of G-STAR

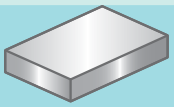
Martensitic Free-Cutting Pre-hardened Stainless Steel with good corrosion resistance. Excels in machinability. Made into high hardness steel by quench and temper. (1,030 quench hardness 48HRC)

■Features of PX5 ~1.2316 X36CrMo17 ~1.2316/X36CrMo17

JIS SCM Pre-Hardening Steel with good machinability and toughness.

■Features of NAK55® Daido Steel

Free-cutting Pre-Hardening Steel with excellent machinability.
Smooth machined surfaces facilitate grinding machining.



All Surfaces Milled

Price (Ex.) When PG–STARFQM–255–165–18

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255	x	60.1 Cent	=	153,20 €

■Volume Discount (Round down to ten Cent.) P.87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

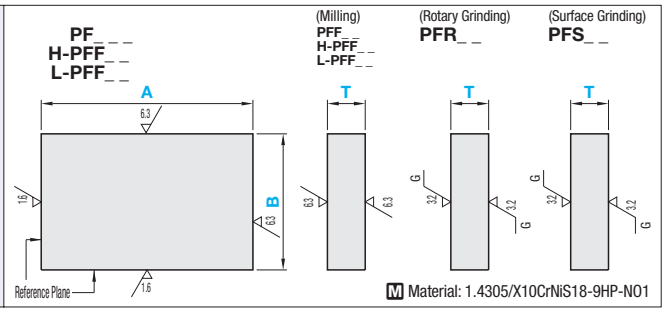
Part Number	A	B \ T	5	6	7, 8	9, 10	11, 12	13~15	16~20	21~25	26~30	31~35	36~40
PG-STARF_ _	50~ 75	20~25	■	■	■	■	■	■	■	■	■	■	■
	76~ 100												
	101~ 200		■	■	■	■	■	■	■	■	■	■	■
	50~ 75	26~40											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	50~ 75	41~60											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	61~ 75	61~80											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	81~ 100	81~100											
	101~ 200		■	■	■	■	■	■	■	■	■	■	■
	201~ 500		▨	▨	▨	▨							
	101~ 125	101~125	▨	▨	■	■	■	■	■	■	■	■	■
	126~ 200		▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■
	126~ 200	126~150	▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■
	151~ 200	151~160	▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■
	161~ 200	161~200	▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■

Part Number	A	B \ T	5	6	7, 8	9, 10	11, 12	13~15	16~20	21~25	26~30	31~35	36~40
PPX5F_ _	50~ 75	20~25	■	■	■	■	■	■	■	■	■	■	■
	76~ 100												
	101~ 200		■	■	■	■	■	■	■	■	■	■	■
	50~ 75	26~40											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	50~ 75	41~60											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	61~ 75	61~80											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	81~ 100	81~100											
	101~ 200		■	■	■	■	■	■	■	■	■	■	■
	201~ 500		▨	▨	▨	▨							
	101~ 125	101~125	▨	▨	■	■	■	■	■	■	■	■	■
	126~ 200		▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■
	126~ 200	126~150	▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■
	151~ 200	151~160	▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■
	161~ 200	161~200	▨	▨									
	201~ 500		▨	▨	▨	▨	■	■	■	■	■	■	■

Part Number	A	B \ T	5	6	7, 8	9, 10	11, 12	13~15	16~20	21~25	26~30	31~35	36~40
PNAK55F_ _	50~ 75	20~25	■	■	■	■	■	■	■	■	■	■	■
	76~ 100												
	101~ 200		■	■	■	■	■	■	■	■	■	■	■
	50~ 75	26~40											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	50~ 75	41~60											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	61~ 75	61~80											
	76~ 100		■	■	■	■	■	■	■	■	■	■	■
	101~ 200												
	201~ 300		■	■	■	■	■	■	■	■	■	■	■
	81~ 100	81~100											
	101~ 200		■	■	■	■	■	■	■	■	■	■	■
	201~ 300		▨	▨	▨	▨							
	101~ 125	101~125	▨	▨	■	■	■	■	■	■	■	■	■
	126~ 200		▨	▨									
	201~ 300		▨	▨	▨	▨	■	■	■	■	■	■	■
	126~ 200	126~150	▨	▨									
	201~ 300		▨	▨	▨	▨	■	■	■	■	■	■	■
	151~ 200	151~160	▨	▨									
	201~ 300		▨	▨	▨	▨	■	■	■	■	■	■	■
	161~ 200	161~200	▨	▨									
	201~ 300		▨	▨	▨	▨	■	■	■	■	■	■	■

1.4305/X10CrNiS18-9 Configurable Plates





Type	2-Surface Finish	Part Number (1) Plate Thickness Tolerance Selection	Part Number (2) A, B Dimension Tolerance Selection	0.5mm Increment A	0.5mm Increment B	0.5mm Increment T
				A≥B		
PF (Standard Size)	F (Milling)	P	P	15~500	10~200	5~ 50
	R (Rotary Grinding)	Q	Q			
	S (Surface Grinding)	N	N			
H-PF (Narrow Size)	F (Milling)	M	M	150~1200	10~19.5	3~ 19.5
L-PF (Large Size)				200.5~1200	20~1000	4~ 50

(1) Plate Thickness Tolerance

2-Surface Finish	A, B Length				
F (Milling)	550mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	550.5mm or more	+0.1~+0.4	0~+0.3	±0.15	-0.3~0
R (Rotary Grinding)	-	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
S (Surface Grinding)	-	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A / B Dimension Tolerance

2-Surface Finish	A / B Dimension				
F (Milling) R (Rotary Grinding) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

■Accuracy Standards

(Max. Value)

Item		2-Surface Finish (Milling)	(Rotary Grinding)	(Surface Grinding)
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T3~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~50	0.05	0.012	0.012
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering	Standard Size	C0.2~C0.5		
	Narrow / Large Size	C0.1 Thread Chamfering		

Days to Ship

(Length) 300mm or less

6 Days

(?)1st day shipping is available for orders received by 5pm.
Orders received after 5pm will be shipped on the next business day.

(Length) 300.5mm or more

8 Days

10 Days Express B 8,00 EUR/ piece P.88

(?)A Express Charge of 21,60 EUR for 3 or more identical pieces.

Order Example

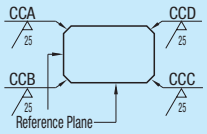
Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	B	T
PF	F	Q	M	-	255	155	18

Alterations

Part Number		A	B	T	
PFRNM	-	300	155	20	-CSC (CSC / CBC / CCA / etc.)

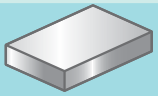
Alterations	Circumference Chamfering		Corner Cut
Code			
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less (?)Applicable to Standard Size only.	Changes the chamfering dimension.	Cuts any corners. Standard Size 1≤Corner Cut≤50 Narrow / Large Size 1≤Corner Cut≤20 1mm Increment $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Example) When the corners of A and D are cut by C5 ⋯›
Price Adder	Free of Charge	Refer to spec.	Refer to spec.

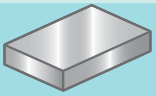


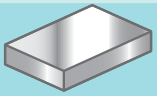


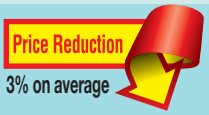
Size	Standard	Modified Value	Code	Price Adder
Standard Size	C0.2~C0.5	C0.5~C1.0		Free of Charge
Narrow size Large Size	C0.1 Thread Chamfering	C0.2~C0.5		15,00
		C0.5~C1.0		20,00
		C1.0~C1.5		25,00
		C1.5~C2.0		27,00

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00


All Surfaces Milled


All Surfaces Milled + Top/ Bottom Rotary Ground


All Surfaces Milled + Top/ Bottom Surfaced



Price (Ex.) When

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	22.3 Cent	=	56,80 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PFF_ _	15 ~ 50	10~19.5													
	50.5~ 100														
	100.5~ 150														
	20.5~ 50	20~25													
	50.5~ 75														
	75.5~ 100														
	100.5~ 250														
	250.5~ 350														
	25.5~ 50	25.5~40													
	50.5~ 75														
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		×	×											
	40.5~ 50	40.5~60													
	50.5~ 75														
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		×	×											
	60.5~ 75	60.5~80													
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		×	×											
	80.5~ 100	80.5~100													
	100.5~ 200														
	200.5~ 500		×	×											
	100.5~ 125	100.5~125													
	125.5~ 200														
	200.5~ 500		×	×											
	125.5~ 200	125.5~150													
	200.5~ 500		×	×											
	150.5~ 200	150.5~160													
	200.5~ 500		×	×											
	160.5~ 200	160.5~200													
	200.5~ 500		×	×											

For Narrow size and Large size, refer to P.1659•1660

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PFR_ _	15 ~ 50	10~19.5												×	×
	50.5~ 100													×	×
	100.5~ 150													×	×
	20.5~ 50	20~25												×	×
	50.5~ 75													×	×
	75.5~ 100													×	×
	100.5~ 250													×	×
	250.5~ 350													×	×
	25.5~ 50	25.5~40												×	×
	50.5~ 75													×	×
	75.5~ 100													×	×
	100.5~ 200													×	×
	200.5~ 500		×	×										×	×
	40.5~ 50	40.5~60													
	50.5~ 75														
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		×	×											
	60.5~ 75	60.5~80													
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		×	×											
	80.5~ 100	80.5~100													
	100.5~ 200														
	200.5~ 500		×	×											
	100.5~ 125	100.5~125													
	125.5~ 200														
	200.5~ 500		×	×											
	125.5~ 200	125.5~150													
	200.5~ 500		×	×											
	150.5~ 200	150.5~160													
	200.5~ 500		×	×											
	160.5~ 200	160.5~200													
	200.5~ 500		×	×											

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PFS_ _	15 ~ 50	10~19.5												×	×
	50.5~ 100													×	×
	100.5~ 150													×	×
	20.5~ 50	20~25												×	×
	50.5~ 75													×	×
	75.5~ 100													×	×
	100.5~ 250													×	×
	250.5~ 350													×	×
	25.5~ 50	25.5~40												×	×
	50.5~ 75													×	×
	75.5~ 100													×	×
	100.5~ 200													×	×
	200.5~ 500		×	×										×	×
	40.5~ 50	40.5~60													
	50.5~ 75														
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		×	×											
	60.5~ 75	60.5~80													
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		×	×											
	80.5~ 100	80.5~100													
	100.5~ 200														
	200.5~ 500		×	×											
	100.5~ 125	100.5~125													
	125.5~ 200														
	200.5~ 500		×	×											
	125.5~ 200	125.5~150													
	200.5~ 500		×	×											
	150.5~ 200	150.5~160													
	200.5~ 500		×	×											
	160.5~ 200	160.5~200													
	200.5~ 500		×	×											

1.4305/X10CrNiS18-9 Configurable Plates

Price

- Large Size Price (Ex.) When L–PFFQM–650–300–14.5

A Dimension	x	Area € € Unit Price	=	Price (Round down to ten Cent.)
650	x	110 Cent	=	€ 715,00

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~10
Rate	€ Unit Price

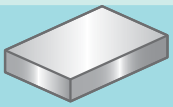
For orders larger than indicated quantity, please request a quotation.

Large Size — All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	3~3.5	4~4.5	5~5.5	6~7.5	8~9.5	10~14.5	15~19.5
H-PFF_ _	150 ~ 200	10~15							
	200.5~ 250								
	250.5~ 300								
	300.5~ 350								
	350.5~ 400								
	400.5~ 450								
	450.5~ 500								
	500.5~ 600								
	600.5~ 700								
	700.5~ 800								
	800.5~ 900								
	900.5~ 1000								
	150.5~ 200	15.5~19.5							
	200.5~ 300								
	300.5~ 350								
	350.5~ 400								
	400.5~ 450								
	450.5~ 500								
	500.5~ 600								
	600.5~ 700								
	700.5~ 800								
	800.5~ 900								
	900.5~ 1000								
	1000.5~ 1100								
	1100.5~ 1200								

Large Size — All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	4~4.5	5~5.5	6~7.5	8~9.5	10~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PFF_ _	350 ~ 400	20~25													
	400.5~ 450														
	450.5~ 500														
	500.5~ 600														
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	500.5~ 600	25.5~40													
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	500.5~ 600	40.5~50													
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	500.5~ 600	50.5~60													
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	500.5~ 600	60.5~80													
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	500.5~ 600	80.5~100													
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	500.5~ 600	100.5~146													
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														



All Surfaces Milled

Price Reduction

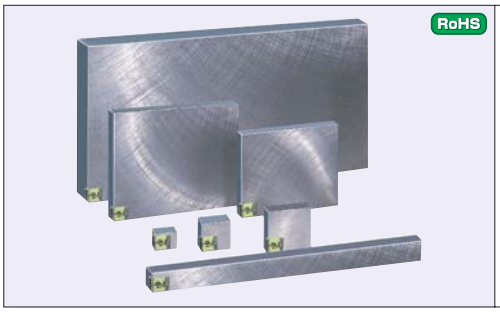
Up to 6%

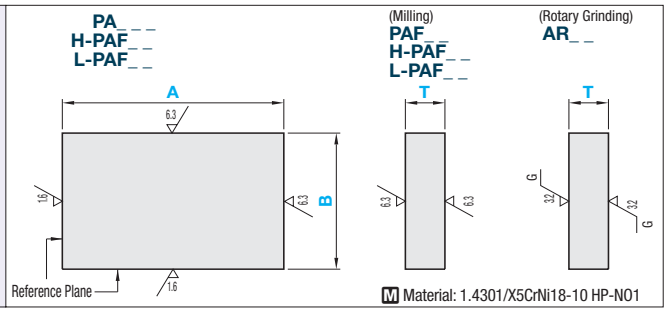
L-PFF_ _

■Large Size　　All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	4~4.5	5~5.5	6~7.5	8~9.5	10~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PFF_ _	500.5~ 600	146.5~200													
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	200.5~ 250	200.5~250													
	250.5~ 300														
	300.5~ 350														
	350.5~ 400														
	400.5~ 450														
	450.5~ 500														
	500.5~ 600														
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	250.5~ 300	250.5~300													
	300.5~ 350														
	350.5~ 400														
	400.5~ 450														
	450.5~ 500														
	500.5~ 600														
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	300.5~ 350	300.5~350													
	350.5~ 400														
	400.5~ 450														
	450.5~ 500														
	500.5~ 600														
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	350.5~ 400	350.5~400													
	400.5~ 450														
	450.5~ 500														
	500.5~ 600														
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	400.5~ 450	400.5~450													
	450.5~ 500														
	500.5~ 600														
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	450.5~ 500	450.5~500													
	500.5~ 600														
	600.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	500.5~ 600	500.5~600													
	600.5~ 650														
	650.5~ 700														
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	600.5~ 700	600.5~700													
	700.5~ 800														
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	700.5~ 800	700.5~800													
	800.5~ 900														
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	800.5~ 900	800.5~900													
	900.5~ 1000														
	1000.5~ 1100														
	1100.5~ 1200														
	900.5~ 1000	900.5~1000													
	1000.5~ 1100														
	1100.5~ 1200														

1.4301/X5CrNi18-10 Configurable Plates





Type	Part Number: 2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	0.5mm Increment: A (A≥B)	B (A≥B)	T
PA (Standard Size)	**F** (Milling) **R** (Rotary Grinding)	**P** **Q** **N** **M**	**P** **Q** **N** **M**	15~500	10~200	5~ 50
H-PA (Narrow Size)	**F** (Milling)			150~800	10~19.5	5~ 19.5
L-PA (Large Size)				300~1200	20~1000	5~ 50

(1) Plate Thickness Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) **R** (Rotary Grinding)	550mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	550.5mm or more	+0.1~+0.4	0~+0.3	±0.15	-0.3~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) **R** (Rotary Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

■Accuracy Standards

(Max. Value)

Item		2-Surface Finish: F (Milling)	R (Rotary Grinding)
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T5~07.5	0.1	0.05
	T8~15.5	0.07	0.03
	T16~25.5	0.05	0.015
	T26~50	0.05	0.012
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering	Standard Size	C0.2~C0.5	
	Narrow / Large Size	C0.1 Thread Chamfering	

Order Example

Part Number: Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	- A	- B	- T
PA	F	Q	M	- 255	- 136	- 18

Days to Ship

- PAF_ _

8 Days — Express A: 2,00 EUR/piece P.88

A Express Charge of 5,40 EUR for 3 or more identical pieces.

- PAR_ _ / H-PAF_ _ / L-PAF_ _

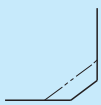
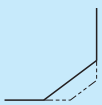
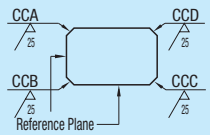
10 Days — Express B: 8,00 EUR/piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alterations

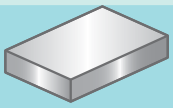
Part Number - A - B - T -(CSC / CBC / CCA / etc.)

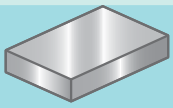
PARNM - 300 - 155 - 20 - CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	(See below)	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less Applicable to Standard Size only (PA_ _ _).	Changes the chamfering dimension.	Cuts any corners. Standard Size 1≤Corner Cut≤50 Narrow / Large Size 1≤Corner Cut≤20 1mm Increment $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Example)When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Refer to spec.	Refer to spec.

Size	Standard	Modified Value	Code	Price Adder
Standard Size	C0.2~C0.5	C0.5~C1.0	CBC	Free of Charge
Narrow size Large Size	C0.1 Thread Chamfering	C0.2~C0.5	CBB	15,00
		C0.5~C1.0	CBC	20,00
		C1.0~C1.5	CBD	25,00
		C1.5~C2.0	CBE	27,00

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground

Price Reduction
3% on average

PAF_ _ / PAR_ _

Price (Ex.) When PAFQM–255–100–10

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255	x	24.3 Cent	=	61,90 €

Volume Discount (Round down to ten Cent.) P.87

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PAF_ _	15 ~ 50	10 ~19.5													
	50.5~ 100														
	100.5~ 150														
	20.5~ 50	20~25													
	50.5~ 75														
	75.5~ 100														
	100.5~ 250														
	250.5~ 350														
	25.5~ 50	25.5~40													
	50.5~ 75														
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		✕	✕	✕										
	40.5~ 50	40.5~60													
	50.5~ 75														
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		✕	✕	✕										
	60.5~ 75	60.5~80													
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		✕	✕	✕										
	80.5~ 100	80.5~100													
	100.5~ 200														
	200.5~ 500		✕	✕	✕										
	100.5~ 125	100.5~125													
	125.5~ 200														
	200.5~ 500		✕	✕	✕										
	125.5~ 200	125.5~150													
	200.5~ 500		✕	✕	✕										
	150.5~ 200	150.5~160													
	200.5~ 500		✕	✕	✕										
	160.5~ 200	160.5~200													
	200.5~ 500		✕	✕	✕										

For Narrow size and Large size, refer to P.1663•1664

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PAR_ _	15 ~ 50	10~19.5												✕	✕
	50.5~ 100													✕	✕
	100.5~ 150													✕	✕
	20.5~ 50	20~25												✕	✕
	50.5~ 75													✕	✕
	75.5~ 100													✕	✕
	100.5~ 250													✕	✕
	250.5~ 350													✕	✕
	25.5~ 50	25.5~40												✕	✕
	50.5~ 75													✕	✕
	75.5~ 100													✕	✕
	100.5~ 200													✕	✕
	200.5~ 500		✕	✕	✕									✕	✕
	40.5~ 50	40.5~60													
	50.5~ 75														
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		✕	✕	✕										
	60.5~ 75	60.5~80													
	75.5~ 100														
	100.5~ 200														
	200.5~ 500		✕	✕	✕										
	80.5~ 100	80.5~100													
	100.5~ 200														
	200.5~ 500		✕	✕	✕										
	100.5~ 125	100.5~125													
	125.5~ 200														
	200.5~ 500		✕	✕	✕										
	125.5~ 200	125.5~150													
	200.5~ 500		✕	✕	✕										
	150.5~ 200	150.5~160													
	200.5~ 500		✕	✕	✕										
	160.5~ 200	160.5~200													
	200.5~ 500		✕	✕	✕										

1.4301/X5CrNi18-10 Configurable Plates

Price

- Large Size Price (Ex.) When L–PAFQM–650–300–14.5

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
650	x	115.6 Cent	=	751,40 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~10
Rate	€ Unit Price

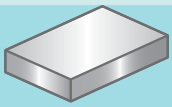
For orders larger than indicated quantity, please request a quotation.

Large Size — All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	5~5.5	6~7.5	8~9.5	10~14.5	15~19.5
H-PAF_ _	150 ~ 200	10~15	■	■	■	■	▨
	200.5~ 250						▨
	250.5~ 300		■	■	■	■	▨
	300.5~ 350						▨
	350.5~ 400		■	■	■	■	▨
	400.5~ 450						▨
	450.5~ 500		■	■	■	■	▨
	500.5~ 600						▨
	600.5~ 700		■	■	■	■	▨
	700.5~ 800						▨
	150.5~ 200	15.5~19.5	■	■	■	■	■
	200.5~ 300						
	300.5~ 350		■	■	■	■	■
	350.5~ 400						
	400.5~ 450		■	■	■	■	■
	450.5~ 500						
	500.5~ 600		■	■	■	■	■
	600.5~ 700						
	700.5~ 800		■	■	■	■	■

Large Size — All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	5~5.5	6~7.5	8~9.5	10~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PAF_ _	300 ~ 350	20~25	■	■	■	■	■	■	■	■	▨	▨	▨	▨
	350.5~ 400										▨	▨	▨	▨
	400.5~ 450		■	■	■	■	■	■	■	■	▨	▨	▨	▨
	450.5~ 500										▨	▨	▨	▨
	500.5~ 600		■	■	■	■	■	■	■	■	▨	▨	▨	▨
	600.5~ 700										▨	▨	▨	▨
	700.5~ 800		■	■	■	■	■	■	■	■	▨	▨	▨	▨
	500.5~ 600	25.5~40											▨	▨
	600.5~ 700		■	■	■	■	■	■	■	■	■	■	▨	▨
	700.5~ 800												▨	▨
	500.5~ 600	40.5~50	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 700													
	700.5~ 800		■	■	■	■	■	■	■	■	■	■	■	■
	500.5~ 600	50.5~60												
	600.5~ 700		▨	▨	■	■	■	■	■	■	■	■	■	■
	700.5~ 800		▨	▨										
	800.5~ 900		▨	▨	■	■	■	■	■	■	■	■	■	■
	900.5~ 1000		▨	▨										
	1000.5~ 1100		▨	▨	▨	■	■	■	■	■	■	■	■	■
	1100.5~ 1200		▨	▨	▨									
	500.5~ 600	60.5~80												
	600.5~ 700		▨	▨										
	700.5~ 800		▨	▨	■	■	■	■	■	■	■	■	■	■
	800.5~ 900		▨	▨										
	900.5~ 1000		▨	▨	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1100		▨	▨	▨									
	1100.5~ 1200		▨	▨	▨	■	■	■	■	■	■	■	■	■
	500.5~ 600	80.5~100												
	600.5~ 700		▨	▨	■	■	■	■	■	■	■	■	■	■
	700.5~ 800		▨	▨										
	800.5~ 900		▨	▨	■	■	■	■	■	■	■	■	■	■
	900.5~ 1000		▨	▨										
	1000.5~ 1100		▨	▨	▨	■	■	■	■	■	■	■	■	■
	1100.5~ 1200		▨	▨	▨									
	500.5~ 600	100.5~146	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 700		▨	▨										
	700.5~ 800		▨	▨	■	■	■	■	■	■	■	■	■	■
	800.5~ 900		▨	▨										
	900.5~ 1000		▨	▨	■	■	■	■	■	■	■	■	■	■
	1000.5~ 1100		▨	▨	▨									
	1100.5~ 1200		▨	▨	▨	■	■	■	■	■	■	■	■	■



Price Reduction
Up to 6%
L-PAF_ _

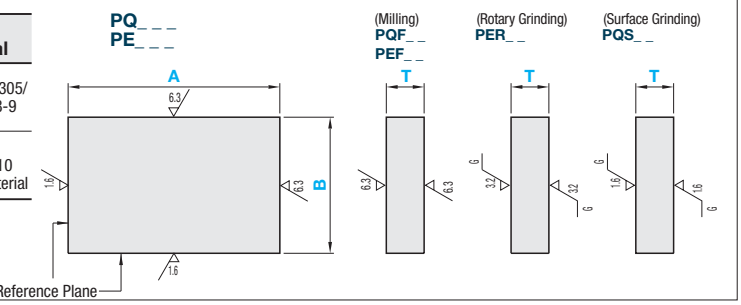
■Large Size　　All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	6~7.5	8~9.5	10~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PAF_ _	500.5~ 600	146.5~200	×	○	○	○	○	○	○	○	○	○	○
	600.5~ 700		×	○	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	○	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	○	○	○	○	○	○	○	○	○	○
	900.5~1000		×	○	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	200.5~ 250	200.5~250	○	○	○	○	○	○	○	○	○	○	○
	250.5~ 300		○	○	○	○	○	○	○	○	○	○	○
	300.5~ 350		×	○	○	○	○	○	○	○	○	○	○
	350.5~ 400		×	○	○	○	○	○	○	○	○	○	○
	400.5~ 450		×	○	○	○	○	○	○	○	○	○	○
	450.5~ 500		×	○	○	○	○	○	○	○	○	○	○
	500.5~ 600		×	○	○	○	○	○	○	○	○	○	○
	600.5~ 700		×	○	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	○	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	○	○	○	○	○	○	○	○	○	○
	900.5~1000		×	○	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	250.5~ 300	250.5~300	○	○	○	○	○	○	○	○	○	○	○
	300.5~ 350		×	○	○	○	○	○	○	○	○	○	○
	350.5~ 400		×	○	○	○	○	○	○	○	○	○	○
	400.5~ 450		×	○	○	○	○	○	○	○	○	○	○
	450.5~ 500		×	○	○	○	○	○	○	○	○	○	○
	500.5~ 600		×	○	○	○	○	○	○	○	○	○	○
	600.5~ 700		×	○	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	○	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	○	○	○	○	○	○	○	○	○	○
	900.5~1000		×	○	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	300.5~ 350	300.5~350	×	○	○	○	○	○	○	○	○	○	○
	350.5~ 400		×	○	○	○	○	○	○	○	○	○	○
	400.5~ 450		×	○	○	○	○	○	○	○	○	○	○
	450.5~ 500		×	○	○	○	○	○	○	○	○	○	○
	500.5~ 600		×	○	○	○	○	○	○	○	○	○	○
	600.5~ 700		×	○	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	○	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	○	○	○	○	○	○	○	○	○	○
	900.5~1000		×	○	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	350.5~ 400	350.5~400	×	×	○	○	○	○	○	○	○	○	○
	400.5~ 450		×	×	○	○	○	○	○	○	○	○	○
	450.5~ 500		×	×	○	○	○	○	○	○	○	○	○
	500.5~ 600		×	×	○	○	○	○	○	○	○	○	○
	600.5~ 700		×	×	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	×	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	×	○	○	○	○	○	○	○	○	○
	900.5~1000		×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	400.5~ 450	400.5~450	×	×	○	○	○	○	○	○	○	○	○
	450.5~ 500		×	×	○	○	○	○	○	○	○	○	○
	500.5~ 600		×	×	○	○	○	○	○	○	○	○	○
	600.5~ 700		×	×	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	×	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	×	○	○	○	○	○	○	○	○	○
	900.5~1000		×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	450.5~ 500	450.5~500	×	×	○	○	○	○	○	○	○	○	○
	500.5~ 600		×	×	○	○	○	○	○	○	○	○	○
	600.5~ 700		×	×	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	×	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	×	○	○	○	○	○	○	○	○	○
	900.5~1000		×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	500.5~ 600	500.5~600	×	×	○	○	○	○	○	○	○	○	○
	600.5~ 650		×	×	○	○	○	○	○	○	○	○	○
	650.5~ 700		×	×	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	×	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	×	○	○	○	○	○	○	○	○	○
	900.5~1000		×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	600.5~ 700	600.5~700	×	×	○	○	○	○	○	○	○	○	○
	700.5~ 800		×	×	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	×	○	○	○	○	○	○	○	○	○
	900.5~1000		×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	700.5~ 800	700.5~800	×	×	○	○	○	○	○	○	○	○	○
	800.5~ 900		×	×	○	○	○	○	○	○	○	○	○
	900.5~1000		×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	800.5~ 900	800.5~900	×	×	○	○	○	○	○	○	○	○	○
	900.5~1000		×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○
	900.5~1000	900.5~1000	×	×	○	○	○	○	○	○	○	○	○
	1000.5~1100		×	×	○	○	○	○	○	○	○	○	○
	1100.5~1200		×	×	○	○	○	○	○	○	○	○	○

1.4305/X10CrNiS18-9 / 1.4301/X5CrNi18-10 Annealed Configurable Plates



Part Number	Material
PQ_ _ _	Annealed 1.4305/ X10CrNiS18-9
PE_ _ _	1.4301/ X5CrNi18-10 Annealed Material



Type	2-Surface Finish	Part Number (1) Plate Thickness Tolerance Selection	Part Number (2) A, B Dimension Tolerance Selection	0.5mm Increment A (A≥B)	0.5mm Increment B (A≥B)	0.5mm Increment T
PQ	F (Milling)	P Q N M	P Q N M	15~500	10~200	6.5~30
	S (Surface Grinding)					
PE	F (Milling)					
	R (Rotary Grinding)					

(1) Plate Thickness Tolerance

2-Surface Finish	A, B Length	P	Q	N	M
F (Milling) R (Rotary Grinding)	550mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	550.5mm or more	+0.1~+0.4	0~+0.3	±0.15	-0.3~0
S (Surface Grinding)	-	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) R (Rotary Grinding) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish F	R	S
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T5~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~35	0.05	0.012	0.012
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering		C0.2~C0.5		

Order Example

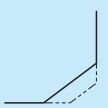
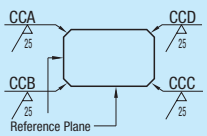
Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
PQ	F	Q	M	-	255	-	155	-	18

Days to Ship

- PQF_ _ / PEF_ _ : 8 Days P.88
  A Express Charge of 5,40 EUR for 3 or more identical pieces.
- PQS_ _ / PER_ _ : 10 Days P.88
  A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alterations

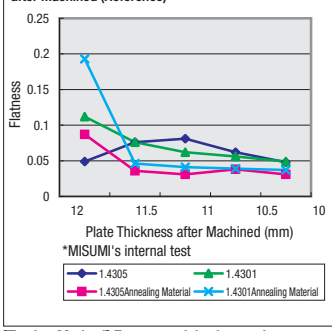
Part Number - A - B - T - (CSC / CBC / CCA / etc.)
PQFNM - 300 - 155 - 20 - CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less	Changes the chamfering dimension. C0.2~C0.5⋯› C0.5~C1.0	Cuts any corners. 1mm Increment 1≤Corner Cut≤50 $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Example)(Ex.) When the corners of A and D are cut by C5, ⋯›CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

Comparison of Flatness Variation Caused by Upper-Lower Surface Milling Cutter

1.4305/X10CrNiS18-9 / 1.4301/X5CrNi18-10 and Annealed 1.4305/X10CrNiS18-9 / 1.4301/X5CrNi18-10 Flatness Variation after Machined (Reference)

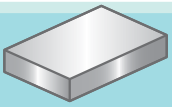


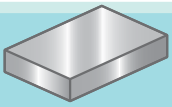
[Testing Method] Four materials shown above (155x155x12mm) are machined with a milling path of 0.5mm and the flatness is measured with a three dimensional measuring instrument.

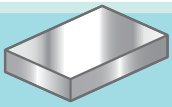
The test results above show that, after machined, annealed 1.4305/X10CrNiS18-9 / 1.4301/X5CrNi18-10 have better flatness than 1.4305/X10CrNiS18-9 / 1.4301/X5CrNi18-10

■Features of 1.4305/X10CrNiS18-9 Stainless Steel and 1.4301/X5CrNi18-10 Annealed

Provided stress-relief heat treatment to avoid distortion when machined. Suitable for warpage prevention during machining. However, it has inferior corrosion resistance.


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced

Price Reduction
3% on average

Price

(Ex.) When PQFQM–255–100–10

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	24 Cent	=	61,20 €

■Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

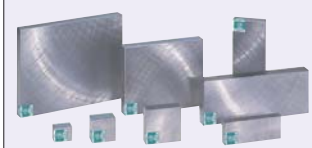
Part Number	A	B \ T	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PQF_ _	15 ~ 50	10~19.5							
	50.5~100								
	100.5~150								
	20 ~ 50	20~25							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	25.5 ~ 50	25.5~40							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	40.5 ~ 50	40.5~60							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	60.5 ~ 75	60.5~80							
	75.5~100								
	100.5~200								
	200.5~500		✕						
	80.5~100	80.5~100							
	100.5~200								
	200.5~500		✕						
	100.5~125	100.5~125							
	125.5~200								
	200.5~500		✕						
	125.5~200	125.5~150							
	200.5~500		✕						
	150.5~200	150.5~160							
	200.5~500		✕						
	160.5~200	160.5~200							
	200.5~500		✕						

Part Number	A	B \ T	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PQS_ _	15 ~ 50	10~19.5							
	50.5~100								
	100.5~150								
	20 ~ 50	20~25							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	25.5 ~ 50	25.5~40							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	40.5 ~ 50	40.5~60							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	60.5 ~ 75	60.5~80							
	75.5~100								
	100.5~200								
	200.5~500		✕						
	80.5~100	80.5~100							
	100.5~200								
	200.5~500		✕						
	100.5~125	100.5~125							
	125.5~200								
	200.5~500		✕						
	125.5~200	125.5~150							
	200.5~500		✕						
	150.5~200	150.5~160							
	200.5~500		✕						
	160.5~200	160.5~200							
	200.5~500		✕						

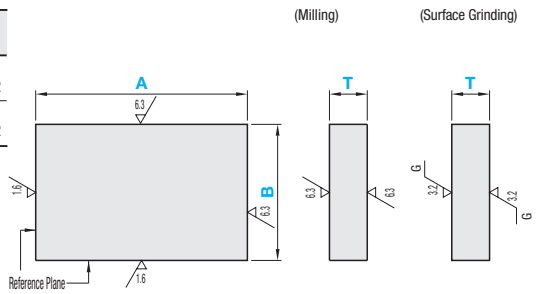
Part Number	A	B \ T	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PEF_ _	15 ~ 50	10~19.5							
	50.5~100								
	100.5~150								
	20 ~ 50	20~25							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	25.5 ~ 50	25.5~40							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	40.5 ~ 50	40.5~60							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	60.5 ~ 75	60.5~80							
	75.5~100								
	100.5~200								
	200.5~500		✕						
	80.5~100	80.5~100							
	100.5~200								
	200.5~500		✕						
	100.5~125	100.5~125							
	125.5~200								
	200.5~500		✕						
	125.5~200	125.5~150							
	200.5~500		✕						
	150.5~200	150.5~160							
	200.5~500		✕						
	160.5~200	160.5~200							
	200.5~500		✕						

Part Number	A	B \ T	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PER_ _	15 ~ 50	10~19.5							
	50.5~100								
	100.5~150								
	20 ~ 50	20~25							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	25.5 ~ 50	25.5~40							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	40.5 ~ 50	40.5~60							
	50.5 ~ 75								
	75.5~100								
	100.5~200								
	200.5~500		✕						
	60.5 ~ 75	60.5~80							
	75.5~100								
	100.5~200								
	200.5~500		✕						
	80.5~100	80.5~100							
	100.5~200								
	200.5~500		✕						
	100.5~125	100.5~125							
	125.5~200								
	200.5~500		✕						
	125.5~200	125.5~150							
	200.5~500		✕						
	150.5~200	150.5~160							
	200.5~500		✕						
	160.5~200	160.5~200							
	200.5~500		✕						

1.4401/X5CrNiMo17-12-2 / 1.4401/X5CrNiMo17-12-2 Configurable Plates



Part Number	Material
P316_ _ _	1.4401/ X5CrNiMo17-12-2
P316L_ _ _	1.4404/ X2CrNiMo17-12-2



Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B (A≥B)	T
P316	F (Milling) S (Surface Grinding)	P Q N M	P Q N M	15~500	10~200	8~30
P316L	F (Milling)					

(1) Plate Thickness Tolerance

2-Surface Finish	P	Q	N	M
F (Milling)	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
S (Surface Grinding)	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish F (Milling)	S (Surface Grinding)
Thickness Parallelism (per 100mm)		0.05	0.012
Flatness (per 100mm)	T8~15.5	0.07	0.03
	T16~25.5	0.05	0.015
	T26~30	0.05	0.012
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		C0.2~C0.5	

Order Example

Part Number										
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T	
P316	F	Q	M	-	255	-	155	-	18	
P316L	F	N	N	-	200	-	20	-	10.5	

Days to Ship

- P316F_ _ / P316LF_ _

8 Days — Express A — 8,00 EUR/ piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

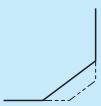
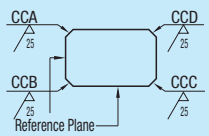
- P316S_ _

10 Days — Express B — 8,00 EUR/ piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alterations

Part Number	-	A	-	B	-	T	(CSC / CBC / CCA / etc.)
P316FNM	-	300	-	155	-	20	- CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5 ⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5 ⋯› C0.5~C1.0	Cuts any corners. 1≤ Corner Cut ≤501mm Increment C≤$\frac{A}{2}$, $\frac{B}{2}$ Ordering Code (Example)When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

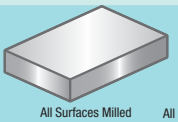
1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

■**Features of 1.4401 X5CrNiMo17-12-2**

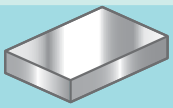
Austenitic Stainless Steel with higher corrosion resistance than 1.4301/X5CrNi18-10.

■**Features of 1.4404 X2CrNiMo17-12-2**

Austenitic Stainless Steel with higher corrosion resistance, toughness, ductibility, machinability and weldability than 1.4401/X5CrNiMo17-12-2.



All Surfaces Milled



All Surfaces Milled + Top/Bottom Surfaced

Price Reduction

Up to 3%

P316F_ _ / P316S_ _

Price (euros)

(Ex) When P316FQM–255–100–10.5

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	40 Cent	=	102,00 €

■**Volume Discount** (Round down to ten Cent.) **P.88**

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

P316F_ _

Part Number	A	B \ T	8~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
	15 ~ 50	10~19.5						
	50.5~100							
	100.5~150							
	20 ~ 50	20~25						
	50.5 ~ 75							
	75.5~100							
	100.5~200							
	25.5~ 50	25.5~40						
	50.5~ 75							
	75.5~100							
	100.5~200							
	200.5~500		×					
	40.5~ 50	40.5~60						
	50.5~ 75							
	75.5~100							
	100.5~200							
	200.5~500		×					
	60.5~ 75	60.5~80						
	75.5~100							
	100.5~200							
	200.5~500		×					
	80.5~100	80.5~100						
	100.5~200							
	200.5~500		×					
	100.5~125	100.5~125						
	125.5~200							
	200.5~500		×					
	125.5~200	125.5~150						
	200.5~500		×					
	150.5~200	150.5~160						
	200.5~500		×					
	160.5~200	160.5~200						
	200.5~500		×					

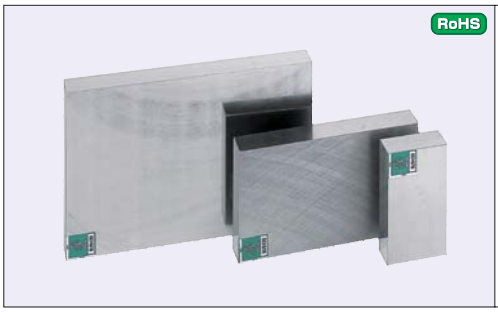
P316S_ _

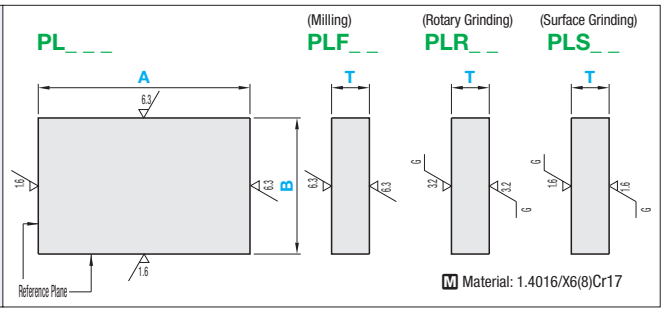
Part Number	A	B \ T	8~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
	15 ~ 50	10~19.5					×	×
	50.5~100						×	×
	100.5~150						×	×
	20 ~ 50	20~25						×
	50.5~ 75							×
	75.5~100							×
	100.5~200							×
	25.5~ 50	25.5~40						
	50.5~ 75							
	75.5~100							
	100.5~200							
	200.5~500		×					
	40.5~ 50	40.5~60						
	50.5~ 75							
	75.5~100							
	100.5~200							
	200.5~500		×					
	60.5~ 75	60.5~80						
	75.5~100							
	100.5~200							
	200.5~500		×					
	80.5~100	80.5~100						
	100.5~200							
	200.5~500		×					
	100.5~125	100.5~125						
	125.5~200							
	200.5~500		×					
	125.5~200	125.5~150						
	200.5~500		×					
	150.5~200	150.5~160						
	200.5~500		×					
	160.5~200	160.5~200						
	200.5~500		×					

P316LF__

Part Number	A	B \ T	8~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
	15 ~ 50	10~19.5						
	50.5~100							
	100.5~150							
	20 ~ 50	20~25						
	50.5~ 75							
	75.5~100							
	100.5~200							
	25.5~ 50	25.5~40						
	50.5~ 75							
	75.5~100							
	100.5~200							
	200.5~500		×					
	40.5~ 50	40.5~60						
	50.5~ 75							
	75.5~100							
	100.5~200							
	200.5~500		×					
	60.5~ 75	60.5~80						
	75.5~100							
	100.5~200							
	200.5~500		×					
	80.5~100	80.5~100						
	100.5~200							
	200.5~500		×					
	100.5~125	100.5~125						
	125.5~200							
	200.5~500		×					
	125.5~200	125.5~150						
	200.5~500		×					
	150.5~200	150.5~160						
	200.5~500		×					
	160.5~200	160.5~200						
	200.5~500		×					

1.4016/X6(8)Cr17 Configurable Plates





Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance	(2) A, B Dimension Tolerance	A	B (A≥B)	T
PL	F (Milling) R (Rotary Grinding) S (Surface Grinding)	P Q N M	P Q N M	20~500	20~200	5~30

(1) Plate Thickness Tolerance

2-Surface Finish	P	Q	N	M
F (Milling)	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
R (Rotary Grinding)	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
S (Surface Grinding)	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) R (Rotary Grinding) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish (Milling)	(Rotary Grinding)	(Surface Grinding)
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T5~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~30	0.05	0.012	0.012
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering		C0.2~C0.5		

Days to Ship

○PLF_ _
8 Days — Express A — 2,00 EUR/ piece — P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

○PLR_ _
8 Days — Express A — 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

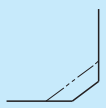
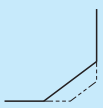
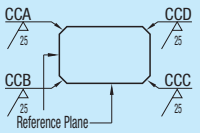
○PLS_ _
10 Days — Express B — 8,00 EUR/ piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Order Example

Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
PL	F	Q	M	-	255	-	155	-	18

Alterations

Part Number		A	-	B	-	T	-(CSC / CBC / CCA / etc.)
PLRNM	-	300	-	155	-	20	- CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5 ⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5 ⋯› C0.5~C1.0	Cuts any corners. 1≤Corner Cut≤50 1mm Increment C≤A/2, B/2 Ordering Code (Example)(Ex.) When the corners of A and D are cut by C5, ⋯› CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

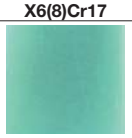
1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

Corrosion Resistance of Stainless Steel (Reference)

Testing Method: Conforms to the JIS H 8502 Cycle Test Method as a complex corrosion test.

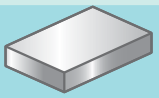
Test Conditions: (1) Salt Water Spray Test (5% NaCl, 35°C) 2hr
(2) Dry (60°C)
(3) Wet (85% RH 50°C)

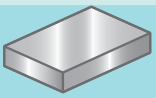
Appearance comparison among before the test, 48hr after the test and 168hr after the test.

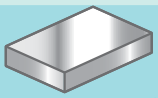
	1.4016/ X6(8)Cr17	1.4305/ X10CrNiS18-9	1.4301/ X5CrNi18-10
Before test			
48 H			
168 H			

■Features of 1.4016/X6(8)Cr17

Ferrite Stainless Steel. Excellent corrosion resistance.
Its magnetism is effective for prevention of warp caused by machining.
Its hardenability is low.


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/ Bottom Surfaced

Price Reduction
3% on average

Price

(Ex.)

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255	x	20.4 Cent	=	52,00 €

■Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

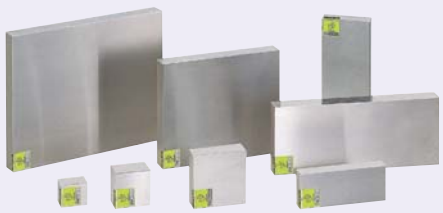
For orders larger than indicated quantity, please request a quotation.

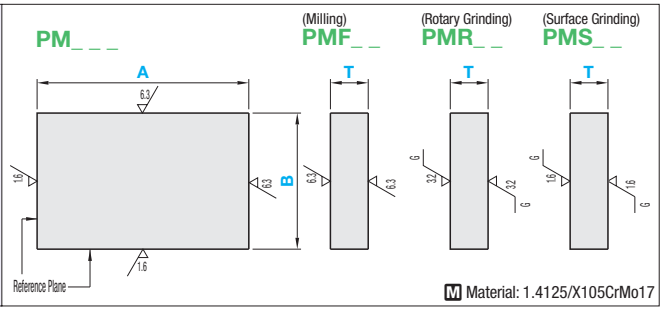
Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PLF_ _	20 ~ 50	20~25									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250										
	250.5~ 350		×								
	25.5~ 50	25.5~40									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×	×						
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×							
	60.5~ 75	60.5~80									
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×							
	80.5~ 100	80.5~100									
	100.5~ 200										
	200.5~ 500		×	×							
	100.5~ 125	100.5~125									
	125.5~ 200										
	200.5~ 500		×	×							
	125.5~ 200	125.5~150									
	200.5~ 500		×	×							
	150.5~ 200	150.5~160									
	200.5~ 500		×	×							
	160.5~ 200	160.5~200									
	200.5~ 500		×	×							

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PLR_ _	20 ~ 50	20~25									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250										
	250.5~ 350		×								
	25.5~ 50	25.5~40									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×	×						
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×							
	60.5~ 75	60.5~80									
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×							
	80.5~ 100	80.5~100									
	100.5~ 200										
	200.5~ 500		×	×							
	100.5~ 125	100.5~125									
	125.5~ 200										
	200.5~ 500		×	×							
	125.5~ 200	125.5~150									
	200.5~ 500		×	×							
	150.5~ 200	150.5~160									
	200.5~ 500		×	×							
	160.5~ 200	160.5~200									
	200.5~ 500		×	×							

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PLS_ _	20 ~ 50	20~25									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250										
	250.5~ 350		×								
	25.5~ 50	25.5~40									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×	×						
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×							
	60.5~ 75	60.5~80									
	75.5~ 100										
	100.5~ 200										
	200.5~ 500		×	×							
	80.5~ 100	80.5~100									
	100.5~ 200										
	200.5~ 500		×	×							
	100.5~ 125	100.5~125									
	125.5~ 200										
	200.5~ 500		×	×							
	125.5~ 200	125.5~150									
	200.5~ 500		×	×							
	150.5~ 200	150.5~160									
	200.5~ 500		×	×							
	160.5~ 200	160.5~200									
	200.5~ 500		×	×							

1.4125/X105CrMo17 Configurable Plates





Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A – B Dimension Tolerance	A	B A≥B	T
PM	F (Milling) R (Rotary Grinding) S (Surface Grinding)	P Q N M	P Q N M	20~500	20~200	5~30

(1) Plate Thickness Tolerance

2-Surface Finish	P	Q	N	M
F (Milling)	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
R (Rotary Grinding)	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
S (Surface Grinding)	+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
F (Milling) R (Rotary Grinding) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

■Accuracy Standards

(Max. Value)

Item		2-Surface Finish F (Milling)	R (Rotary Grinding)	S (Surface Grinding)
Thickness Parallelism (per 100mm)		0.05	0.012	0.012
Flatness (per 100mm)	T5~7.5	0.1	0.05	0.05
	T8~15.5	0.07	0.03	0.03
	T16~25.5	0.05	0.015	0.015
	T26~30	0.05	0.012	0.012
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering		C0.2~C0.5		

Order Example

Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
PM	F	Q	M	-	255	-	155	-	18

Days to Ship

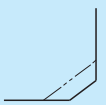
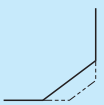
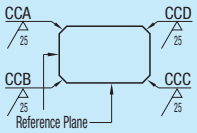
○PMF_ _ **8 Days** — Express A 2,00 EUR/piece — P.88
A Express Charge of 5,40 EUR for 3 or more identical pieces.

○PMR_ _ **8 Days** — Express A 8,00 EUR/piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

○PMS_ _ **10 Days** — Express B 8,00 EUR/piece — P.88
A Express Charge of 21,60 EUR for 3 or more identical pieces.

Alterations

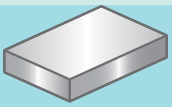
Part Number	-	A	-	B	-	T	-(CSC / CBC / CCA / etc.)
PMRNM	-	300	-	155	-	20	- CSC

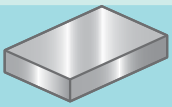
Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.1 or less	Changes the circumference chamfering dimension. C0.2~C0.5⋯› C0.5~C1.0	Cuts any corners. 1≤ Corner Cut ≤501mm Increment C≤A/2, B/2 Ordering Code (Example)When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

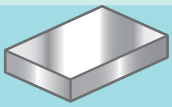
1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

Features of 1.4125/X105CrMo17

Martensitic Stainless Steel with the highest degree of hardness provided by heat treatment.


All Surfaces Milled


All Surfaces Milled + Top/Bottom Rotary Ground


All Surfaces Milled + Top/Bottom Surfaced **PMF_ _ / PMR_ _ / PMS_ _**

Price Reduction
3% on average

Price

(Example)PMFQM-255-100-10

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255	x	24.3 Cent	=	61,90 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

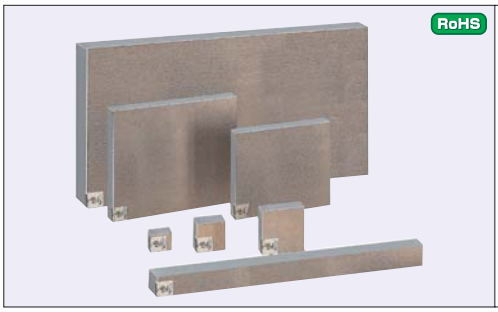
Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PMF_ _	20 ~ 50	20~25									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250		×	×							
	250.5~ 350		×	×	×						
	25.5~ 50	25.5~40									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	60.5~ 75	60.5~80									
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	80.5~ 100	80.5~100	×	×							
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	100.5~ 125	100.5~125	×	×							
	125.5~ 200		×	×							
	200.5~ 500		×	×	×						
	125.5~ 200	125.5~150	×	×							
	200.5~ 500		×	×	×						
	150.5~ 200	150.5~160	×	×							
	200.5~ 500		×	×	×						
	160.5~ 200	160.5~200	×	×							
	200.5~ 500		×	×	×						

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PMR_ _	20 ~ 50	20~25									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250		×	×							
	250.5~ 350		×	×	×						
	25.5~ 50	25.5~40									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	60.5~ 75	60.5~80									
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	80.5~ 100	80.5~100	×	×							
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	100.5~ 125	100.5~125	×	×							
	125.5~ 200		×	×							
	200.5~ 500		×	×	×						
	125.5~ 200	125.5~150	×	×							
	200.5~ 500		×	×	×						
	150.5~ 200	150.5~160	×	×							
	200.5~ 500		×	×	×						
	160.5~ 200	160.5~200	×	×							
	200.5~ 500		×	×	×						

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30
PMS_ _	20 ~ 50	20~25									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250		×	×							
	250.5~ 350		×	×	×						
	25.5~ 50	25.5~40									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	40.5~ 50	40.5~60									
	50.5~ 75										
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	60.5~ 75	60.5~80									
	75.5~ 100										
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	80.5~ 100	80.5~100	×	×							
	100.5~ 200		×	×							
	200.5~ 500		×	×	×						
	100.5~ 125	100.5~125	×	×							
	125.5~ 200		×	×							
	200.5~ 500		×	×	×						
	125.5~ 200	125.5~150	×	×							
	200.5~ 500		×	×	×						
	150.5~ 200	150.5~160	×	×							
	200.5~ 500		×	×	×						
	160.5~ 200	160.5~200	×	×							
	200.5~ 500		×	×	×						

Aluminum Configurable Plates

-EN AW-5052/AlMg2,5- (Aℓ-Mg Base Aluminum Alloy)



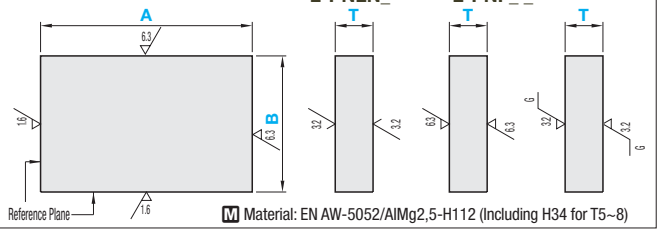
RoHS

PN_ _ _ (Standard Size)
H-PN_ _ _ (Narrow Size)
L-PN_ _ _ (Large Size)

(Rolling) PNLN_ H-PNLN_ _ L-PNLN_

(Milling) PNF_ _ H-PNF_ _ L-PNF_ _

(Surface Grinding) PNS_ _



Material: EN AW-5052/AlMg2,5-H112 (Including H34 for T5~8)

Part Number Type		2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	0.5mm Increment A	0.5mm Increment B	T Selection - Configurable
					A≥B		
Standard Size	PN	L (Rolling)	N	P Q N M	25~ 500	10~ 300	5, 6, 8, 10, 12, 15, 20, 25, 30, 40, 50
Narrow size	H-PN				6~ 1600	6~ 19.5	3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35
Large Size	L-PN				250~ 3000	20~ 1500	3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50
Standard Size		F (Milling)	P Q N M	P Q N M	25~ 500	10~ 300	5~49 (0.5mm Increment)
Narrow size	H-PN				7~ 1600	8~ 19.5	3~29.5 (0.5mm Increment)
Large Size	L-PN				250~ 3000	20~ 800	5~50 (0.5mm Increment)
Standard Size	PN	S (Surface Grinding)			25~ 500	10~ 300	5, 6, 7~49 (0.5mm Increment)

(1) Plate Thickness Tolerance

Selectable for N only

2-Surface Finish	T Dimension 3	4, 5	6	8	10	12, 15	20	25	30, 35	40	45, 50
N (Rolling)	±0.2	±0.35	±0.45	±0.5	±0.6	±0.7	±0.8	±0.9	±1.0	±1.1	±1.3

2-Surface Finish	A, B Length	P	Q	N	M
F (Milling)	550mm or less	+0.1~+0.3	0~0.2	±0.1	-0.2~0
	550.5mm or more	+0.1~+0.4	0~0.3	±0.15	-0.3~0
S (Surface Grinding)		+0.1~+0.2	0~0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
L (Rolling) F (Milling) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	± 0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish L (Rolling)	F (Milling)	S (Surface Grinding)
Thickness Parallelism (per 100mm)	T3~6.5	-	0.05	0.025
	T7~12.5			0.03
	T13~15.5			0.05
	T16~20.5		0.07	0.07
	T21~50		0.1	0.1
Flatness (per 100mm)	T3~8.5	0.15	0.15	0.12
	T9~12.5		0.13	0.06
	T13~20.5		0.12	
	T21~50		0.1	
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering		Standard Size	C0.3 or less	
		Narrow / Large Size	C0.1 Thread Chamfering	

Order Example

Part Number Type	Top / Bottom Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	- A	- B	- T
PN	F	Q	M	- 255	- 220	- 18

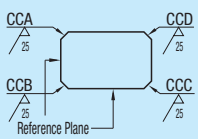
Days to Ship

- PNLN_ **6 Days** P.88
- PFF_ _ A (Length) 300mm or less **6 Days** P.88
- PNF_ _ A (Length) 300.5mm or more **8 Days**
- H-PN_ _ _, L-PN_ _ _ **8 Days**
- PNS_ _ **10 Days** Express A 8,00 EUR/piece, Express B 5,00 EUR/piece P.88

Flat charges of A: 21,60 EUR and B: 13,50 EUR for 3 or more identical pieces.

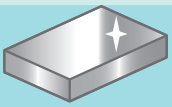
Alterations

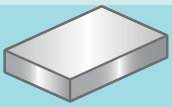
Part Number - A - B - T -(CSC / CBC / etc.)
PNFNM - 300 - 280 - 20 - CSC

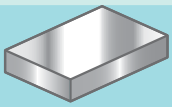
Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	(See below)	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.3⋯› C0.1 or less. Available for Standard Size only.	Changes the circumference chamfering dimension.	Cuts any corners. 1≤ Corner Cut ≤501mm Increment. C≤ A/2, B/2. Ordering Code. (Example)When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Refer to spec.	Refer to spec.

Size	Standard	Modified Value	Code	Price Adder
Standard Size	C0.3 or less	C0.5~C1.0	CBC	Free of Charge
Narrow size Large Size	C0.1 Thread Chamfering	C0.2~C0.5	CBB	10,00
		C0.5~C1.0	CBC	12,00
		C1.0~C1.5	CBD	15,00
		C1.5~C2.0	CBE	16,00

1mm Increment	Price Adder
1~5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00


4-Surface Milling (Rolled)


All Surfaces Milled


All Surfaces Milled + Top/Bottom Surfaced

Price Reduction
3% on average

PNLN_ / PNF_ _ / PNS_

Price (Ex.) When PNFQM–255–220–18

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	24.5 Cent	=	62,40 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

PNLN_

H-PNL (Narrow Size) L-PNL (Large Size) is listed on **P.1675•1676**

Part Number	A	B \ T	5	6	8	10	12	15	20	25	30	40	50
PNLN_	25~ 50	10~19.5											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	25~ 50	20~50											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	50.5~ 75	50.5~75											
	75.5~ 100												
	100.5~ 200												
	200.5~ 500												
	75.5~ 100	75.5~100											
	100.5~ 200												
	200.5~ 300												
	300.5~ 500												
	100.5~ 250	100.5~125											
	250.5~ 500												
	125.5~ 300	125.5~150											
	300.5~ 500												
	150.5~ 300	150.5~160											
	300.5~ 500												
	160.5~ 500	160.5~200											
	200.5~ 500	200.5~250											
	250.5~ 500	250.5~300											

PNF_ _

H–PNF (Narrow Size) L–PNF (Large Size) is listed on **P.1677•1678**

Part Number	A	B \ T	5	5.5, 6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~39	39.5~49
PNF_ _	25~ 50	10~19.5											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	25~ 50	20~50											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	50.5~ 75	50.5~75											
	75.5~ 100												
	100.5~ 200												
	200.5~ 500												
	75.5~ 100	75.5~100											
	100.5~ 200												
	200.5~ 300												
	300.5~ 500												
	100.5~ 250	100.5~125											
	250.5~ 500												
	125.5~ 300	125.5~150											
	300.5~ 500												
	150.5~ 300	150.5~160											
	300.5~ 500												
	160.5~ 500	160.5~200											
	200.5~ 500	200.5~250											
	250.5~ 500	250.5~300											

PNS_ _

Part Number	A	B \ T	5	6	7~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~39	39.5~49
PNS_ _	25~ 50	10~19.5											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	25~ 50	20~50											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	50.5~ 75	50.5~75											
	75.5~ 100												
	100.5~ 200												
	200.5~ 500												
	75.5~ 100	75.5~100											
	100.5~ 200												
	200.5~ 300												
	300.5~ 500												
	100.5~ 250	100.5~125											
	250.5~ 500												
	125.5~ 300	125.5~150											
	300.5~ 500												
	150.5~ 300	150.5~160											
	300.5~ 500												
	160.5~ 500	160.5~200											
	200.5~ 500	200.5~250											
	250.5~ 500	250.5~300											

T5, 6, 8, 10, 12, 15, 20, 25, 30 of PNS_ _ are buff finished.
Sizes larger than plate thickness 50 and precision tolerance are only available on "Material Shop 24 Website". For details, refer to **P.1581**
* Except Surface Grinding

Aluminum Configurable Plates Price List

-EN AW-5052/AlMg2,5- (Aℓ-Mg Base Aluminum Alloy)

Price

- Large Size Price (Ex.) When L–PNLNP–1000.5–700–10

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1000.5	x	25.4 Cent	=	254,10 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Narrow Size H-PNLN_ 4-Surface Milling (Rolled) A, B 0.5mm Increment

Part Number	A	B T	3	4	5	6	8	10	12	15	20	25	30	35
H-PNLN_ _	6~ 50	6~9.5												
	50.5~ 100													
	100.5~ 150													
	150.5~ 200													
	200.5~ 250													
	250.5~ 300													
	300.5~ 350													
	350.5~ 400													
	400.5~ 500													
	500.5~ 600													
	30~ 50	10~19.5												
	50.5~ 100													
	100.5~ 150													
	150.5~ 200													
	200.5~ 250													
	250.5~ 300													
	300.5~ 350													
	350.5~ 500													
	500.5~ 600													
	600.5~ 700													
	700.5~ 800													
	800.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													

Large Size L-PNLN_ 4-Surface Milling (Rolled) A, B 0.5mm Increment

Part Number	A	B T	3	4	5	6	8	10	12	15	20	25	30	35	40	45	50
L-PNLN_	250~ 350	20~30															
	350.5~ 700																
	700.5~ 800																
	800.5~ 900																
	900.5~ 1000																
	1000.5~ 1200																
	1200.5~ 1400																
	1400.5~ 1600																
	250.5~ 350	30.5~50															
	350.5~ 700																
	700.5~ 800																
	800.5~ 900																
	900.5~ 1000																
	1000.5~ 1200																
	1200.5~ 1400																
	1400.5~ 1600																
	1600.5~ 1800																
	1800.5~ 2000																
	2000.5~ 2200																
	2200.5~ 2400																
	2400.5~ 2600																
	2600.5~ 2800																
	2800.5~ 3000																
	500.5~ 950	51.5~100															
	950.5~ 1250																
	1250.5~ 1500																
	1500.5~ 2150																
	2150.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	500.5~ 900	100.5~150															
	900.5~ 1400																
	1400.5~ 2150																
	2150.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	500.5~ 850	150.5~200															
	850.5~ 1350																
	1350.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	500.5~ 800	200.5~250															
	800.5~ 1300																
	1300.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	500.5~ 750	250.5~300															
	750.5~ 1300																
	1300.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	300.5~ 700	300.5~350															
	700.5~ 1250																
	1250.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																

■Large Size L-PNLN_ 4-Surface Milling (Rolled) A, B 0.5mm Increment

Part Number	A	B T	3	4	5	6	8	10	12	15	20	25	30	35	40	45	50
L-PNLN_	350.5~ 650	350.5~400															
	650.5~ 1200																
	1200.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	400.5~ 600	400.5~450															
	600.5~ 1100																
	1100.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	450.5~ 550	450.5~500															
	550.5~ 1100																
	1100.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	500.5~ 1050	500.5~550															
	1050.5~ 1550																
	1550.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	550.5~ 1000	550.5~600															
	1000.5~ 1550																
	1550.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	600.5~ 900	600.5~650															
	900.5~ 1700																
	1700.5~ 2500																
	2500.5~ 2800																
	2800.5~ 3000																
	650.5~ 900	650.5~700															
	900.5~ 1100																
	1100.5~ 2150																
	2150.5~ 2500																
	700.5~ 850	700.5~750															
	850.5~ 1100																
	1100.5~ 1700																
	1700.5~ 2500																
	750.5~ 1200	750.5~800															
	1200.5~ 1650																
	1650.5~ 2100																
	2100.5~ 2500																
	800.5~ 1200	800.5~850															
	1200.5~ 1650																
	1650.5~ 2100																
	2100.5~ 2500																
	850.5~ 1400	850.5~900															
	1400.5~ 1950																
	1950.5~ 2500																
	900.5~ 1400	900.5~950															
	1400.5~ 1950																
	1950.5~ 2500																
	950.5~ 1400	950.5~1000															
	1400.5~ 1950																
	1950.5~ 2500																
	1000.5~ 1500	1000.5~1050															
	1500.5~ 2000																
	2000.5~ 2500																
	1050.5~ 1500	1050.5~1100															
	1500.5~ 2000																
	2000.5~ 2500																
	1100.5~ 1500	1100.5~1150															
	1500.5~ 2000																
	2000.5~ 2500																
	1150.5~ 1600	1150.5~1200															
	1600.5~ 2050																
	2050.5~ 2500																
	1200.5~ 1600	1200.5~1250															
	1600.5~ 2050																
	2050.5~ 2500																
	1250.5~ 1650	1250.5~1300															
	1650.5~ 2050																
	1300.5~ 1700	1300.5~1350															
	1700.5~ 2050																
	1350.5~ 1700	1350.5~1400															
	1700.5~ 2050																
	1400.5~ 1700	1400.5~1450															
	1700.5~ 2050																
	1450.5~ 1700	1450.5~1500															
	1700.5~ 2050																

Aluminum Configurable Plates Price List

-EN AW-5052/AlMg2,5- (Aℓ-Mg Base Aluminum Alloy)

Price

- Large Size Price (Ex.) When L–PNFNP–1000.5–700–10.5

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1000.5	x	82.7 Cent	=	827,40 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

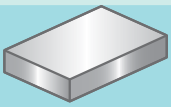
For orders larger than indicated quantity, please request a quotation.

Narrow Size H-PNF_ _ All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	3~4.5	5~7.5	8~9.5	10~11.5	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5
H-PNF_ _	7~ 50	8~9.5										
	50.5~ 100											
	100.5~ 150											
	150.5~ 200											
	200.5~ 250											
	250.5~ 300											
	300.5~ 400											
	400.5~ 500											
	500.5~ 600											
	30~ 50	10~19.5										
	50.5~ 100											
	100.5~ 150											
	150.5~ 200											
	200.5~ 250											
	250.5~ 300											
	300.5~ 400											
	400.5~ 500											
	500.5~ 600											
	600.5~ 700											
	700.5~ 800											
	800.5~ 900											
	900.5~ 1000											
	1000.5~ 1100											
	1100.5~ 1200											
	1200.5~ 1300											
	1300.5~ 1400											
	1400.5~ 1500											
	1500.5~ 1600											

Large Size L-PFF_ _ All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	5~7.5	8~9.5	10~11.5	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PNF_ _	250~ 350	20~30												
	350.5~ 500													
	500.5~ 650													
	650.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	250.5~ 350	30.5~50												
	350.5~ 500													
	500.5~ 650													
	650.5~ 800													
	800.5~ 1000													
	1000.5~ 1300													
	1300.5~ 1600													
	500.5~ 650	50.5~100												
	650.5~ 800													
	800.5~ 1000													
	1000.5~ 1300													
	1300.5~ 1600													
	1600.5~ 2000													
	2000.5~ 2400													
	2400.5~ 2800													
	2800.5~ 3000													
	500.5~ 600	100.5~145												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	500.5~ 600	145.5~200												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	500.5~ 600	200.5~250												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													



Price Reduction
Up to 6%
L-PNF_ _

■Large Size L-PFF_ _ All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	8~9.5	10~11.5	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PNF_ _	500.5~ 600	250.5~300											
	600.5~ 700												
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400												
	1400.5~ 1600												
	300.5~ 400	300.5~350											
	400.5~ 500												
	500.5~ 600												
	600.5~ 700												
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	350.5~ 500	350.5~400											
	500.5~ 600												
	600.5~ 700												
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	400.5~ 500	400.5~450											
	500.5~ 600												
	600.5~ 700												
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	450.5~ 500	450.5~500											
	500.5~ 600												
	600.5~ 700												
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	500.5~ 600	500.5~550											
	600.5~ 700												
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	550.5~ 600	550.5~600											
	600.5~ 700												
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	600.5~ 700	600.5~650											
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	650.5~ 700	650.5~700											
	700.5~ 800												
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										
	700.5~ 800	700.5~800											
	800.5~ 900												
	900.5~ 1000												
	1000.5~ 1200												
	1200.5~ 1400		✕										
	1400.5~ 1600		✕										

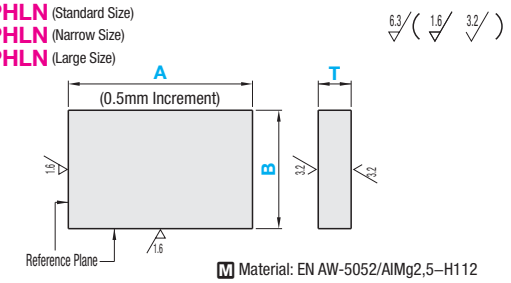
High Precision Aluminum Configurable Plates

-EN AW-5052/AlMg2,5- (Aℓ-Mg Base Aluminum Alloy, Precision Rolling Products)



RoHS

PHLN (Standard Size)
PHLN (Narrow Size)
PHLN (Large Size)



M Material: EN AW-5052/AlMg2,5–H112

Part Number			0.5mm Increment		
Type		A, B Dimension Tolerance Selection	A	B	T Selection
			A≥B		
Standard Size	PHLN	P	25~500	10~300	5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50
Narrow size	H-PHLN	Q	6~1600	6~19.5	4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35
Large Size	L-PHLN	N	250~2500	20~1000	4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50
		M			

A, B Dimension Tolerance

A, B Dimension	P	Q	N	M
250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

- T Dim. Tolerance

4, 5, 6	8, 10, 12	15	20	25, 30, 35, 40, 45, 50
±0.04	±0.05	±0.08	±0.10	±0.15

- Flatness: 0.4 or less per 1000mm
- Perpendicularity of Reference Plane: 0.015 or less per 100mm
- Circumference Chamfering: C0.3 or less

Order Example

Part Number						
Type	A, B Dimension Tolerance		A	B	T	
PHLN	M	-	255	220	15	

Alterations

Part Number					
PHLNP	-	500	125	10	-CCD20 (CCA, etc.)

Days to Ship

- PHLN_ (Standard Size)

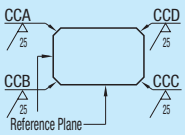
8 Days

Express A | 4,00 EUR/piece P.88

A Express Charge of 10,80 EUR for 3 or more identical pieces.

- H-PHLN_ / L-PHLN_

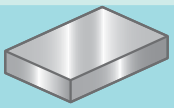
8 Days

Alterations	Code	Spec.	Price Adder
Corner Cut 		Cuts any corners. 1≤ Corner Cut ≤501mm Increment $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Ex.) When the corners of A and D are cut by C5, ···› CCA5-CCD5	Refer to Spec.

1mm Increment	Price Adder
1~5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

Standard Size PHLN_ (4-Surface Milling)

Part Number	A	B \ T	5	6	8	10	12	15	20	25	30	35	40	45	50
PHLN_	25~ 50	10~19.5													
	50.5~ 75														
	75.5~ 100														
	100.5~ 250														
	25~ 50	20~50													
	50.5~ 75														
	75.5~ 100														
	100.5~ 250														
	50.5~ 75	50.5~75													
	75.5~ 100														
	100.5~ 200														
	200.5~ 500														
	75.5~ 100	75.5~100													
	100.5~ 200														
	200.5~ 300														
	300.5~ 500														
	100.5~ 250	100.5~125													
	250.5~ 500														
	125.5~ 300	125.5~150													
	300.5~ 500														
	150.5~ 300	150.5~160													
	300.5~ 500														
	160.5~ 500	160.5~200													
	200.5~ 500	200.5~250													
	250.5~ 500	250.5~300													



Price

(Ex.) When

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1000.5	x	31 Cent	=	310,10 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Narrow Size H–PHLN (4-Surface Milling)

Part Number	A	B \ T	4	5	6	8	10	12	15	20	25	30	35
H-PHLN_	6~ 50	6~9.5											
	50.5~ 100												
	100.5~ 150												
	150.5~ 200												
	200.5~ 250												
	250.5~ 300												
	300.5~ 350												
	350.5~ 600												
	30~ 50	10~19.5											
	50.5~ 100												
	100.5~ 150												
	150.5~ 200												
	200.5~ 250												
	250.5~ 300												
	300.5~ 350												
	350.5~ 950												
	950.5~ 1450												
	1450.5~ 1500												
	1500.5~ 1550												
	1550.5~ 1600												

Large Size L–PHLN (4-Surface Milling)

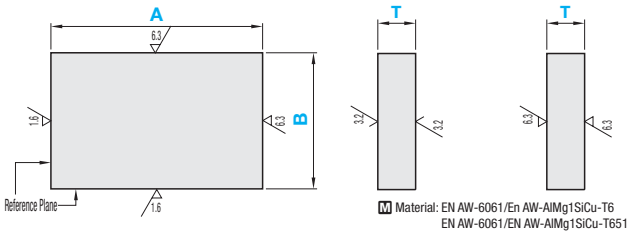
Part Number	A	B \ T	4	5	6	8	10	12	15	20	25	30	35	40	45	50
L-PHLN_	250~ 350	20~30														
	350.5~ 700															
	700.5~ 1000															
	1000.5~ 1450															
	1450.5~ 1500															
	1500.5~ 1550															
	1550.5~ 1600															
	250.5~ 350	30.5~50														
	350.5~ 700															
	700.5~ 1000															
	1000.5~ 1450															
	1450.5~ 1500															
	1500.5~ 1550															
	1550.5~ 2150															
	2150.5~ 2500															
	500.5~ 950	50.5~100														
	950.5~ 1250															
	1250.5~ 1500															
	1500.5~ 2150															
	2150.5~ 2500															
	500.5~ 900	100.5~150														
	900.5~ 1400															
	1400.5~ 2150															
	2150.5~ 2500															
	500.5~ 850	150.5~200														
	850.5~ 1350															
	1350.5~ 2500															
	500.5~ 800	200.5~250														
	800.5~ 1300															
	1300.5~ 2500															
	500.5~ 750	250.5~300														
	750.5~ 1300															
	1300.5~ 2500															
	300.5~ 700	300.5~350														
	700.5~ 1250															
	1250.5~ 2500															
	350.5~ 650	350.5~400														
	650.5~ 1200															
	1200.5~ 2500															
	400.5~ 600	400.5~450														
	600.5~ 1100															
	1100.5~ 2500															
	450.5~ 550	450.5~500														
	550.5~ 1100															
	1100.5~ 2500															
	500.5~ 1050	500.5~550														
	1050.5~ 1550															
	1550.5~ 2500															
	550.5~ 1000	550.5~600														
	1000.5~ 1550															
	1550.5~ 2500															
	600.5~ 900	600.5~650														
	900.5~ 1700															
	1700.5~ 2500															
	650.5~ 900	650.5~700														
	900.5~ 1100															
	1100.5~ 2150															
	2150.5~ 2500															
	700.5~ 850	700.5~750														
	850.5~ 1100															
	1100.5~ 1700															
	1700.5~ 2500															
	750.5~ 1050	750.5~800														
	1050.5~ 1700															
	1700.5~ 2500															
	800.5~ 1200	800.5~850														
	1200.5~ 1950															
	1950.5~ 2500															
	850.5~ 1650	850.5~900														
	1650.5~ 2500															
	900.5~ 1650	900.5~950														
	1650.5~ 2500															
	950.5~ 1650	950.5~1000														
	1650.5~ 2500															

Aluminum Configurable Plates

-EN AW-6061/EN AW-AlMg1SiCu- (Al-Mg-Si Base Aluminum Alloy)



A6061___ (Rolling) A6061LN_ (Milling) A6061F__



M Material: EN AW-6061/En AW-AlMg1SiCu-T6
EN AW-6061/EN AW-AlMg1SiCu-T651

Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B	T Selection - Configurable
				A≥B		
A6061	L (Rolling)	N	P Q N M	25~500	10~300	5, 6, 8, 10, 12, 15, 20 25, 30, 35, 40, 45, 50
	F (Milling)	P Q N M	P Q N M	25~500	10~300	5~49(0.5mm Increment)

(1) Plate Thickness Tolerance

2-Surface Finish	Selectable for N only T Dimension									
	5	6	8, 10	12	15	20	25	30, 35	40	45, 50
L (Rolling)	±0.25	±0.28	±0.48	±0.64	±0.7	±0.8	±0.9	±1.0	±1.1	±1.3

2-Surface Finish	P	Q	N	M
F (Milling)	+0.1~+0.3	0~0.2	±0.1	-0.2~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Dimension	P	Q	N	M
L (Rolling) F (Milling)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish L (Rolling)	2-Surface Finish F (Milling)
Thickness Parallelism (per 100mm)	T5~ 6.5	-	0.05
	T7~ 12.5		
	T13~ 15.5		
	T16~ 20.5		0.07
	T21~ 50		0.1
Flatness (per 100mm)	T5~ 8.5	0.15	0.15
	T9~ 12.5		0.13
	T13~ 20.5		0.12
	T21~ 50		0.1
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		Standard Size	C0.3 or less
		Narrow / Large Size	C0.1 Thread Chamfering

Order Example

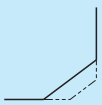
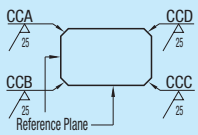
Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
A6061	F	Q	M	-	255	-	220	-	18

Days to Ship - A6061LN_ / A6061F_ _

8 Days | Express A | 8,00 EUR/ piece P.88

Alterations

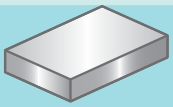
Part Number		A	-	B	-	T	(CSC / CBC / CCA / etc.)
A6061LNM	-	300	-	280	-	20	- CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	CBC	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.3 or less···› C0.1 or less	Changes the circumference chamfering dimension. C0.2~0.5···› C0.5~C0.1	Cuts any corners. 1≤ Corner Cut ≤501mm Increment C≤ A/2, B/2 Ordering Code (Example)When the corners of A and D are cut by C5 ···› CCA5-CCD5
Price Adder	Free of Charge	Free of Charge	Refer to spec.

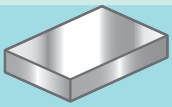
1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

■Features of EN AW-6061

Provided with higher mechanical strength than EN AW-5052/AlMg2,5 and more corrosion resistance than EN AW-2017/AlCu4MgSi.



All Surfaces Milled



All Surfaces Milled + Top/Bottom Surfaced

Price

(Ex.) When A6061FQM-255-220-18

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	29 Cent	=	73,90 €

■Volume Discount (Round down to ten Cent.) **P88**

Quantity	1~4	5~19
Rate	€ Unit Price	5%

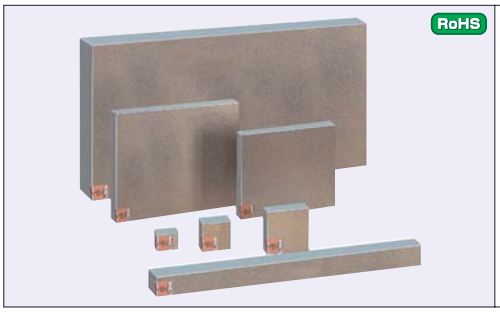
For orders larger than indicated quantity, please request a quotation.

Part Number	A	B \ T	5	6	8	10	12	15	20	25	30	35	40	45	50
A6061LN_	25 ~ 50	10~19.5	●	●	●	●	●	●	●	●	●	●	●	●	●
	50.5~ 75														
	75.5~ 100		●	●	●	●	●	●	●	●	●	●	●	●	●
	100.5~ 250														
	25 ~ 50	20~50	●	●	●	●	●	●	●	●	●	●	●	●	●
	50.5~ 75														
	75.5~ 100		●	●	●	●	●	●	●	●	●	●	●	●	●
	100.5~ 250														
	50.5~ 75	50.5~75	●	●	●	●	●	●	●	●	●	●	●	●	●
	75.5~ 100														
	100.5~ 200		●	●	●	●	●	●	●	●	●	●	●	●	●
	200.5~ 500														
	75.5~ 100	75.5~100	●	●	●	●	●	●	●	●	●	●	●	●	●
	100.5~ 200														
	200.5~ 300		●	●	●	●	●	●	●	●	●	●	●	●	●
	300.5~ 500														
	100.5~ 250	100.5~125	●	●	●	●	●	●	●	●	●	●	●	●	●
	250.5~ 500														
	125.5~ 300	125.5~150	●	●	●	●	●	●	●	●	●	●	●	●	●
	300.5~ 500														
	150.5~ 300	150.5~160	●	●	●	●	●	●	●	●	●	●	●	●	●
	300.5~ 500														
	160.5~ 500	160.5~200	●	●	●	●	●	●	●	●	●	●	●	●	●
	200.5~ 500	200.5~250													
	250.5~ 500	250.5~300	●	●	●	●	●	●	●	●	●	●	●	●	●

Part Number	A	B \ T	5	5.5~6.5	7~10	10.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~49
A6061F__	25 ~ 50	10~19.5	●	●	●	●	●	●	●	●	●	●	●
	50.5~ 75												
	75.5~ 100		●	●	●	●	●	●	●	●	●	●	●
	100.5~ 250												
	25 ~ 50	20~50	●	●	●	●	●	●	●	●	●	●	●
	50.5~ 75												
	75.5~ 100		●	●	●	●	●	●	●	●	●	●	●
	100.5~ 250												
	50.5~ 75	50.5~75	●	●	●	●	●	●	●	●	●	●	●
	75.5~ 100												
	100.5~ 300		●	●	●	●	●	●	●	●	●	●	●
	300.5~ 500												
	75.5~ 100	75.5~100	●	●	●	●	●	●	●	●	●	●	●
	100.5~ 200												
	200.5~ 300		●	●	●	●	●	●	●	●	●	●	●
	300.5~ 500												
	100.5~ 250	100.5~125	●	●	●	●	●	●	●	●	●	●	●
	250.5~ 500												
	125.5~ 300	125.5~150	●	●	●	●	●	●	●	●	●	●	●
	300.5~ 500												
	150.5~ 300	150.5~160	●	●	●	●	●	●	●	●	●	●	●
	300.5~ 500												
	160.5~ 500	160.5~200	●	●	●	●	●	●	●	●	●	●	●
	200.5~ 500	200.5~250											
	250.5~ 500	250.5~300	●	●	●	●	●	●	●	●	●	●	●

Duralumin Configurable Plates

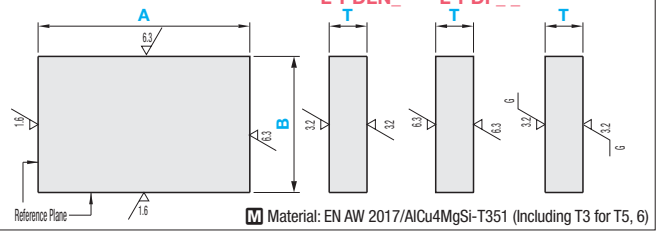
-EN AW-2017/AlCu4MgSi- (Aℓ-Cu Base Aluminum Alloy)



RoHS

PD_ _ (Standard Size)
H-PD_ _ (Narrow Size)
L-PD_ _ (Large Size)

(Rolling) PDLN_ H-PDLN_ L-PDLN_
(Milling) PDF_ _ H-PDF_ _ L-PDF_ _
(Surface Grinding) PDS_ _



M Material: EN AW 2017/AlCu4MgSi-T351 (Including T3 for T5, 6)

Type		2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	0.5mm Increment A	0.5mm Increment B	T Selection - Configurable
					A≥B		
Standard Size	PD	(Rolling)	N	P Q N M	25~ 500	10~ 300	5, 6, 8, 10, 12, 15, 20, 25, 30, 40, 50
Narrow size	H-PD				6~ 1600	6~ 19.5	3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35
Large Size	L-PD				250~ 2500	20~ 1250	3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, 50
Standard Size	PD	(Milling)	P Q N M	P Q N M	25~ 500	10~ 300	5~49 (0.5mm Increment)
Narrow size	H-PD				8~ 1600	8~ 19.5	3~29.5 (0.5mm Increment)
Large Size	L-PD				250~ 2400	20~ 800	5~50 (0.5mm Increment)
Standard Size	PD	(Surface Grinding)			25~ 500	10~ 300	5~49 (0.5mm Increment)

(1) Plate Thickness Tolerance

2-Surface Finish	Selectable for N only: T Dimension										
	3	4, 5	6	8	10	12, 15	20	25	30, 35	40	45, 50
L (Rolling)	±0.2	±0.35	±0.45	±0.5	±0.6	±0.7	±0.8	±0.9	±1.0	±1.1	±1.3

2-Surface Finish	A, B Length	P	Q	N	M
F (Milling)	550mm or less	+0.1~+0.3	0~-0.2	±0.1	-0.2~0
	550.5mm or more	+0.1~+0.4	0~-0.3	±0.15	-0.3~0
S (Surface Grinding)		+0.1~+0.2	0~-0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Length	P	Q	N	M
L (Rolling) F (Milling) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish: L (Rolling)	F (Milling)	S (Surface Grinding)
Thickness Parallelism (per 100mm)	T3~ 6.5	-	0.05	0.025
	T7~ 12.5			0.03
	T13~ 15.5			0.05
	T16~ 20.5		0.07	0.07
	T21~ 50		0.1	0.1
Flatness (per 100mm)	T3~ 8.5	0.2	0.15	0.12
	T9~ 12.5		0.13	0.06
	T13~ 20.5		0.12	
	T21~ 50		0.1	
Perpendicularity of Reference Plane		0.015 per 100mm		
Circumference Chamfering		Standard Size	C0.3 or less	
		Narrow / Large Size	C0.1 Thread Chamfering	

Order Example

Part Number							
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	- A -	B	- T	
PD	F	Q	M	- 255 -	220	- 15	

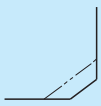
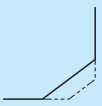
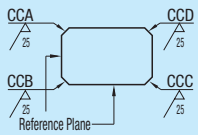
Days to Ship

- PDLN_		6 Days
- PDF_ _	A (Length) 300mm or less	6 Days
- PDF_ _	A (Length) 300.5mm or more	8 Days
- H-PD_ _ _ / L-PD_ _ _		8 Days
- PDS_ _		10 Days

Express A 8,00 EUR/piece
Express B 5,00 EUR/piece
P88
Flat charges of A: 21,60 EUR and B: 13,50 EUR for 3 or more identical pieces.

Part Number - A - B - T -(CSC / CBC / CCA / etc.)
PDFNM - 300 - 280 - 20 - CSC

Alterations

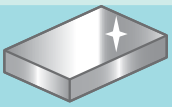
Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	(See below)	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.3 or less⋯› C0.1 or less. Available for Standard Size Type only.	Changes the circumference chamfering dimension.	Cuts any corners. 1≤ Corner Cut ≤501mm Increment. C≤ A/2, B/2. Ordering Code. (Example) When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Refer to spec.	Refer to spec.

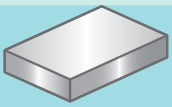
Circumference Chamfering:

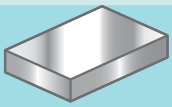
Size	Standard	Modified Value	Code	Price Adder
Standard Size	C0.3 or less	C0.5~C1.0	CBC	Free of Charge
Narrow size Large Size	C0.1 Thread Chamfering	C0.2~C0.5	CBB	10,00
		C0.5~C1.0	CBC	12,00
		C1.0~C1.5	CBD	15,00
		C1.5~C2.0	CBE	16,00

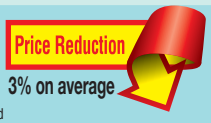
Corner Cut:

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00


4-Surface Milling (Rolled)


All Surfaces Milled


All Surfaces Milled + Top/Bottom Surfaced



Price

(Ex.) When PDFQM–255–220–18

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
255	x	36.8 Cent	=	93,80 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Part Number	A	B \ T	5	6	8	10	12	15	20	25	30	40	50
PDLN_	25 ~ 50	10~19.5											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	25 ~ 50	20~50											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	50.5~ 75	50.5~75											
	75.5~ 100												
	100.5~ 200												
	200.5~ 500												
	75.5~ 100	75.5~100											
	100.5~ 200												
	200.5~ 300												
	300.5~ 500												
	100.5~ 250	100.5~125											
	250.5~ 500												
	125.5~ 300	125.5~150											
	300.5~ 500												
	150.5~ 300	150.5~160											
	300.5~ 500												
	160.5~ 500	160.5~200											
	200.5~ 500	200.5~250											
	250.5~ 500	250.5~300											

H–PDL (Rolling)
Narrow size
L–PDL (Rolling)
For Large Size,
refer to
P.1685•1686

Part Number	A	B \ T	5	5.5~6	6.5~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~39	39.5~49
PDF_ _	25 ~ 50	10~19.5											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	25 ~ 50	20~50											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	50.5~ 75	50.5~75											
	75.5~ 100												
	100.5~ 200												
	200.5~ 500												
	75.5~ 100	75.5~100											
	100.5~ 200												
	200.5~ 300												
	300.5~ 500												
	100.5~ 250	100.5~125											
	250.5~ 500												
	125.5~ 300	125.5~150											
	300.5~ 500												
	150.5~ 300	150.5~160											
	300.5~ 500												
	160.5~ 500	160.5~200											
	200.5~ 500	200.5~250											
	250.5~ 500	250.5~300											

H–PDF (Milling)
Narrow size
L–PDF (Milling)
For Large Size,
refer to
P.1687•1688

Part Number	A	B \ T	5	6	7~8	8.5~10	10.5~12	12.5~15	15.5~20	20.5~25	25.5~30	30.5~39	39.5~49
PDS_ _	25 ~ 50	10~19.5											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	25 ~ 50	20~50											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	50.5~ 75	50.5~75											
	75.5~ 100												
	100.5~ 200												
	200.5~ 500												
	75.5~ 100	75.5~100											
	100.5~ 200												
	200.5~ 300												
	300.5~ 500												
	100.5~ 250	100.5~125											
	250.5~ 500												
	125.5~ 300	125.5~150											
	300.5~ 500												
	150.5~ 300	150.5~160											
	300.5~ 500												
	160.5~ 500	160.5~200											
	200.5~ 500	200.5~250											
	250.5~ 500	250.5~300											

1mm Increment for T=5~7 of surface

Duralumin Configurable Plates Price List

-EN AW-2017/AlCu4MgSi- (Aℓ-Cu Base Aluminum Alloy)

Price

- Large Size Price (Ex.) When L–PDLNM–1000.5–700–10

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
1000.5	x	35.7 Cent	=	357,10 EUR

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

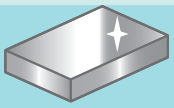
For orders larger than indicated quantity, please request a quotation.

Narrow Size H-PDLN_ 4-Surface Milling (Rolled) A, B 0.5mm Increment

Part Number	A	B \ T	3	4	5	6	8	10	12	15	20	25	30	35
H-PDLN_	6 ~ 50	6~9.5												
	50.5~ 100													
	100.5~ 150													
	150.5~ 200													
	200.5~ 250													
	250.5~ 300													
	300.5~ 350													
	350.5~ 400													
	400.5~ 500													
	500.5~ 600													
	30 ~ 50	10~19.5												
	50.5~ 100													
	100.5~ 150													
	150.5~ 200													
	200.5~ 250													
	250.5~ 300													
	300.5~ 350													
	350.5~ 500													
	500.5~ 600													
	600.5~ 700													
	700.5~ 800													
	800.5~ 1000													
	1000.5~1200													
	1200.5~1400													
	1400.5~1600													

Large Size L-PDLN_ 4-Surface Milling (Rolled) A, B 0.5mm Increment

Part Number	A	B \ T	3	4	5	6	8	10	12	15	20	25	30	35	40	45	50
L-PDLN_	250 ~ 350	20~30															
	350.5~ 700																
	700.5~ 800																
	800.5~ 900																
	900.5~ 1000																
	1000.5~1200																
	1200.5~1400																
	1400.5~1600																
	250.5~ 350	30.5~50															
	350.5~ 700																
	700.5~ 800																
	800.5~ 900																
	900.5~ 1000																
	1000.5~1200																
	1200.5~1400																
	1400.5~1600																
	1600.5~1800																
	1800.5~2000																
	2000.5~2200																
	500.5~ 950	50.5~100															
	950.5~ 1250																
	1250.5~1500																
	1500.5~2150																
	2150.5~2500																
	500.5~ 900	100.5~150															
	900.5~ 1400																
	1400.5~2150																
	2150.5~2500																
	500.5~ 850	150.5~200															
	850.5~ 1350																
	1350.5~2500																
	500.5~ 800	200.5~250															
	800.5~ 1300																
	1300.5~2500																
	500.5~ 750	250.5~300															
	750.5~ 1300																
	1300.5~ 2500																



4-Surface Milling (Rolled)

Price Reduction

Up to 6%

L-PDLN_

■Large Size L-PDLN_ 4-Surface Milling (Rolled) A, B 0.5mm Increment

Part Number	A	B \ T	3	4	5	6	8	10	12	15	20	25	30	35	40	45	50
L-PDLN_	300.5~ 700	300.5~350	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	700.5~ 1250																
	1250.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	350.5~ 650	350.5~400															
	650.5~ 1200		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200.5~2500																
	400.5~ 600	400.5~450	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	600.5~ 1100																
	1100.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	450.5~ 550	450.5~500															
	550.5~ 1100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1100.5~2500																
	500.5~ 1050	500.5~550	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1050.5~1550																
	1550.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	550.5~ 1000	550.5~600															
	1000.5~1550		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1550.5~2500																
	600.5~ 900	600.5~650	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	900.5~ 1700																
	1700.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	650.5~ 900	650.5~700															
	900.5~ 1100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1100.5~1550																
	1550.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	700.5~ 850	700.5~750															
	850.5~ 1100		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1100.5~1700																
	1700.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	750.5~ 1200	750.5~800															
	1200.5~1650		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1650.5~2100																
	2100.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	800.5~ 1200	800.5~850															
	1200.5~1650		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1650.5~2100																
	2100.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	850.5~ 1400	850.5~900															
	1400.5~1950		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1950.5~2500																
	900.5~ 1400	900.5~950	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1400.5~1950																
	1950.5~2500		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	950.5~ 1400	950.5~1000	▨	▨	▨	▨	▨										
	1400.5~1950		▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■
	1950.5~2500		▨	▨	▨	▨	▨										
	1000.5~1500	1000.5~1050	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■
	1500.5~2000		▨	▨	▨	▨	▨										
	2000.5~2500		▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■
	1050.5~1500	1050.5~1100	▨	▨	▨	▨	▨										
	1500.5~2000		▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■
	2000.5~2500		▨	▨	▨	▨	▨										
	1100.5~1500	1100.5~1150	▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■
	1500.5~2000		▨	▨	▨	▨	▨										
	2000.5~2500		▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■
	1150.5~1600	1150.5~1200	▨	▨	▨	▨	▨										
	1600.5~2050		▨	▨	▨	▨	▨	■	■	■	■	■	■	■	■	■	■
	2050.5~2500		▨	▨	▨	▨	▨										
	1200.5~1600	1200.5~1250	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	■	■
	1600.5~2050		▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨		
	2050.5~2500		▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	■	■

Duralumin Configurable Plates Price List

-EN AW-2017/AlCu4MgSi- (Aℓ-Cu Base Aluminum Alloy)

Price

- Large Size Price (Ex.) When L–PDFNM–1000–700–15

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
1000	x	113.7 Cent	=	1137,00 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

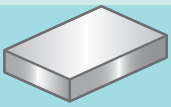
For orders larger than indicated quantity, please request a quotation.

Narrow Size H-PDF_ _ All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	3~4.5	5~7.5	8~9.5	10~11.5	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5
H-PDF_ _	8 ~ 50	8~9.5										
	50.5~ 100											
	100.5~ 150											
	150.5~ 200											
	200.5~ 250											
	250.5~ 300											
	300.5~ 400											
	400.5~ 500											
	500.5~ 600											
	30 ~ 50	10~19.5										
	50.5~ 100											
	100.5~ 150											
	150.5~ 200											
	200.5~ 250											
	250.5~ 300											
	300.5~ 400											
	400.5~ 500											
	500.5~ 600											
	600.5~ 700											
	700.5~ 800											
	800.5~ 900											
	900.5~ 1000											
	1000.5~ 1100											
	1100.5~ 1200											
	1200.5~ 1300											
	1300.5~ 1400											
	1400.5~ 1500											
	1500.5~ 1600											

Large Size L-PDF_ _ All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	5~7.5	8~9.5	10~11.5	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PDF_ _	250 ~ 350	20~30												
	350.5~ 500													
	500.5~ 650													
	650.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	250.5~ 350	30.5~50												
	350.5~ 500													
	500.5~ 650													
	650.5~ 800													
	800.5~ 1000													
	1000.5~ 1300													
	1300.5~ 1600													
	1600.5~ 2000													
	2000.5~ 2400													
	500.5~ 650	50.5~100												
	650.5~ 800													
	800.5~ 1000													
	1000.5~ 1300													
	1300.5~ 1600													
	1600.5~ 2000													
	2000.5~ 2400													
	500.5~ 600	100.5~145												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	500.5~ 600	145.5~200												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	500.5~ 600	200.5~250												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													



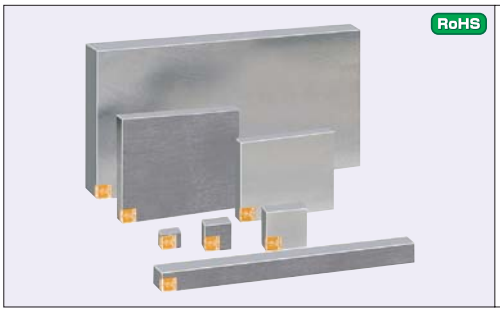


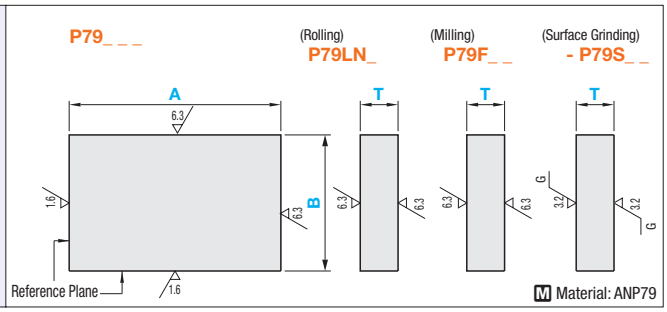
■Large Size L-PDF_ _ All Surfaces Milled A, B, T 0.5mm Increment

Part Number	A	B \ T	5~7.5	8~9.5	10~11.5	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PDF_ _	500.5~ 600	250.5~300												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	300.5~ 400	300.5~350												
	400.5~ 500													
	500.5~ 600													
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	350.5~ 500	350.5~400												
	500.5~ 600													
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	400.5~ 500	400.5~450												
	500.5~ 600													
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	450.5~ 500	450.5~500												
	500.5~ 600													
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	500.5~ 600	500.5~550												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	550.5~ 600	550.5~600												
	600.5~ 700													
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	600.5~ 700	600.5~650												
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	650.5~ 700	650.5~700												
	700.5~ 800													
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													
	700.5~ 800	700.5~800												
	800.5~ 900													
	900.5~ 1000													
	1000.5~ 1200													
	1200.5~ 1400													
	1400.5~ 1600													

JIS-ANP79 Configurable Plates

-A7000 Type- (Aℓ-Zn-Mg-Cu Base Aluminum Alloy)





Part Number				0.5mm Increment		
Type	2-Surface Finish	(1) Plate Thickness Tolerance Selection	(2) A, B Dimension Tolerance Selection	A	B	T Selection - Configurable
				A≥B		
P79	L (Rolling)	N	P Q N M	25~500	20~300	8, 10, 15, 20, 25, 30, 35, 40, 45, 50
	F (Milling)	P Q N M	P Q N M	25~500	20~300	7~50 (0.5mm Increment)
	S (Surface Grinding)			25~500	20~300	7~50 (0.5mm Increment)

(1) Plate Thickness Tolerance

2-Surface Finish	Selectable for N only							
	T Dimension							
	8	10	15	20	25	30	35,40	45,50
L (Rolling)	0~+0.8	0~+0.9	0~+1.2	0~+1.3	0~+1.46	0~+1.5	0~+2.0	0~+2.5

2-Surface Finish	P	Q	N	M
F(Milling)	+0.1~+0.3	0~0.2	±0.1	-0.2~0
S (Surface Grinding)	+0.1~+0.2	0~0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Length	P	Q	N	M
L (Rolling) F (Milling) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5~500	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

Accuracy Standards

(Max. Value)

Item		2-Surface Finish		
		L (Rolling)	F (Milling)	S (Surface Grinding)
Thickness Parallelism (per 100mm)	T7~12.5	-	0.05	0.03
	T13~15.5			0.05
	T16~20.5		0.07	0.07
	T21~50		0.1	0.1
Flatness (per 100mm)	T7~8.5	-	0.15	0.12
	T9~12.5		0.13	0.06
	T13~20.5		0.12	
	T21~50		0.1	
Perpendicularity of Reference Plane		0.03 per 100mm		
Circumference Chamfering		C0.3 or less		

Order Example

Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
P79	F	Q	M	-	255	-	220	-	18

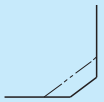
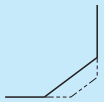
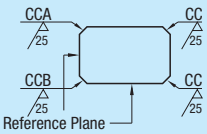
Days to Ship

- P79LN_: 8 Days — Express A 4,00 EUR/piece — €
- P79F_ _: 8 Days — Express A 4,00 EUR/piece
  A Express Charge of 10,80 EUR for 3 or more identical pieces.
- P79S_ _: 10 Days — Express A 8,00 EUR/piece, Express B 5,00 EUR/piece
  Flat charges of A: 21,60 EUR and B: 13,50 EUR for 3 or more identical pieces.

P88

Alterations

Part Number	-	A	-	B	-	T	-(CSC,CBC,CCA,etc.)
P79LNM	-	300	-	280	-	20	- CSC

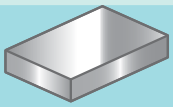
Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	(See below)	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.3 or less⋯› C0.1 or less	Changes the circumference chamfering dimension.	Cuts any corners. 1≤ Corner Cut ≤501mm Increment $C \leq \frac{A}{2}, \frac{B}{2}$ Ordering Code (Example)When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Refer to spec.	Refer to spec.

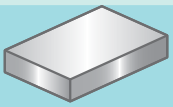
Size	Standard	Modified Value	Code	Price Adder
Standard Size	C0.3 or less	C0.5~C1.0	CBC	Free of Charge
Narrow size Large Size	C0.1 Thread Chamfering	C0.2~C0.5	CBB	10,00
		C0.5~C1.0	CBC	12,00
		C1.0~C1.5	CBD	15,00
		C1.5~C2.0	CBE	16,00

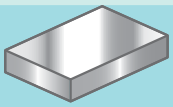
1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00

Features of ANP79

Compared with Iron 15C, it is harder and its machinability is at least 10 times higher.
Compared with 7075 material, it has about the same hardness, higher uniformity, and lower internal stress.
Suitable for applying to things that require high strength, lightweight and high accuracy such as base plates, robot components, jigs and dies.


4-Surface Milling (Rolled)


All Surfaces Milled


All Surfaces Milled + Top/Bottom Surfaced

Price

(Ex.) P79FQM–255–220–18

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	55 Cent	=	140,20 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Part Number	A	B \ T	8	10	15	20	25	30	35	40	45	50
P79LN_	25 ~ 50	20~50										
	50.5~ 75											
	75.5~ 100											
	100.5~ 250											
	50.5~ 75	50.5~75										
	75.5~ 100											
	100.5~ 200											
	200.5~ 500											
	75.5~ 100	75.5~100										
	100.5~ 200											
	200.5~ 300											
	300.5~ 500											
	100.5~ 250	100.5~125										
	250.5~ 500											
	125.5~ 300	125.5~150										
	300.5~ 500											
	150.5~ 300	150.5~160										
	300.5~ 500											
	160.5~ 500	160.5~200										
	200.5~ 500	200.5~250										
	250.5~ 500	250.5~300										

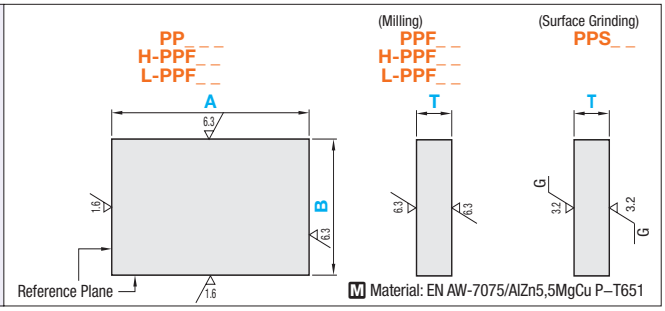
Part Number	A	B \ T	7~10	10.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
P79F_ _	25 ~ 50	20~50									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250										
	50.5~ 75	50.5~75									
	75.5~ 100										
	100.5~ 200										
	200.5~ 500										
	75.5~ 100	75.5~100									
	100.5~ 200										
	200.5~ 300										
	300.5~ 500										
	100.5~ 250	100.5~125									
	250.5~ 500										
	125.5~ 300	125.5~150									
	300.5~ 500										
	150.5~ 300	150.5~160									
	300.5~ 500										
	160.5~ 500	160.5~200									
	200.5~ 500	200.5~250									
	250.5~ 500	250.5~300									

Part Number	A	B \ T	7~10	10.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
P79S_ _	25 ~ 50	20~50									
	50.5~ 75										
	75.5~ 100										
	100.5~ 250										
	50.5~ 75	50.5~75									
	75.5~ 100										
	100.5~ 200										
	200.5~ 500										
	75.5~ 100	75.5~100									
	100.5~ 200										
	200.5~ 300										
	300.5~ 500										
	100.5~ 250	100.5~125									
	250.5~ 500										
	125.5~ 300	125.5~150									
	300.5~ 500										
	150.5~ 300	150.5~160									
	300.5~ 500										
	160.5~ 500	160.5~200									
	200.5~ 500	200.5~250									
	250.5~ 500	250.5~300									

Extra Super Duralumin Configurable Plates

-EN AW-7075/AlZn5,5MgCu- (Aℓ-Zn-Mg Base Aluminum Alloy)





Part Number					0.5mm Increment					
Type		2-Surface Finish	(1) Plate Thickness Tolerance	(2) A, B Dimension Tolerance	A		B		T	
			Selection	Selection	A≥B					
Standard Size	PP	F (Milling) S (Surface Grinding)	P Q N M	P Q N M	25~	500	10~	300	5~	50
Narrow size	H-PP	F (Milling)			8~	1600	8~	19.5	3~	24.5
Large Size	L-PP				250~	2400	20~	800	3~	50

(1) Plate Thickness Tolerance

2-Surface Finish	A, B Length	P	Q	N	M
F(Milling)	550mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	550.5mm or more	+0.1~+0.4	0~+0.3	±0.15	-0.3~0
S(Surface Grinding)		+0.1~+0.2	0~+0.1	±0.05	-0.1~0

(2) A, B Dimension Tolerance

2-Surface Finish	A, B Length	P	Q	N	M
F (Milling) S (Surface Grinding)	250mm or less	+0.1~+0.3	0~+0.2	±0.1	-0.2~0
	250.5mm or more	+0.1~+0.6	0~+0.5	±0.25	-0.5~0

■Accuracy Standards

(Max. Value)

Item		2-Surface Finish F (Milling)	2-Surface Finish S (Surface Grinding)
Thickness Parallelism (per 100mm)	T3~ 6.5	0.05	0.025
	T7~ 12.5		0.03
	T13~ 15.5		0.05
	T16~ 20.5	0.07	0.07
	T21~ 50	0.1	0.1
Flatness (per 100mm)	T5~ 8.5	0.15	0.12
	T9~ 12.5	0.13	0.06
	T13~ 20.5	0.12	
	T21~ 50	0.1	
Perpendicularity of Reference Plane		0.015 per 100mm	
Circumference Chamfering		C0.3 or less	

Order Example

Part Number								
Type	2-Surface Finish	Plate Thickness Tolerance	A, B Dimension Tolerance	-	A	-	B	-	T
PP	F	Q	M	-	255	-	220	-	18

Days to Ship

6 Days P.88

- PPF_ _ A (Length) 300.5mm or more

8 Days

- PPS_ _

8 Days | Express A | 4,00 EUR/ piece P.88

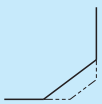
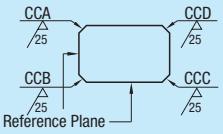
A Express Charge of 10,80 EUR for 3 or more identical pieces.

- H-PP_ _ _ / L-PP_ _ _

8 Days

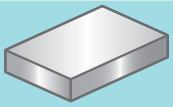
Alterations

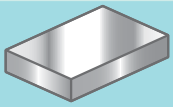
Part Number	-	A	-	B	-	T	-(CSC / CBC / CCA / etc.)
PPFNM	-	300	-	280	-	20	- CSC

Alterations	Circumference Chamfering		Corner Cut
			
Code	CSC	(See below)	CCA / CCB / CCC / CCD
Spec.	Changes the circumference chamfering dimension. C0.3 or less⋯› C0.1 or less Available for Standard Size Type only.	Changes the circumference chamfering dimension.	Cuts any corners. 1≤ Corner Cut ≤501mm Increment C≤ A/2 , B/2 Ordering Code (Example)When the corners of A and D are cut by C5 ⋯› CCA5-CCD5
Price Adder	Free of Charge	Refer to spec.	Refer to spec.

Size	Standard	Modified Value	Code	Price Adder
Standard Size	C0.3 or less	C0.5~C1.0	CBC	Free of Charge
Narrow size Large Size	C0.1 Thread Chamfering	C0.2~C0.5	CBB	10,00
		C0.5~C1.0	CBC	12,00
		C1.0~C1.5	CBD	15,00
		C1.5~C2.0	CBE	16,00

1mm Increment	Price Adder
1~ 5	2,00
6~10	2,50
11~20	4,50
21~30	6,00
31~40	7,00
41~50	8,00


All Surfaces Milled


All Surfaces Milled + Top/Bottom Surfaced

Price Reduction
3% on average

Price

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255	x	54.6 Cent	=	139,20 EUR

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

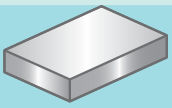
Part Number	A	B \ T	5	5.5~6.5	7~10	10.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PPF_ _	25 ~ 50	10~19.5											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	25 ~ 50	20~50											
	50.5~ 75												
	75.5~ 100												
	100.5~ 250												
	50.5~ 75	50.5~75											
	75.5~ 100												
	100.5~ 200												
	200.5~ 500												
	75.5~ 100	75.5~100											
	100.5~ 200												
	200.5~ 300												
	300.5~ 500												
For H-PP Narrow size L-PP For Large Size, refer to P.1693	100.5~ 250	100.5~125											
	250.5~ 500												
	125.5~ 300	125.5~150											
	300.5~ 500												
	150.5~ 300	150.5~160											
	300.5~ 500												
	160.5~ 300	160.5~200											
	300.5~ 500												
	200.5~ 350	200.5~250											
	350.5~ 500												
	250.5~ 500	250.5~300											

Part Number	A	B \ T	5, 6	7~10	10.5~15	15.5~20	20.5~25	25.5~30	30.5~35	35.5~40	40.5~45	45.5~50
PPS_ _	25 ~ 50	10~19.5										
	50.5~ 75											
	75.5~ 100											
	100.5~ 250											
	25 ~ 50	20~50										
	50.5~ 75											
	75.5~ 100											
	100.5~ 250											
	50.5~ 75	50.5~75										
	75.5~ 100											
	100.5~ 200											
	200.5~ 500											
	75.5~ 100	75.5~100										
	100.5~ 200											
	200.5~ 300											
	300.5~ 500											
	100.5~ 250	100.5~125										
	250.5~ 500											
	125.5~ 300	125.5~150										
	300.5~ 500											
	150.5~ 300	150.5~160										
	300.5~ 500											
	160.5~ 300	160.5~200										
	300.5~ 500											
	200.5~ 350	200.5~250										
	350.5~ 500											
	250.5~ 500	250.5~300										

1mm Increment for T=5~7 of S (surface)

Extra Super Duralumin Configurable Plates Price List

-EN AW-7075/AlZn5,5MgCu- (Aℓ-Zn-Mg Base Aluminum Alloy)g


All Surfaces Milled



Price

• Large Size Price (Ex.) When L–PPFQM–1000–700–10.5

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
1000	x	116.6 Cent	=	1166,00 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Narrow Size H–PPF_ _ All Surfaces Milled

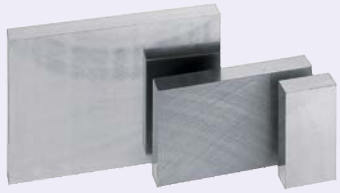
Part Number	A	B \ T	3~4.5	5~7.5	8~9.5	10~11	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5
H-PPF_ _	8 ~ 50	8~9.5									
	50.5~ 100										
	100.5~ 150										
	150.5~ 200										
	200.5~ 250										
	250.5~ 300										
	300.5~ 350										
	350.5~ 500										
	500.5~ 600										
	30 ~ 50	10~19.5									
	50.5~ 100										
	100.5~ 150										
	150.5~ 200										
	200.5~ 250										
	250.5~ 300										
	300.5~ 350										
	350.5~ 500										
	500.5~ 1000										
	1000.5~ 1250										
	1250.5~ 1600										

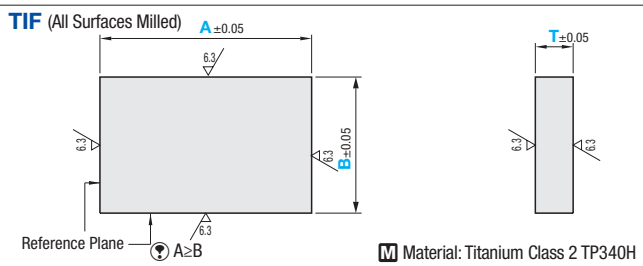
Large Size L-PPF_ _ All Surfaces Milled

Part Number	A	B \ T	3~4.5	5~7.5	8~9.5	10~11.5	12~14.5	15~17.5	18~19.5	20~21.5	22~24.5	25~29.5	30~34.5	35~39.5	40~50
L-PPF_ _	250 ~ 350	20~30													
	350.5~ 500														
	500.5~ 1000														
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	250.5~ 350	30.5~50													
	350.5~ 500														
	500.5~ 1000														
	1000.5~ 1300														
	1300.5~ 1600														
	1600.5~ 2000														
	2000.5~ 2400														
	500.5~ 1000	50.5~100													
	1000.5~ 1300														
	1300.5~ 1600														
	1600.5~ 2000														
	2000.5~ 2400														
	500.5~ 1000	100.5~145													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	500.5~ 1000	145.5~200													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	500.5~ 1000	200.5~250													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	500.5~ 1000	250.5~300													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	300.5~ 400	300.5~350													
	400.5~ 500														
	500.5~ 1000														
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	350.5~ 500	350.5~400													
	500.5~ 1000														
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	400.5~ 500	400.5~450													
	500.5~ 1000														
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	450.5~ 500	450.5~500													
	500.5~ 1000														
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	500.5~ 1000	500.5~550													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	550.5~ 1000	550.5~600													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	600.5~ 1000	600.5~650													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	650.5~ 1000	650.5~700													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														
	700.5~ 1000	700.5~800													
	1000.5~ 1200														
	1200.5~ 1400														
	1400.5~ 1600														

Titanium Configurable Plates

All Surfaces Milled





Part Number	0.1mm Increment		
Type	A	B	T
	A≥B		
TIF	10~300	6~300	2~28

Accuracy Standards

(Max. Value)

Parallelism (per 100mm)	0.02 or less
Flatness (per 100mm)	0.02 or less
Perpendicularity of Datum Plane (per 100mm)	0.02 or less
Circumference Chamfering	C0.1 Thread Chamfering

Order Example

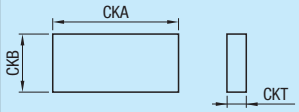
Part Number	-	A	-	B	-	T
TIF	-	255.3	-	221.1	-	18.9

Days to Ship 8 Days

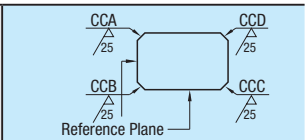
A \ B	T 2~2.9	3~3.9	4~4.9	5~5.9	6~7.9	8~9.9	10~14.9	15~19.9	20~24.9	25~28
10 ~ 50	6~7.9									
50.1 ~ 100										
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
10 ~ 50	8~15									
50.1 ~ 100										
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
15.1 ~ 50	15.1~20									
50.1 ~ 100										
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
20.1 ~ 50	20.1~25									
50.1 ~ 100										
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
25.1 ~ 50	25.1~35									
50.1 ~ 100										
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
35.1 ~ 50	35.1~50									
50.1 ~ 100										
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
50.1 ~ 100	50.1~75									
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
75.1 ~ 100	75.1~100									
100.1 ~ 150										
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
100.1 ~ 150	100.1~150									
150.1 ~ 200										
200.1 ~ 250										
250.1 ~ 300										
150.1 ~ 200	150.1~200									
200.1 ~ 250										
250.1 ~ 300										
200.1 ~ 250	200.1~250									
250.1 ~ 300										
250.1 ~ 300	250.1~300									

Alterations

Part Number	-	A	-	B	-	T	- (CKA, CKB, CCA ...etc.)
TIF	-	255.3	-	221.1	-	18.9	- CKT

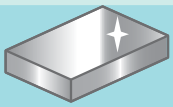
Alterations	Dimension Tolerance (Reduction)
	
Code	CKA / CKB / CKT
Spec.	Improves the dimensional tolerance. ±0.05→±0.025 Ordering Code CKA for A Dimension CKB for B Dimension CKT for T Dimension
Price Adder	Refer to spec.

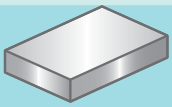
	Code	Price Adder
A (Length)	CKA	5,00
B (Width)	CKB	5,00
T (Plate Thickness)	CKT	5,00

Alterations	
Code	CCA / CCB / CCC / CCD
Spec.	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5 ···› CCA5-CCD5
Price Adder	5,00 / 1 Corner

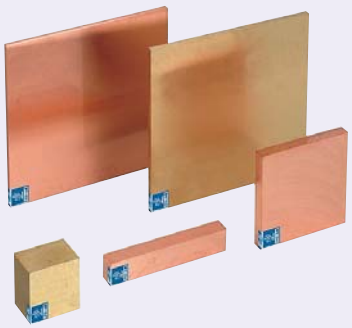
Copper / Brass Configurable Plates

-Tough Pitch Copper / Oxygen Free Copper / Chrome Copper / Brass Plates-

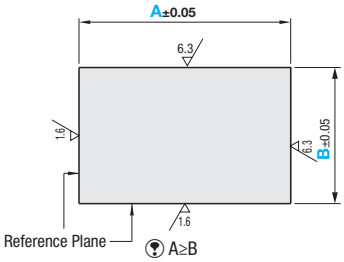

4-Surface Milling (Rolled)


All Surfaces Milled

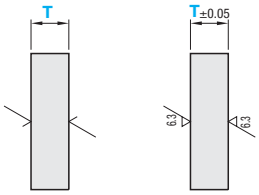
RoHS



Part Number	Material
CTAP_	Tough Pitch Copper CW004A/Cu-ETP H3100 C1100P–1/4
CJAP_	Oxygen Free Copper CW008A/Cu-OFP H3100 C1020P–1/2
CCSP_	Chrome Copper JIS Z3234 Class 2
C28P_	Brass Plates CW505L/CuZn30 H3100 C2801P–1/4



(Rolling) (Milling)



Part Number			0.1mm Increment		T
Type		2-Surface Finish	A	B	Selection - Configurable
			A≥B		
CTAP (Tough Pitch Copper) CJAP (Oxygen Free Copper) CCSP (Chrome Copper) C28P (Brass Plates)		*L (Rolling)	6~300	6~300	5, 6, 8, 10, 12, 15, 20, 25, 30, 40, 50
		F (Milling)	16~300	6~300	3~30 (0.1mm Increment)

When CCSP (Chromium Copper) and L (Rolling) are selected, T15 or larger sizes are cast and wrought products.

Accuracy Standards

(Max. Value)

Item	2-Surface Finish	
	L (Rolling)	F (Milling)
Parallelism (per 100mm)	-	0.02 or less
Flatness (per 100mm)	2mm (per 1000mm)	0.02 or less
Perpendicularity (per 100mm)	0.02 or less	
Circumference Chamfering	C0.1 Thread Chamfering	

Plate Thickness Tolerance

2-Surface Finish	T					
L (Rolling)	5	6, 8	10, 12	15, 20	25	30
	±0.18	±0.23	±0.28	±0.35	±0.55	±0.66
F (Milling)	±0.05					

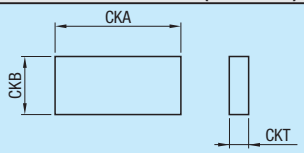
Order Example

Part Number			-	A	-	B	-	T
Type	2-Surface Finish							
C28P	F		-	255.3	-	221.1	-	18.9

Days to Ship 8 Days

Alterations

Part Number		A	-	B	-	T	-(CKA / CKB / etc.)
C28PF	-	255.3	-	221.1	-	18.9	- CKT

	Dimension Tolerance (Reduction)
Alterations	
Code	CKA / CKB / CKT
Spec.	Improves the dimensional tolerance. ±0.05→±0.025 Ordering Code CKA for A Dimension CKB for B Dimension CKT for T Dimension
Price Adder	Refer to spec.

	Code	Price Adder
A (Length)	CKA	5,00
B (Width)	CKB	5,00
T (Plate Thickness)	CKT	5,00

■Features of Tough Pitch Coppers
The most widely used copper generally, and excellent in electrical and thermal conductivity.

■Features of Oxygen Free Coppers
Commercially-available highest purity Copper. The oxygen free nature prevents hydrogen embrittlement.

■Features of Chrome Coppers
Excellent in mechanical strength and abrasion resistance at high temperature.

■Features of Brass Plates
Excellent in strength and ductile.

Price

(Ex.) When CTAPL–220.3–100–10

A Dimension	x	Area € Unit Price	=	€ Price (Round down to ten Cent.)
220.3	x	35 Cent	=	€

■Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

■CTAPL (Tough Pitch Copper 4-Surface Milling (Rolled))

A	B T	5	6	8	10	12	15	20	25	30
6 ~ 50	6~10									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
10.1~ 50	10.1~15									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
15.1~ 50	15.1~20									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
20.1~ 100	20.1~30									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
30.1~ 100	30.1~40									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
40.1~ 100	40.1~60									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
60.1~ 100	60.1~80									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
80.1~ 150	80.1~100									
150.1~ 200										
200.1~ 250										
250.1~ 300										
100.1~ 150	100.1~146									
150.1~ 200										
200.1~ 250										
250.1~ 300										
146.1~ 250	146.1~200									
250.1~ 300										
200.1~ 300	200.1~250									
250.1~ 300	250.1~300									

■CJAPL (Oxygen Free Copper 4-Surface Milling (Rolled))

A	B T	5	6	8	10	12	15	20	25	30
6 ~ 50	6~10									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
10.1~ 50	10.1~15									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
15.1~ 50	15.1~20									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
20.1~ 100	20.1~30									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
30.1~ 100	30.1~40									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
40.1~ 100	40.1~60									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
60.1~ 100	60.1~80									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
80.1~ 150	80.1~100									
150.1~ 200										
200.1~ 250										
250.1~ 300										
100.1~ 150	100.1~146									
150.1~ 200										
200.1~ 250										
250.1~ 300										
146.1~ 250	146.1~200									
250.1~ 300										
200.1~ 300	200.1~250									
250.1~ 300	250.1~300									

■CTAPF (Tough Pitch Copper All Surfaces Milled)

A	B T	3~3.9	4~4.9	5~5.9	6~7.9	8~9.9	10~14.9	15~19.9	20~24.9	25~30
16 ~ 50	6~10									
50.1~ 100										
100.1~ 150										
16 ~ 50	10.1~15									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
16 ~ 50	15.1~20									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
20.1~ 100	20.1~25									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
25.1~ 100	25.1~40									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
40.1~ 100	40.1~60									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
60.1~ 100	60.1~80									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
80.1~ 150	80.1~100									
150.1~ 200										
200.1~ 250										
250.1~ 300										
100.1~ 150	100.1~146									
150.1~ 200										
200.1~ 250										
250.1~ 300										
146.1~ 250	146.1~200									
250.1~ 300										
200.1~ 300	200.1~250									
250.1~ 300	250.1~300									

■CJAPF (Oxygen Free Copper All Surfaces Milled)

A	B T	3~3.9	4~4.9	5~5.9	6~7.9	8~9.9	10~14.9	15~19.9	20~24.9	25~30
16 ~ 50	6~10									
50.1~ 100										
100.1~ 150										
16 ~ 50	10.1~15									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
16 ~ 50	15.1~20									
50.1~ 100										
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
20.1~ 100	20.1~25									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
25.1~ 100	25.1~40									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
40.1~ 100	40.1~60									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
60.1~ 100	60.1~80									
100.1~ 150										
150.1~ 200										
200.1~ 250										
250.1~ 300										
80.1~ 150	80.1~100									
150.1~ 200										
200.1~ 250										
250.1~ 300										
100.1~ 150	100.1~146									
150.1~ 200										
200.1~ 250										
250.1~ 300										
146.1~ 250	146.1~200									
250.1~ 300										
200.1~ 300	200.1~250									
250.1~ 300	250.1~300									

Refer to the next page for the price list for chrome coppers and brass plates.

Copper / Brass Configurable Plates Price List

–Chrome Copper / Brass Plates–

Price

(Ex.) When C28PL–255.3–100–10

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
255.3	x	29 Cent	=	74,00 EUR

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

(Chrome Copper 4-Surface Milling (Rolled))

A \ B \ T	5	6	8	10	12	15	20	25	30
6 ~ 50	6~10								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
10.1~ 50	10.1~15								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
15.1~ 50	15.1~20								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
20.1~100	20.1~30								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
30.1~100	30.1~40								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
40.1~100	40.1~60								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
60.1~100	60.1~80								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
80.1~150	80.1~100								
150.1~200									
200.1~250									
250.1~300									
100.1~150	100.1~146								
150.1~200									
200.1~250									
250.1~300									
146.1~250	146.1~200								
250.1~300									
200.1~300	200.1~250								
250.1~300	250.1~300								

(Brass Plates 4-Surface Milling (Rolled))

A \ B \ T	5	6	8	10	12	15	20	25	30
6 ~ 50	6~10								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
10.1~ 50	10.1~15								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
15.1~ 50	15.1~20								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
20.1~100	20.1~30								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
30.1~100	30.1~40								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
40.1~100	40.1~60								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
60.1~100	60.1~80								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
80.1~150	80.1~100								
150.1~200									
200.1~250									
250.1~300									
100.1~150	100.1~146								
150.1~200									
200.1~250									
250.1~300									
146.1~250	146.1~200								
250.1~300									
200.1~300	200.1~250								
250.1~300	250.1~300								

(Chrome Copper All Surfaces Milled)

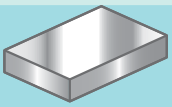
A \ B \ T	3~3.9	4~4.9	5~5.9	6~7.9	8~9.9	10~14.9	15~19.9	20~24.9	25~30
16 ~ 50	6~10								
50.1~100									
100.1~150									
16 ~ 50	10.1~15								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
16 ~ 50	15.1~20								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
20.1~100	20.1~25								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
25.1~100	25.1~40								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
40.1~100	40.1~60								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
60.1~100	60.1~80								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
80.1~150	80.1~100								
150.1~200									
200.1~250									
250.1~300									
100.1~150	100.1~146								
150.1~200									
200.1~250									
250.1~300									
146.1~250	146.1~200								
250.1~300									
200.1~300	200.1~250								
250.1~300	250.1~300								

(Brass Plates All Surfaces Milled)

A \ B \ T	3~3.9	4~4.9	5~5.9	6~7.9	8~9.9	10~14.9	15~19.9	20~24.9	25~30
16 ~ 50	6~10								
50.1~100									
100.1~150									
16 ~ 50	10.1~15								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
16 ~ 50	15.1~20								
50.1~100									
100.1~150									
150.1~200									
200.1~250									
250.1~300									
20.1~100	20.1~25								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
25.1~100	25.1~40								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
40.1~100	40.1~60								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
60.1~100	60.1~80								
100.1~150									
150.1~200									
200.1~250									
250.1~300									
80.1~150	80.1~100								
150.1~200									
200.1~250									
250.1~300									
100.1~150	100.1~146								
150.1~200									
200.1~250									
250.1~300									
146.1~250	146.1~200								
250.1~300									
200.1~300	200.1~250								
250.1~300	250.1~300								

High Accuracy Blocks

-Guaranteed Perpendicularity of All Angles-



All Surfaces Milled + Top/Bottom Surfaced

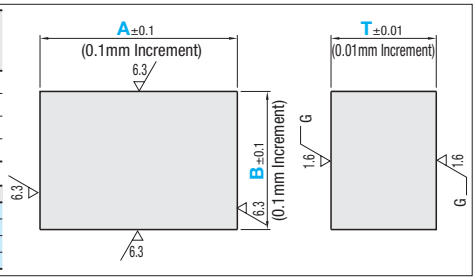


RoHS

Part Number		M Material	H Hardness
Thin Type	Standard Size		
U-SSFBG	SSFBG	1.0038/S235JR	-
U-SCFBG	SCFBG	1.1206/C50E	-
U-PXSG	PXSG	PX5 ~1.2316	30~33HRC
U-NAKSG	NAKSG	NAK55®	37~43HRC

■Accuracy Standards(Max. Value)

Item	Standard Value
Thickness Parallelism	0.01 per 100mm
Thickness Flatness	0.01 per 100mm
Perpendicularity (Each plane)	0.02 per 100mm
Circumference Chamfering	C0.2~0.3



Order Example

Part Number	-	A	-	B	-	T
U-SCFBG	-	99.9	-	10.1	-	3.01
SSFBG	-	30.5	-	20.6	-	17.13

Days to Ship

- Thin Type: 8 Days
- Standard Size: 8 Days — Express A 8,00 EUR/piece — P.88

Ⓟ A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

■Volume Discount (Ⓟ Round down to ten Cent.) P.88

Quantity	1~4	5~10
Rate	€ Unit Price	5%

Ⓟ For orders larger than indicated quantity, please request a quotation.

■Thin Type (T=3~9.99mm)

0.1mm Increment			T: 0.01mm Increment											
A		B	3~4.99			5~7.99				8.0~9.99				
			U-SCFBG	U-PXSG	U-NAKSG	U-SSFBG	U-SCFBG	U-PXSG	U-NAKSG	U-SSFBG	U-SCFBG	U-PXSG	U-NAKSG
10.0~ 60.0	10.0~ 60.0												
60.1~ 100.0													
100.1~ 130.0													
130.1~ 160.0													
10.0~ 60.0	60.1~ 100.0												
60.1~ 100.0													
100.1~ 130.0													
130.1~ 160.0													
10.0~ 60.0	100.1~ 130.0												
60.1~ 100.0													
100.1~ 130.0													
130.1~ 160.0													
10.0~ 60.0	130.1~ 160.0												
60.1~ 100.0													
100.1~ 130.0													
130.1~ 160.0													

■Standard Type (T=10~60mm)

0.1mm Increment		T: 0.01mm Increment																			
A	B	10.0~20.0				20.01~30.0				30.01~40.0				40.01~50.0				50.01~60.0			
		SSFBG	SCFBG	PXSG	NAKSG	SSFBG	SCFBG	PXSG	NAKSG	SSFBG	SCFBG	PXSG	NAKSG	SSFBG	SCFBG	PXSG	NAKSG	SSFBG	SCFBG	PXSG	NAKSG
10.0~ 60.0	10.0~60.0																				
60.1~ 100.0																					
100.1~ 130.0																					
130.1~ 160.0																					
160.1~ 180.0																					
180.1~ 200.0																					
200.1~ 250.0	20.0~60.0																				
250.1~ 300.0																					
300.1~ 350.0																					
350.1~ 400.0																					
400.1~ 450.0																					
450.1~ 500.0																					
10.0~ 60.0	60.1~100.0																				
60.1~ 100.0																					
100.1~ 130.0																					
130.1~ 160.0																					
160.1~ 180.0																					
180.1~ 200.0																					
200.1~ 250.0																					
250.1~ 300.0																					
300.1~ 350.0																					
350.1~ 400.0																					
400.1~ 450.0																					
450.1~ 500.0																					
10.0~ 60.0	100.1~130.0																				
60.1~ 100.0																					
100.1~ 130.0																					
130.1~ 160.0																					
160.1~ 180.0																					
180.1~ 200.0																					
200.1~ 250.0																					
250.1~ 300.0																					
300.1~ 350.0																					
350.1~ 400.0																					
400.1~ 450.0																					
450.1~ 500.0																					
10.0~ 60.0	130.1~160.0																				
60.1~ 100.0																					
100.1~ 130.0																					
130.1~ 160.0																					
160.1~ 180.0																					
180.1~ 200.0																					
200.1~ 250.0																					
250.1~ 300.0																					
300.1~ 350.0																					
350.1~ 400.0																					
400.1~ 450.0																					
450.1~ 500.0																					
10.0~ 60.0	160.1~180.0																				
60.1~ 100.0																					
100.1~ 130.0																					
130.1~ 160.0																					
160.1~ 180.0																					
180.1~ 200.0																					
200.1~ 250.0																					
250.1~ 300.0																					
300.1~ 350.0																					
350.1~ 400.0																					
400.1~ 450.0																					
450.1~ 500.0																					
10.0~ 60.0	180.1~200.0																				
60.1~ 100.0																					
100.1~ 130.0																					
130.1~ 160.0																					
160.1~ 180.0																					
180.1~ 200.0																					
200.1~ 250.0																					
250.1~ 300.0																					
300.1~ 350.0																					
350.1~ 400.0																					
400.1~ 450.0																					
450.1~ 500.0																					

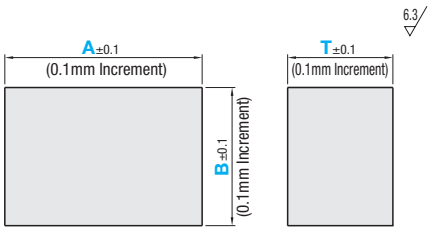
Metal Blocks Standard

-Guaranteed Perpendicularity of All Angles 0.1mm Increment-



RoHS

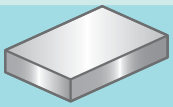
Part Number	M Material	H Hardness
SSFB	1.0038/S235JR	-
SCFB	1.1206/C50E	-
SCNFB	1.1206/C50E Thermal Refined	25±3HRC
SCFF	1.4305/X10CrNiS18-9 HP-N01	-
SCFS	1.4301/X5CrNi18-10 HP-N01	-



All Surfaces Milled

0.1mm Increment		T : 0.1mm Increment				
A	B \ T	1.5~9.9			5.0~9.9	
		SSFB	SCFB	SCNFB	SCFF	SCFS
10.0~ 60.0	10.0~60.0					
60.1~100.0						
10.0~ 60.0	60.1~ 100.0					
60.1~100.0						

0.1mm Increment		T : 0.1mm Increment														
A	B \ T	10.0~20.0					20.1~30.0					30.1~40.0				
		SSFB	SCFB	SCNFB	SCFF	SCFS	SSFB	SCFB	SCNFB	SCFF	SCFS	SSFB	SCFB	SCNFB	SCFF	SCFS
10.0~ 60.0	10.0~60.0															
60.1~ 100.0																
100.1~ 130.0																
130.1~ 160.0																
160.1~ 180.0																
180.1~ 200.0																
200.1~ 250.0	20.0~60.0															
250.1~ 300.0																
300.1~ 350.0																
350.1~ 400.0																
400.1~ 450.0																
450.1~ 500.0																
10.0~ 60.0	60.1~100.0															
60.1~ 100.0																
100.1~ 130.0																
130.1~ 160.0																
160.1~ 180.0																
180.1~ 200.0																
200.1~ 250.0																
250.1~ 300.0																
300.1~ 350.0																
350.1~ 400.0																
400.1~ 450.0																
450.1~ 500.0																
10.0~ 60.0	100.1~130.0															
60.1~ 100.0																
100.1~ 130.0																
130.1~ 160.0																
160.1~ 180.0																
180.1~ 200.0																
200.1~ 250.0																
250.1~ 300.0																
300.1~ 350.0																
350.1~ 400.0																
400.1~ 450.0																
450.1~ 500.0																
10.0~ 60.0	130.1~160.0															
60.1~ 100.0																
100.1~ 130.0																
130.1~ 160.0																
160.1~ 180.0																
180.1~ 200.0																
200.1~ 250.0																
250.1~ 300.0																
300.1~ 350.0																
350.1~ 400.0																
400.1~ 450.0																
450.1~ 500.0																
10.0~ 60.0	160.1~180.0															
60.1~ 100.0																
100.1~ 130.0																
130.1~ 160.0																
160.1~ 180.0																
180.1~ 200.0																
200.1~ 250.0																
250.1~ 300.0																
300.1~ 350.0																
350.1~ 400.0																
400.1~ 450.0																
450.1~ 500.0																
10.0~ 60.0	180.1~200.0															
60.1~ 100.0																
100.1~ 130.0																
130.1~ 160.0																
160.1~ 180.0																
180.1~ 200.0																
200.1~ 250.0																
250.1~ 300.0																
300.1~ 350.0																
350.1~ 400.0																
400.1~ 450.0																
450.1~ 500.0																



All Surfaces Milled

Order Example

Part Number	-	A	-	B	-	T
SCFB		- 30.5		- 20.6		- 17.1

Days to Ship

8 Days | Express A | 8,00 EUR/ piece | P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

Quantity	1~4	5~19
Rate	€ Unit Price	5%

For orders larger than indicated quantity, please request a quotation.

Accuracy Standards

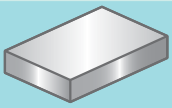
(Max. Value)

Item		1.0038/ 1.1206/ 1.1206/C50E Thermal Refined	1.4305/ X10CrNiS18-9 HP-NO1 1.4301/ X5CrNi18-10 HP-NO1
Thickness Parallelism (per 100mm)		0.02	0.05
Flatness (per 100mm)	T1.5~7.9	0.04	0.1
	T8~15.9		0.07
	T16~		0.05
Perpendicularity (Each plane)		0.02 per 100mm	
Circumference Chamfering		C0.5 or less	

0.1mm Increment		T : 0.1mm Increment																	
A	T / B	40.1~50.0					50.1~60.0					60.1~70		70.1~80		80.1~90		90.1~100	
		SSFB	SCFB	SCNFB	SCFF	SCFS	SSFB	SCFB	SCNFB	SCFF	SCFS	SSFB	SCFB	SSFB	SCFB	SSFB	SCFB	SSFB	SCFB
10.0~ 60.0	10.0~60.0																		
60.1~ 100.0																			
100.1~ 130.0																			
130.1~ 160.0																			
160.1~ 180.0																			
180.1~ 200.0																			
200.1~ 250.0	20.0~60.0																		
250.1~ 300.0																			
300.1~ 350.0																			
350.1~ 400.0																			
400.1~ 450.0																			
450.1~ 500.0																			
10.0~ 60.0	60.1~100.0																		
60.1~ 100.0																			
100.1~ 130.0																			
130.1~ 160.0																			
160.1~ 180.0																			
180.1~ 200.0																			
200.1~ 250.0																			
250.1~ 300.0																			
300.1~ 350.0																			
350.1~ 400.0																			
400.1~ 450.0																			
450.1~ 500.0																			
10.0~ 60.0	100.1~130.0																		
60.1~ 100.0																			
100.1~ 130.0																			
130.1~ 160.0																			
160.1~ 180.0																			
180.1~ 200.0																			
200.1~ 250.0																			
250.1~ 300.0																			
300.1~ 350.0																			
350.1~ 400.0																			
400.1~ 450.0																			
450.1~ 500.0																			
10.0~ 60.0	130.1~160.0																		
60.1~ 100.0																			
100.1~ 130.0																			
130.1~ 160.0																			
160.1~ 180.0																			
180.1~ 200.0																			
200.1~ 250.0																			
250.1~ 300.0																			
300.1~ 350.0																			
350.1~ 400.0																			
400.1~ 450.0																			
450.1~ 500.0																			
10.0~ 60.0	160.1~180.0																		
60.1~ 100.0																			
100.1~ 130.0																			
130.1~ 160.0																			
160.1~ 180.0																			
180.1~ 200.0																			
200.1~ 250.0																			
250.1~ 300.0																			
300.1~ 350.0																			
350.1~ 400.0																			
400.1~ 450.0																			
450.1~ 500.0																			
10.0~ 60.0	180.1~200.0																		
60.1~ 100.0																			
100.1~ 130.0																			
130.1~ 160.0																			
160.1~ 180.0																			
180.1~ 200.0																			
200.1~ 250.0																			
250.1~ 300.0																			
300.1~ 350.0																			
350.1~ 400.0																			
400.1~ 450.0																			
450.1~ 500.0																			

Metal Block Long

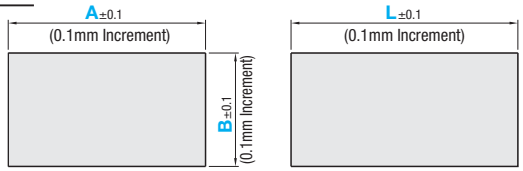
-Guaranteed Perpendicularity of All Angles 0.1mm Increment-



RoHS



Part Number	Material
SSFBL	1.0038/S235JR
SCFBL	1.1206/C50E



All Surfaces Milled

Order Example

Part Number	-	A	-	B	-	L
SSFBL	-	20.0	-	20.5	-	400.0

Days to Ship

8 Days

Accuracy Standards

(Max. Value)

Item	Standard Value
Thickness Parallelism	0.02 per 100mm
Flatness	0.05 per 100mm
Perpendicularity (Each Plane)	0.02 per 100mm
Circumference Chamfering	C0.5 or less

Price

Volume Discount (Round down to ten Cent.) P.88

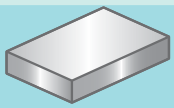
Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity please request a quotation.

0.1mm Increment		L : 0.1mm Increment															
A	B \ L	200.1~300.0		300.1~400.0		400.1~500.0		500.1~600.0		600.1~700.0		700.1~800.0		800.1~900.0		900.1~1000.0	
		SSFBL	SCFBL	SSFBL	SCFBL	SSFBL	SCFBL	SSFBL	SCFBL	SSFBL	SCFBL	SSFBL	SCFBL	SSFBL	SCFBL	SSFBL	SCFBL
20.0~ 30.0	20.0~30.0																
30.1~ 40.0																	
40.1~ 50.0																	
50.1~ 60.0																	
60.1~ 70.0																	
70.1~ 80.0																	
80.1~ 90.0																	
90.1~ 100.0																	
20.1~ 30.0	30.1~40.0																
30.1~ 40.0																	
40.1~ 50.0																	
50.1~ 60.0																	
60.1~ 70.0																	
70.1~ 80.0																	
80.1~ 90.0																	
90.1~ 100.0																	
20.1~ 30.0	40.1~50.0																
30.1~ 40.0																	
40.1~ 50.0																	
50.1~ 60.0																	
60.1~ 70.0																	
70.1~ 80.0																	
80.1~ 90.0																	
90.1~ 100.0																	
20.1~ 30.0	50.1~60.0																
30.1~ 40.0																	
40.1~ 50.0																	
50.1~ 60.0																	
60.1~ 70.0																	
70.1~ 80.0																	
80.1~ 90.0																	
90.1~ 100.0																	

Aluminum Blocks

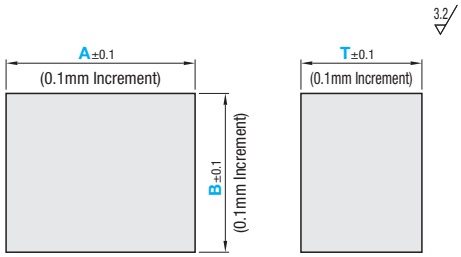
-Guaranteed Perpendicularity of All Angles 0.1mm Increment-



All Surfaces Milled



Part Number	Material
ALNB	EN AW-5052/ AlMg25-H112
ALDB	EN AW-2017/ AlCu4MGSi-T351
ALPB	EN AW-7075/ AlZn55MgCu-T651



Part Number	0.1mm Increment		
	A	B	T
ALNB (EN AW-5052/AlMg2,5)	25.0~200.0	25.0~200.0	30.1~100.0
ALDB (EN AW-2017/AlCu4MgSi)			30.1~95.0
ALPB (EN AW-7075/AlZn55MgCu)			30.1~100.0

Order Example

Part Number	-	A	-	B	-	T
ALNB	-	147.0	-	87.0	-	56.0

Days to Ship: 6 Days

Price

■Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity please request a quotation.

■Accuracy Standards

Item	Standard Value
Perpendicularity (Each plane)	0.02 or less per 100mm
Parallelism of each upper-lower surface	0.02 or less per 100mm
Flatness of each upper-lower surface	0.04 or less per 100mm
Circumference Chamfering	C0.3 or less

0.1mm Increment		T : 0.1mm Increment											
A	T / B	ALNB(EN AW-5052/AlMg25) € Unit Price				ALDB (EN AW-2017/AlCu4MgSi) € Unit Price				ALPB (EN AW-7075/AlZn55MgCu) € Unit Price			
		30.1 ~45.0	45.1 ~60.0	60.1 ~85.0	85.1 ~100.0	30.1 ~45.0	45.1 ~60.0	60.1 ~85.0	85.1 ~95.0	30.1 ~45.0	45.1 ~60.0	60.1 ~85.0	85.1 ~100.0
25.0~ 55.0	25.0~ 55.0												
55.1~ 85.0	25.0~ 55.0												
	55.1~ 85.0												
85.1~115.0	25.0~ 55.0												
	55.1~ 85.0												
	85.1~115.0												
115.1~145.0	25.0~ 55.0												
	55.1~ 85.0												
	85.1~115.0												
	115.1~145.0												
145.1~175.0	25.0~ 55.0												
	55.1~ 85.0												
	85.1~115.0												
	115.1~145.0												
	145.1~175.0												
175.1~200.0	25.0~ 55.0												
	55.1~ 85.0												
	85.1~115.0												
	115.1~145.0												
	145.1~175.0												
	175.1~200.0												

Flat Bars / 6F Plates

-Cold-rolled Flat Bars (1.0038, 1.1206, 1.1191) / 6F Plates (1.0038, 1.1206)-

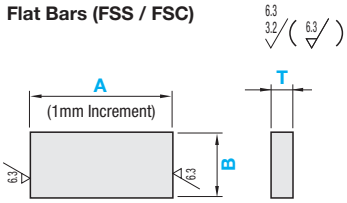
RoHS



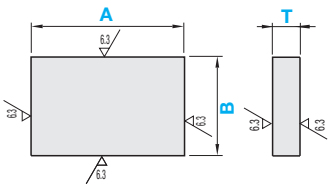
Type	Part Number	M Material
Flat Bars	FSS	1.0038/S235JR
	FSC	1.1191/C45E
6F	SS400-CUT	1.0038/S235JR
	S50C-CUT	1.1206/C50E

* 6F S50C-CUT, material for T6 is 1.1191/C45E.

Flat Bars (FSS / FSC)



6F Plates (SS400-CUT / S50C-CUT)



*6F : Base material is milled on top, bottom, and side surfaces for cut by 1mm increment.

Price

(Ex.) When FSS−250−32−9

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
250	x	3.7 Cent	=	9,20 €

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	5%

Please request a quotation for orders larger than indicated quantity.

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~2	3~4	5~10
Rate	€ Unit Price	5%	10%

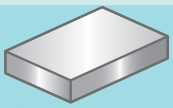
For orders larger than indicated quantity, please request a quotation.

FSS(Flat Bars: Material 1.0038/S235JR) Price

A 1mm Increment	B \ T	5	6	9	10	12	16	19	22	25	30
30~ 50	16	■	■	■	■	■	■	×	×	×	×
51~ 150								×	×	×	×
151~ 300		■	■	■	■	■	■	×	×	×	×
301~ 800								×	×	×	×
30~ 50	22	■	■	■	■	■	■	■	×	×	×
51~ 150									×	×	×
151~ 300		■	■	■	■	■	■	■	×	×	×
301~ 800									×	×	×
30~ 50	25	■	■	■	■	■	■	■	■	×	×
51~ 150										×	×
151~ 300		■	■	■	■	■	■	■	■	×	×
301~ 800										×	×
30~ 50	32	■	■	■	■	■	■	■	■	■	×
51~ 150											×
151~ 300		■	■	■	■	■	■	■	■	■	×
301~ 800											×
30~ 50	38	■	■	■	■	■	■	■	■	■	×
51~ 150											×
151~ 300		■	■	■	■	■	■	■	■	■	×
301~ 800											×
30~ 50	50	■	■	■	■	■	■	■	■	■	■
51~ 150											
151~ 300		■	■	■	■	■	■	■	■	■	■
301~ 800											
30~ 50	60	×	■	■	■	■	■	■	×	■	×
51~ 150		×							×		×
151~ 300		×	■	■	■	■	■	■	×	■	×
301~ 800		×							×		×
30~ 50	75	×	■	■	■	■	■	■	■	■	■
51~ 150		×									
151~ 300		×	■	■	■	■	■	■	■	■	■
301~ 800		×									
30~ 50	100	×	■	■	■	■	■	■	■	■	■
51~ 150		×									
151~ 300		×	■	■	■	■	■	■	■	■	■
301~ 800		×									
30~ 50	125	×	■	■	×	■	■	■	■	■	■
51~ 150		×			×						
151~ 300		×	■	■	×	■	■	■	■	■	■
301~ 800		×			×						

SS400-CUT (6F : Material 1.0038/S235JR) Price

A 1mm Increment	B \ T	5	6	9	10	12	16	19	22	25	30
16~ 50	16	■	■	■	■	■	■	×	×	×	×
51~ 100								×	×	×	×
101~ 250		■	■	■	■	■	■	×	×	×	×
251~ 400								×	×	×	×
401~ 600		■	■	■	■	■	■	×	×	×	×
601~ 1000								×	×	×	×
22~ 50	22	■	■	■	■	■	■	■	×	×	×
51~ 100									×	×	×
101~ 250		■	■	■	■	■	■	■	×	×	×
251~ 400									×	×	×
401~ 600		■	■	■	■	■	■	■	×	×	×
601~ 1000									×	×	×
25~ 50	25	■	■	■	■	■	■	■	■	■	×
51~ 100											×
101~ 250		■	■	■	■	■	■	■	■	■	×
251~ 400											×
401~ 600		■	■	■	■	■	■	■	■	■	×
601~ 1000											×
32~ 50	32	■	■	■	■	■	■	■	■	■	×
51~ 100											×
101~ 250		■	■	■	■	■	■	■	■	■	×
251~ 400											×
401~ 600		■	■	■	■	■	■	■	■	■	×
601~ 1000											×
38~ 50	38	×	■	■	■	■	■	■	■	■	×
51~ 100		×									×
101~ 250		×	■	■	■	■	■	■	■	■	×
251~ 400		×									×
401~ 600		×	■	■	■	■	■	■	■	■	×
601~ 1000		×									×
50~ 100	50	■	■	■	■	■	■	■	■	■	■
101~ 250											
251~ 400		■	■	■	■	■	■	■	■	■	■
401~ 600											
601~ 1000		■	■	■	■	■	■	■	■	■	■
60~ 100	60	■	■	■	■	■	■	■	■	■	■
101~ 250											
251~ 400		■	■	■	■	■	■	■	■	■	■
401~ 600											
601~ 1000		■	■	■	■	■	■	■	■	■	■
75~ 100	75	■	■	■	■	■	■	■	■	■	■
101~ 250											
251~ 400		■	■	■	■	■	■	■	■	■	■
401~ 600											
601~ 1000		■	■	■	■	■	■	■	■	■	■
100~ 250	100	■	■	■	■	■	■	■	■	■	■
251~ 400											
401~ 600		■	■	■	■	■	■	■	■	■	■
601~ 1000											
125~ 250	125	×	×	■	■	■	■	■	■	■	■
251~ 400											
401~ 600		×	×	■	■	■	■	■	■	■	■
601~ 1000											



Top/Bottom/Width Milled, Length Precision Cut

Cold-rolled Flat Bars Accuracy Standards

Item	/				
T Dimension Tolerance	5 • 6	8 • 9 • 10	12 • 15 • 16	19 ~ 30	40 ~ 50
	0 -0.18	0 -0.22	0 -0.27	0 -0.3	0 -0.39
A Dimension Tolerance	±0.15				
B Dimension Tolerance	16	~ 25	~ 50	~ 60	~ 100	~ 125
	0 -0.18	0 -0.21	0 -0.25	0 -0.3	0 -0.35	0 -0.4
Bending	0.1 or less per 100mm					
Cut Surface Chamfering	C0.1~0.3					

6F Plates (SS400-CUT / S50C-CUT) Dimension Tolerance

Reference : Length	~600mm	601~800mm
Length (A)	±0.1	±0.2
Width (B)	±0.1	
Thickness (T)	±0.1	

6F Plates Accuracy Standards (Max. Value)

Item		Conditions	Standard Value
Width Parallelism		Minimum Length~200mm	0.03
		Length 201~500mm	0.05
		Length 501~Max.	0.1
Thickness Parallelism		To length 100mm and width 100mm	0.05
Flatness	T5~12		0.05
	T16~25		0.04
	T30		0.03
Perpendicularity (Each Plane)			0.05
Circumference Chamfering		Burr-free is required. (?)Chamfering may be about C0.1.	

FSC (Flat Bars: Material 1.1191/C45E) Price

A 1mm Increment	B \ T	5	6	9	12	16	19	22	25	30
30~ 50	16	●	●	●	●	●				
51~ 150										
151~ 300		●	●	●	●	●				
301~ 800										
30~ 50	22	●	●	●	●	●				
51~ 150										
151~ 300		●	●	●	●	●				
301~ 800										
30~ 50	25	●	●	●	●	●	●	●		
51~ 150										
151~ 300		●	●	●	●	●	●	●		
301~ 800										
30~ 50	32		●	●	●	●	●	●	●	
51~ 150										
151~ 300			●	●	●	●	●	●	●	
301~ 800										
30~ 50	38		●	●	●	●	●	●	●	
51~ 150										
151~ 300			●	●	●	●	●	●	●	
301~ 800										
30~ 50	50			●	●	●	●	●	●	●
51~ 150										
151~ 300				●	●	●	●	●	●	●
301~ 800										
30~ 50	60			●	●	●	●		●	
51~ 150										
151~ 300				●	●	●	●		●	
301~ 800										
30~ 50	75			●	●	●	●	●	●	●
51~ 150										
151~ 300				●	●	●	●	●	●	●
301~ 800										
30~ 50	100			●	●	●	●	●	●	●
51~ 150										
151~ 300				●	●	●	●	●	●	●
301~ 800										
30~ 50	125			●	●	●	●		●	
51~ 150										
151~ 300				●	●	●	●		●	
301~ 800										

S50C-CUT(6F : Material 1.1206/C50E · 1.1191/C45E for T6) Price

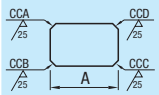
A 1mm Increment	B \ T	5	6	9	12	16	19	22	25	30
16~ 50	16	●	●	●	●	●				
51~ 100										
101~ 250		●	●	●	●	●				
251~ 400										
401~ 600		●	●	●	●	●				
601~ 1000										
22~ 50	22	●	●	●	●	●	●			
51~ 100										
101~ 250		●	●	●	●	●	●			
251~ 400										
401~ 600		●	●	●	●	●	●			
601~ 1000										
25~ 50	25	●	●	●	●	●	●	●	●	
51~ 100										
101~ 250		●	●	●	●	●	●	●	●	
251~ 400										
401~ 600		●	●	●	●	●	●	●	●	
601~ 1000										
32~ 50	32	●	●	●	●	●	●	●	●	
51~ 100										
101~ 250		●	●	●	●	●	●	●	●	
251~ 400										
401~ 600		●	●	●	●	●	●	●	●	
601~ 1000										
38~ 50	38			●	●	●	●	●	●	
51~ 100										
101~ 250				●	●	●	●	●	●	
251~ 400										
401~ 600				●	●	●	●	●	●	
601~ 1000										
50~ 100	50		●	●	●	●	●	●	●	●
101~ 250										
251~ 400			●	●	●	●	●	●	●	●
401~ 600										
601~ 1000			●	●	●	●	●	●	●	●
60~ 100	60									
101~ 250			●	●	●	●	●	●	●	●
251~ 400										
401~ 600			●	●	●	●	●	●	●	●
601~ 1000										
75~ 100	75									
101~ 250			●	●	●	●	●	●	●	●
251~ 400										
401~ 600			●	●	●	●	●	●	●	●
601~ 1000										
100~ 250	100									
251~ 400			●	●	●	●	●	●	●	●
401~ 600										
601~ 1000			●	●	●	●	●	●	●	●
125~ 250	125									
251~ 400			●	●	●	●	●	●	●	●
401~ 600										
601~ 1000			●	●	●	●	●	●	●	●

Alterations

Part Number - A - B - T -(CCA / CCB / CCC / CCD)

FSS - 300 - 60 - 10 - CCA5-CCD5

(?)Not applicable to 6F (SS400-CUT / S50C-CUT).

Alterations	Code	Spec.	Price Adder
Corner Cut 	CCA CCB CCC CCD	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5 ···›CCA5-CCD5	5,00/ Per Corner

Order Example

Flat Bars: Part Number - A - B - T

FSC - 560 - 25 - 9

6F: Part Number - A - B - T

SS400-CUT - 100 - 25 - 10

Days to Ship

- 6F (SS400-CUT / S50C-CUT)

6 Days P.88

8 Days Express A 8,00 EUR/ piece P.88

(?)A Express Charge of 21,60 EUR for 3 or more identical pieces.

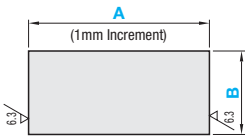
Flat Bars

-Cold-rolled Flat Bars (1.4301/X5CrNi18-10 · EN AW-6063/AlMg0,7Si) / Square Steel-

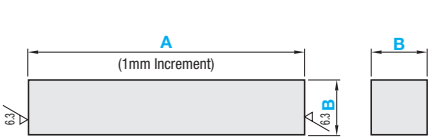


Type	Part Number	Material
Flat Bars	FSSS	1.4301/X5CrNi18-10
	FSSA	EN AW-6063/AlMg0,7Si
Square Steel	FSK	1.0038/S235JR
	FSCK	1.1191/C45E
	FSSK	1.4301/X5CrNi18-10
	FSSAK	EN AW-6063/AlMg0,7Si

Flat Bars (FSSS / FSSA)



Square Steel



6.3 3.2 (6.3)

Price

(Ex.) When FSSS-250-32-9

A Dimension	x	Area € Unit Price	=	Price (Round down to ten Cent.)
250	x	7.6 Cent	=	€ 19,00 €

-Flat Bars / Square Steel

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~4	5~19
Rate	€ Unit Price	0.05

Please request a quotation for orders larger than indicated quantity.

FSSS (Material 1.4301/X5CrNi18-10) Price

A 1mm Increment	B \ T	5	6	9	10	12	16	19	22	25	30
30~ 50	15	■	■	■	▨	▨	▨	▨	▨	▨	▨
51~ 150					▨	▨	▨	▨	▨	▨	▨
151~ 300		■	■	■	▨	▨	▨	▨	▨	▨	▨
301~ 800					▨	▨	▨	▨	▨	▨	▨
30~ 50	20	■	■	■	■	■	■	▨	▨	▨	▨
51~ 150								▨	▨	▨	▨
151~ 300		■	■	■	■	■	■	▨	▨	▨	▨
301~ 800								▨	▨	▨	▨
30~ 50	25	■	■	■	■	■	■	■	▨	■	▨
51~ 150									▨		▨
151~ 300		■	■	■	■	■	■	■	▨	■	▨
301~ 800									▨		▨
30~ 50	32	■	■	■	■	■	■	■	■	■	▨
51~ 150											▨
151~ 300		■	■	■	■	■	■	■	■	■	▨
301~ 800											▨
30~ 50	38	■	■	■	■	■	■	■	■	■	▨
51~ 150											▨
151~ 300		■	■	■	■	■	■	■	■	■	▨
301~ 800											▨
30~ 50	50	■	■	■	■	■	■	■	■	▨	▨
51~ 150										▨	▨
151~ 300		■	■	■	■	■	■	■	■	▨	▨
301~ 800										▨	▨
30~ 50	65	■	■	■	■	■	■	■	■	■	■
51~ 150											
151~ 300		■	■	■	■	■	■	■	■	■	■
301~ 800											
30~ 50	100	■	■	■	■	■	■	■	■	■	■
51~ 150											
151~ 300		■	■	■	■	■	■	■	■	■	■
301~ 800											
30~ 50	125	▨	■	■	■	■	■	■	▨	■	▨
51~ 150		▨							▨		▨
151~ 300		▨	■	■	■	■	■	■	▨	■	▨
301~ 800		▨							▨		▨

FSSA (Material EN AW-6063/AlMg0,7Si) Price

A 1mm Increment	B \ T	5	6	8	10	12	15	20	25	30
30~ 50	15	■	■	■	■	■	■	■	▨	■
51~ 150									▨	
151~ 300		■	■	■	■	■	■	■	▨	■
301~ 800									▨	
30~ 50	20	■	■	■	■	■	■	■	▨	■
51~ 150									▨	
151~ 300		■	■	■	■	■	■	■	▨	■
301~ 800									▨	
30~ 50	30	■	■	■	■	■	■	■	■	■
51~ 150										
151~ 300		■	■	■	■	■	■	■	■	■
301~ 800										
30~ 50	40	■	■	■	■	■	■	■	■	■
51~ 150										
151~ 300		■	■	■	■	■	■	■	■	■
301~ 800										
30~ 50	50	■	■	■	■	■	■	■	■	■
51~ 150										
151~ 300		■	■	■	■	■	■	■	■	■
301~ 800										
30~ 50	60	■	■	■	■	■	■	■	■	■
51~ 150										
151~ 300		■	■	■	■	■	■	■	■	■
301~ 800										
30~ 50	100	■	■	■	■	■	■	■	■	■
51~ 150										
151~ 300		■	■	■	■	■	■	■	■	■
301~ 800										

Order Example

Flat Bars	Part Number	-	A	-	B	-	T	
	FSSS	-	560	-	25	-	9	
Square Steel	Part Number	-	A					
	FSK10	-	125					

Days to Ship

-Flat Bars / Square Steel

8 Days | Express A | 8,00 EUR/ piece | P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Cold-rolled Flat Bars / Square Steel Accuracy Standards

Item	FSK / FSCK	FSSS / FSSK	FSSA / FSSAK
Flat Bar T Dimension Tolerance Square Steel B Dimension Tolerance	5 • 6: 0 / -0.18 8 • 9 • 10: 0 / -0.22 12 • 15 • 16: 0 / -0.27 19 ~ 30: 0 / -0.3 40 ~ 50: 0 / -0.39	5 • 6: 0 / -0.3 8 • 9 • 10: 0 / -0.22 12 • 15 • 16: 0 / -0.27 19 ~ 30: 0 / -0.33 40 ~ 50: 0 / -0.39	5 • 6: ±0.27 8 ~ 12: ±0.3 15 • 16: ±0.35 20 • 25: ±0.38 30: ±0.45 40 ~ 50: 0 / -0.39
A Dimension Tolerance	±0.15	±0.15	±0.15
Flat Bar B Dimension Tolerance	16: 0 / -0.18 ~25: 0 / -0.21 ~50: 0 / -0.25 ~60: 0 / -0.3 ~100: 0 / -0.35 ~125: 0 / -0.4	15: 0 / -0.27 ~25: 0 / -0.33 ~50: 0 / -0.39 ~60: 0 / -0.46 ~125: 0 / -0.73	15: ±0.35 ~20: ±0.38 ~30: ±0.45 ~50: ±0.54 ~100: ±0.92
Bending	0.1 or less per 100mm	0.1 or less per 100mm	0.1 or less per 100mm
Cut Surface Chamfering	C0.1~0.3	C0.1~0.3	C0.1~0.3

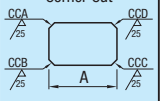
Square Steel Price

Part Number		A : 1 mm Increment								
Type	B	15~29	30~100	101~200	201~300	301~400	401~500	501~600	601~700	701~800
FSK (1.0038/S235JR)	8									
	10									
	12									
	15									
	20									
	25									
	30									
	40									
	50									
FSCK (1.1191/C45E)	8									
	10									
	12									
	15									
	20									
	25									
	30									
	40									
	50									
FSSK (1.4301/ X5CrNi18-10)	8									
	10									
	12									
	15									
	20									
	25									
	30									
	40									
	50									
FSSAK (EN AW-6063/ AlMg0,7Si)	8									
	10									
	12									
	15									
	20									
	25									
	30									
	40									
	50									

Alterations

Part Number - A - B - T -(CCA / CCB / CCC / CCD)

FSSS - 300 - 65 - 10 - CCA5-CCD5

Alterations	Code	Spec.	Price Adder
Corner Cut 	CCA CCB CCC CCD	Cuts any corners. 1≤Corner Cut≤10 1mm Increment Ordering Code (Example)When the corners of A and D are cut by C5⋯› CCA5-CCD5	5,00/ Per Corner

Material Shop 24 Guide

■[Material Shop 24 Shape Machining Website Outline]

[Material Shop 24 Shape Machining Website Contents]

- **Select alterations, then part number, delivery date and price are automatically displayed. Please proceed to ordering with the information.**
- **Enable to save time skipping the process of shape machining and hole machining.**

■Material Shop 24 Shape Machining Website Product Lineup (Exclusive Merchandise for Material Shop 24)



Different Angle Corners

Plate corners can be cut at any combination of different angles (1~4 corners).
Convenient when there is no relief or enough width to insert plates.

■Surface Treatment (Not available for Large Size)

1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized-	Black Oxide, Electroless Nickel Plating, Trivalent Chromate
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu	Clear Anodize, Black Anodize

1~2 tapped holes might be placed on the side of long surface depending on the sizes.



Side Female Thread, Precision Holes

Female Thread holes and precision holes (H7) are machined on the sides.
Best suited as holes for hanging and assembling.

■Surface Treatment (Not available for Large Size)

1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized-	Black Oxide, Electroless Nickel Plating, Trivalent Chromate
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu	Clear Anodize, Black Anodize

1~2 tapped holes might be placed on the side of long surface depending on the sizes.

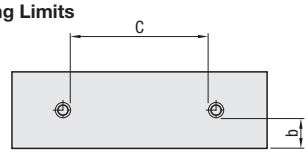
■Side Female Thread Hole

Nominal Dia. (M)	Pitch	Effective Depth	Size	
			Standard	Large
3	0.5	Mx2	○	-
4	0.7			
5	0.8			
6	1			
8	1.25			○
10	1.5			
12	1.75			
14	2			
16	2			

Female Thread holes may go through when the depth of the side (ex. B dim. for side A) is Mx3 or less.

When Both Sides are specified and the depth is Mx4 or less, tapped holes go through.

■Machining Limits



■Application Table by Material

Applicable Sizes	Plate Finish, Size				
	Finish	Size	A (Length)	B (Width)	T (Plate Thickness)
1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized	6F / 4F2RG 4F2G	Standard	50~500	50~300	5~50
		Large	500~1000	301~500	20~80
JIS SKS93 · 1.2510/100MnCrW4 · 1.2379/X155CrVMo12-1	6F / 4F2RG 4F2G	Standard	50~500	50~300	5~50
		Large	50.1~1000	50.1~300	20~60
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu	4F 6F	Standard	50~500	50~300	5~50
		Large	200~1400	100~600	5~50
1.4305/X10CrNiS18-9 · 1.4301/ X5CrNi18-10	6F	Standard	50~500	50~200	5~50
303 · 304 Annealed Material					6.5~30

Machining is not applicable to some materials and finishes.

■Days to Ship

Finish	Standard Size		Large Size
	-	Surface Finished	
4F/6F			
4F2RG			
4F2G			

* For details of accuracy standards, refer to Precision & Machining Range on the web.

■Application Table by Material

Applicable Sizes	Plate Finish, Size				
	Finish	Size	A (Length)	B (Width)	T (Plate Thickness)
1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized	6F / 4F2RG 4F2G	Standard	50~500	50~300	5~50
		Large	500~1000	301~500	20~80
JIS SKS93 · 1.2510/100MnCrW4 · 1.2379/X155CrVMo12-1	6F / 4F2RG 4F2G	Standard	50~500	50~300	5~50
		Large	50.1~1000	50.1~300	20~60
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu	4F 6F	Standard	50~500	50~300	5~50
		Large	200~1400	100~600	5~50
1.4305/X10CrNiS18-9 · 1.4301/X5CrNi18-10	6F	Standard	50~500	50~200	5~50
303 · 304 Annealed Material					6.5~30

Machining is not applicable to some materials and finishes.

■Days to Ship

Finish	Standard Size		Large Size
	-	Surface Finished	
4F/6F			
4F2RG			
4F2G			

* For details of accuracy standards, refer to Precision & Machining Range on the web.

■Side Precision Holes (H7)

Nominal Dia. (D)	Effective Depth (Max.)	Dimension Precision	Size	
			Standard	Large
2	10	- Pitch Accuracy [±0.02] - Location Accuracy from End Face [±0.02]	○	-
2.5	15			
3	20			
4	25			
5	25			
6	30			
8	30			
10	30			

■Min. distance between holes (b), min. distance between a hole and an end face ('c).

Product	Min. Distance (b) / ('c)
Except below	2mm
Large Aluminum	5mm

Not Available



L, U/T-Shaped, Inclined

Machining to L, U/T-shaped and inclined materials in process. Best suited for block parts and base plates.

Surface Treatment (Standard Size Only)

1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized	Black Oxide, Electroless Nickel Plating, Trivalent Chromate
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu	Clear Anodize, Black Anodize

(P)1~2 tapped holes might be placed on the side of long surface depending on the sizes.

Days to Ship

Finish	Standard Size		Large Size
	-	Surface Finished	-
4F/6F			
4F2RG			
4F2G			



Hollowing out ○□

Large holes (through hole, accura… square hole) are machined.
MISUMI offers plates with large holes w… requires a lot of work and time.

Dimension Accuracy of Precision Hole

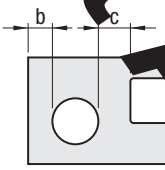
Location from End Face, Dimension Accuracy between Precision H… ±0.02

Min. distance between holes (b)

Product	Required Distance
Others	2mm
Large Aluminum	10mm

Min. distance between a hole and the end face ('c)

Product	Required Distance
Others	10mm
Large Aluminum	20mm



* For details of accuracy standards, refer to Precision & Machining Range on the web.

Surface Treatment (Standard Size Only)

1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized	Black Oxide, Electroless Nickel Plating, Trivalent Chromate
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu	Clear Anodize, Black Anodize

(P)1~2 tapped holes might be placed on the side of long surface depending on the sizes.

Application Table by Material

Applicable Sizes	Plate Finish, Size					R (Inside Slot) Selection (Plate Type Only)
	Finish	Size	A (Length)	B (Width)	T (Plate Thickness)	
1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized	6F	Standard	20~500	20~300	5~50	L≤20: 5R, 10R, 15R, 20R L>20: 6R, 10R, 15R, 20R
		Large	500~1000	301~500	20~80	L≤35: 10R, 15R, 20R L>35: 15R, 20R
JIS SKS93 · 1.2510/100MnCrW4 · 1.2379/X155CrVMo12-1		Standard	20~500	20~300	5~50	L≤20: 5R, 10R, 15R, 20R L>20: 6R, 10R, 15R, 20R
		Large	50.1~1000	50.1~300	20~60	L≤35: 10R, 15R, 20R L>35: 15R, 20R
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu		Standard	20~500	20~300	5~50	L≤20: 5R, 10R, 15R, 20R L>20: 6R, 10R, 15R, 20R
		Large	200~1400	100~600	5~50	L≤30: 5R, 10R, 15R, 20R 30<L≤40: 10R, 15R, 20R L>40: 15R, 20R
1.4305/X10CrNiS18-9 · 1.4301/X5CrNi18-10		Standard	20~500	20~200	5~50	L≤20: 5R, 10R, 15R, 20R L>20: 6R, 10R, 15R, 20R
303 · 304 Annealed Material					6.5~30	

(P)Machining is not applicable to some materials and finishes.

Application Table by Material

Applicable Sizes	Plate Finish, Size					Hole Machining Size Range
	Finish	Size	A (Length)	B (Width)	T (Plate Thickness)	Hollowing Out □ Corner R Selection
1.0038/S235JR · 1.1206/C50E · 1.1203/C55E normalized	6F 4F2RG 4F2G	Standard	50~500	50~300	5~50	T≤205R, 10R, 15R, 20R T>206R, 10R, 15R, 20R
		Large	500~1000	301~500	20~80	T≤3510R, 15R, 20R T>3515R, 20R
JIS SKS93 · 1.2510/100MnCrW4 · 1.2379/X155CrVMo12-1	6F 4F2RG 4F2G	Standard	50~500	50~300	5~50	T≤205R, 10R, 15R, 20R T>206R, 10R, 15R, 20R
		Large	50.1~1000	50.1~300	20~60	T≤3510R, 15R, 20R T>3515R, 20R
EN AW-5052/AlMg2,5 · 52 High Precision · EN AW-2017/AlCu4MgSi · EN AW-7075/AlZn5,5MgCu	4F 6F	Standard	50~500	50v300	5~50	T≤205R, 10R, 15R, 20R T>206R, 10R, 15R, 20R
		Large	200~1400	100~600	5~50	T≤305R, 10R, 15R, 20R 30<T≤4010R, 15R, 20R T>4015R, 20R
1.4305/X10CrNiS18-9 · 1.4301/X5CrNi18-10	6F	Standard	50~500	50~200	5~50	T≤205R, 10R, 15R, 20R T>206R, 10R, 15R, 20R
303 · 304 Annealed Material					6.5~30	

(P)Machining is not applicable to some materials and finishes.

Days to Ship

Finish	Standard Size		Large Size
	-	Surface Finished	-
4F/6F			
4F2RG			
4F2G			

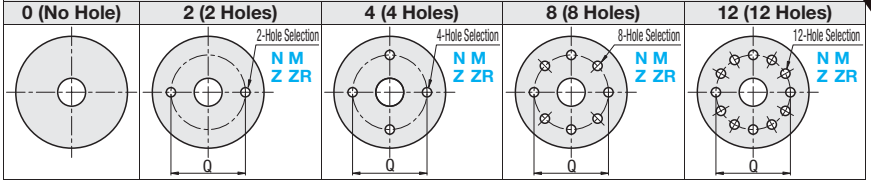
Size Application Table

Applicable Sizes	Shape	Circular Plate Size			Hole Machining Size Range			
		T (Plate Thickness)	D (Outer Dia.)	V (Inner Dia.)	H (No. of Holes)	Hole Selection	Nominal Dia.	Outside Hole Pit
1.0038/S235JR · 1.1206/C50E · EN AW-5052/AlMg2,5 · 1.4305/X10CrNiS18-9	Flat Type V-Shaped Type T-Shaped Type	8 10 15 20 25 30	60~300	10~100 V≤Dx0.8	0 2 4 8 12	Through Hole Female Thread Hole Counterbore Hole Back Surface Counterbore	5 6 8 10	35~280 Q>W+d1(d2)+2b1

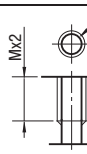
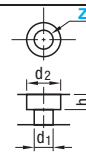
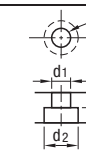
(P)Machining is not applicable to some materials and finishes.

H: No. of Holes Selection (Uniform Division)

0 (No Hole)	2 (2 Holes)	4 (4 Holes)	8 (8 Holes)	12 (12 Holes)
	2-Hole Selection N M Z ZR	4-Hole Selection N M Z ZR	8-Hole Selection N M Z ZR	12-Hole Selection N M Z ZR



Hole Selection

Hole Type	Through Hole	Female Thread Hole	Counterbore Hole	Back Surface Counterbore
Code	N	M	Z	ZR
Shape				

Machining Limits
Machining Limits Specification

Dimension	Nominal Dia.			
	5	6	8	10
d1	5.5	6.5	9	11

The pilot hole for tapping goes through for Mx2<T.
The pilot hole for tapping goes through for Mx2≥T

Dimension	Bolt Nominal			
	5	6	8	10
d1, h	5.5	6.5	9	11
d2	9.5	11	14	18

For bolt nominal diameter 6, T≥10 (When Shape Z, T−S≥10)
For 8 and 10, T≥15 (T−S≥15, when shape Z)



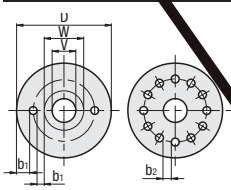
Circular Plates

Hole machining for Circular Plates (flat, uneven).
Best suited for jig receivers or bases for index table.

Machining Limits of Q and PX

Through Hole (N) Female Thread Hole (M) Dowel Hole (PC)	Nominal Dia.			
	5	6	8	10
d1	5.5	6.5	9	11
Min. distance between a hole and D, W and V diameter (b1)	4.5	5.5	7.5	9
Min. distance between holes (b2)	Qn/No. of Holes (H)−d1(M)−(PC)≥d1(M)+(PC)			

Counterbore Hole (Z) Back Surface Counterbore (ZR)	Nominal Dia.			
	5	6	8	10
d2	9.5	11	14	18
Min. distance between a hole and D, W and V diameter (b1)	2.5	3	4.5	5
Min. distance between holes (b2)	Qn/No. of Holes (H)−d2−(PC)≥d2+(PC)			



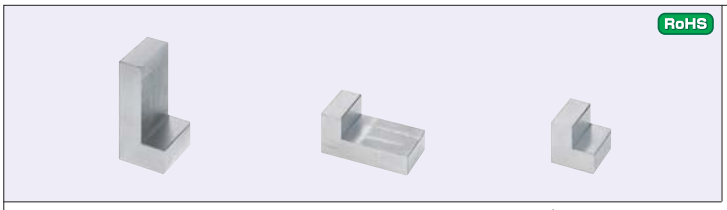
* H hole diameter in the diagram indicates d1, M and d2.

Days to Ship 13 Days

Not Available

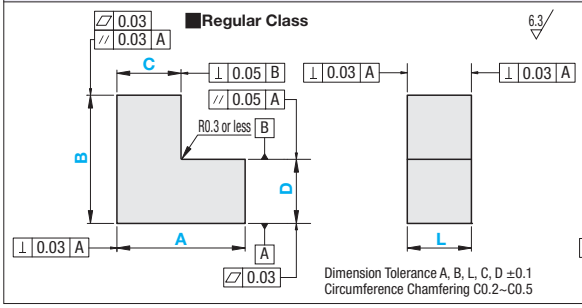
L-Shaped Blocks

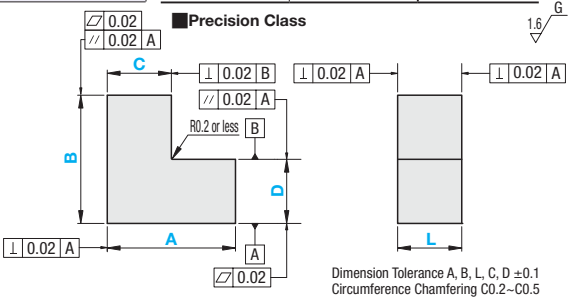
–0.1mm Increment-



RoHS

Part Number		Material
Regular Class	Precision Class	
SSLF	SSLG	1.0038/S235JR
SCLF	SCLG	1.1206/C50E
SULF	-	1.4305/X10CrNiS18-9
ALLF	-	EN AW-5052/AlMg2,5
SKLF	-	JIS SKS93
SDLF	-	1.2379/X155CrVMo12-1





Regular Class

Part Number	0.1mm Increment				
	A	B	L	C	D
SSLF SCLF SULF ALLF SKLF SDLF	10.0 ~ 200.0	* 10.0 ~ 100.0	10.0 ~ 200.0	5.0 ~ 200.0 (C≤A)	5.0 ~ 100.0 (B-D≤80.0 D≤B)

Precision Class

Part Number	0.1mm Increment				
	A	B	L	C	D
SSLG SCLG	10.0 ~ 160.0	10.0 ~ 100.0	10.0 ~ 100.0	5.0 ~ 160.0 (C≤A)	5.0 ~ 100.0 (B-D≤60.0 D≤B)

* For SKLF and SDLF, B10.0~50.0.

Standard Class (B10.0~60.0mm)

0.1mm Increment		B : 0.1mm Increment															
		10.0~30.0						30.1~50.0						50.1~60.0			
A	L	SSLF	SCLF	SULF	ALLF	SKLF	SDLF	SSLF	SCLF	SULF	ALLF	SKLF	SDLF	SSLF	SCLF	SULF	ALLF
10.0~ 60.0	10.0 ~ 60.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	60.1 ~ 100.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	100.1 ~ 130.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	130.1 ~ 160.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	160.1 ~ 180.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	180.1 ~ 200.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	

Price Reduction
Up to 8%

Order Example

Part Number	-	A	-	B	-	L	-	C	-	D
SSLF	-	A120.5	-	B100.0	-	L120.0	-	C30.3	-	D40.0

Alterations

Part Number	-	A	-	B	-	L	-	C	-	D	-(NG...etc.)
SSLF	-	A100.0	-	B90.0	-	L90.0	-	C40.0	-	D60.0	- NG

Days to Ship

- Regular Class: **8 Days** — Express A — 8,00 EUR/ piece — P.88
  - A Express Charge of 21,60 EUR for 3 or more identical pieces.
- Precision Class: **10 Days** — Express B — 8,00 EUR/ piece — P.88
  - A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Alterations	Relief	Dimension Tolerance (Precision Class Only)
Code	NG	CKA / CKB / CKL / CKC / CKD
Spec.	Adds a relief groove. C, D≥10, A-C≥10, B-D≥10, R0.5. Applicable to Standard Class only. Not applicable to SK_ _, SD_ _.	Changes the dimension tolerance. ±0.1→±0.02. Ordering Code: CKA for A Dimension CKA; CKB for B Dimension CKB; CKL for L Dimension CKL; CKC for C Dimension CKC; CKD for D Dimension CKD. Applicable to Precision Class only.
Price Adder	5,00	7,00

Precision Class

0.1mm Increment		B : 0.1mm Increment													
A	L	10~30.0		30.1~50.0		50.1~60.0		60.1~70.0		70.1~80.0		80.1~90.0		90.1~100.0	
		SSLG	SCLG	SSLG	SCLG	SSLG	SCLG	SSLG	SCLG	SSLG	SCLG	SSLG	SCLG	SSLG	SCLG
10.0~ 60.0	10.0 ~ 60.0														
60.1~100.0															
100.1~130.0															
130.1~160.0															
10.0~ 60.0	60.1 ~ 100.0														
60.1~100.0															
100.1~130.0															
130.1~160.0															

Standard Class (B60.1~100.0mm)

0.1mm Increment		B : 0.1mm Increment															
A	L	60.1~70.0				70.1~80.0				80.1~90.0				90.1~100.0			
		SSLF	SCLF	SULF	ALLF	SSLF	SCLF	SULF	ALLF	SSLF	SCLF	SULF	ALLF	SSLF	SCLF	SULF	ALLF
10.0~ 60.0	10.0 ~ 60.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	60.1 ~ 100.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	100.1 ~ 130.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	130.1 ~ 160.0																
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160.1~180.0																	
180.1~200.0																	
10.0~ 60.0	180.1 ~ 200.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	

U-Shaped Blocks

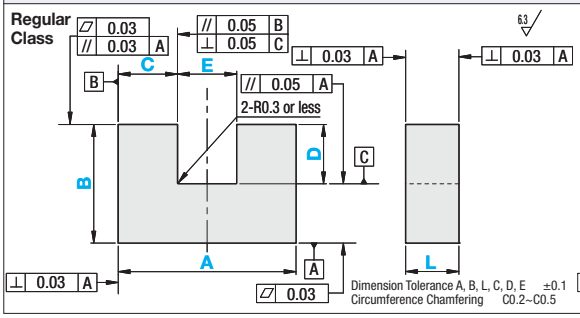
-0.1mm Increment-

Price Reduction
Up to 8%

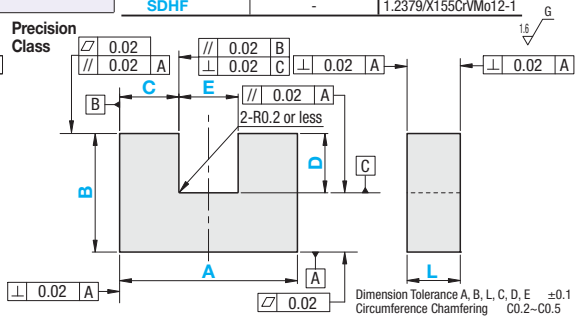


Part Number		Material
Regular Class	Precision Class	
SSHF	SSHG	1.0038/S235JR
SCHF	SCHG	1.1206/C50E
SUHF	-	1.4305/X10CrNiS18-9
ALHF	-	EN AW-5052/AlMg2,5
SKHF	-	JIS SKS93
SDHF	-	1.2379/X155CrVMo12-1

Regular Class



Precision Class



■Regular Class

Part Number	0.1mm Increment					
	A	B	L	C	D	E
SSHF SUHF SCHF ALHF SKHF SDHF	15.0~200.0	10.0~100.0	10.0~200.0	5.0~190.0	1.0~80.0 (B-D≥5) (When 5≤E≤20,D≤10)	5.0~190.0 (C+E+5≤A)

■Precision Class

Part Number	0.1mm Increment					
	A	B	L	C	D	E
SSHG SCHG	20.0~160.0	10.0~100.0	10.0~100.0	5.0~145.0	1.0~60.0 (B-D≥5) (When 10≤E≤35,D≤30)	10.0~150.0 (C+E+5≤A)

Order Example

Part Number - A - B - L - C - D - E

SSHF - A120.5 - B100.0 - L120.0 - C30.3 - D40.0 - E50.2

Price

■Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Standard Class

8 Days — Express A — 8,00 EUR/piece — P.88

- Precision Class

10 Days — Express B — 8,00 EUR/piece — P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

■Common for Standard Class, V-Shaped Type, T-Shaped Type

A	L \ B	10.0~30.0						30.1~50.0						50.1~60.0					
		SS400	S50C	SUS303	EN AW5052	JIS SKS93	SKD11	SS400	S50C	SUS303	EN AW5052	JIS SKS93	SKD11	SS400	S50C	SUS303	EN AW5052	JIS SKS93	SKD11
10.0~ 60.0 (V-Shaped Type 15.0~)	10.0~60.0 (SK, SD_ _ 10.0~50)																		
60.1~100.0																			
100.1~130.0																			
130.1~160.0																			
160.1~180.0																			
180.1~200.0																			
10.0~ 60.0	60.1~100.0 (SK, SD_ _ 50.1~)																		
60.1~100.0																			
100.1~130.0																			
130.1~160.0																			
160.1~180.0																			
180.1~200.0																			
10.0~ 60.0	100.1~130.0																		
60.1~100.0																			
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60.1~100.0																			
100.1~130.0																			
130.1~160.0																			
160.1~180.0																			
180.1~200.0																			

■Precision Class

A	L \ B	10.0~30.0		30.1~50.0		50.1~60.0		60.1~70.0		70.1~80.0		80.1~90.0		90.1~100.0	
		SSHG	SCHG	SSHG	SCHG	SSHG	SCHG	SSHG	SCHG	SSHG	SCHG	SSHG	SCHG	SSHG	SCHG
20.0~ 60.0	10.0 ~ 60.0														
60.1~100.0															
100.1~130.0															
130.1~160.0															
20.0~ 60.0	60.1 ~ 100.0														
60.1~100.0															
100.1~130.0															
130.1~160.0															

Alterations

Part Number - A - B - L - C - D - E -(CKA, etc.)

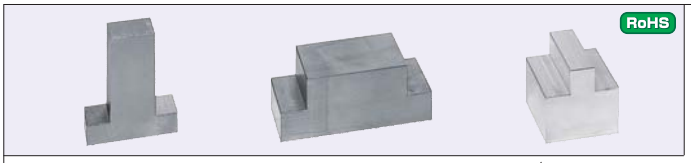
- A90.0 - B100.0 - L100.0 - C20.3 - D30.0 - E30.2 - CKA

Alterations	Dimension Tolerance (Precision Class Only)
Code	CKA / CKB / CKL / CKC / CKD / CKE
Spec.	Changes the dimension tolerance. ±0.1→±0.02 (Ordering Code) CKA for A Dimension CKA, CKB for B Dimension CKB, CKL for L Dimension CKL, CKC for C Dimension CKC, CKD for D Dimension CKD, CKE for E Dimension CKE
Price Adder	7,00

T-Shaped Blocks

-0.1mm Increment-

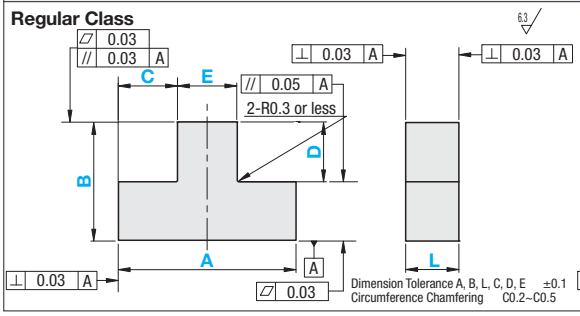
Price Reduction
Up to 8%



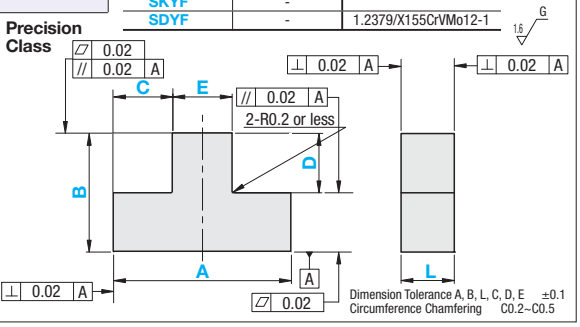
RoHS

Part Number		Material
Regular Class	Precision Class	
SSYF	SSYG	1.0038/S235JR
SCYF	SCYG	1.1206/C50E
SUYF	-	1.4305/X10CrNiS18-9
ALYF	-	
SKYF	-	
SDYF	-	1.2379/X155CrVMo12-1

Regular Class



Precision Class



Regular Class

Part Number	0.1mm Increment					
	A	B	L	C	D	E
SSYF SUYF SCYF ALYF SKYF SDYF	10.0~200.0	10.0~100.0	10.0~200.0	1.0~195.0 (A>C+E)	1.0~80.0 (B-D≥5)	5.0~190.0

Precision Class

Part Number	0.1mm Increment					
	A	B	L	C	D	E
SSYG SCYG	10.0~160.0	10.0~100.0	10.0~100.0	1.0~155.0	1.0~60.0 (B-D≥5)	5.0~155.0

Order Example

Part Number	-	A	-	B	-	L	-	C	-	D	-	E
SSYF		- A100.0		- B100.0		- L120.0		- C30.0		- D40.0		- E50.2

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Days to Ship

- Standard Class: 8 Days — Express A — 8,00 EUR/piece — P.88
  A Express Charge of 21,60 EUR for 3 or more identical pieces.
- Precision Class: 10 Days — Express B — 8,00 EUR/piece — P.88
  A Express Charge of 21,60 EUR for 3 or more identical pieces.

60.1~70.0						70.1~80.0						80.1~90.0						90.1~100.0					
SS400	S50C	SUS303	EN AW-5052	JIS SKS93	SKD11	SS400	S50C	SUS303	EN AW-5052	JIS SKS93	SKD11	SS400	S50C	SUS303	EN AW-5052	JIS SKS93	SKD11	SS400	S50C	SUS303	EN AW-5052	JIS SKS93	SKD11

Precision Class

A	B L	10.0~30.0		30.1~50.0		50.1~60.0		60.1~70.0		70.1~80.0		80.1~90.0		90.1~100.0	
		SSYG	SCYG	SSYG	SCYG	SSYG	SCYG	SSYG	SCYG	SSYG	SCYG	SSYG	SCYG	SSYG	SCYG
10.0~ 60.0															
60.1~100.0	10.0 ~ 60.0														
100.1~130.0															
130.1~160.0															
10.0~ 60.0															
60.1~100.0	60.1 ~ 100.0														
100.1~130.0															
130.1~160.0															

Alterations

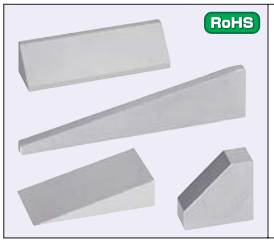
Part Number	-	A	-	B	-	L	-	C	-	D	-	E	-(NG)
SSYF		- A90.0		- B100.0		- L100.0		- C20.3		- D30.0		- E30.2	- NG

Alterations Code	Relief (T-Shaped Type only)
	NG
Spec.	Adds a relief groove.  C, D, E≥10 B-D≥10 A-C-E≥10 Applicable to Standard Class only. Not applicable to SK_ _, SD_ _.
Price Adder	7,00

Inclined Blocks
-0.1mm Increment-

Price Reduction
Up to 8%

0.1mm Increment for each dimension, this block can respond to desired slope shape by specifying angle of gradient.

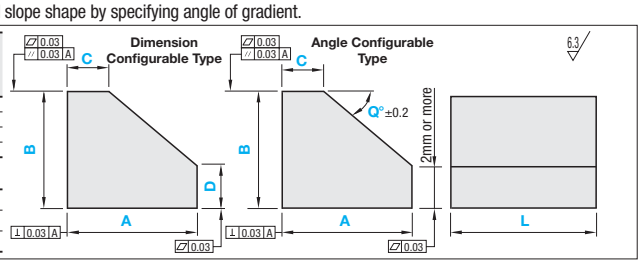


RoHS

Part Number		Material
Dimension Configurable Type	Angle Configurable Type	
SSRF	SSRAF	1.0038
SCRF	SCRAF	1.1206
SURF	SURAF	1.4305
ALRF	ALRAF	EN AW-5052

Dimension Tolerance

A, B, L 50mm or less	±0.05
A, B, L 50mm or more	±0.1
Circumference Chamfering C0.2~0.5	



Dimension Configurable Type

Part Number	0.1mm Increment				
	A	B	L	C	D
SSRF SCRF SURF ALRF	20.0 ~ 200.0	10.0 ~ 100.0 (B≥A/3)	10.0 ~ 200.0	0.0 ~ 200.0 (C≤A)	2.0 ~ 100.0 (D≤B)

Angle Configurable Type

Part Number	0.1mm Increment				1° Increment
	A	B	L	C	Q
SSRAF SCRAF SURAF ALRAF	20.0 ~ 200.0	10.0 ~ 100.0 (B≥A/3)	10.0 ~ 200.0	0.0 ~ 200.0 (C≤A)	0 ~ 90° 1° Increment

Part Number	-	A	-	B	-	L	-	C	-	D (Q)
SSRF	-	A100	-	B80	-	L52.3	-	C45	-	D30.3
SSRAF	-	A100	-	B80	-	L52.3	-	C45	-	Q55

8 Days

Express A 8,00 EUR/ piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount

(Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	0.05	0.1

For orders larger than indicated quantity, please request a quotation.

0.1mm Increment		B 0.1mm Increment															
A	L	10~30				30.1~40				40.1~50				50.1~60			
		SS400	S50C	SUS303		SS400	S50C	SUS303		SS400	S50C	SUS303		SS400	S50C	SUS303	
20.0~60.0	10~30.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	30.1~60.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	60.1~100.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	100.1~130.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	130.1~160.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
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60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	180.1~200.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	

0.1mm Increment		B 0.1mm Increment															
A	L	60.1~70				70.1~80				80.1~90				90.1~100			
		SS400	S50C	SUS303	EN AW-5052	SS400	S50C	SUS303	EN AW-5052	SS400	S50C	SUS303	EN AW-5052	SS400	S50C	SUS303	EN AW-5052
20.0~60.0	10~30.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	30.1~60.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	60.1~100.0																
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130.1~160.0																	
160.1~180.0																	
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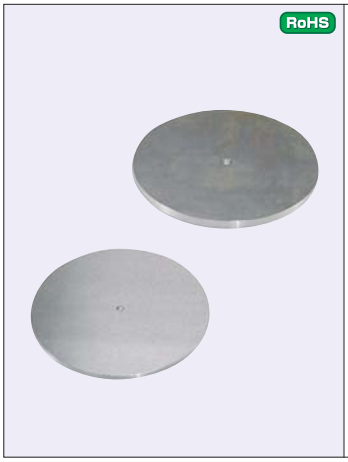
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	
20.0~60.0	180.1~200.0																
60.1~100.0																	
100.1~130.0																	
130.1~160.0																	
160.1~180.0																	
180.1~200.0																	

Circular Plates
-Standard Class / Precision Class-

Price Reduction
4% on average
Standard Grade, Configurable Size
Precision Grade, Configurable Size

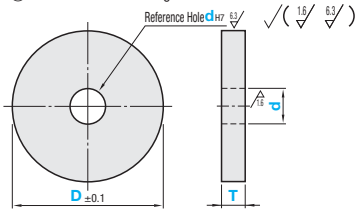


RoHS

Regular Class

Type		Material
Standard Size	Dimension Configurable Type	
ENPMH	ENPM	(Steel) 1.0038/S235JR
ENPNH	ENPN	(Aluminum) EN AW-5052
ENPDH	ENPD	(Duralumin) EN AW-2017
ENPGH	ENPG	(Stainless Steel) 1.4305

Circumference chamfering C0.5 or less

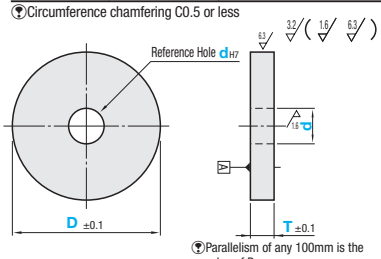


Parallelism of any 1000mm is 2mm based on the material accuracy.

Precision Class

Type		Material
Standard Size	Dimension Configurable Type	
ENPSH	ENPS	(Steel) 1.0038/S235JR
ENPAH	ENPA	(Aluminum) EN AW-5052
ENPJH	ENPJ	(Duralumin) EN AW-2017
ENPUH	ENPU	(Stainless Steel) 1.4305

Circumference chamfering C0.5 or less



Parallelism of any 100mm is the value of B.

Standard Class, Standard Size

Part Number		D	d 1mm Increment	T Dimension Tolerance	€ Unit Price			
Type	T	Selection			D100	D150	D200	D300
ENPMH (1.0038)	10	100 150 200 300	0~50	±0.6				
	15			±0.7				
ENPNH (A5052P)	10	100 150 200 300	0~50	±0.6				
	15			±0.7				
NPDH (EN AW-2017)	10	100 150 200 300	0~50	±0.6				
	15			±0.7				
ENPGH (1.4305)	10	100 150 200 300	0~50	±0.6				
	15			±0.7				

Precision Class, Standard Size

Part Number		D	d 1mm Increment	B Parallelism	€ Unit Price			
Type	T	Selection			D100	D150	D200	D300
ENPSH (1.0038)	10	100 150 200 300	0~50	0.012				
	15							
ENPAH (A5052P)	10	100 150 200 300	0~50	0.03				
	15			0.05				
ENPJH (EN AW-2017)	10	100 150 200 300	0~50	0.03				
	15			0.05				
ENPUH (1.4305)	10	100 150 200 300	0~50	0.03				
	15			0.05				

Standard Class, Configurable Size

Part Number		1mm Increment		T Dimension Tolerance	€ Unit Price						
Type	T	D	d d≤Dx0.8		D50 ~ 200	D201 ~ 300	D301 ~ 400	D401 ~ 500	D501 ~ 600	D601 ~ 700	D701 ~ 800
ENPM (1.0038)	8~9	50~200	0~50	±0.2							
	10	50~600	0~100								
	11~15										
	16~20	100~800									
	21~25										
	26~30										
ENPN (EN AW-5052)	8~9	50~200	0~50	±0.2							
	10	100~800	0~100	±0.6							
	11~14			±0.2							
	15			±0.7							
	16~19			±0.2							
	20			±0.8							
	21~24			±0.2							
	25			±0.9							
	26~29			±0.2							
	30			±1.0							
ENPD (EN AW-2017)	8~9	50~200	0~50	±0.2							
	10	100~800	0~100	±0.6							
	11~14			±0.2							
	15			±0.7							
	16~19			±0.2							
	20			±0.8							
	21~24			±0.2							
	25			±0.9							
	26~29			±0.2							
	30			±1.0							
ENPG (1.4319)	8~9	50~200	0~50	±0.2							
	10	50~300	0~100								
	11~15										
	16~20										
	21~25										
	26~30										

Precision Class, Configurable Size

Part Number		1mm Increment		B Parallelism	€ Unit Price						
Type	T	D	d d≤Dx0.8		D50 ~ 200	D201 ~ 300	D301 ~ 400	D401 ~ 500	D501 ~ 600	D601 ~ 700	D701 ~ 800
ENPS (1.0038)	8~9	50~200	0~50	0.012							
	10	50~600	0~100								
	11~15										
	16~20	100~800									
	21~25										
	26~30										
ENPA (EN AW-5052)	8~9	50~200	0~50	0.03							
	10	100~800	0~100								
	11~14			0.05							
	15										
	16~19			0.07							
	20										
	21~24			0.09							
	25										
	26~29			0.11							
	30										
ENPJ (EN AW-2017)	8~9	50~200	0~50	0.03							
	10	50~600	0~100								
	11~14			0.05							
	15										
	16~19	100~800		0.07							
	20										
	21~24			0.09							
	25										
	26~29			0.11							
	30										
ENPU (1.4305)	8~9	50~200	0~50	0.03							
	10	50~300	0~100								
	11~15			0.05							
	16~20			0.07							
	21~25			0.09							
	26~30			0.11							

Order Example

Part Number	-	D	-	d
ENPNH15	-	200	-	8
ENPN19	-	670	-	18

Days to Ship

- Standard Size: 10 Days
- Configurable Size: 10 Days

Express B 8,00 EUR/piece P.88

A Express Charge of 21,60 EUR for 3 or more identical pieces.

Price

Volume Discount (Round down to ten Cent.) P.88

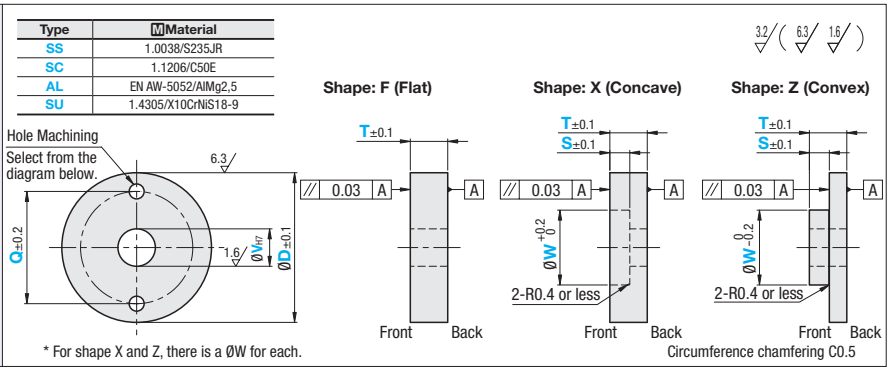
Quantity	1~9	10~14	15~19
Rate	€ Unit Price	0.05	0.1

For orders larger than indicated quantity, please request a quotation.

Machined Circular Plates

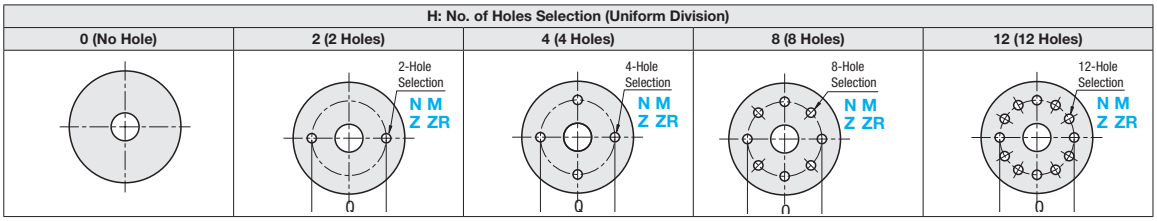


Type	Material
SS	1.0038/S235JR
SC	1.1206/C50E
AL	EN AW-5052/AlMg2,5
SU	1.4305/X10CrNiS18-9

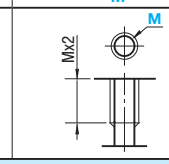
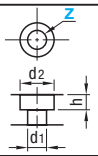
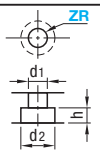


Part Number			1mm Increment				Selection			1mm Increment
Type	Shape	T	D	V	W	S	H: No. of Holes	Hole Selection	Nominal Dia.	Q
SS(1.0038/S235JR) SC(1.1206/C50E) AL(EN AW5052/AlMg2,5) SU(1.4305 X10CrNiS18-9)	F(Flat) X(Concave) Z(Convex)	8 10 15 20 25 30	60~300	10~100 V≤Dx0.8	20~260 W-V≥10 D-W≥20	5~25 T-S≥5	0 2 4 8 12	N(Through hole) M(Female Thread Hole) Z(Counterbore Hole) ZR(Back Surface Counterbore)	5 6 8 10	35~280 Q>W+d1(d2)+2b1 (Refer to Machining Limits at the bottom of this page.)

H: No. of Holes Selection (Uniform Division)



■Hole Selection

Hole Type	Through Hole	Female Thread Hole	Counterbore Hole	Back Surface Counterbore
Code	N	M	Z	ZR
Shape				

Machining Limits Specification

Dimension	Nominal Dia. 5	6	8	10
d1	5.5	6.5	9	11

The pilot hole for tapping goes through for Mx2<T.
The pilot hole for tapping goes through for Mx2≥T

Dimension	Bolt Nominal 5	6	8	10
d1, h	5.5	6.5	9	11
d2	9.5	11	14	18

For bolt nominal diameter 6, T≥10 (When Shape Z, T−S≥10)
For 8 and 10, T≥15 (T−S≥15, when shape Z)

Order Example

Part Number											
Type	Shape	T	- D	- V	- W	- S	- H	- Hole Selection Code - Nominal Diameter	- Q		
SS	F	10	- D100	- V20			- H2	- N5	- Q60		
SS	X	10	- D100	- V50	- W60	- S5	- H4	- M5	- Q80		

Days to Ship

13 Days

Express C 8,00 EUR/ piece

P.88

※A Express Charge of 21,60 EUR for 3 or more identical pieces.

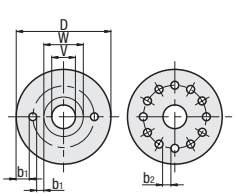
Alterations

Part Number												
Type	Shape	T	- D	- V	- W	- S	- H	- Hole Selection Code - Nominal Diameter	- Q	-(WA, WB, WC, PC)	
SS	Z	20	- D200	- V30	- W100	- S10	- H4	- Z5	- Q150	-WB-PC10 PX75	

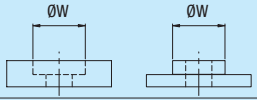
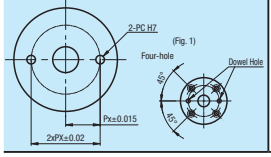
■Machining Limits of Q and PX

Through Hole (N) Female Thread Hole (M) Dowel Hole (PC)	Nominal Dia. 5	6	8	10
d1	5.5	6.5	9	11
Min. Distance between a Hole and D, W and V diameter (b1)	4.5	5.5	7.5	9
Min. Distance between Holes (b2)	Qπ/No. of Holes (H)−d1(M)−(PC)≥d1(M)+(PC)			

Counterbore Hole (Z) Back Surface Counterbore (ZR)	Nominal Dia. 5	6	8	10
d2	9.5	11	14	18
Min. Distance between a Hole and D, W and V diameter (b1)	2.5	3	4.5	5
Min. Distance between Holes (b2)	Qπ/No. of Holes (H)−d2−(PC)≥d2+(PC)			



* H hole diameter in the diagram indicates d1, M and d2.

Alterations	Code	Spec.	Price Adder
W Diameter Tolerance 	WA WB WC	Shape / Tolerance / Code X (Concave) / H7 / WA Z (Convex) / g6 / WB h6 / WC	15,00
Dowel Hole 	PC	Ordering Code PC (Selection)−PX (Specified) Ex. of Ordering PC10−PX50 PC Selection=5, 6, 8, 10 Depth PC=Through (Effective depth PCx3) PX: 2PX>W+d1(d2)+2b1 Refer to Machining Limit When there are motor mounting holes, the dowel holes will be located on a center line between the screw holes. (refer to Fig. 1)	30,00

Price Reduction
4% on average
SS / SC / AL / SU

Price

Volume Discount (Round down to ten Cent.) P.88

Quantity	1~9	10~14	15~19
Rate	€ Unit Price	5%	10%

For orders larger than indicated quantity, please request a quotation.

Hole Machining Charge

H	Price
No Hole	
2 Holes	
4 Holes	
8 Holes	
12 Holes	

Price Calculation Method. Add hole machining charge to the shape price.

(Example) When SSZ10–D100–V50–W60–S5–H4–N5–Q80

Shape Price	+	Hole Charge	=	Price
40,50	+	28,00	=	68,50 €

Shape Price

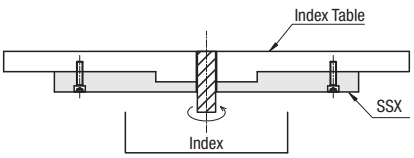
Type	T	D	V	€ Unit Price Shape F	Shape X	Shape Z
SS (1.0038/S235JR)	8 • 10	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	15	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	20	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	25	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	30	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			

Type	T	D	V	€ Unit Price Shape F	Shape X	Shape Z
SC (1.1206/C50E)	8 • 10	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	15	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	20	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	25	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	30	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			

Type	T	D	V	€ Unit Price Shape F	Shape X	Shape Z
AL (EN AW-5052/ AlMg2,5)	8 • 10	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	15	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	20	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	25	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	30	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			

Type	T	D	V	€ Unit Price Shape F	Shape X	Shape Z
SU (1.4305/ X10CrNiS18-9)	8 • 10	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	15	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	20	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	25	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			
	30	60~100	10~50			
			51~80			
		101~200	10~50			
			51~100			
		201~300	10~50			
			51~100			

Example



Angles · Section Steels

Angles Structural Steels




Addition

Price Reduced Average 8%


Addition


Addition



Product Name	Material Shop 24 Angles / Section Steels site	-L-Shaped Angles - Cut-off Material with R - 2 Equal Sides Type-	-Cut-off Material with R - Unequal Sides Type-	-L-Shaped Aluminum Angles without R-	L-Shaped Resin Angles
Page	1718	1719	1719	1720	1720











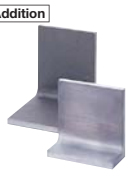
Price Reduced Average 8%

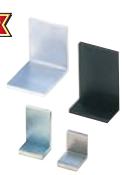


Price Reduced Average 8%

-Outside Datum - 2 and 3 Equal Sides Type-	-Mill Finished - Outside Datum Perpendicularity - Unequal Sides Type-	-Milled Square Stock - Perpendicularity Datum Outside - Dimension Selectable Type-	-Mill Finished - Perpendicularity Datum Outside Rough - Configurable Type-	-Mill Finished - Outside Datum Configurable Type-	-Mill Finished - Perpendicularity Datum Outside - Plate Thickness Configurable Type-
1721	1722	1723	1724	1725	1727

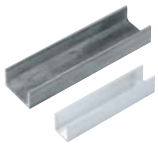
Addition











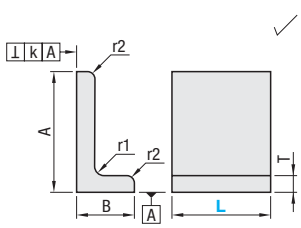




-Mill Finished-Unfinished Inside-Outside Datum Perpendicularity-Configurable-	L-shaped Surface Treated Angles	L-Shaped Machined Angles	L-Shaped Welded Angles	C-Shaped Section Steels	Metal Boxes	Box Stays
1728	1729	1731	1733	1734	1734	1734

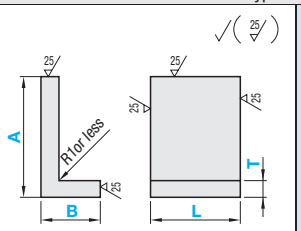
L-Shaped Angles Overview

Cut-off Material with R Type



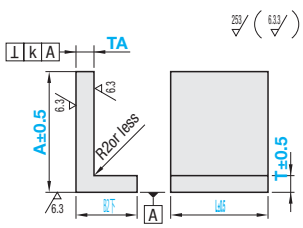
P.1719

Cut-off Material without R Type



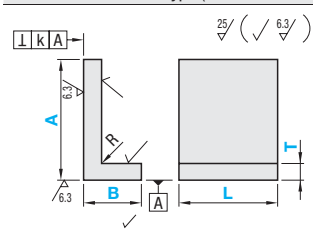
P.1720

Mill Finished Type (Standard)



P.1721

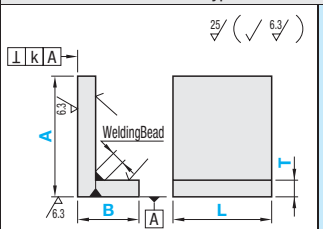
Mill Finished Type (No Finish Inside)



area of 1.0038/S235JR has shot blast finishing.

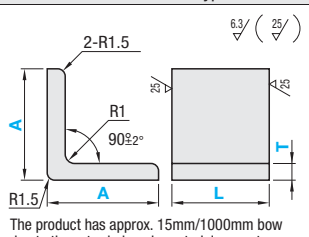
P.1728

Welded Type



P.1733

Resin Type



The product has approx. 15mm/1000mm bow due to the extruded res in material property.

P.1720

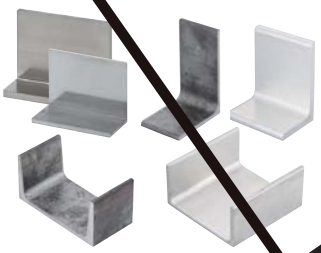
Material Finish		Outer perpendicularity Guarantee	Dimension Specification	Material					
				1.0038/S235JR	1.1206/C50E	EN AW-6063	EN AW-5052	1.4301	Resin
Cut-off Materials		-	2 Sides Selectable, Length Configurable (with R)	○	-	○	-	○	○
			3 Sides Configurable (Without R)	-	-	○	-	-	-
Mill Finished	Standard	Δ Rough Precision	3 Sides Configurable	○	-	○	-	○	-
		○	3 Sides Selectable	○	-	○	-	○	-
			2 Sides Selectable, Length Configurable (Long)	○	○	-	-	-	-
			3 Sides Configurable	○	○	○	-	○	-
			Plate Thickness Configurable	○	○	○	-	-	-
	No Finish Inside	○	3 Sides Configurable	○	-	○	-	-	-
	Surface Treatment	○	3 Sides Configurable	○	-	○	-	-	-
	Machined Shape	○	3 Sides Configurable	○	-	○	-	-	-
Welded		○	3 Sides Configurable	-	-	-	○	○	-
Other Section Steels (Lightweight Channel Steels)		-	2 Sides Selectable, Length Configurable	○	-	○	-	○	-

Guide of "Material Shop 24 Angles / Section Ste

新商品

材料屋24 アングル・形鋼材

[Site Details]
After selecting the specs, MISUMI part numbers, Delivery Time and Prices are automatically generated, and the ordering can be placed directly from the web site.



"Material Shop 24 Angles / Section Steels site"

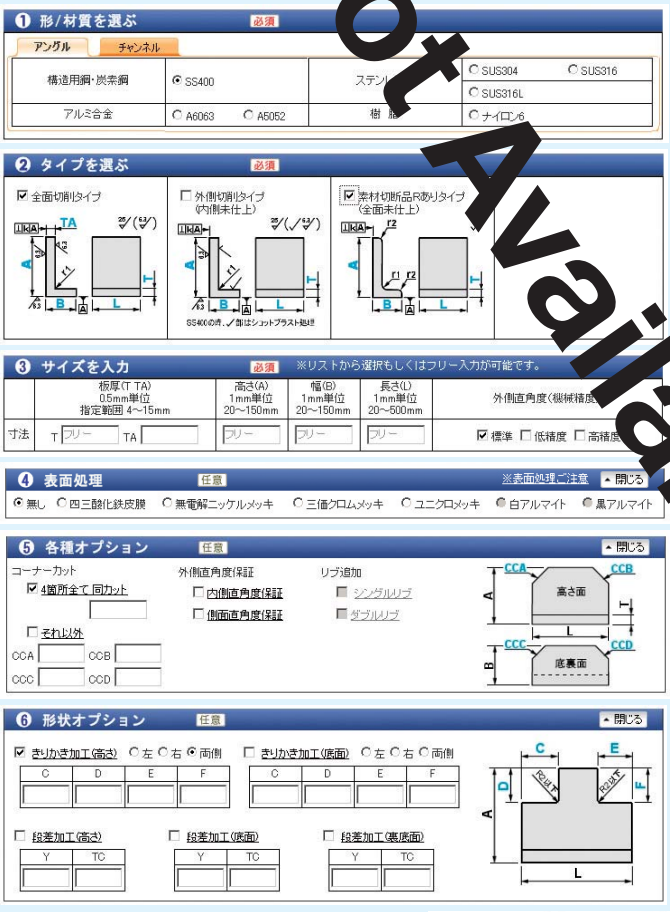
Displays MISUMI Part Numbers, Days to Ship and Prices in an instant!

■Selection Steps

1	**Specification Selection**	Shape / Material / Type / Size / Qty.
2	**Item Auto-extraction**	List up MISUMI Part Numbers, Days to Ship and Prices
3	**Select Ordering Method**	Ordering by WOS
		Printing FAX order sheet
		Downloading CSV data

Screen shots of Material Shop 24 Angles / Section Steels site

Not Available



Selection Steps

1Select shapes / materials.
Angles / Channels are selectable with the tab.

2Select types.
Max. 4 types from cut-off hot-rolled and mill finished materials are available.
Multiple types can be selected.
*All the types may not be listed on the quotation results.

3Enter sizes.
"Configurable" means the size can be specified by 1mm increments.

4Options (optional)
Many useful alterations are available.
- Surface treatment
- Corner cut
- Higher perpendicularity guaranteed
- Side plane parallelism guaranteed
- Gusset addition (welding only)
- Notching
- Stepping

Consider this to improve your factory operational status and total costs!

Enter quantity and click the Quotation button.

Quotation results are listed in the lowest price order.
We confirm the selected item specs and precision for you.
If no problem is found, check the box on the left and click the Order button.

***The web-only standard cut-off materials of 178 Angles and 58 Chanel Steels are available.**

L-Shaped Angles

-Cut-off Material with R - 2 Equal Sides Type · Unequal Sides Type- LACS · LACA · LACU

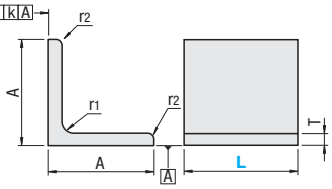
Price Reduction
Average 8%

■Cut-off Material with R - 2 Equal Sides Type

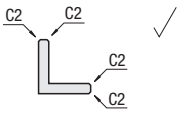
RoHS



Type	Material
LACS	1.0038/S235JR
LACA	EN AW-6063/AlMg0,7Si
LACU	1.4301/X5CrNi18-10



*LACA12 (Aluminum) only has radius r2 shape as shown on the right.



T Tolerance

Type	No.	k	A	L
LACS	3 · 5 · 6 · 8 · 9 · 9A · 13	±2.0	±2.0	+1.0 0
LACS	9B · 15, 15A · 15B	±3.0	±3.0	+3.0 0
LACA	3 · 3A · 3B · 3C · 4 · 4A · 4B · 5 · 5A · 5B · 5C · 6 · 6A · 6B · 6C · 8 · 9 · 9A · 10 · 10A · 12	±2.0	±0.9	+1.0 0
LACA LACU	14 · 18 6 · 8 · 8A · 9 · 10	±3.0	±0.8	+2.0 0

(P)1.0038/S235JR products are shot blasted.
EN AW-6063/AlMg0,7SI and 1.4301/X5CrNi18-10 surfaces are "as material".

Part Number Type	No.	L 1mm Increment	T	T Dim. Tolerance	A	r_1	r_2	€ Unit Price L30~49	L50~99	L100~149	L150~199	L200~249	L250~300
LACS (1.0038/S235JR)	3	30~300	3	±0.5	30	3.0	1.5						
	5		5		30	5.0	2.5						
	6		6		50	6.0	3.0						
	8		8	±0.7	65	9.0	4.0						
	9		9		75								
	9A				90		4.5						
	9B			±0.8	130								
	13		13		90	13.0	6.5						
	15	100~300	15		130	15.0	7.5						
	15A				150								
	15B				175								
LACA (EN AW-6063/AlMg0,7Si)	3	30~300	3	±0.25	20	-	-						
	3A				30	-	-						
	3B				40	-	-						
	3C				50	-	-						
	4		4		30	-	-						
	4A				40	-	-						
	4B				50	-	-						
	5		5		30	-	-						
	5A				40	-	-						
	5B				50	-	-						
	5C				60	-	-						
	6		6	±0.3	40	-	-						
	6A				50	-	-						
	6B				60	-	-						
	6C				75	6.0	3.0						
	8		8		80	8.0	5.0						
	9A		9		75	9.0	4.5						
	9				90	9.0	4.5						
	10A		10		50	-	-						
	10	50~300			100	10.0	5.0						
	12		12		130	12.0	*						
	14		14	±0.5	130	0.5	0.5						
	18		18		155	1.0	1.0						
LACU (1.4301/X5CrNi18-10)	6	30~300	6	±0.6	65	6.0	3.0						
	8		8	±0.7	65	8.0	4.0						
	8A				100								
	9	50~300	9		75	8.5	6.0						
	10		10	±0.8	100	10.0	7.0						

*No r2 for LACA12.r_2

Order Example: Part Number LACA8 - L 100

Days to Ship
• LACS: 8 Days
• LACA · LACU: 8 Days — Express A 5,00 EUR/piece — P.88
(P)A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (P)(Round down to Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

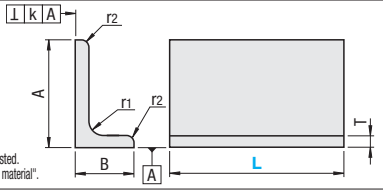
(P)For larger quantity orders "Days to Ship" may differ from published catalog term.

■Cut-off Material with R - Unequal Sides Type

RoHS



Type	Material
LAFS	1.0038/S235JR
LAFA	EN AW-6063/AlMg0,7Si



T Tolerance

Part Number	k	A	L
LAFS9	±2.0	±3.0	+1.0 0
LAFS9A			+2.0 0
LAFS12	±3.0		
LAFS15			+3.0 0
LAFA5	±2.0	±0.7	+1.0 0
LAFA6			
LAFA10			+2.0 0
LAFA12			

(P)1.0038/S235JR products are shot blasted.
EN AW-6063/AlMg0,7Si surfaces are "as material".

Part Number Type	No.	L 1mm Increment	T	T Dim. Tolerance	A	B	r_1	r_2	€ Unit Price L30~49	L50~99	L100~149	L150~199	L200~249	L250~300
LAFS (1.0038/S235JR)	9	30~300	9	±0.6	90	75	8.5	6						
	9A	50~300		±0.7	125	75	10	7						
	12		12	±0.8	125	75	10	7						
	15	100~300	15		150	100	12	8.5						
LAFA (EN AW-6063/AlMg0,7Si)	5	30~300	5	±0.27	75	50	5	2.5						
	6		6		90	60	9	4.5						
	10		10		75	50	-	-						
	12	50~300	12	±0.3	125	75	10	7						

Order Example: Part Number LAFS12 - L 200

Days to Ship
• LAFS: 8 Days
• LAFA: 8 Days — Express A 5,00 EUR/piece — P.88
(P)A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (P)(Round down to Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

(P)For larger quantity orders "Days to Ship" may differ from published catalog term.

L-Shaped Aluminum Angles / L-Shaped Resin Angles

-Cut-off Material without R - Configurable Type-

CAD Data

■-L-Shaped Aluminum Angles without radiuses (R).

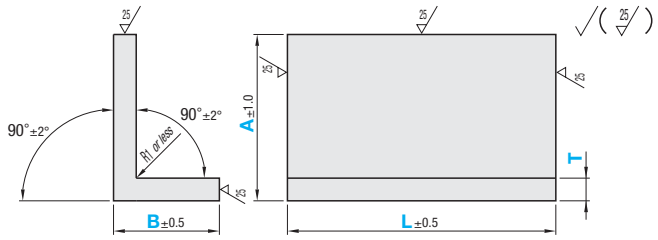
RoHS



Type	Material
LRA	EN AW-6063/AlMg0,7Si

The longest length extrusion has "as cut" ends.

For LRA6 · inside R=6 when either A or B is 61mm or longer. For LRA12 · inside R=12 when either A or B is 101mm or longer.



Part Number Type	T	T Tolerance	1mm Increment A	1mm Increment B	1mm Increment L
LRA	3	±0.3	20~40	20~40	20~300
	5		20~50	20~50	
	6		20~70	20~70	
	8		20~75	20~75	
	10		20~100	20~100	
	12		50~125	50~125	50~300
	14		50~130	50~130	
	18		100~155	100~155	

Order Example: Part Number - A - B - L → LRA10 - A85 - B60 - L130

Days to Ship: 8 Days | ExpressA 5,00 EUR/piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

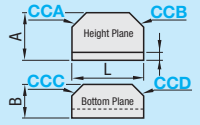
■Volume Discount (Round down to Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For larger quantity orders "Days to Ship" may differ from published catalog term.

Part Number Type	T	A	B	€ Unit Price L20~50	L51~100	L101~150	L151~200	L201~250	L251~300
LRA	3	20~30	20~40						
		31~40							
	5	20~30	20~30						
		31~50							
		20~30	31~50						
		31~50							
	6	20~30	20~30						
		31~50							
		51~70							
		20~30	31~50						
		31~50							
		51~70							
		20~30	51~70						
		31~50							
		51~70							
	8	20~30	20~30						
		31~50							
		51~75							
		20~30	31~50						
		31~50							
		51~75							
		20~30	51~75						
		31~50							
		51~75							
	10	20~30	20~30						
		31~50							
		51~75							
		20~30	31~50						
		31~50							
		51~75							
		76~95							
		20~30	51~75						
		31~50							
		51~75							
		76~95							
		20~30	76~95						
		31~50							
		51~75							
		76~95							
	12	50~75	50~75						
		76~100							
		101~125							
		50~75	76~100						
		76~100							
		101~125							
		50~75	101~125						
		76~100							
		101~125							
	14	50~75	50~75						
		76~100							
		101~130							
		50~75	76~100						
		76~100							
		101~130							
		50~75	101~130						
		76~100							
		101~130							
	18	100~125	101~125						
		126~155							
		100~125	126~155						
		126~155							

Alterations

Alterations	Corner Cut
	
Code	CCA · CCB · CCC · CCD
Spec.	Any corner can be cut. 1≤Corner Cut≤301mm Increment

1mm Increment	Price Adder
1 ~ 3	0,80
4~10	2,40
11~20	4,00
21~30	5,60

Ordering Code

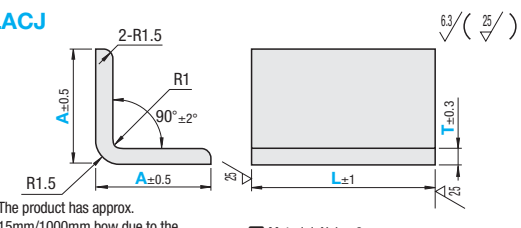
(Ex.) When A and D are to be cut with C5 →CCA5 · CCD5

■L-Shaped Resin Angles

RoHS



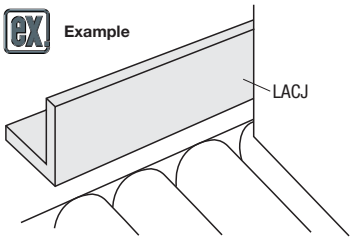
LACJ



The product has approx. 15mm/1000mm bow due to the extruded resin material property.

Material: Nylon 6

Example



As rudimentary work guides.

Part Number Type	T	A	L 1mm Increment	€ Unit Price L50~100	L101~200	L201~300	L301~400	L401~500	L501~600	L601~700	L701~800	L801~900	L901~1000
LACJ	6	30	50~1000										
		50											

Order Example: Part Number - A - L → LACJ6 - A50 - L200

Days to Ship: 8 Days | ExpressA 5,00 EUR/piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to Cent.) P.87

Qty.	1~19	20~34	35~49	50~99
Rate	€ Unit Price	5%	10%	18%

For larger quantity orders "Days to Ship" may differ from published catalog term.

L-Shaped Angles

-Outside Datum - 2 and 3 Equal Sides Type-

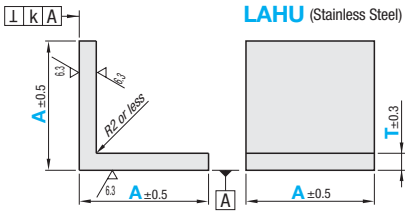
CAD Data



RoHS

3 Equal Sides Type
LAHS (Steel)
LAHA (Aluminum)
LAHU (Stainless Steel)

2 Equal Sides Type
LAKS (Steel)
LAKA (Aluminum)
LAKU (Stainless Steel)



Type		Material
LAHS	LAKS	1.0038/S235JR
LAHA	LAKA	EN AW-6063/AlMg0,7Si
LAHU	LAKU	1.4301/X5CrNi18-10

■3 Equal Sides Type

Part Number Type	A	T Selection	k Perpendicularity	LAHS € Unit Price Qty. 1~14	LAHS Volume Discount 15~	LAHA € Unit Price Qty. 1~14	LAHA Volume Discount 15~	LAHU € Unit Price Qty. 1~14	LAHU Volume Discount 15~
LAHS LAHA LAHU	25	5 6	0.05						
	30	5 6							
	50	5 6 *8 **10							
	75	5 6 *8 **10							
LAHS LAHA	100	10	0.1						
LAHS	125	10							

Those marked with * are applicable to LAHU only. Those marked with ** are applicable to LAHS and LAHA only.

Order Example: Part Number - T → LAHS50 - 10

Days to Ship: 6 Days P.87

■2 Equal Sides Type

Part Number Type	A	L Selection	T Selection	k Perpendicularity
LAKS LAKA LAKU	25	30 40 50 60 70 80 100 150	5 6	0.05
	30	40 50 60 70 80 100 150	5 6	
	40	30 50 60 70 80 100 150	5 6 *8 **10	
	50	30 40 60 70 80 100 150	5 6 *8 **10	
	60	30 40 50 70 80 100 150	5 6 *8 **10	
	75	30 40 50 60 70 80 100 150	5 6 *8 **10	
LAKS LAKA	100	40 50 60 70 80 150	10	0.1
LAKS	125	50 60 70 80 100 150	10	

Those marked with * are applicable to LAKU only. Those marked with ** are applicable to LAKS and LAKA only.

Order Example: Part Number - L - T → LAKS50 - 80 - 5

Days to Ship: 8 Days

Express A: 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Price

■Volume Discount (Round down to Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

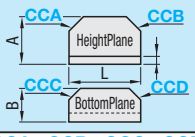
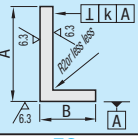
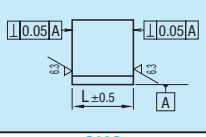
For larger quantity orders "Days to Ship" may differ from published catalog term.

Part Number Type	A	T Selection	€ Unit Price LAKS L30	L40	L50	L60	L70	L80	L100	L150	LAKA L30	L40	L50	L60	L70	L80	L100	L150
LAKS LAKA	25	5 6																
	30	5 6																
	40	5 6 10																
	50	5 6 10																
	60	5 6 10																
	75	5 6 10																
	100	10																
LAKS	125	10																

Part Number Type	A	T Selection	€ Unit Price LAKU L30	L40	L50	L60	L70	L80	L100	L150
LAKU	25	5 6								
	30	5 6								
	40	5 6 8								
	50	5 6 8								
	60	5 6 8								
	75	5 6 8								

Alterations

Part Number - L - T - (CKC)
LAKS50 - 60 - 10 - CKC

	Corner Cut	Inner perpendicularity guaranteed	Side perpendicularity guaranteed
Alterations			
Code	CCA · CCB · CCC · CCD	FC	CKC
Spec.	Any corner can be cut. 1≤Corner Cut≤301mm Increment. Ordering Code (Ex.) When A and D are to be cut with C5 → CCA5 / CCD5. ⊗Not applicable to LAH_.	Guarantees the inner vertical plane perpendicularity to the datum plane A. Ordering Code FC. ⊗Not applicable to LAH_.	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC. ⊗Not applicable to LAH_.
Price Adder	Refer to Spec.	10,00	8,00

1mm Increment	Price Adder
1~ 3	
4~10	
11~20	
21~30	

Dimension A	k
20~ 75	0.05
76~ 100	0.1
101~125	0.15

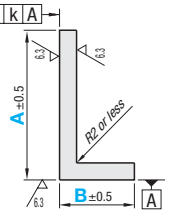
L-Shaped Angles

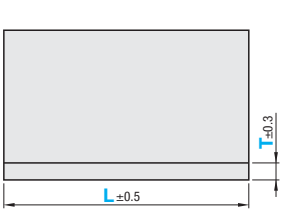
-Mill Finished - Outside Datum Perpendicularity - Unequal Sides Type-

CAD Data



Type	Material
LASS	1.0038/S235JR
LASA	EN AW-6063/AlMg0,7Si
LASU	1.4301/X5CrNi18-10





Part Number Type	A	B	L Selection	T Selection	k Perpendicularity
LASS LASA LASU	30	25	25 30 40 50 60 70 80 90 100 150	5 6	0.05
	40	25	25 30 40 50 60 70 80 90 100 150	5 6 *8 **10	
		30	25 30 40 50 60 70 80 90 100 150	5 6 *8 **10	
	50	25	25 30 40 50 60 70 80 90 100 150	5 6 *8 **10	
		30	25 30 40 50 60 70 80 90 100 150	5 6 *8 **10	
		40	25 30 40 50 60 70 80 90 100 150	5 6 *8 **10	
	60	30	25 30 40 50 60 70 80 90 100 150	5 6 *8 **10	
		40	30 40 50 60 70 80 90 100 150	5 6 *8 **10	
		50	30 40 50 60 70 80 90 100 150	5 6 *8 **10	
	75	50	30 40 50 60 70 80 90 100 150	5 6 *8 **10	
LASS LASA	80	40	30 40 50 60 70 80 90 100 150	5 6 10	
	100	50	30 40 50 60 70 80 90 100 150	6 10	
		60	30 40 50 60 70 80 90 100 150	6 10	
LASS	125	60	30 40 50 60 70 80 90 100 150	10	0.1
	150	70	30 40 50 60 70 80 90 100 150	10	

Order Example: Part Number - L - T → LASS8040 - 70 - 6

Days to Ship: 8 Days

Express A: 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

Those marked with * are applicable to LASU only. Those marked with ** are applicable to LASS and LASA only.

Price

Volume Discount (Round down to Cent.) P.87

Qty.	1~14	15~19	20~49	50~99
Rate	€ Unit Price	5%	10%	15%

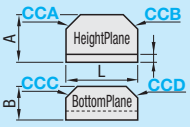
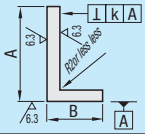
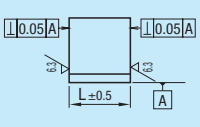
For larger quantity orders "Days to Ship" may differ from published catalog term.

Part Number Type	A	B	T Selection	€ Unit Price LASS L25	L30	L40	L50	L60	L70	L80	L90	L100	L150	LASA L25	L30	L40	L50	L60	L70	L80	L90	L100	L150
LASS LASA	30	25	5 6																				
	40	25	5 6 10																				
		30	5 6 10																				
	50	25	5 6 10																				
		30	5 6 10																				
		40	5 6 10																				
	60	30	5 6 10																				
		40	5 6 10																				
		50	5 6 10																				
	75	50	5 6 10																				
LASS LASA	80	40	5 6 10																				
	100	50	6 10																				
		60	6 10																				
LASS	125	60	10																				
	150	70	10																				

Part Number Type	A	B	T Selection	€ Unit Price LASU L25	L30	L40	L50	L60	L70	L80	L90	L100	L150
LASU	30	25	5 6										
	40	25	5 6 8										
		30	5 6 8										
	50	25	5 6 8										
		30	5 6 8										
		40	5 6 8										
	60	30	5 6 8										
		40	5 6 8										
		50	5 6 8										
	75	50	5 6 8										

Alterations

Part Number - L - T - (CKC) → LASS8040 - 70 - 6 - CKC

	Corner Cut	Inner perpendicularity guaranteed	Side perpendicularity guaranteed
Alterations			
Code	CCA · CCB · CCC · CCD	FC	CKC
Spec.	Any corner can be cut. 1≤Corner Cut≤301mm Increment. Ordering Code (Ex.) When A and D are to be cut with C5→ CCA5 / CCD5	Guarantees the inner vertical plane perpendicularity to the datum plane A. Ordering Code FC	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC
Price Adder	Refer to Spec.	10,00	8,00

1mm Increment	Price Adder
1 ~ 3	
4~10	
11~20	
21~30	

Dimension A	k
20~ 75	0.05
76~ 100	0.1
101~125	0.15
126~150	0.2

NEW

L-Shaped Angles

-Milled Square Stock - Perpendicularity Datum Outside - Dimension Selectable Type-

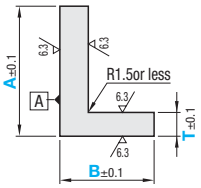
CAD Data

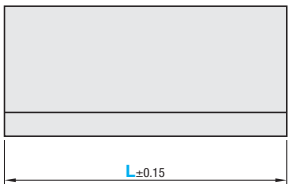


RoHS

Type	Material
LAJS	1.0038/ S235JR
LAJC	1.1206/C50E

Longitudinal Dimension A and B	k
50~70	0.05 or less
71~125	0.10 or less





Part Number Type	T	A	B	L	€ Unit Price L20~50	L51~75	L76~100	L101~200	L201~400	L401~600	L601~800	L801~1000	L1001~1200
LAJS (1.0038/ S235JR)	5	50	50	20~1200									
		75	50										
			70										
	6	50	50										
		75	50										
			70										
	10	50	50										
		75	70										
		100											
		125											
	12	50	50										
		75	70										
		100											
		125											
	15	50	50										
		75	70										
		100											
		125											

Part Number Type	T	A	B	L	€ Unit Price L20~50	L51~75	L76~100	L101~200	L201~400	L401~600	L601~800	L801~1000	L1001~1200
LAJC (1.1206/ C50E)	5	50	50	20~1200									
		75	50										
			70										
	6	50	50										
		75	50										
			70										
	10	50	50										
		75	70										
		100											
		125											
	12	50	50										
		75	70										
		100											
		125											
	15	50	50										
		75	70										
		100											
		125											

Order Example

Part Number	-	A	-	B	-	L
LAJS10	-	A50	-	B50	-	L1000

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For larger quantity orders "Days to Ship" may differ from published catalog term.

Days to Ship: 8 Days

Express A: 5,00 EUR / piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces .

L-Shaped Angles

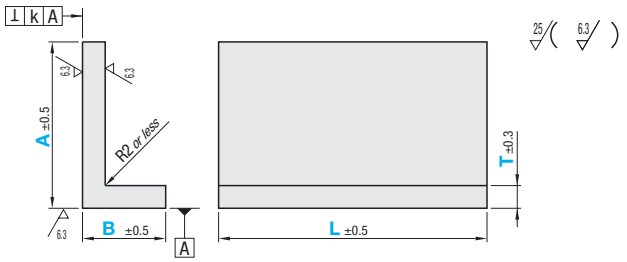
-Mill Finished - Perpendicularity Datum Outside Rough - Configurable Type-

CAD Data



RoHS

Type	Material
LASR	1.0038/ S235JR
LAAR	EN AW-6063/ AlMg0,7Si
LAUR	1.4301/ X5CrNi18-10



T Dimension	Longitudinal Dimension A and B	k
5 / 6	25~75	0.2
8	25~75	0.35
10	25~75	0.2
	76~100	0.3
	101~125	0.35

Part Number	T	A	B	L	€ Unit Price					
					Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
LASR (1.0038/ S235JR)	5 6	25~50	25~50	25~300						
		51~75								
	10	25~50	30~50							
		51~75								
		76~100								
		51~75	51~75							
		76~100								
		101~125								
		76~100	76~100							
		101~125								
		101~125	101~125							

Part Number	T	A	B	L	€ Unit Price					
					Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
LAAR (EN AW-6063/ AlMg0,7Si)	5	20~50	20~50	25~300						
		51~75								
		51~75	51~75							
	6	30~50	30~50							
		51~75								
	10	50	30~50							
		51~75								
		76~100								
		51~75	51~75							
		76~100								
		76~100	76~100							

Part Number	T	A	B	L	€ Unit Price					
					Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
LAUR (1.4301/ X5CrNi18-10)	5	20~60	25~50	25~300						
	6	60~75	25~50							
			51~75							
	8	50	50							
		51~75	51~75							

Order Example

Part Number	-	A	-	B	-	L
LASR10	-	A100	-	B100	-	L300

Days to Ship: 8 Days

Express A: 5,00 EUR/ piece

P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

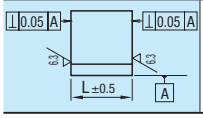
Price

Volume Discount (Round down to one Cent.) P.87

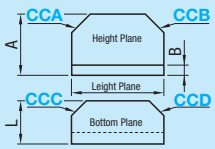
Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For larger quantity orders "Days to Ship" may differ from published catalog term.

Alterations

Alteration	Code	Spec.	Price Adder
	CKC	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC	8,00

Alterations

Alterations	Corner Cut
	
Code	CCA / CCB / CCC / CCD
Spec.	Any corner can be cut. 1≤Corner Cut≤30 1mm Increment

1mm Increment	Price Adder
1~3	0,80
4~10	2,40
11~20	4,00
21~30	5,60

Ordering Code

(Ex.) When A and D are cut with C5 CCA5 / CCD5

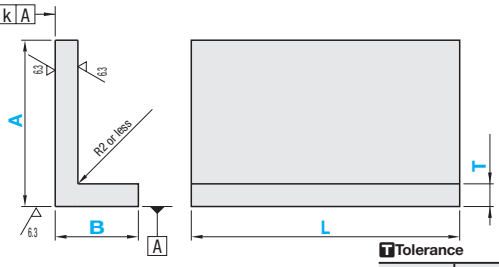
L-Shaped Angles

-Mill Finished - Outside Datum Configurable Type-



RoHS

Type	Material
LAS	1.0038/S235JR
LASC	1.1206/C50E
LAA	EN AW-6063/AlMg0,7Si
LAU	1.4301/X5CrNi18-10



TTolerance

	T	A	B	L
L~300	±0.3	±0.5	±0.5	±0.5
L301~	±0.5	±0.7	±0.7	±0.5

Part Number		1mm Increment		
Type	T	A	B	L
LAS	5	20~75	20~75	25~300
	6			
	10	25~125	25~125	25~500
	12	50~125	50~125	50~500
	15	50~150	50~150	
LASC	5	20~75	20~70	25~300
	6			
	10	25~125	25~70	25~500
	12	50~125	50~70	
	15			
LAA	5	20~75	20~75	25~300
	6			
	10	25~100	25~100	25~500
	12	50~125	50~125	
	15	100~150	100~150	
LAU	5	25~75	25~75	25~300
	6			
	8			
	10	50~100	50~100	25~200

T Dimension	Longitudinal Dimension A · B	k			
		LAS · LASC · LAA			LAU
		L~300	L301~400	L401~500	L~300
5 · 6	Min. ~75	0.05	-		0.05
8	76~90	-			0.1
10	50 mm/min	0.05	0.2	0.25	-
	51~80		0.25	0.35	0.15
	81~125	0.1	0.3	0.4	0.2
12 · 15	Min. ~80	0.05	0.3	0.35	-
	81~125	0.1	0.35	0.4	
15	126~150	0.35	0.4	0.5	

Order Example

Part Number	-	A	-	B	-	L
LAS5	-	A25	-	B25	-	L100

Days to Ship

•L~300mm: 8 Days

Express A 5,00 EUR/ piece P.88

A Express Charge of 13,50 EUR for 3 or more identical pieces.

•301mm~: 8 Days

Price

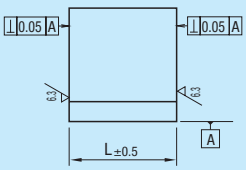
Volume Discount (Round down to one Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

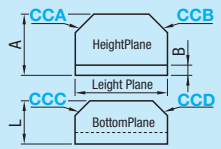
For larger quantity orders "Days to Ship" may differ from published catalog term.

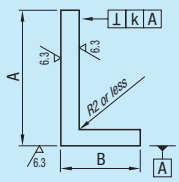
Alterations

Part Number	-	A	-	B	-	L	-	(CKC)
LAS10	-	A100	-	B50	-	L200	-	CKC

Alterations	Code	Spec.	Price Adder
	CKC	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC	8,00

Alterations

Alterations	Corner Cut
	
Code	CCA · CCB · CCC · CCD
Spec.	Any corner can be cut. 1≤Corner Cut≤30 1mm Increment 1mm Increment / Price Adder: 1~3: 0,80; 4~10: 2,40; 11~20: 4,00; 21~30: 5,60 Ordering Code (Ex.) When A and D are cut with C5→ CCA5 / CCD5

Alterations	- Inner perpendicularity guaranteed
	
Code	FC
Spec.	Guarantees the inner vertical plane perpendicularity to the datum plane A. Dimension A / Perpendicularity k: 20~75: 0.05; 76~100: 0.1; 101~125: 0.15; 126~150: 0.2 Ordering Code FC
Price Adder	10,00

Price Reduction
Average 8%

CAD Data

Part Number	T	A	B	€ Unit Price													
				Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300	L301~325	L326~350	L351~375	L376~400	L401~425	L426~450	L451~475	L476~500
LAS (1.0038/ S235JR)	5	20~50	20~50														
		51~75															
	6	20~50	51~75														
		51~75															
	10	25~50	25~50														
		51~75															
		76~100															
		101~125															
		25~50	51~75														
		51~75															
		76~100															
		101~125															
		25~50	76~100														
		51~75															
		76~100															
		101~125															
		25~50	101~125														
		51~75															
		76~100															
		101~125															
	12	50	50														
		51~75															
		76~100															
		101~125															
		50	51~75														
		51~75															
		76~100															
		101~125															
		50	76~100														
		51~75															
		76~100															
		101~125															
		50	101~125														
		51~75															
		76~100															
		101~125															
	15	50	50														
		51~75															
		76~100															
		101~125															
		50	51~75														
		51~75															
		76~100															
		101~125															
		50	76~100														
		51~75															
		76~100															
		101~125															
		126~150															
		50	101~125														
		51~75															
		76~100															
		101~125															
		126~150															
		51~75	126~150														
		76~100															
		101~125															
		126~150															

Part Number		A	B	€ Unit Price													
Type	T			Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300	L301~325	L326~350	L351~375	L376~400	L401~425	L426~450	L451~475	L476~500
LASC (1.1206/ C50E)	5	20~50	20~50														
			51~70														
		51~75	20~50														
			51~70														
	6	20~50	20~50														
			51~70														
		51~75	20~50														
			51~70														
	10	25~50	25~50														
			51~70														
		51~75	25~70														
		76~100															
		101~125	25~70														
	12	50	50														
			51~70														
		51~75	50														
		76~100	50														
		101~125	50														
	15	50	50														
			51~70														
		51~75	50														
		76~100	50														
		101~125	50														

Part Number	T	A	B	€ Unit Price													
				Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300	L301~325	L326~350	L351~375	L376~400	L401~425	L426~450	L451~475	L476~500
LAA (EN AW-6063/ AlMg0,7Si)	5	20~50	20~50														
		51~75															
	6	20~50	51~75														
		51~75															
	10	25~50	25~50														
		51~75															
		76~100															
		25~50	51~75														
		51~75															
		76~100															
		25~50	76~100														
		51~75															
		76~100															
	12	50~75	50~75														
		76~100															
		101~125															
		50~75	76~100														
		76~100															
		101~125															
		50~75	101~125														
		76~100															
		101~125															
	15	100~125	100~125														
		126~150															
		126~150	126~150														

Part Number	T	A	B	€ Unit Price					
				Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
LAU (1.4301/ X5CrNi18-10)	5-6	25~50	25~50						
		51~75							
		76~90							
		25~50	51~75						
		51~75							
		76~90							
		25~50	76~90						
		51~75							
		76~90							
	8	25~50	25~50						
		51~75							
		76~90							
		25~50	51~75						
		51~75							
		76~90							
		25~50	76~90						
		51~75							
		76~90							
	10	50~75	50~75						
		76~100							
		50~75	76~100						
		76~100							

NEW

L-Shaped Angles

-Mill Finished - Perpendicularity Datum Outside - Plate Thickness Configurable Type-

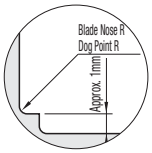
Price Reduction
Average 8%

CAD Data

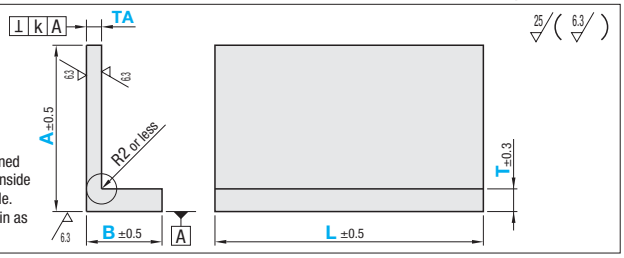


RoHS

Type	Material
LAST	1.0038/S235JR
LACT	1.1206/C50E
LAAT	EN AW-6063/AlMg0,7Si



TA dimension is obtained by machining on the inside surfaces of the L-angle. Tool radius may remain as shown.



Part Number Type	Specified in 0.5mm increments. T · TA	1mm Increment A	B	L
LAST	4.0~10.0	20~75	20~75	25~200
	10.5~15.0	20~150	20~150	25~300
LACT	4.0~10.0	20~100	20~70	25~200
	10.5~15.0	20~125	20~70	25~300
LAAT	4.0~10.0	20~75	20~75	25~200
	10.5~12.0	20~125	20~125	25~300
	12.5~15.0	76~150	76~150	50~300

Longitudinal Dimension A and B	Perpendicularity k
20~75	0.05 or less
76~125	0.1 or less
126~150	0.2 or less

Order Example

Part Number	-	TA	-	A	-	B	-	L
LAST10	-	8	-	A50	-	B55	-	L100

Days to Ship: 8 Days

Price

■Volume Discount (Round down to one Cent.) P87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For larger quantity orders "Days to Ship" may differ from published catalog term.

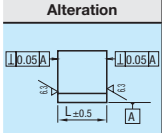
Part Number	A	B	€ Unit Price T · TA4 ~6 Min. L~50	L51~100	L101~150	L151~200	T · TA6.5~10 Min. L~50	L51~100	L101~150	L151~200	T · TA10.5 ~12.0 Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300	T · TA12.5 ~15 Min. L ~100	L101~150	L151~200	L201~250	L251~300
LAST (1.0038/S235JR)	20~50	20~50																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				
	20~50	51~75																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				
	20~50	76~100																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				
	20~50	101~125																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				
	20~50	126~150																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				

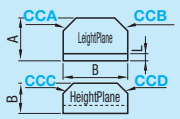
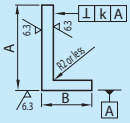
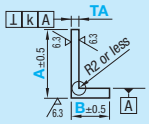
Part Number	A	B	€ Unit Price T · TA4 ~6 Min. L~50	L51~100	L101~150	L151~200	T · TA6.5~10 Min. L~50	L51~100	L101~150	L151~200	T · TA10.5 ~12.0 Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300	T · TA12.5 ~15 Min. L ~100	L101~150	L151~200	L201~250	L251~300
LACT (1.1206/C50E)	20~50	20~50																			
	51~75																				
	76~100																				
	101~125																				
	20~50	51~70																			
	51~75																				
	76~100																				
	101~125																				

Part Number	A	B	€ Unit Price T · TA4 ~6 Min. L~50	L51~100	L101~150	L151~200	T · TA6.5~10 Min. L~50	L51~100	L101~150	L151~200	T · TA10.5 ~12.0 Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300	T · TA12.5 ~15 L50 ~100	L101~150	L151~200	L201~250	L251~300
LAAT (EN AW-6063/ AlMg0,7Si)	20~50	20~50																			
	51~75																				
	76~100																				
	101~125																				
	20~50	51~75																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				
	20~50	76~100																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				
	20~50	101~125																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				
	20~50	126~150																			
	51~75																				
	76~100																				
	101~125																				
	126~150																				

Alterations

Part Number - TA - A - B - L - (CKC)
LAST10 - 8 - A50 - B55 - L100 - CKC

Alteration	Code	Spec.	Price Adder
	CKC	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC	8,00

Alterations	Corner Cut	- Inner perpendicularity guaranteed	TA Dimension Change
			
Code	CCA · CCB · CCC · CCD	FC	TAC
Spec.	Any corner can be cut. 1≤Corner Cut≤20 1mm Increment 1mm Increment / Price Adder: 1~3 / 0,80; 4~10 / 2,40; 11~20 / 4,00; 21~30 / 5,60 Ordering Code (Ex.) When A and D are to be cut with C5 →CCA5-CCD5	Guarantees the inner vertical plane perpendicularity to the datum plane A. Dimension A / Perpendicularity k: 20~75 / 0.05; 76~100 / 0.1; 101~125 / 0.15; 126~150 / 0.2 Ordering Code FC	Plate thickness TA can be changed within the following range. Type / Specified in 0.5mm increments. / Price Adder: LAST · LACT / 6.5~15 / 30,00; LAAT / 6.5~15 / 22,00 Machining Limits: T=10.5~12 TA≥9; T=12.5~15 TA≥11 Ordering Code LAST11-TAC8-A120-B100-L150
Price Adder	Refer to Spec.	10,00	Refer to Spec.

L-Shaped Angles

-Mill Finished-Unfinished Inside-Outside Datum Perpendicularity-Configurable-

CAD Data



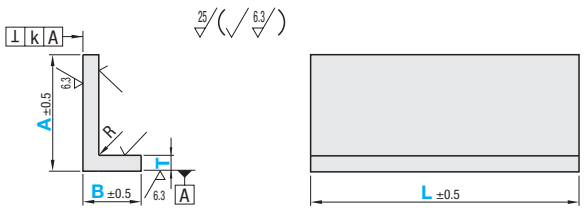
RoHS

Type	Material
LSS	1.0038/ S235JR
LSA	EN AW-6063/ AlMg0,7Si

▼√ area of 1.0038/S235JR has shot blast finishing

▼EN AW-6063/AlMg0,7Si surfaces are "as extruded".

LSS
LSA



Part Number Type	T	T Tolerance	1mm Increment A	B	L
LSS	5	±0.5	25~75	25~75	25~300
	6				
	10	±1.0	25~125	25~125	
	12	±1.5	101~150	101~150	
	15		151~175	151~175	50~300
LSA	5	±0.5	25~75	25~75	25~300
	6				
	10	±1.0	25~125	25~125	
	12		100~125	100~125	

Longitudinal Dimension A and B	k LSS	k LSA
25~80	0.05 or less	
81~125	0.10 or less	
126~150		
151~200	0.15 or less	

Longitudinal Dimension A and B	T	R LSS	R LSA
25~60	5	8.5~10	1 or Less
61~75			6~8
25~50	6		
51~75			8~9
25~60	10~12	10~14	12
61~150			

Part Number	A	B	€ Unit Price LSS5 · LSS6 L25~50	L51~100	L101~150	L151~200	L201~250	L251~300	LSS10 L25~50	L51~100	L101~150	L151~200	L201~250	L251~300	LSS12 L25~50	L51~100	L101~150	L151~200	L201~250	L251~300	LSS15 L50~100	L101~150	L151~200	L201~250	L251~300
LSS5 LSS6 LSS10 LSS12 LSS15	25~50	25~50																							
	51~75																								
	76~100																								
	101~125																								
	25~50	51~75																							
	51~75																								
	76~100																								
	101~125																								
	25~50	76~100																							
	51~75																								
	76~100																								
	101~125																								
	25~50	101~125																							
	51~75																								
	76~100																								
	101~125																								
	126~150																								
	101~125	126~150																							
	126~150																								
	151~175	151~175																							

Part Number	A	B	€ Unit Price LSA5 · LSA6 L25~50	L51~100	L101~150	L151~200	L201~250	L251~300	LSA10 L25~50	L51~100	L101~150	L151~200	L201~250	L251~300	LSA12 L51~100	L101~150	L151~200	L201~250	L251~300
LSA5 LSA6 LSA10 LSA12	25~50	25~50																	
	51~75																		
	76~100																		
	25~50	51~75																	
	51~75																		
	76~100																		
	25~50	76~100																	
	51~75																		
	76~100																		
	101~125	101~125																	

Order Example: Part Number - A - B - L
LSS5 - A25 - B25 - L100

Days to Ship: ·LSS · LSA 8 Days

Express A 5,00 EUR/ piece P.88

▼A Express Charge of 13,50 EUR for 3 or more identical pieces.

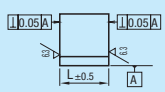
Price

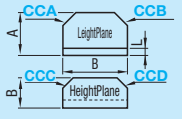
■Volume Discount (▼(Round down to one Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

▼For larger quantity orders "Days to Ship" may differ from published catalog term.

Alterations: Part Number - A - B - L - (CKC · SR · WR)
LSS10 - A100 - B50 - L200 - CKC

Alterations	Code	Spec.	Price Adder	
	CKC	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC	LSS LSA	8,00

Alterations	Corner Cut
	
Code	CCA · CCB · CCC · CCD
Spec.	Any corner can be cut. 1≤Corner Cut≤201mm Increment

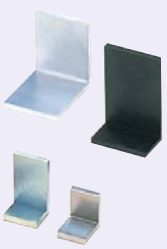
1mm Increment	Price Adder
1~ 3	0,80
4~10	2,40
11~20	4,00
21~30	5,60

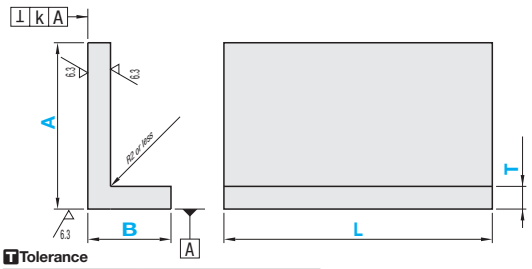
Ordering Code
(Ex.) When A and D are to be cut with C5
→CCA5-CCD5

L-shaped Surface Treated Angles

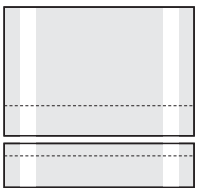
-Mill Finished - Outside Datum Perpendicularity Configurable Type-

RoHS





SS material and aluminum are tied by steel wire and aluminum wire respectively, hung and plated since angles don't have holes.
Areas tied by wire may be discolored as below after treatment.



TTolerance

	T	A	B	L
L~300	±0.3	±0.5	±0.5	±0.5
L301~	±0.5	±0.7	±0.7	±0.5

MMaterial	**S**Surface Treatment	Code
1.0038/S235JR	Black Oxide	BLAS
	Electroless Nickel Plating	MLAS
	JIS STKM Bright Chromate Plating	YLAS
	Trivalent Chromate	SLAS
EN AW-6063/ AlMg0,7Si	White Alumite	WLAA
	Black Alumite	ELAA

T Dimension	Longitudinal Dimension A and B	Perpendicularity k		
		L~300	L301~400	L401~500
5 / 6	Min. ~ 75	0.05	-	-
10	Min. ~ 50	0.05	0.2	0.25
	51~ 80		0.25	0.35
	81~125	0.1	0.3	0.4
12 / 15	Min. ~ 80	0.05	0.3	0.35
	81~125	0.1	0.35	0.4
15	126~150	0.35	0.4	0.5

Part Number		1mm Increment		
Type	T	A	B	L
BLAS MLAS YLAS SLAS	5	20~75	20~75	25~300
	6			
	10	25~125	25~125	
	12	50 / 125	50~125	50~300
	15	50~150	50~150	
WLAA ELAA	5	20~75	20~75	25~300
	6			
	10	25 / 100	25~100	
	12	50~125	50~125	50~300

Order Example

Part Number	-	A	-	B	-	L
BLAS10	-	A75	-	B50	-	L100

Price

Volume Discount (Round down to one Cent.) P.87

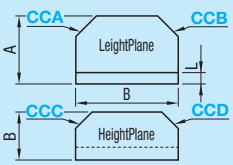
Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

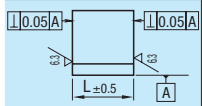
For larger quantity orders "Days to Ship" may differ from published catalog term.

Days to Ship

- BLAS · MLAS: 8 Days
- YLAS · SLAS · WLAA · ELAA: 10 Days

Alterations

Alteration	Code	Spec.
	CCA CCB CCC CCD	Any corner can be cut. 1≤Corner Cut≤30 1mm Increment 1mm Increment / Price Adder: 1~ 3: 0,80; 4~10: 2,40; 11~20: 4,00; 21~30: 5,60 Ordering Code (Ex.) When A and D are cut with C5→ CCA5 / CCD5

Alteration	Code	Spec.	Price Adder
	CKC	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC	8,00

Part Number	T	A	B	€ Unit Price: Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
WLAA (EN AW-6063/ AlMg0,7Si White Anodize)	5	20~50	20~50						
		51~75							
	6	20~50	51~75						
		51~75							
	10	25~50	25~50						
		51~75							
		76~100							
		25~50	51~75						
		51~75							
		76~100							
		25~50	76~100						
		51~75							
		76~100							
	12	50~75	50~75						
		76~100							
		101~125							
		50~75	76~100						
		76~100							
		101~125							
		50~75	101~125						
		76~100							
		101~125							

Part Number	T	A	B	€ Unit Price: Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
ELAA (EN AW-6063/ AlMg0,7Si Black Alumite)	5	20~50	20~50						
		51~75							
	6	20~50	51~75						
		51~75							
	10	25~50	25~50						
		51~75							
		76~100							
		25~50	51~75						
		51~75							
		76~100							
		25~50	76~100						
		51~75							
		76~100							
	12	50~75	50~75						
		76~100							
		101~125							
		50~75	76~100						
		76~100							
		101~125							
		50~75	101~125						
		76~100							
		101~125							

Part Number	T	A	B	€ Unit Price					
				Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
BLAS (1.0038/S235JR Black Oxide)	5	20~50	20~50						
		51~75							
	6	20~50	51~75						
		51~75							
	10	25~50	25~50						
		51~75							
		76~100							
		101~125							
		25~50	51~75						
		51~75							
		76~100							
		101~125							
		25~50	76~100						
		51~75							
		76~100							
		101~125							
		25~50	101~125						
		51~75							
		76~100							
		101~125							
	12	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		50	76~100						
		51~75							
		76~100							
		101~125							
		50	101~125						
		51~75							
		76~100							
		101~125							
	15	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		50	76~100						
		51~75							
		76~100							
		101~125							
		126~150							
		50	101~125						
		51~75							
		76~100							
		101~125							
		126~150							
		51~75	126~150						
		76~100							
		101~125							
		126~150							

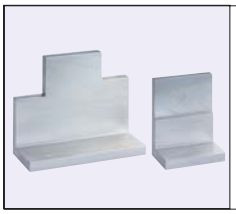
Part Number	T	A	B	€ Unit Price					
				Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
MLAS (1.0038/S235JR Electroless Nickel Plating)	5	20~50	20~50						
		51~75							
	6	20~50	51~75						
		51~75							
	10	25~50	25~50						
		51~75							
		76~100							
		101~125							
		25~50	51~75						
		51~75							
		76~100							
		101~125							
		25~50	76~100						
		51~75							
		76~100							
		101~125							
		25~50	101~125						
		51~75							
		76~100							
		101~125							
	12	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		50	76~100						
		51~75							
		76~100							
		101~125							
		50	101~125						
		51~75							
		76~100							
		101~125							
	15	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		126~150							
		50	76~100						
		51~75							
		76~100							
		101~125							
		126~150							
		51~75	101~125						
		76~100							
		101~125							
		126~150							
		51~75	126~150						
		76~100							
		101~125							
		126~150							

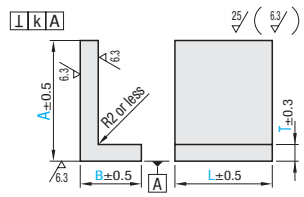
Part Number	T	A	B	€ Unit Price					
				Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
SLAS (1.0038/S235JR Trivalent Chromate)	5	20~50	20~50						
		51~75							
	6	20~50	51~75						
		51~75							
	10	25~50	25~50						
		51~75							
		76~100							
		101~125							
		25~50	51~75						
		51~75							
		76~100							
		101~125							
		25~50	76~100						
		51~75							
		76~100							
		101~125							
		25~50	101~125						
		51~75							
		76~100							
		101~125							
	12	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		50	76~100						
		51~75							
		76~100							
		101~125							
		50	101~125						
		51~75							
		76~100							
		101~125							
	15	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		50	76~100						
		51~75							
		76~100							
		101~125							
		126~150							
		50	101~125						
		51~75							
		76~100							
		101~125							
		126~150							
		51~75	126~150						
		76~100							
		101~125							
		126~150							

Part Number	T	A	B	€ Unit Price					
				Min. L~50	L51~100	L101~150	L151~200	L201~250	L251~300
YLAS (1.0038/S235JR JIS STKM Bright Chromate Plating)	5	20~50	20~50						
		51~75							
	6	20~50	51~75						
		51~75							
	10	25~50	25~50						
		51~75							
		76~100							
		101~125							
		25~50	51~75						
		51~75							
		76~100							
		101~125							
		25~50	76~100						
		51~75							
		76~100							
		101~125							
		25~50	101~125						
		51~75							
		76~100							
		101~125							
	12	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		50	76~100						
		51~75							
		76~100							
		101~125							
		50	101~125						
		51~75							
		76~100							
		101~125							
	15	50	50						
		51~75							
		76~100							
		101~125							
		50	51~75						
		51~75							
		76~100							
		101~125							
		126~150							
		50	76~100						
		51~75							
		76~100							
		101~125							
		126~150							
		51~75	101~125						
		76~100							
		101~125							
		126~150							
		51~75	126~150						
		76~100							
		101~125							
		126~150							

L-Shaped Machined Angles

-Mill Finished - Outside Datum Perpendicularity Configurable Type-



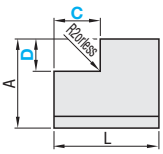


Type	Material
LAS__	1.0038/S235JR
LAA__	EN AW-6063/AlMg0,7Si

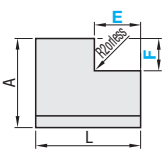
T Dimension	Longitudinal Dimension A and B	k
5 · 6	Min. ~75	0.05
10	50 mm/min	0.05
	51~80	
	81~125	0.1
12 · 15	Min. ~80	0.05
	81~125	0.1

Shape Selection

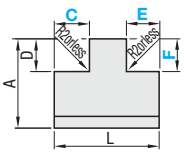
Shape HL



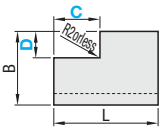
Shape HR



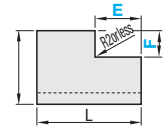
Shape HT



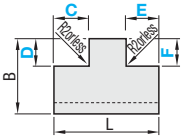
Shape TL



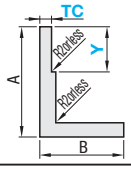
Shape TR



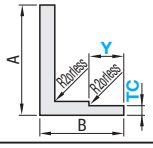
Shape TT



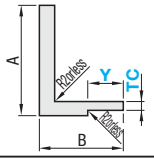
Shape DH



Shape DT



Shape DU



Part Number			1mm Increment			C	D	E	F	Y	TC
Type	Shape Selection	T	A	B	L						
LAS	HL HR HT TL TR TT	5 · 6	20~ 75	20~ 75	20~150	1mm Increment					
LAA	DH DT DU	10 · 12 · 15	50~125	50~125	50~125						

*For 15 in T selection, only LAS is available.

Shape	Selection						Machining Limits Formula
HL · TL	C	D	-	-	-	-	C≤L/3, D≤(A or B)-T, L≤150
HT · TT	C	D	E	F	-	-	C≤L-30+E, E≤L-30+C D≤(A or B)-T, E≤(A or B)-T, L≤150
HR · TR	-	-	E	F	-	-	E≤L/3, F≤(A or B)-T, L≤150
DH · DT · DU	-	-	-	-	Y	TC	Y≤(A or B)/2, TC≥T/2, L≤150

Order Example

Part Number													
Type	Shape	T	A	B	L	C	D	E	F	Y	TC		
LAS	HL	15	A100	B100	L150	C50	D50			Y30	TC8		
LAA	DH	10	A80	B60	L100								

Price

Volume Discount (Round down to one Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For larger quantity orders "Days to Ship" may differ from published catalog term.

Days to Ship 10 Days

Shape HL · HR

Part Number	A	B	€ Unit Price									
			LASHL5 · LASHR5 · LASHL6 · LASHR6			LASHL10 · LASHR10			LASHL12 · LASHR12		LASHL15 · LASHR15	
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150	Min. L~100	L101~150
Steel LASHL5 · LASHR5 LASHL6 · LASHR6 LASHL10 · LASHR10 LASHL12 · LASHR12 LASHL15 · LASHR15	20~50	20~50										
		51~75										
		76~100										
		101~125										
	51~75	20~50										
		51~75										
		76~100										
		101~125										
	76~100	20~50										
		51~75										
		76~100										
		101~125										
	101~125	20~50										
		51~75										
		76~100										
		101~125										

Part Number	A	B	€ Unit Price									
			LAAHL5 · LAAHR5 · LAAHL6 · LAAHR6			LAAHL10 · LAAHR10			LAAHL12 · LAAHR12			
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150		
Aluminum LAAHL5 · LAAHR5 LAAHL6 · LAAHR6 LAAHL10 · LAAHR10 LAAHL12 · LAAHR12	20~50	20~50										
		51~75										
		76~100										
		101~125										
	51~75	20~50										
		51~75										
		76~100										
		101~125										
	76~100	20~50										
		51~75										
		76~100										
		101~125										
	101~125	20~50										
		51~75										
		76~100										
		101~125										

Shape HT

Part Number	A	B	€ Unit Price									
			LASHT5 · LASHT6			LASHT10			LASHT12		LASHT15	
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150	Min. L~100	L101~150
LASHT5 LASHT6 LASHT10 LASHT12 LASHT15	20~50	20~50										
		51~75										
		76~100										
		101~125										
	51~75	20~50										
		51~75										
		76~100										
		101~125										
	76~100	20~50										
		51~75										
		76~100										
		101~125										
	101~125	20~50										
		51~75										
		76~100										
		101~125										

Part Number	A	B	€ Unit Price									
			LAAHT5 · LAAHT6			LAAHT10			LAAHT12			
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150		
Aluminum LAAHT5 LAAHT6 LAAHT10 LAAHT12	20~50	20~50										
		51~75										
		76~100										
		101~125										
	51~75	20~50										
		51~75										
		76~100										
		101~125										
	76~100	20~50										
		51~75										
		76~100										
		101~125										
	101~125	20~50										
		51~75										
		76~100										
		101~125										

■Shape TL · TR

Part Number	A	B	€ Unit Price									
			LASTL5 · LASTR5 · LASTL6 · LASTR6			LASTL10 · LASTR10			LASTL12 · LASTR12		LASTL15 · LASTR15	
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150	Min. L~100	L101~150
Steel LASTL5 · LASTR5 LASTL6 · LASTR6 LASTL10 · LASTR10 LASTL12 · LASTR12 LASTL15 · LASTR15	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

Part Number	A	B	€ Unit Price									
			LAATL5 · LAATR5 · LAATL6 · LAATR6			LAATL10 · LAATR10			LAATL12 · LAATR12			
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150		
Aluminum LAATL5 · LAATR5 LAATL6 · LAATR6 LAATL10 · LAATR10 LAATL12 · LAATR12	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

■Shape TT

Part Number	A	B	€ Unit Price									
			LASTT5 · LASTT6			LASTT10			LASTT12		LASTT15	
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150	Min. L~100	L101~150
Steel LASTT5 LASTT6 LASTT10 LASTT12 LASTT15	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

Part Number	A	B	€ Unit Price									
			LAATT5 · LAATT6			LAATT10			LAATT12			
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150		
Aluminum LAATT5 LAATT6 LAATT10 LAATT12	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

■Shape DH

Part Number	A	B	€ Unit Price									
			LASDH5 · LASDH6			LASDH10			LASDH12		LASDH15	
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150	Min. L~100	L101~150
Steel LASDH5 LASDH6 LASDH10 LASDH12 LASDH15	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

Part Number	A	B	€ Unit Price									
			LAADH5 · LAADH6			LAADH10			LAADH12			
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150		
Aluminum LAADH5 LAADH6 LAADH10 LAADH12	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

■Shape DT

Part Number	A	B	€ Unit Price									
			LASDT5 · LASDT6			LASDT10			LASDT12		LASDT15	
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150	Min. L~100	L101~150
Steel LASDT5 LASDT6 LASDT10 LASDT12 LASDT15	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

Part Number	A	B	€ Unit Price									
			LAADT5 · LAADT6			LAADT10			LAADT12			
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150		
Aluminum LAADT5 LAADT6 LAADT10 LAADT12	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

■Shape DU

Part Number	A	B	€ Unit Price									
			LASDU5 · LASDU6			LASDU10			LASDU12		LASDU15	
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150	Min. L~100	L101~150
Steel LASDU5 LASDU6 LASDU10 LASDU12 LASDU15	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

Part Number	A	B	€ Unit Price									
			LAADU5 · LAADU6			LAADU10			LAADU12			
			Min. L~50	L51~100	L101~150	Min. L~50	L51~100	L101~150	Min. L~100	L101~150		
Aluminum LAADU5 LAADU6 LAADU10 LAADU12	20~50 51~75 76~100 101~125	20~50										
	20~50 51~75 76~100 101~125	51~75										
	20~50 51~75 76~100 101~125	76~100										
	20~50 51~75 76~100 101~125	101~125										

L-Shaped Welded Angles

-Dimension Configurable Type-

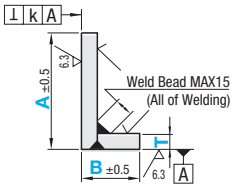
CAD Data

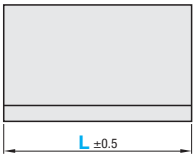


Type	Material
LSAW	EN AW-5052/ AlMg2,5
LSUW	1.4301/ X5CrNi18-10

Type	T	T Tolerance
LSAW	10 · 12	±1.0
	15	±1.5
LSUW	10 · 12	±1.0
	15	±1.5

LSAW
LSUW



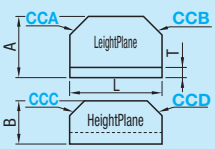


25 / 6.3

Part Number	A	B	€ Unit Price									
			LSAW10			LSAW12			LSAW15				
			L50~100	L101~150	L151~200	L50~100	L101~150	L151~200	L50~100	L101~150	L151~200	L201~250	L251~300
LSAW10 LSAW12 LSAW15	101~125	101~125											
	126~150												
	151~175												
	176~200												
	101~125	126~150											
	126~150												
	151~175												
	176~200												
	101~125	151~175											
	126~150												
	151~175												
	176~200												
	101~125	176~200											
	126~150												
	151~175												
	176~200												

Part Number	A	B	€ Unit Price								
			LSUW10			LSUW12			LSUW15		
			L50~100	L101~150	L151~200	L50~100	L101~150	L151~200	L50~100	L101~150	L151~200
LSUW10 LSUW12 LSUW15	76~100	76~100									
	101~125										
	126~150										
	76~100	101~125									
	101~125										
	126~150										
	151~175										
	176~200										
	76~100	126~150									
	101~125										
	126~150										
	151~175										
	176~200										
	101~125	151~175									
	126~150										
	151~175										
	176~200										
	101~125	176~200									
	126~150										
	151~175										
	176~200										

Longitudinal Dimension A and B	k	
	LSAW	LSUW
25~ 80	0.05 or less	0.10 or less
81~125	0.10 or less	
126~150		
151~200	0.15 or less	0.15 or less

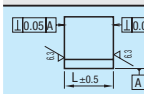
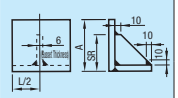
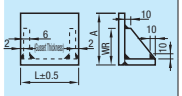
Alterations	Corner Cut
	
Code	CCA · CCB · CCC · CCD
Spec.	Any corner can be cut. 1≤Corner Cut≤30 1mm Increment

1mm Increment	Price Adder
1 ~ 3	0,80
4 ~10	2,40
11 ~20	4,00
21 ~30	5,60

Ordering Code (Ex.) When A and D are to be cut with C5⟶ CCA5 / CCD5

Alterations

Part Number - A - B - L - (CKC · SR · WR)
LSAW10 - A120 - B120 - L150 - WR60

Alterations	Code	Spec.	Price Adder	
	CKC	Both sides of dimension L are machined to be perpendicular to surface A. Ordering Code CKC	LSAW LSUW	12,00
	SR	Gusset (t6mm) is welded at the center of dimension L. SR≥A/2 Ordering Code SR80 (Gusset Height = 80mm from Bottom Surface)	LSAW	22,00
			LSUW	40,00
	WR	Two gussets (t6mm) are welded 2mm inside from both ends of dimension L. WR≥A/2 Ordering Code WR70 (Gusset Height = 70mm from Bottom Surface)	LSAW	41,00
			LSUW	62,00

Order Example: Part Number - A - B - L
LSAW10 - A120 - B120 - L150

Days to Ship: 10 Days

Price

Volume Discount (Round down to Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For larger quantity orders "Days to Ship" may differ from published catalog term.

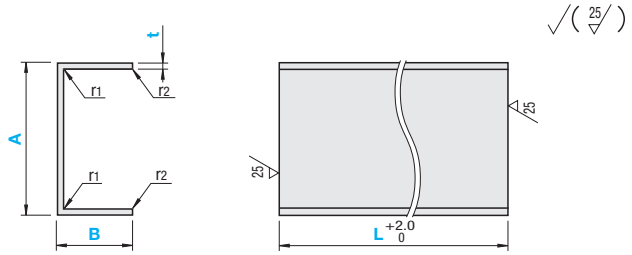
Lightweight Section Steels (C-Shaped) / Metal Boxes / Box Stays

CAD Data

C-Shaped Section Steels RoHS



Type	Material
CASS	1.0038/S235JR
CASU	1.4301/X5CrNi18-10
CASA	EN AW-6063/AlMg0,7Si



CASA does not come with r1 and r2.

Part Number Type	t	A-B	L 1mm Increment	T Tolerance	A	Tolerance	B	Tolerance	(r_1)	(r_2)	€ Unit Price L30~100	L101~200	L201~400	L401~600	L601~800	L801~1000
CASS	2.3	4020	30~1000	±0.25	40	±1.5	20	±1.5	4	2						
		8040			80		40		8	2						
CASU	3	4020		±0.4	40	±1.5	20	±1.5	4	2						
	5	8040			80	±2.0	40		4.5	3						
	1.5	1515		±0.23	15	±0.35	15	±0.35	-	-						
	2	2525		±0.23	25	±0.38	25	±0.38	-	-						
CASA	2.5	2020		±0.23	20	±0.38	20	±0.38	-	-						
		5025			50	±0.54	25									
	3	4020		±0.23	40	±0.54	20	±0.38	-	-						
		6030			60	±0.92	30	±0.45								
	4	8040		±0.27	80	±0.92	40	±0.54	-	-						
	5	7550			75		50									

Order Example

Part Number	-	A-B	-	L
CASA2	-	2525	-	400

Days to Ship 8 Days

Price

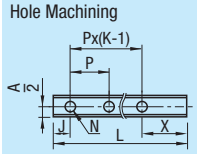
Volume Discount (Round down to Cent.) P.87

Qty.	1~14	15~19	20~49
Rate	€ Unit Price	5%	10%

For larger quantity orders "Days to Ship" may differ from published catalog term.

Alterations

Part Number	-	A-B	-	L	-	(NC)
CASA2	-	2525	-	400	-	NC3 - J10 - P80 - K3

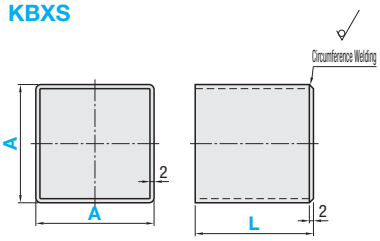
Alteration	Code	Spec.	Price Adder
Hole Machining  X=L-P(K-1)-J	NC	NC: Applicable Bolt Size J: 1 mm Increment P: Pitch in 1mm Increment ≥0≤P K: No. of Holes ≥1≤K≤10 ≥6≤J ≥6≤X Ordering Code NC3-J10-P80-K3	CASA 5,00 CASS CASU 8,00

NC	Applicable Bolts	N
3	M3	Ø3.5
4	M4	Ø4.5
5	M5	Ø5.5

Metal Boxes RoHS



KBXS



Material: 1.4301/X5CrNi18-10

Part Number Type	A	L	€ Unit Price
KBXS	50	50	
		75	
	75	75	
		100	
	100	100	
		150	

Order Example

Part Number	-	L
KBXS75	-	100
STXS100		

Days to Ship 6 Days P.88

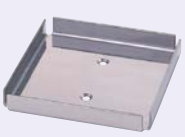
Price

Volume Discount (Round down to Cent.) P.87

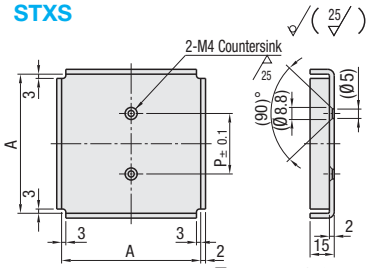
Qty.	1~19	20~34	35~49	50~199
Rate	€ Unit Price	5%	10%	18%

For larger quantity orders "Days to Ship" may differ from published catalog term.

Box Stays RoHS



STXS

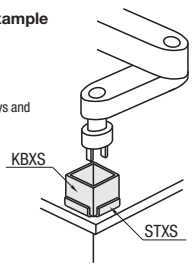


Material: 1.4301/X5CrNi18-10

Part Number Type	Nominal	A	P	€ Unit Price
STXS	50	51	25	
	75	76	35	
	100	101	45	

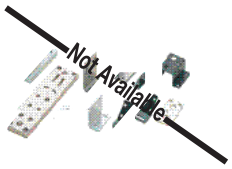
Example

For rejecting strays and defective parts.



Machined Sheet Metals/Machined Metal Plates

Machined Sheet Metals Machined Metal Plates








Product Name	Online Configuration and Ordering Service	Machined Sheet Metals –Plate Type–	–Disk Type–	–Bent Type–	–Angle Type–
Page	1737	1741	1743	1745	1747






Machined Metal Plates	–Flat Bar Type–	Machined L-Shaped Brackets –Standard Type–	–Shape of Material Type–
1749	1751	1753	1753

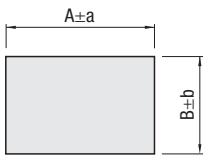
■Machining Dimension Tolerance and Machining Limits

•Sheet Metals

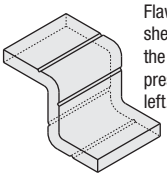
1. General Tolerance of Cutting Dimension

Standard Dimension (A·B Dimension)	6 or less	6 to 30 or less	30 to 120 or less	120 to 400 or less
Flat Plate (No Bending) Tolerance (a·b)	±0.1	±0.2	±0.3	±0.5
Bending Parts Tolerance (a·b)	±0.3	±0.5	±0.8	±1.2

* Tolerance Class for JIS B 0408 Metal Press Parts : Class B is adopted.

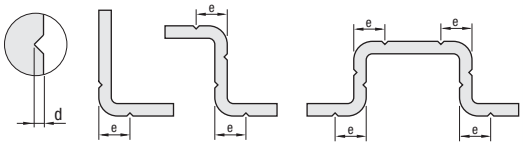


2. Position and Depth of Flaws Caused by the Press Brake



Flaws will be on bent sheet metal caused by the brake support of press brake as shown on left.

Plate Thickness		Position	Depth
1.0330/DC01 (St.12)	1.4301/ X5CrNi18-10-D	e	d
1.6	1.5	6	0.05
2.3	2.0	7.5	0.1
3.2	3.0	10.5	0.2
4.5	4.0	13.5	0.3
6.0	–	15.0	0.4

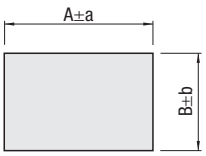


•Metal Plates

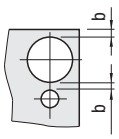
1. General Tolerance of Cutting Dimension

Standard Dimension (A·B Dimension)	0.5 to 6 or less	6 to 30 or less	30 to 120 or less	120 to 400 or less
Tolerance (a·b)	±0.1	±0.2	±0.3	±0.5

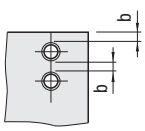
* Tolerance Class for JIS B 0405 Cutting Dimensions : Middle Class (m)



2. Machining Limits (Distance Between Holes, Thickness between Holes and Edges)



Drill Hole Diameter	b (Min. Value)
3.0~5.0	0.8
5.5~25.0	1
25.5~50.0	2
51.0~	3



Tapped Hole Dia.	b (Min. Value)
3 · 4 · 5	0.8
6 · 8 · 10	1.0

□□□□□□□□□

□□□□□□□□

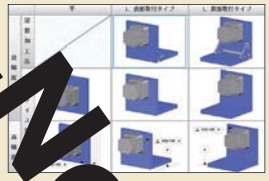
BRACKETS EASY SELECTION –PRODUCT LINE-UPS–

ブラケット楽々チョイス

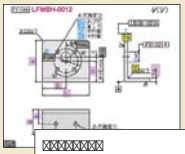
これまでは・・・	✕市販品に合った商品を探すのが大変 取付寸法を型式にあてはめるのが面倒	✕ブラケット寸法を イメージしづらい	✕選定ミスが多い
ブラケット楽々チョイスなら・・・	○商品検索不要 取付寸法入力不要	○市販品外形確認 しながら簡単設計	○完全規格チェックで ミス防止

STEP 1 市販品の型式選択 → STEP 2 欲しいブラケットの形状選択 → STEP 3 寸法入力 → STEP 4 型式完成

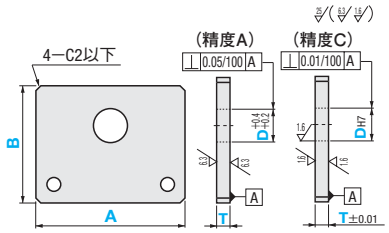






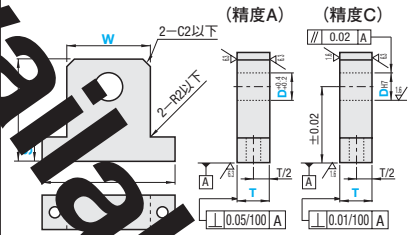


LFMBH-SS-T10-A20-



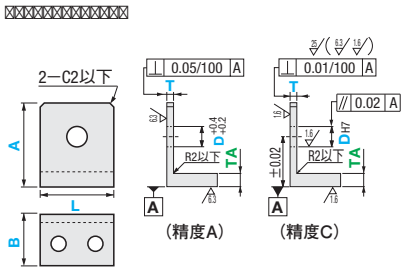
0.1mm	
A	10.0~45[illegible]
B	10.0~[illegible]
T	5.0~[illegible]

T



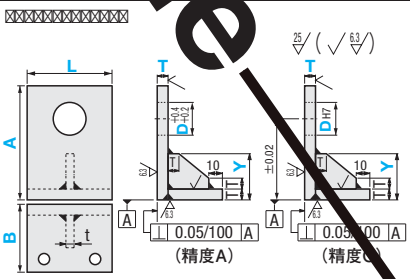
0.1mm	
A	25.0~450.0
B	25.0~450.0
T	5.0~30.0

L



T	1mm
	5~30
0.1mm	
A	25.0~250.0
B	15.0~100.0
L	25.0~250.0
TA	1mm
	5~50

L



T	10·12·15·20
1mm	
A	50~300
B	40~150
L	40~300

M

		A		C	
1.0038/S235JR		5	B		
		8	C		
1.1191/C45E		5	B	5	×
		8	C	8	C
				8	C
EN AW-5052/AlCu4MgSi		5	B		
		8	C		
EN AW-2017/AlCu4MgSi		5	B		
		8	C		
		5	B		

M

1.0038/S235JR +		8	
		10	
EN AW-5052/AlMg2,5		8	×
		10	
1.4301/X5CrNi18-10		8	

Not Available

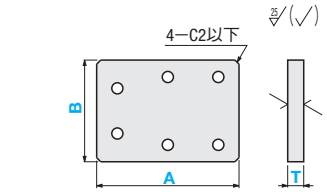
http://cp.misumi.jp/10-006/

http://cp.misumi.jp/10-007/

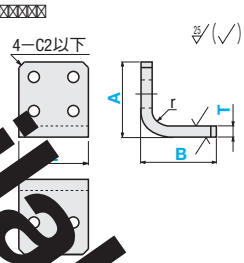


http://cp.misumi.jp/10-006/

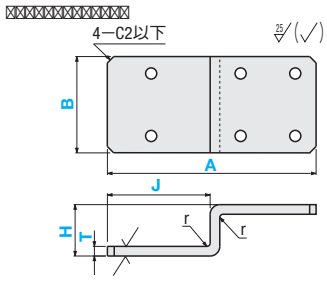
Not Available



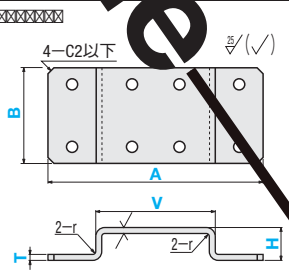
T	0.8~3.2
1mm	
A	20~2[illegible]
B	20~200



T	0.8~3.2
1mm	
A	20~150
B	20~100
L	20~150



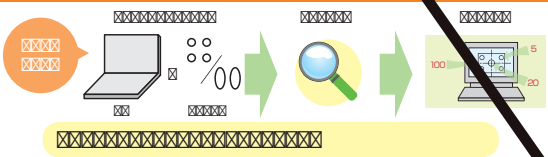
T	0.8~3.2
1mm	
A	40~200
B	20~150
1mm	
H	10~100



T	0.8~3.2
1mm	
A	40~200
B	10~200
1mm	
H	10~100

M L/Z

1.0330/1.0320/St.22 4.5 SPHC		5	×
		8	×
		5	×
SECC		5	×
EN AW-5052/AlMg2,5		5	B
		8	C
1.4301/X5CrNi18-10(2B)		5	×
1.0038/S235JR		5	×
1.4301/X5CrNi18-10		5	×





http://cp.misumi.jp/10-008/

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Step1–2

Step1.

Step2.

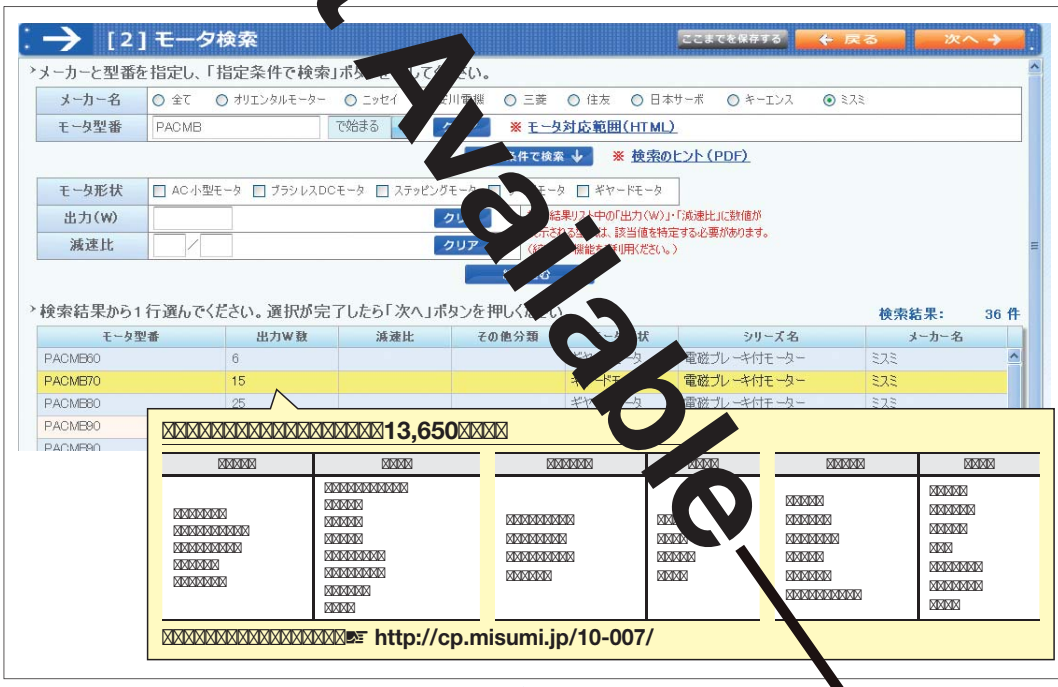
Step3.

Step4.

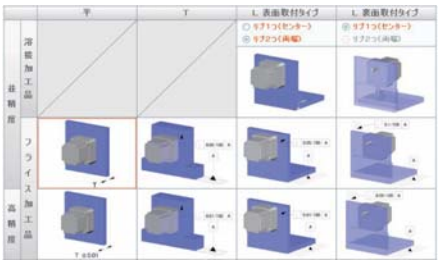
Step1.



Step2.–

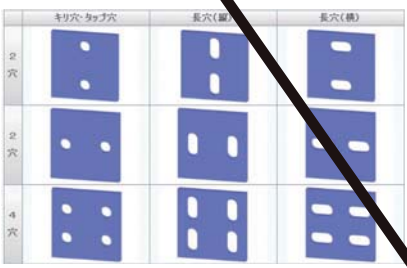


Step2.–



×

Step2.–



Not Available

□□□□ □□□ Step3□4

Step1.
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Step2.
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Step3.
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Step4.
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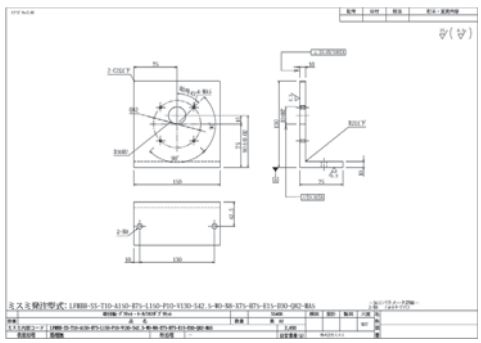
Step3. □□□□□□□□□□□□/□□□□□□□□□□□□□□□□□□□□



Step4. □□□□□□□/□□□□□/□□□□□□□



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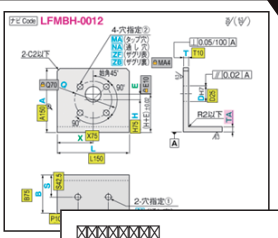

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LFMBH-SS-T10-A20-□□□

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□□□□□Web Order System□□□□□□□□□

Not Available

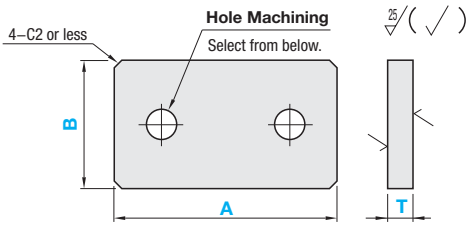
Machined Sheet Metals

–Plate type–



Type	M Material	S Surface Treatment
KBLN	1.0330/DC01 (St.12)	–
KBLB		Black Oxide
KBLU		Bright Chromate Plating
KBLA	EN AW-5052/ AlMg2,5	–
KBLW		Clear Anodize
KBLE		Black Anodize
KBLS	1.4301/ X5CrNi18-10-D	–

For plate thickness 4.5 · 6.0, it is 1.0320/St.22.
For tolerance, refer to P.1735.

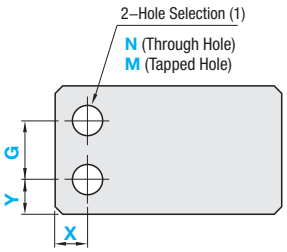


Hole Machining Selection

A No Hole



Z



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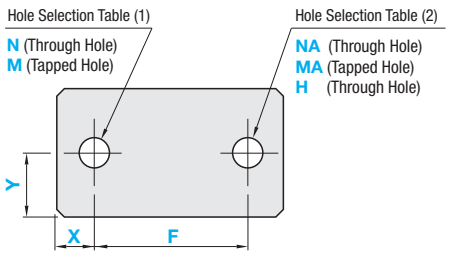
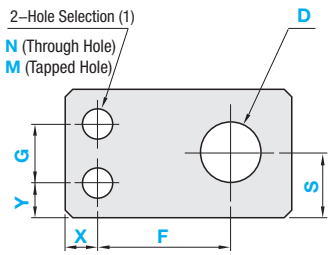
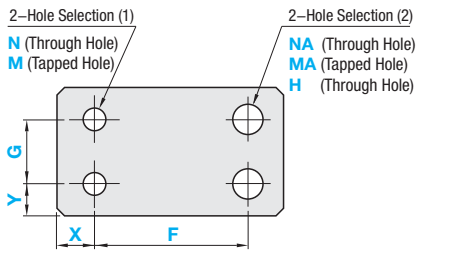


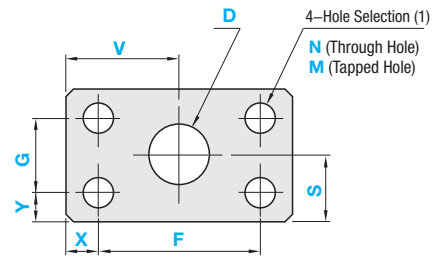
T



F



V



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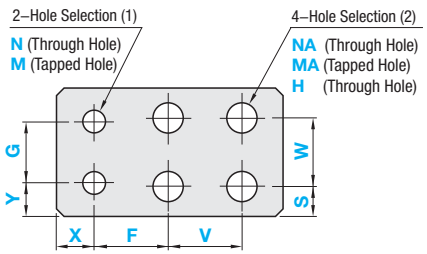
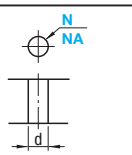
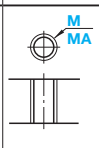
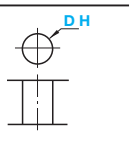


Hole Selection Table

Hole Type	Through Hole	Tapped Hole (Coarse Thread)	Through Hole
Code	N · NA	M · MA	D · H
Shape			
Machining Specifications	Dimension / Nominal Dia. 3 4 5 6 8 10 / d 3.5 4.5 5.5 6.5 9 11		3~30

1.Burr Height 0.1 or Less
2.Machining Limits

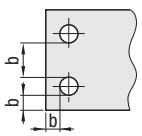


Plate Thickness			Min. Distance
1.0330/DC01 (St.12)	EN AW-5052/ AlMg2,5	1.4301/ X5Crni18-10-D	b
1.6	1.5	1.5	2
2.3	2.0	2.0	
3.2	3.0	3.0	
4.5	–	4.0	3
6.0	–	–	

Part Number					1mm Increment									Hole Selection (1)		Hole Selection (2)		0.5mm Increment
Type	Hole Machining Selection	T Selection 1.0330/DC01 (St.12)	T Selection EN AW-5052/ AlMg2,5	T Selection 1.4301/ X5Crni18-10-D	A	B	X	Y	F	G	V	S	W	Code	Nominal Dia.	Code	Nominal Dia.	D
KBLN	A															NA	3	
KBLB	W	1.6															4	
KBLU	F	2.3	1.5	1.5										N	3	MA	5	
KBLA	Y	3.2	2.0	2.0	15~300	15~200	0.1mm Increment								4		6	3~30
KBLW	Z	4.5	3.0	3.0											5		8	
KBLE	T	6.0		4.0										M	6	H	10	
KBLS	V														8		3~30 0.5mm Increment	
															10			

Order Example

Part Number	Type	Hole Machining	T	–	A	–	B	–	X	–	Y	–	F	–	G	–	V	–	S	–	W	–	Hole Selection (1) Code · Nominal	–	Hole Selection (2) Code · Nominal	–	D
KBLB	W	3.2		–	A100	–	B50	–	X10	–	Y25	–	F60											–	N3	–	MA4		
KBLS	T	3.0		–	A50	–	B30	–	X10	–	Y10	–	F20	–	G10			–	S15			–	N3					–	D10

Days to Ship

- •KBLN, KBLA: **10 Days**
- •KBLB · KBLU · KBLW · KBLE · KBLS: **13 Days**

Price

■Volume Discount (℗Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Rate	€ Unit Price	5%	10%	15%

℗For orders larger than indicated quantity, please request a quotation.

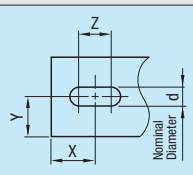
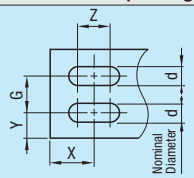
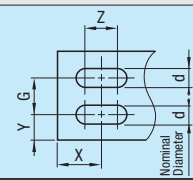
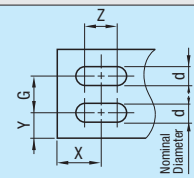
℗Add hole machining charge to the body price.
(Body price only for A No Hole Type.)

T	A	B	€ Unit Price Qty. 1~4							Hole Machining Price (€ Body Price+)					
			KBLN	KBLB	KBLU	KBLA	KBLW	KBLE	KBLS	W	F	Y	Z	T	V
1.5~3.2	15~100	15~100													
4.0~6.0															
1.5~3.2		101~200													
4.0~6.0															
1.5~3.2	101~200	15~100													
4.0~6.0															
1.5~3.2		101~200													
4.0~6.0															
1.5~3.2	201~300	15~100													
4.0~6.0															
1.5~3.2		101~200													
4.0~6.0															

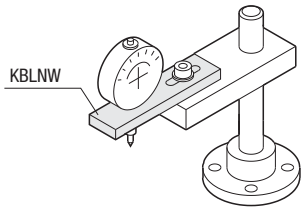
Alterations

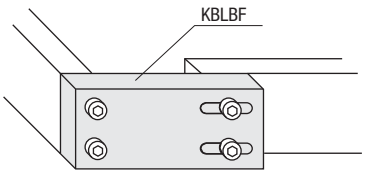
Part Number	Type	Hole Machining	T	–	A	–	B	–	X	–	Y	–	F	–	G	–	V	–	S	–	W	–	Hole Selection (1) Code · Nominal	–	Hole Selection (2) Code · Nominal	–	D	– (WNC · FNC…etc.)
KBLB	W	3.2		–	A100	–	B50	–	X10	–	Y25	–	F60											–	N3	–	MA4	–	WNC–Z5.0

⊗Alterations are not available for **KBLA** ·**KBLW** · **KBLE**.

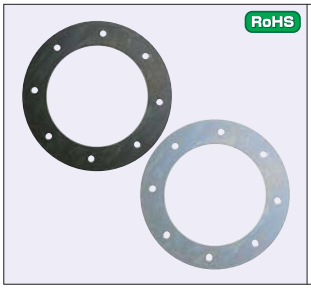
Alterations	N (Through Hole) to Slot Hole			
				
Code	WNC	FNC	YNC	TNC
Spec.	℗Applicable to Hole Machining W Z = 0.5mm Increment Ordering Code WNC–Z5.0 ℗Z≤Nx3	℗Applicable to Hole Machining F Z = 0.5mm Increment Ordering Code FNC–Z5.0 ℗Z≤Nx3	℗Applicable to Hole Machining Y Z = 0.5mm Increment Ordering Code YNC–Z5.0 ℗Z≤Nx3	℗Applicable to Hole Machining T Z = 0.5mm Increment Ordering Code TNC–Z5.0 ℗Z≤Nx3
Price Adder	2,00	4,00	4,00	4,00

Example



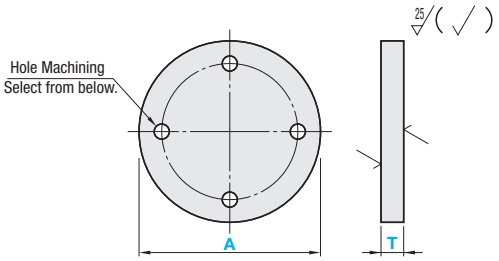


Machined Sheet Metals
–Disk Type–



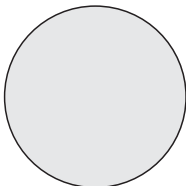
Type	Material	Surface Treatment
KBRN	1.0330/DC01 (St.12)	–
KBRB		Black Oxide
KBRU		Bright Chromate
KBRA	EN AW-5052/AlMg2,5	–
KBRW		Clear Anodize
KBRE		Black Anodize
KBRS	1.4301/X5CrNi18-10	–

For plate thickness 4.5 · 6.0, it is 1.0320/St.22.
For tolerance, refer to P.1735.

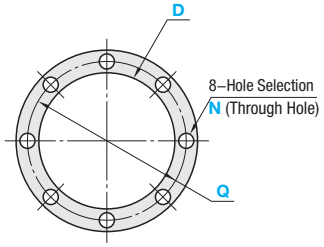


Hole Machining Selection

A No Hole



Y



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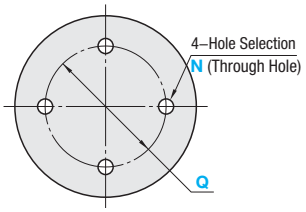

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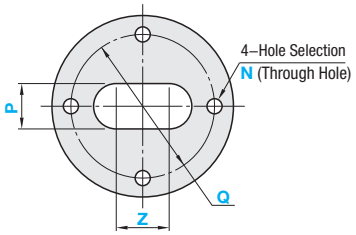

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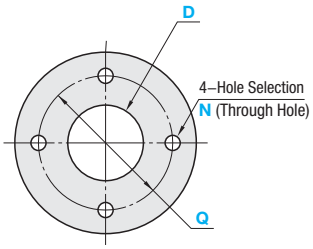

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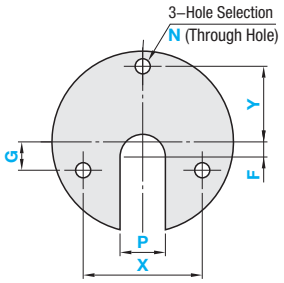
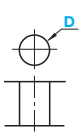


Hole Selection Table

Hole Type	Through Hole	Through Hole
Code	N	D
Shape		
Machining Specifications	Dimension d: 3 (3.5), 4 (4.5), 5 (5.5), 6 (6.5), 8 (9), 10 (11)	3~290

1.Burr Height 0.1 or Less
2.Machining Limits

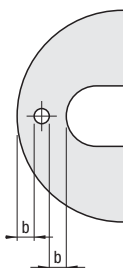


Plate Thickness			Min. Distance
1.0330/DC01 (St.12)	EN AW-5052/AlMg2,5	1.4301/X5CrNi18-10	b
1.0	—	1.0	2
1.6	1.5	1.5	
2.3	2.0	2.0	
3.2	3.0	3.0	
4.5	—	4.0	3
6.0	—	—	

Part Number					1mm Increment							Hole Selection		0.5mm Increment	
Type	Hole Machining Selection	T Selection 1.0330/DC01 (St.12)	T Selection EN AW-5052/ AlMg2,5	T Selection 1.4301/ X5CrNi18-10	A	Q	Z	X	Y	F	G	Code	Nominal Diameter	P	D
KBRN KBRB KBRU KBRA KBRW KBRE KBRS	A* F W Y R V	1.0 1.6 2.3 3.2 4.5 6.0	1.5 2.0 3.0	1.0 1.5 2.0 3.0 4.0	30~300	0.1mm Increment						N	3 4 5 6 8 10	3~100	3~290

*KBRWA, KBREA are not selectable.

Order Example

Part Number																
Type	Hole Machining	T	–	A	–	Q	–	Z	–	X	–	Y	–	F	–	G	–	Hole Selection Code·Nominal	–	P	–	D
KBRU	F	3.2	–	A200	–	Q100											–	N5				
KBRA	Y	3.0	–	A100	–	Q80											–	N6			–	D60

Days to Ship

- •KBRN · KBRA: **10 Days**
- •KBRB · KBRU · KBRW · KBRE · KBRS: **13 Days**

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated values, please request for quotation.

Add hole machining charge to the body price. (Body price only for A No Hole Type.)

T	A	€ Unit Price Qty. 1~4							Hole Machining Price (€ Body Price +)				
		KBRN	KBRB	KBRU	KBRA	KBRW	KBRE	KBRS	F	W	Y	R	V
1.0~3.2	30~100												
4.0~6.0													
1.0~3.2	101~200												
4.0~6.0													
1.0~3.2	201~300												
4.0~6.0													

Alterations

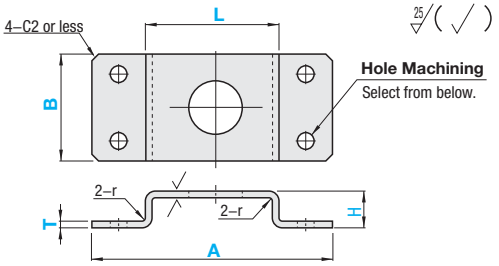
| Part Number | | | | | | | | | | | | | | | |

Machined Sheet Metals
–Bent Type–



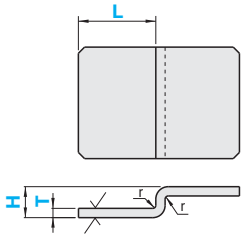
Type	Material	Surface Treatment
KBUN	1.0330/DC01 (St.12)	–
KBUB		Black Oxide
KBUU		Bright Chromate Plating
KBUA	EN AW-5052/AlMg2,5	–
KBUW		Clear Anodize
KBUE		Black Anodize
KBUS	1.4301/X5CrNi18-10–D	–

For plate thickness 4.5 · 6.0, it is 1.0320/St.22.
For tolerance, refer to P.1735
Bending Select from below.

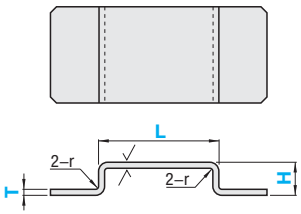


Hole Machining and Bending

A No Hole



B No Hole



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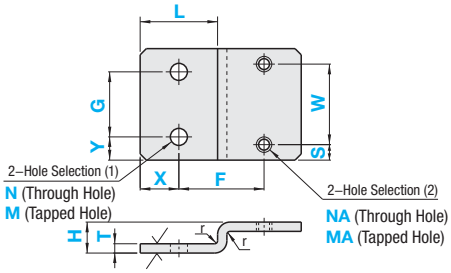

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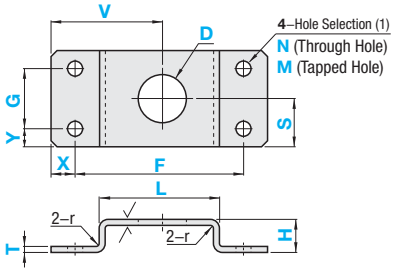
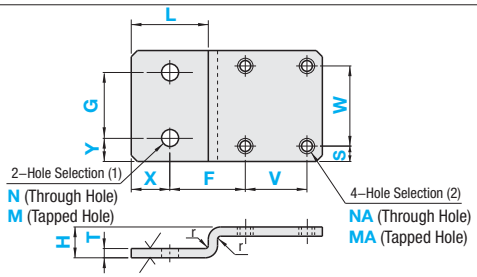


Y



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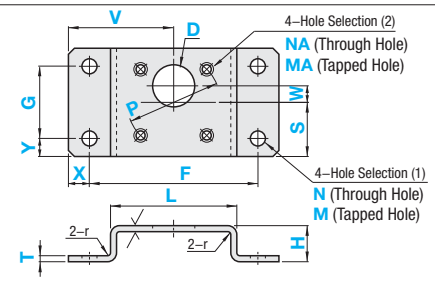

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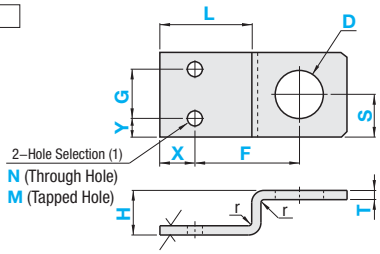
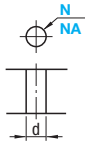
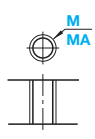
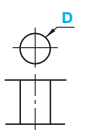
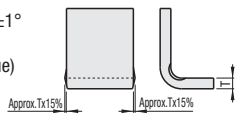


Hole Selection Table

Hole Type	Through Hole	Tapped Hole (Coarse Thread)	Through Hole
Code	N · NA	M · MA	D
Shape			
Machining Specifications	Dimension / d: Nominal Dia. 3 (3.5), 4 (4.5), 5 (5.5), 6 (6.5), 8 (9), 10 (11)		3~30

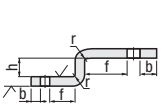
1. Burr Height 0.1 or Less
2. Bending Angle Tolerance ±1°
3. Swelling Due to Bending
4. Machining Limit (Min. value)
5. Scratches may be caused by the press brake.

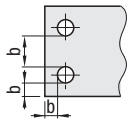
P.1735



*=Distance between...

Plate Thickness 1.0330	Plate Thickness EN AW-5052	Plate Thickness 1.4301-D	r	f(* hole and bending) D	f(* hole and bending) N · NA	f(* hole and bending) M · MA	b(* hole and section)	h
1.6	1.5	1.5	1.5	5	4	6	2	6
2.3	2.0	2.0	2	6	5	7		7
3.2	3.0	3.0	3	8	7	9		9
4.5	–	4.0	4	10	8	11	3	11
6.0	–	–	6	19	16	20		21





Part Number					1mm Increment											Hole Selection (1)		Hole Selection (2)		0.5mm Incr.
Type	Hole Machining	T Selection 1.0330	T Selection EN AW-5052	T Selection 1.4301-D	A	B	H	L	X	Y	F	G	V	S	W	P	Code	Nominal Dia.	Code	Nominal Dia.	D
KBUN KBUB KBUU KBUA KBUW KBUE KBUS	A F Y T B V Q	1.6 2.3 3.2 4.5 6.0	1.5 2.0 3.0	1.5 2.0 3.0 4.0	20~ 200	20~ 200	10~ 100	min 15~ L>H (Bending only)	0.1mm Increment								N M	3 4 5 6 8 10	NA MA	3 4 5 6 8 10	3~30

L>H is applicable to ⊓ bending only.

Order Example

Part Number	– A	– B	– H	– L	– X	– Y	– F	– G	– V	– S	– W	– P	– Hole Selection (1) Code · Nominal	– Hole Selection (2) Code · Nominal	– D
KBUN F 3.2	– A80	– B40	– H30	– L40	– X20	– Y10	– F40	– G20		– S6	– W28		– N4	– MA3	
KBUU V 2.3	– A80	– B35	– H40	– L50	– X7.5	– Y7.5	– F65	– G20	– V4.0	– S17.5			– N3		– D20

Days to Ship

- •KBUN · KBUA: **10 Days**
- •KBUB · KBUU · KBUW · KBUE · KBUS: **13 Days**

Price

Volume Discount (Round down to one Cent.) P87

Quantity	1~4	5~9	10~19	20~49
Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated quantity, please request a quotation.

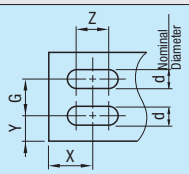
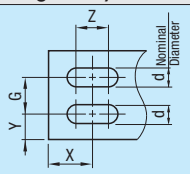
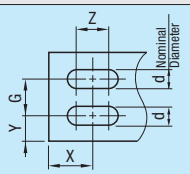
Add hole machining charge to the body price. (Body price only for A B No Hole Type.)

T	A	B	€ Unit Price KBUN	KBUB	KBUU	KBUA	KBUW	KBUE	KBUS	Hole Machining Price (€ Body Price+) F	Y	T	V	Q
1.5~3.2	20~100	20~100												
4.0~6.0						⊗	⊗	⊗						
1.5~3.2		101~200												
4.0~6.0						⊗	⊗	⊗						
1.5~3.2	101~200	20~100												
4.0~6.0						⊗	⊗	⊗						
1.5~3.2		101~200												
4.0~6.0						⊗	⊗	⊗						

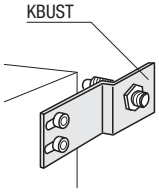
Alterations

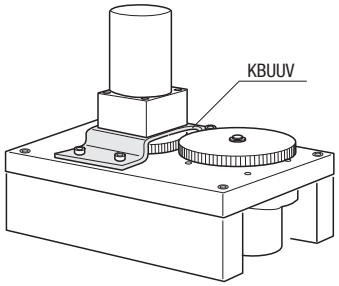
Part Number	– A	– B	– H	– L	– X	– Y	– F	– G	– V	– S	– W	– P	– Hole Selection (1) Code · Nominal	– Hole Selection (2) Code · Nominal	– D	– (FNC · YNC · TNC)
KBUN F 3.2	– A80	– B40	– H30	– L40	– X20	– Y10	– F40	– G20		– S6	– W28		– N4	– MA3		– FNC–Z5.0

⊗ Alterations are not available for **KBUA · KBUW · KBUE**.

Alterations	N (Through Hole) to Slot Hole		
			
Code	FNC	YNC	TNC
Spec.	Applicable to Hole Machining F. Z = 0.5mm Increment Ordering Code FNC–Z5.0 Z≤Nx3	Applicable to Hole Machining Y. Z = 0.5mm Increment Ordering Code YNC–Z5.0 Z≤Nx3	Applicable to Hole Machining T. Z = 0.5mm Increment Ordering Code TNC–Z5.0 Z≤Nx3
Price Adder	4,00	4,00	4,00

Example





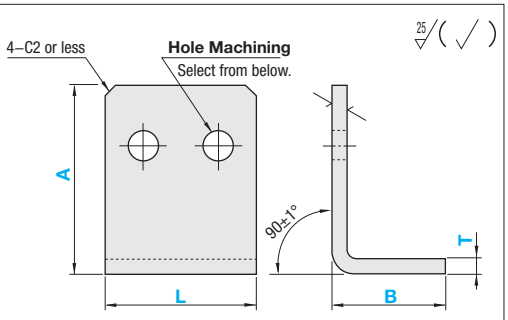
Machined Sheet Metals

–Angle Type–



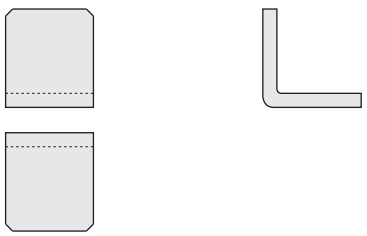
Type	M Material	S Surface Treatment
KBAN	1.0330/DC01 (St.12)	–
KBAB		Black Oxide
KBAU		Bright Chromate Plating
KBAA	EN AW-5052/AlMg2,5	–
KBAW		Clear Anodize
KBAE		Black Anodize
KBAS	1.4301/X5CrNi18-10	–

For plate thickness 4.5 · 6.0, it is 1.0320/St.22.
For tolerance, refer to P.1735.

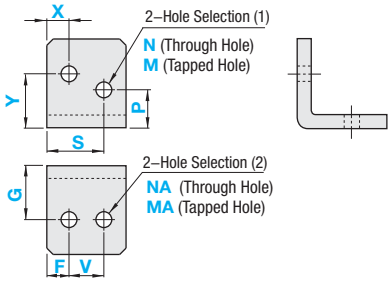


Hole Machining and Bending

A No Hole



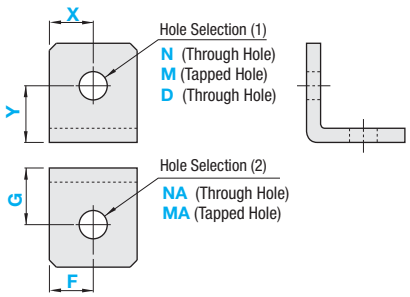
Z



2–Hole Selection (1)
N (Through Hole)
M (Tapped Hole)

2–Hole Selection (2)
NA (Through Hole)
MA (Tapped Hole)

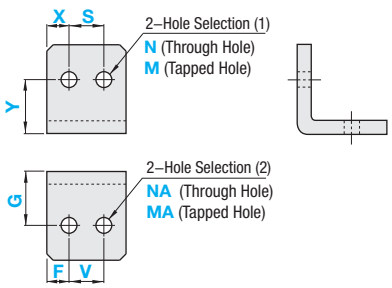
W



Hole Selection (1)
N (Through Hole)
M (Tapped Hole)
D (Through Hole)

Hole Selection (2)
NA (Through Hole)
MA (Tapped Hole)

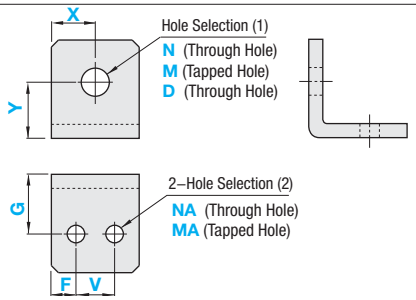
F



2–Hole Selection (1)
N (Through Hole)
M (Tapped Hole)

2–Hole Selection (2)
NA (Through Hole)
MA (Tapped Hole)

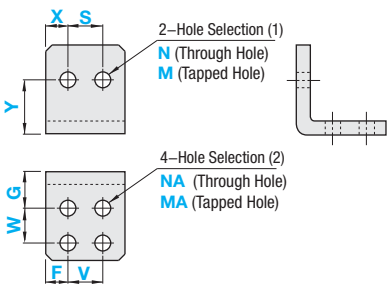
T



Hole Selection (1)
N (Through Hole)
M (Tapped Hole)
D (Through Hole)

2–Hole Selection (2)
NA (Through Hole)
MA (Tapped Hole)

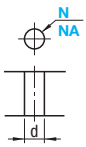
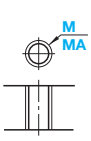
Y



2–Hole Selection (1)
N (Through Hole)
M (Tapped Hole)

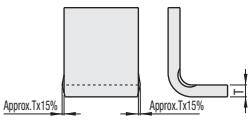
4–Hole Selection (2)
NA (Through Hole)
MA (Tapped Hole)

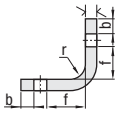
Hole Selection Table

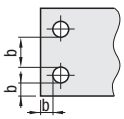
Hole Type	Through Hole	Tapped Hole (Coarse Thread)	Through Hole
Code	N · NA	M · MA	D
Shape			
Machining Specifications	Dimension / Nominal Dia. 3 4 5 6 8 10 / d 3.5 4.5 5.5 6.5 9 11		3~30

1.Burr Height 0.1 or Less 2.Swelling Due to Bending
3.Machining Limit (Min. value)
4.Scratches may be caused by the press brake. P.1735

Plate Thickness 1.0330/DC01 (St.12)	Plate Thickness EN AW-5052/AlMg2,5	Plate Thickness 1.4301/X5CrNi18-10	r	f(Distance between hole and bending) D	f N · NA	f M · MA	b (Distance between hole and section)
1.6	1.5	1.5	1.5	5	4	6	2
2.3	2.0	2.0	2	6	5	7	
3.2	3.0	3.0	3	8	7	9	
4.5	–	4.0	4	10	8	11	3
6.0	–	–	6	19	16	20	







Part Number					1mm Increment											Hole Selection (1)				Hole Selection (2)	
Type	Hole Machining	T Selection			A	B	L	X	Y	F	G	V	S	W	P	Code	Nominal Dia.	Code	Specified 0.5mm Increment	Code	Nominal Dia.
		1.0330 (St.12)	EN AW-5052	1.4301																	
KBAN KBAB KBAU KBAA KBAW KBAE KBAS	A W T Z F Y	1.6	1.5	1.5	20~80	15~80	15~80	0.1mm Increment								N	3 4 5 6 8 10	D	3~30	NA MA	3 4 5 6 8 10
		2.3	2.0	2.0																	
		3.2	3.0	3.0	20~100	15~80										M					
		4.5	–	4.0																	
		6.0		–	30~300	30~100	30~100														

Order Example

Part Number	–	A	–	B	–	L	–	X	–	Y	–	F	–	G	–	V	–	S	–	W	–	P	–	Hole Selection (1) Code · Nominal	–	Hole Selection (2) Code · Nominal
Type / Hole Machining / T																										
KBAB W 6.0	–	A200	–	B50	–	L30	–	X15	–	Y180	–	F15	–	G30										M4	–	NA4
KBAU F 4.5	–	A50	–	B30	–	L30	–	X8	–	Y30	–	F8	–	G20	–	V14	–	S14						N3	–	NA3

Days to Ship

- •KBAN · KBAA: 10 Days
- •KBAB · KBAU · KBAW · KBAE · KBAS: 13 Days

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Rate	€ Unit Price	5%	10%	15%

For orders larger than indicated values, please request for quotation.

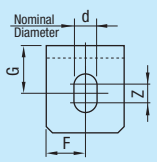
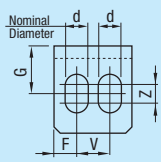
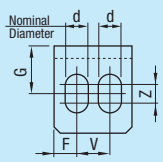
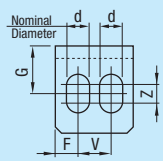
Add hole machining charge to the body price. (Body price only for A No Hole Type.)

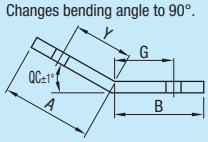
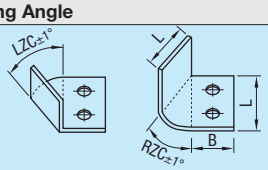
T	A	B	€ Unit Price Qty. 1~4							Hole Machining Price (€ Body Price+)				
			KBAN	KBAB	KBAU	KBAA	KBAW	KBAE	KBAS	W	T	Z	F	Y
1.5~3.2	20~100	15~80												
4.0 · 4.5														
6.0	30~200	30~100												
	201~300													

Alterations

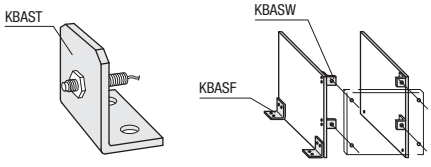
Part Number	–	A	–	B	–	L	–	X	–	Y	–	F	–	G	–	V	–	S	–	W	–	P	–	Hole Selection (1) Code · Nominal	–	Hole Selection (2) Code · Nominal	– (WRC · TRC…etc.)
Type / Hole Machining / T																											
KBAB W 6.0	–	A200	–	B50	–	L30	–	X15	–	Y180	–	F15	–	G30										M4	–	NA4	– WRC–Z5.0

KBAA · KBAW · KBAE are applicable to QC only.

Alterations	NA (Through Hole) to Slot Hole			
				
Code	WRC	TRC	ZRC	FRC
Spec.	Applicable to Hole Machining W. Z = 0.5mm Increment Ordering Code WRC–Z5.0 Z≤NAx3	Applicable to Hole Machining T. Z = 0.5mm Increment Ordering Code TRC–Z5.0 Z≤NAx3	Applicable to Hole Machining Z. Z = 0.5mm Increment Ordering Code ZRC–Z5.0 Z≤NAx3	Applicable to Hole Machining F. Z = 0.5mm Increment Ordering Code FRC–Z5.0 Z≤NAx3
Price Adder	2,00	4,00	4,00	4,00

Alterations	Bending Angle	
	Changes bending angle to 90°. 	
Code	QC	LZC · RZC
Spec.	QC = 5° Increment Ordering Code QC30 5≤QC≤135 A · B · hole dimensions exclude the plate thickness.	LZC · RZC = 5° Increment Ordering Code LZC30 5≤LZC · RZC≤45 Impossible to use in combination with QC
Price Adder	3,00	3,00

Example

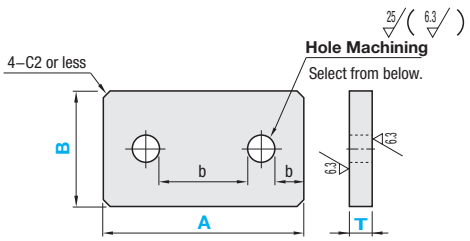


Machined Metal Plates



Type	Material	Surface Treatment
KPLN	1.1191/ C45E (Ck45)	–
KPLB		Black Oxide
KPLM		Electroless Nickel Plating
KPLA	EN AW-5052/ AlMg2,5	–
KPLW		Clear Anodize
KPLE		Black Anodize
KPLS	1.4301/ X5CrNi18-10	–

Chamfered to C0.2 to C0.5, unless otherwise specified.
For b dimension and tolerance, refer to P.1735.

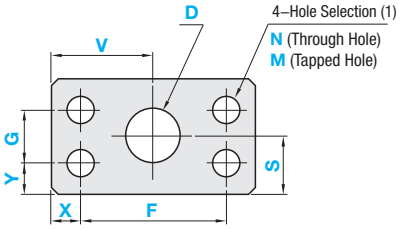


Hole Machining Selection

A No Hole



V



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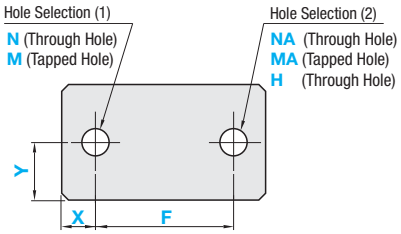
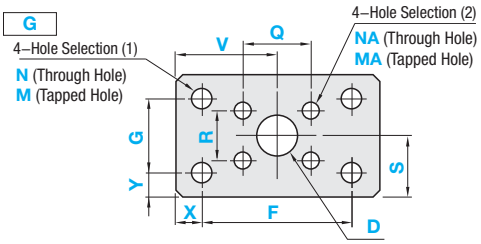


G



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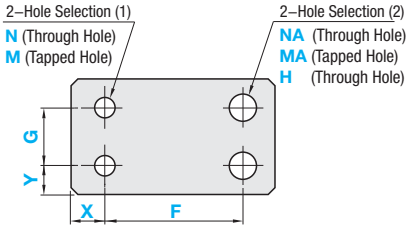

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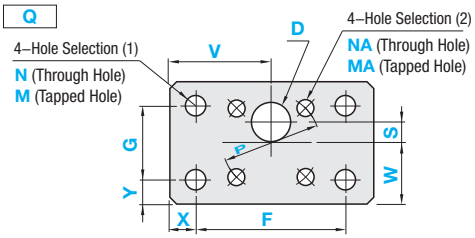

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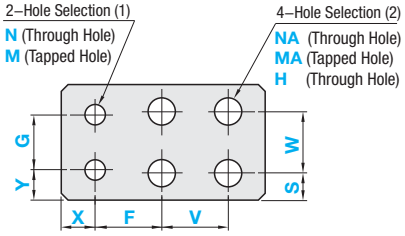

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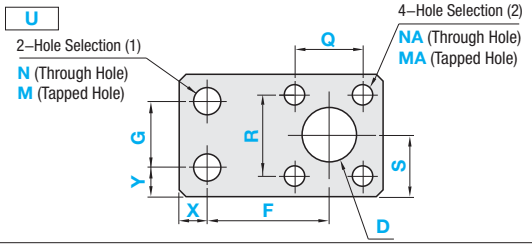

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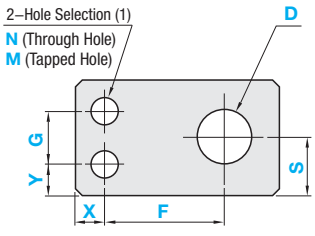
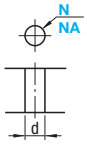
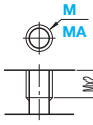


Hole Selection Table

Hole Type	Through Hole	Tapped Hole (Coarse Thread)	Through Hole
Code	N · NA	M · MA	D · H
Shape			
Machining Specifications	Dimension / Nominal Dia. 3 4 5 6 8 10; d 3.5 4.5 5.5 6.5 9 11		3~30

Part Number			A	B										Hole Selection (1)		Hole Selection (2)		0.5mm Increment
Type	Hole Machining Selection	T Selection	1mm Increment	Selection	X	Y	F	G	V	S	W	Q	R	P	Code	Nominal Dia.	Code	Nominal Dia.	D
KPLN KPLB KPLM KPLA KPLW KPLE KPLS	A W F Y T V G Q U	5 6 8 10 12 15 20	25~200	10 20 30 40 50 60 70 80 90 100 150 200	0.1mm Increment										N M	3 4 5 6 8 10	NA MA H	3 4 5 6 8 10 3~30 0.5mm Increment	3~30

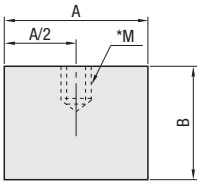
Order Example

Part Number	Type	Hole Machining	T	–	A	–	B	–	X	–	Y	–	F	–	G	–	V	–	S	–	W	–	Q	–	R	–	P	–	Hole Selection (1) Code · Nominal	–	Hole Selection (2) Code · Nominal	–	D
KPLA	V		5	–	A80	–	B40	–	X10	–	Y10	–	F60	–	G20	–	V40	–	S20									–	N4			–	D20
KPLS	U		10	–	A85	–	B50	–	X8	–	Y8	–	F52	–	G34			–	S25			–	Q30	–	R30			–	N4	–	MA3	–	D20

Days to Ship

- •KPLN · KPLA · KPLS: **10 Days**
- •KPLB · KPLM · KPLW · KPLE: **13 Days**

A
No Hole Type of anodize (clear · black) is provided with a hanging hole (tapped hole) as shown on the right for convenience in plating.



*When T5 · 6 M3
When T8~ M5

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Rate	€ Unit Price	5%	10%	15%

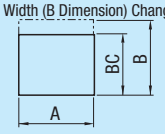
For orders larger than indicated values, please request for quotation.

Add hole machining charge to the body price. (Body price only for A No Hole Type.)

A	B	T	€ Unit Price Qty. 1~4							Hole Machining Price (€ Body Price+)							
			KPLN	KPLB	KPLM	KPLA	KPLW	KPLE	KPLS	W	F	Y	T	V	G	Q	U
25~100	10~50	5 6															
		8 10															
		12 15															
		20															
	60~100	5 6															
		8 10															
		12 15															
		20															
	150 200	5 6															
		8 10															
		12 15															
		20															
101~200	10~50	5 6															
		8 10															
		12 15															
		20															
	60~100	5 6															
		8 10															
		12 15															
		20															
	150 200	5 6															
		8 10															
		12 15															
		20															

Alterations

Part Number	Type	Hole Machining	T	–	A	–	B (BC)	–	X	–	Y	–	F	–	G	–	V	–	S	–	W	–	Q	–	R	–	P	–	Hole Selection (1) Code · Nominal	–	Hole Selection (2) Code · Nominal	–	D (DC)
KPLA	V		5	–	A80	–	BC39	–	X10	–	Y10	–	F60	–	G20	–	V40	–	S20									–	N4			–	DC31

Alteration	Code	Spec.	Price Adder
Width (B Dimension) Change 	BC	Cuts the B dimension. BC = 1 mm Increment Ordering Code Specify dimension B as BC. (Ex.) B=75⋯BC75 11≤BC≤199	5,00

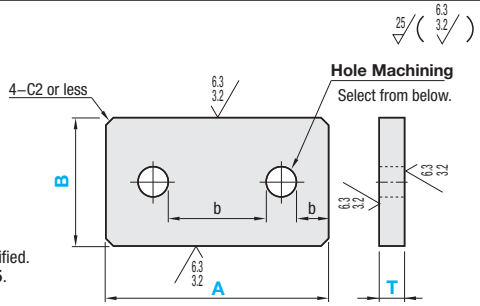
Alteration	Code	Spec.	Price Adder	
D Hole Diameter 	DC	Changes the diameter of D hole. DC = 1 mm Increment Ordering Code Specify dimension D as DC. (Ex.) D=40⋯DC40 31≤DC≤60	DC31~40	6,00
			DC41~50	8,00
			DC51~60	10,00

Machined Metal Plates
–Flat Bar Type–



Type	M Material	S Surface Treatment
KPFN	1.1191/C45E	–
KPFB		Black Oxide
KPFM		Electroless Nickel Plating
KPFS	1.4301/X5CrNi18-10	–

Chamfered to C0.1 to C0.5, unless otherwise specified.
For b dimension and tolerance, refer to P.1735.

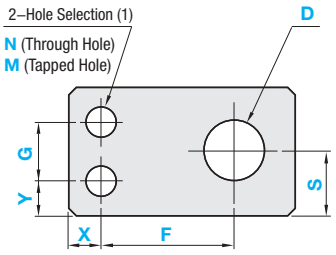


Hole Selection

A No Hole



T



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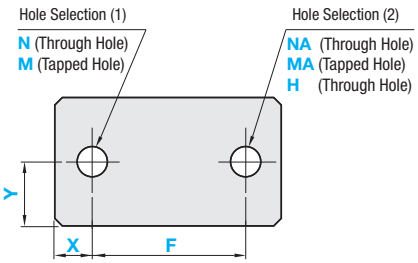

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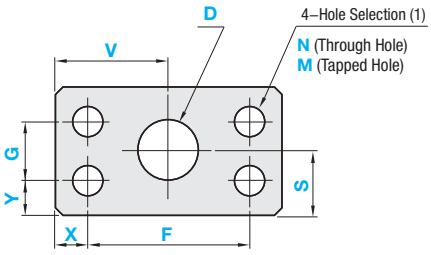

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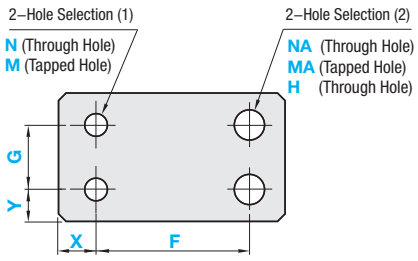

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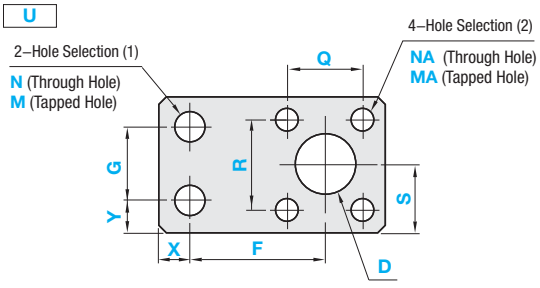

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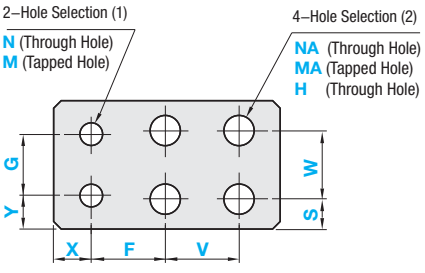
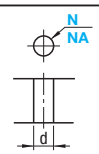
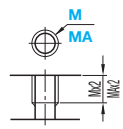


Hole Selection Table

Hole Type	Through Hole	Tapped Hole (Coarse Thread)	Through Hole
Code	N · NA	M · MA	D · H
Shape			
Machining Specifications			3~30

Dimension	Nominal Diameter					
	3	4	5	6	8	10
d	3.5	4.5	5.5	6.5	9	11

Part Number			A 1mm Increment	B Selection	X	Y	F	G	V	S	W	Q	R	Hole Selection (1)		Hole Selection (2)		0.5mm Increment
Type	Hole Machining Selection	T Selection												Code	Nominal Diameter	Code	Nominal Diameter	D
KPFN KPFB KPFM	A W F Y T V U	6 9 12 16 19	30~300	25 32 38 50 60 100 125	0.1mm Increment									N	3 4 5 6 8 10	NA MA	3 4 5 6 8 10	3~30
KPFS				25 32 38 50 65 100 125										M		H	3~30 0.5mm Increment	

※B=125 is not available for type KPFS. ※A≥B

Order Example

Part Number	Type	Hole Machining	T	A	B	X	Y	F	G	V	S	W	Q	R	Hole Selection (1) Code · Nominal	Hole Selection (2) Code · Nominal	D
KPFN	W	6		A80	B50	X10	Y25	F60							N4	NA4	
KPFS	U	12		A85	B50	X8	Y8	F52	G34		S25		Q30	R30	N4	MA3	D20

Days to Ship

- •KPFN · KPFS: 10 Days
- •KPFB · KPFM: 13 Days

Price

■Volume Discount (※Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Rate	€ Unit Price	5%	10%	15%

※For orders larger than indicated quantity, please request a quotation.

※Add hole machining charge to the body price. (Body price only for A No Hole Type.)

A	B	T	€ Unit Price Qty. 1~4 KPFN	KPFB	KPFM	KPFS	Hole Machining Price (€ Body Price+) W	F	Y	T	V	U
30~50	25 32	6 9 12										
51~150												
151~300												
30~50		16 19										
51~150												
151~300												
38~50	38 50	6 9 12										
51~150												
151~300												
38~50		16 19										
51~150												
151~300												
60~150	60	6 9 12										
151~300												
60~150		16 19										
151~300												
65~150	65	6 9 12										
151~300												
65~150		16 19										
151~300												
100~150	100	6 9 12										
151~300												
100~150		16 19										
151~300												
125~150	125	6 9 12										
151~300												
125~150		16 19										
151~300												

Alterations

Part Number	Type	Hole Machining	T	A	B	X	Y	F	G	V	S	W	Q	R	Hole Selection (1) Code · Nominal	Hole Selection (2) Code · Nominal	D (DC)
KPFN	V	6		A80	B38	X10	Y10	F60	G20	V40	S20				N4		DC31

Alteration	Code	Spec.	Price Adder	
D Hole Diameter 	DC	Changes the diameter of D hole. DC = 1 mm Increment. Ordering Code: Specify dimension D as DC. (Ex.) D=40⋯DC40 ※31≤DC≤60	DC31~40	6,00
			DC41~50	8,00
			DC51~60	10,00

■Precision Standards

	(1.1191/C45E)				(1.4301/X5CrNi18-10-D)			
· T Dimension Tolerance	6	9	12·16	19	6	9	12·16	19
	0 −0.18	0 −0.22	0 −0.27	0 −0.3	0 −0.3	0 −0.22	0 −0.27	0 −0.33
· A Dimension Tolerance	±0.15				±0.15			
· B Dimension Tolerance	25	~50	~60	100	125	25	~50	65	100	125
	0 −0.21	0 −0.25	0 −0.3	0 −0.35	0 −0.4	+0.15 −0.33	+0.15 −0.39	+0.15 −0.46	+0.15 −0.54	0 −0.73
· Bending	0.1 or Less per 100mm				0.25 or Less per 100mm			

Machined L-Shaped Brackets

–Standard/Shape of Material Type–



RoHS

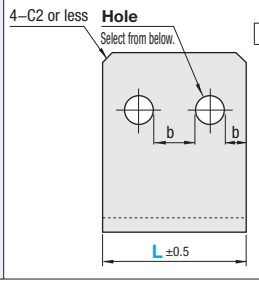
Type		Material M	Surface Treatment S
Standard	Shape of Material Type		
KPAN	KPCN	1.0040/ Ust.42.2	–
KPAB	KPCB		Black Oxide
KPAM	KPCM		Electroless Nickel Plating
KPAA	KPCA	EN AW-6063/ AlMg0,7Si	–
KPAW	KPCW		Clear Anodize
KPAE	KPCE		Black Anodize
KPAS	–	1.4301/ X5CrNi18-10	–

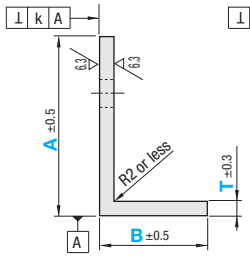
Chamfered to C0.2 to C0.5, unless otherwise specified.

Longitudinal Dimension between A and B	Perpendicularity k
25~80	0.05 or less
81~125	0.10 or less

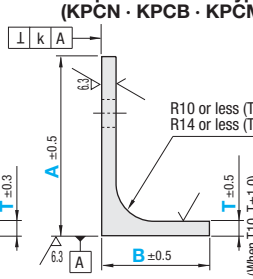
25 / (6.3 /)

Standard

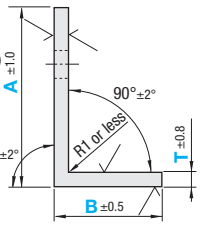




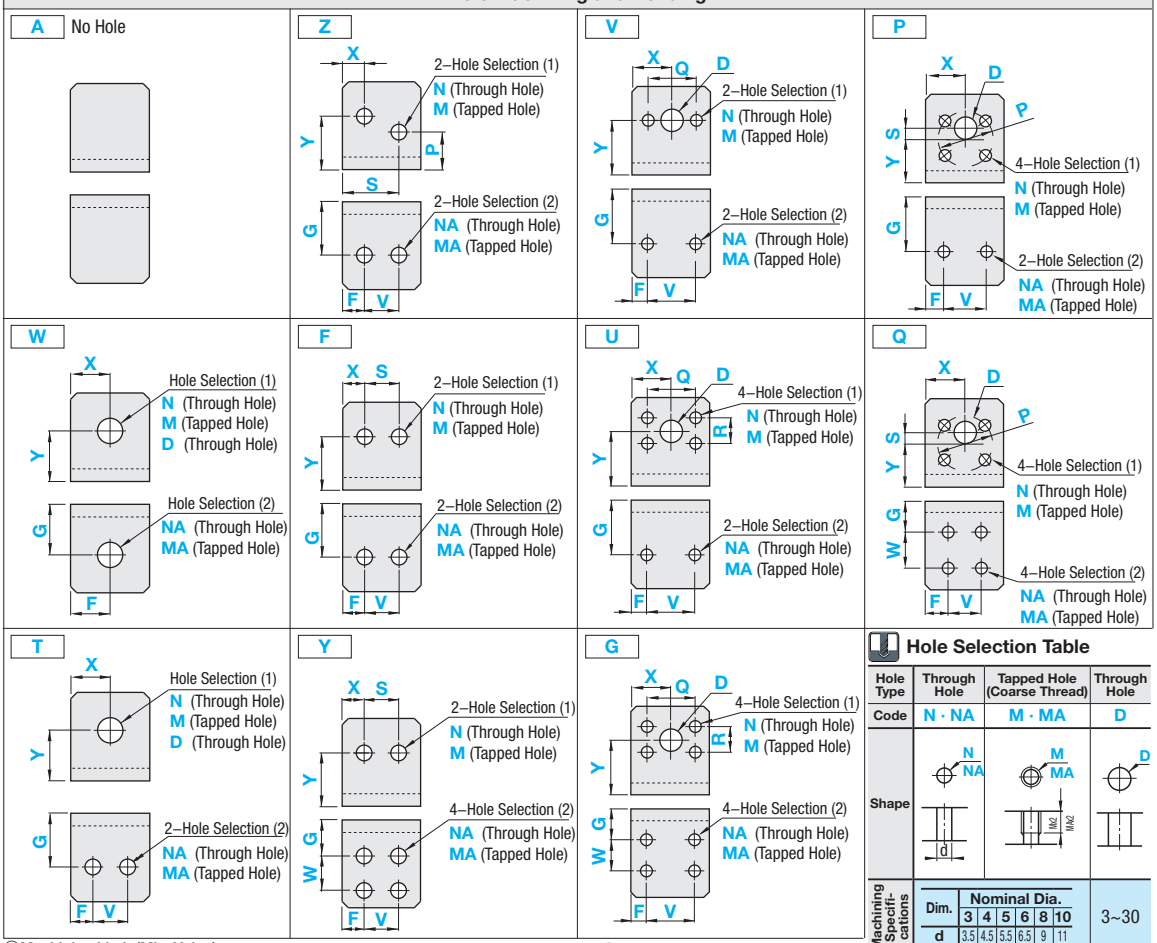
Shape of Material Type (KPCN · KPCB · KPCM)



Shape of Material Type (KPCA · KPCW · KPCE)



Hole Machining and Bending

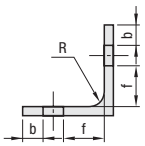


Hole Selection Table

Hole Type	Through Hole	Tapped Hole (Coarse Thread)	Through Hole
Code	N · NA	M · MA	D
Shape			
Machining Specifications Dim. d	3 / 3.5	4 / 4.5	5 / 5.5	6 / 6.5	8 / 9	10 / 11	3~30

Machining Limit (Min. Value)

Type		f		b
Standard		2		Refer to P.2742 2.Machining Limits (Distance Between Holes · Thickness between Holes and Edges)
Shape of Material Type	1.0040/Ust.42.2	T5 · T6	10	
		T10	14	
	EN AW-6063/AlMg0,7Si	2		



The range within AC selection can be specified in the following range.

B	AC			
	KPAN KPAB KPAM	KPCN KPCB KPCM KPAS	KPAA KPAW KPAE	KPCA KPCW KPCE
25	25~50	25~50	25~50	25~50
30	30~60	30~60	30~60	30~60
40	50~80	50~60	50~80	50~60
50	50~100	50~60	50~100	50~60

B	AC			
	KPAN KPAB KPAM	KPCN KPCB KPCM KPAS	KPAA KPAW KPAE	KPCA KPCW KPCE
60	100~125	–	100	100
100	100	–	–	–
125	125	–	–	–

Part Number			A	B	L	X	Y	F	G	V	Q	R	W	P	S	Hole Selection (1)		Hole Selection (2)		D
Type	Hole Machining	T Selection	Selection	Selection	Selection											Code	Nominal Dia.	Code	Nominal Dia.	0.5mm Increment
KPAN KPAB KPAM	A	5 6	25 30 40 50 30 40 50 60	25 30	25 30 40 50 60 70 80 90 100 150	0.1mm Increment										N	3 4 5 6	NA	3 4 5 6	3~30
		5 6 10	50 60 80	40	30 40 50 60 70 80 90 100 150															
		6 10	50 60 100	50																
			100 125	60																
		10	100	100	50 60 70 80 90 100 150															
			125	125																
KPCN KPCB KPCM	W T Z	5 6	25 30 40 50 30 40 50 60	25 30	25 30 40 50 60 70 80 90 100 150															
		10	50 60	40	30 40 50 60 70 80 90 100 150															
			50 60	50																
KPAA KPAW KPAE	F Y V U G	5 6	25 30 40 50 30 40 50 60	25 30	25 30 40 50 60 70 80 90 100 150											M	8 10	MA	8 10	
		5 6 10	50 60 80	40	30 40 50 60 70 80 90 100 150															
		6 10	50 60 100	50																
			100	60																
KPCA KPCW KPCE	P Q	5 6	25 30 40 50 30 40 50 60	25 30	25 30 40 50 60 70 80 90 100 150															
		5 6 10	50 60	40	30 40 50 60 70 80 90 100 150															
		6 10	50 60	50																
		10	100	60	50 60 70 80 90 100 150															
KPAS		5 6	25 30 40 50 30 40 50 60	25 30	25 30 40 50 60 70 80 90 100 150															
		5 6 8	50 60 50 60	40 50	30 40 50 60 70 80 90 100 150															

Order Example

Part Number: Type (Hole Machining) T – A – B – L – X – Y – F – G – V – Q – R – W – P – S – Hole Selection (1) Code · Nominal – Hole Selection (2) Code · Nominal – D

KPAA V 5 – A50 – B30 – L50 – X25 – Y30 – F10 – G20 – V30 – Q30 – M3 – NA5 – D16

KPAM Q 6 – A100 – B50 – L70 – X35 – Y70 – F10 – G20 – V50 – W35 – P45 – S5 – M3 – NA5 – D20

Days to Ship

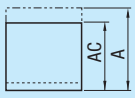
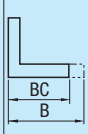
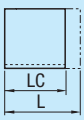
- KPAN · KPAA · KPAS · KPCN · KPCA — **10 Days**
- KPAB · KPAM · KPAW · KPAE · KPCB · KPCM · KPCW · KPCE — **13 Days**

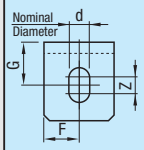
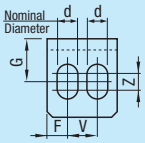
Price P.1756.

Alterations

Part Number: Type (Hole Machining) T – A (AC) – B (BC) – L (LC) – X – Y – F – G – V – Q – R – W – P – S – Hole Selection (1) Code · Nominal – Hole Selection (2) Code · Nominal – D (DC) – (VRC · URC...etc.)

KPAA V 5 – A50 – BC29 – L50 – X25 – Y30 – F10 – G20 – V30 – Q30 – M3 – NA5 – D16 – VRC – Z4

	Height (Dimension A)	Width (B Dimension)	Length (Dimension L)	D Hole Diameter
Alterations				
	For AC selection range, refer to P.2757.	B / BC: 25 / 20~24; 30 / 26~29; 40 / 31~39; 50 / 41~49; 60 / 51~59; 100 / 61~99; 125 / 101~124		
Code	AC	BC	LC	DC
Spec.	Cuts the A dimension. AC = 1mm Increment Ordering Code Specify dimension A as AC. (Ex.) A=35···›AC35 AC can be specified within the A dimension selection range. (Except when B25, 20≤AC≤A max.)	Cuts the B dimension. BC = 1 mm Increment Ordering Code Specify dimension B as BC. (Ex.) B=45···›BC45	Cuts the L dimension. LC = 1 mm Increment Ordering Code Specify dimension L as LC. (Ex.) L=75···›LC75 LC can be specified within the L dimension selection range. (Except when B25 or 30, 20≤LC≤L max.)	Changes the diameter of D hole. DC = 1 mm Increment Ordering Code Specify dimension D as DC. (Ex.) D=40···›DC40 31≤DC≤60
Price Adder	5,00	5,00	5,00	DC31~40 6,00 / DC41~50 8,00 / DC51~60 10,00

	NA (Through Hole) to Slot Hole						
Alterations							
Code	WRC	TRC	ZRC	FRC	VRC	URC	PRC
Spec.	Applicable to Hole Machining W Z = 1mm Increment Ordering Code WRC–Z5 Z≤NAx3	Applicable to Hole Machining T Z = 1mm Increment Ordering Code TRC–Z5 Z≤NAx3	Applicable to Hole Machining Z Z = 1mm Increment Ordering Code ZRC–Z5 Z≤NAx3	Applicable to Hole Machining F Z = 1mm Increment Ordering Code FRC–Z5 Z≤NAx3	Applicable to Hole Machining V Z = 1mm Increment Ordering Code VRC–Z5 Z≤NAx3	Applicable to Hole Machining U Z = 1mm Increment Ordering Code URC–Z5 Z≤NAx3	Applicable to Hole Machining P Z = 1mm Increment Ordering Code PRC–Z5 Z≤NAx3
Price Adder	5,00	10,00	10,00	10,00	5,00	10,00	10,00

Machined L-Shaped Brackets

–Price List–

Price

Volume Discount (Round down to one Cent.) P.87

Quantity	1~4	5~9	10~19	20~49
Rate	€ Unit Price	5%	10%	15%

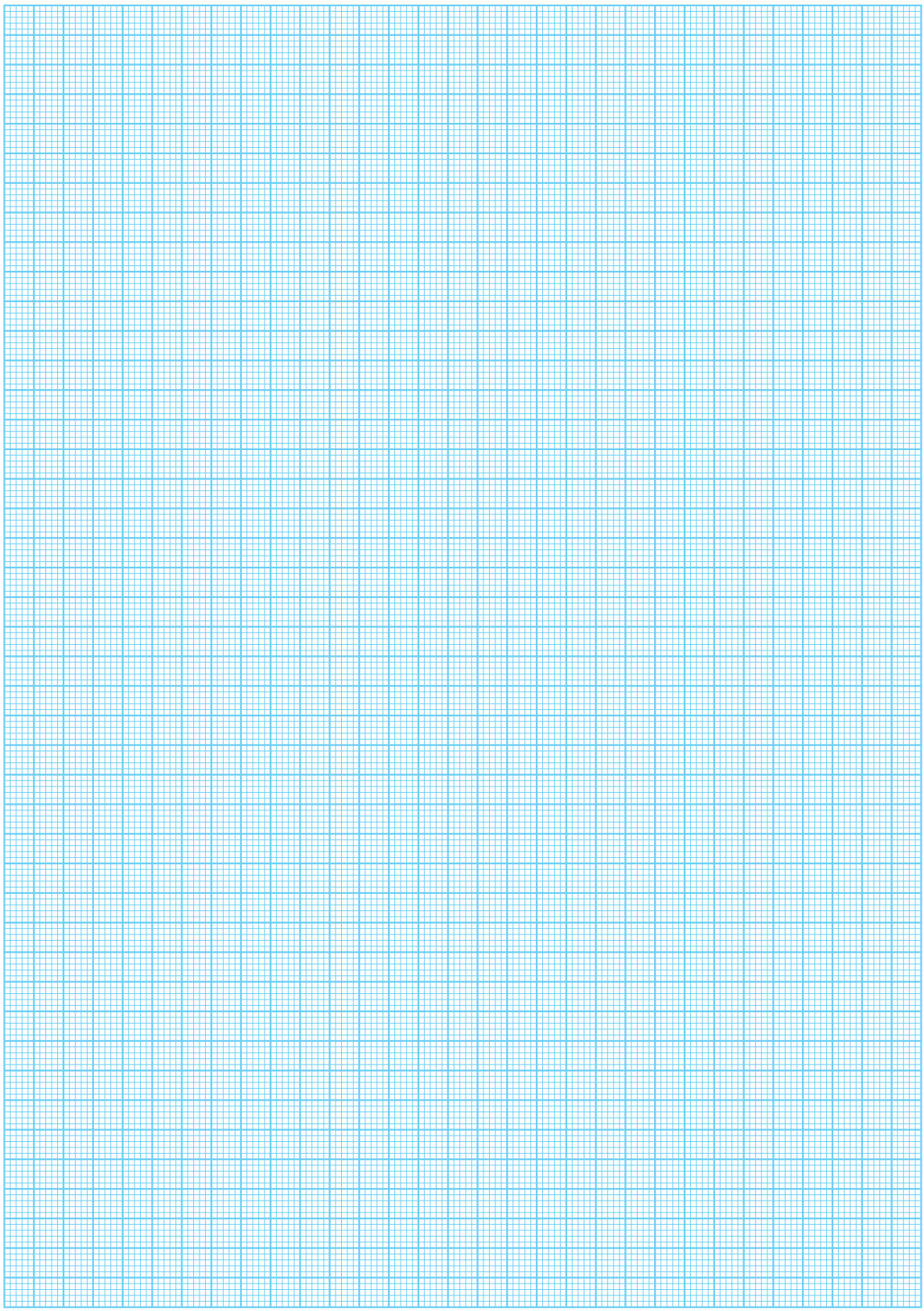
For orders larger than indicated values, please request for quotation.

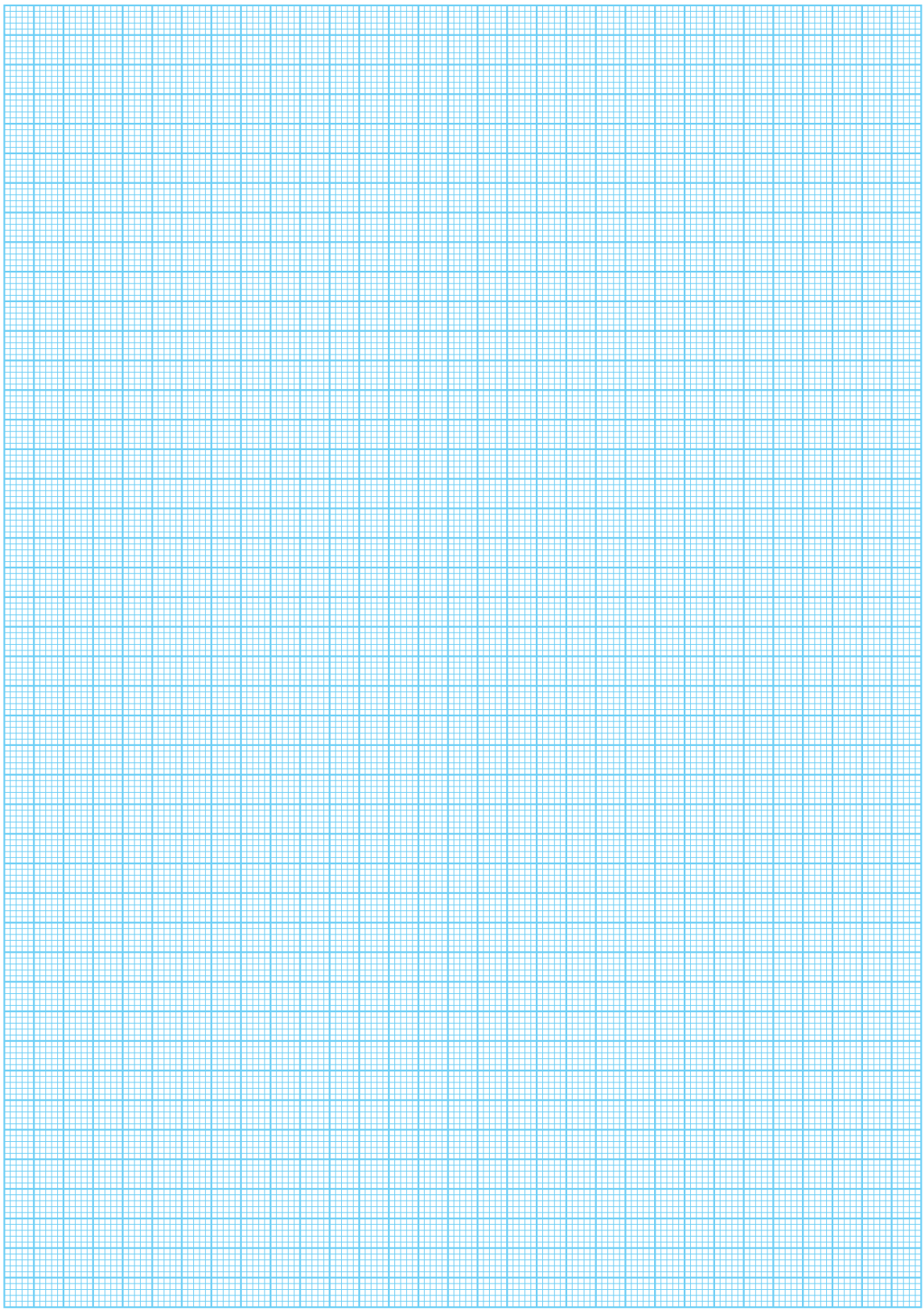
Multiply material rate to the body price, and add hole machining charge.

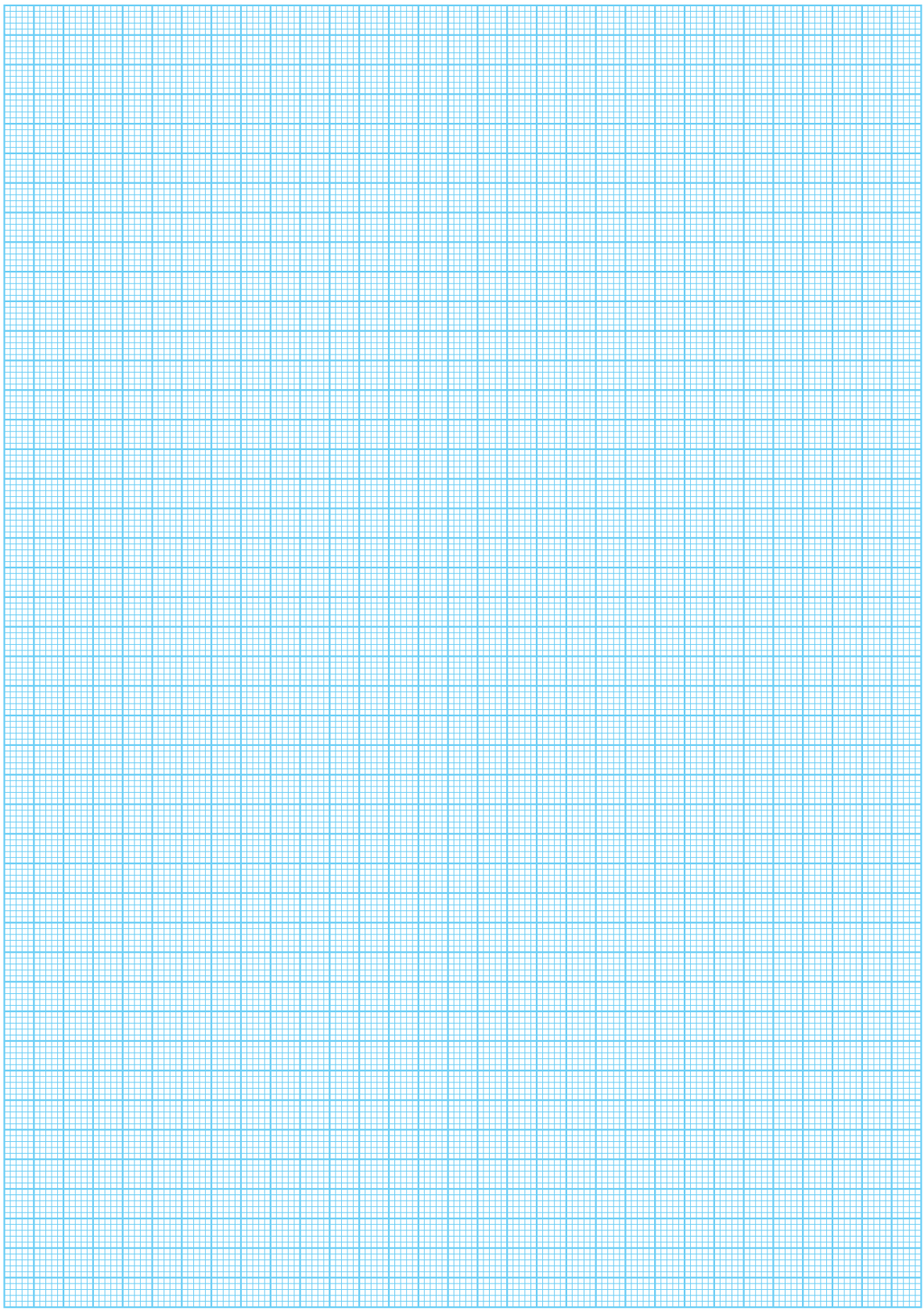
Type (Material Rate)	T	B	A	€ Unit Price Qty. 1~4										Hole Machining Price (€ Body Price+)						
				L25	L30	L40	L50	L60	L70	L80	L90	L100	L150	W	T	Z · F	Y	V	U · P	G · Q
KPAN (x1.0)	5	25	25																	
			30																	
			40																	
			50																	
		30	30																	
	6		40																	
			50																	
			60																	
		40	50																	
			60																	
			80																	
	10		50																	
			60																	
			80																	
KPCN (x0.85)	6	50	50																	
			60																	
			100																	
	10		50																	
			60																	
			100																	
	6	60	100																	
			125																	
	10		100																	
			125																	
	10	100	100																	
	10	125	125																	
KPAB (x1.0)	5	25	25																	
			30																	
			40																	
			50																	
		30	30																	
	6		40																	
			50																	
			60																	
		40	50																	
			60																	
			80																	
	10		50																	
			60																	
			80																	
KPCB (x0.85)	6	50	50																	
			60																	
			100																	
	10		50																	
			60																	
			100																	
	6	60	100																	
			125																	
	10		100																	
			125																	
	10	100	100																	
	10	125	125																	
KPAM (x1.0)	5	25	25																	
			30																	
			40																	
			50																	
		30	30																	
	6		40																	
			50																	
			60																	
		40	50																	
			60																	
			80																	
	10		50																	
			60																	
			80																	
KPCM (x0.85)	6	50	50																	
			60																	
			100																	
	10		50																	
			60																	
			100																	
	6	60	100																	
			125																	
	10		100																	
			125																	
	10	100	100																	
	10	125	125																	

Select the combination of A, B and T dimension for material shape type (KPCN · KPCB · KPCM · KPCA · KPCW · KPCE) from the list on P.1754.

Type (Material Rate)	T	B	A	€ Unit Price Qty. 1~4										Hole Machining Price (€ Body Price+)						
				L25	L30	L40	L50	L60	L70	L80	L90	L100	L150	W	T	Z · F	Y	V	U · P	G · Q
KPAA (x1.0) KPCA (x0.6)	5 6	25	25																	
			30																	
			40																	
			50																	
		30	30																	
			40																	
			50																	
			60																	
		40	50																	
			60																	
			80																	
	10		50																	
			60																	
			80																	
	6	50	50																	
			60																	
			100																	
	10		50																	
			60																	
			100																	
	6	60	100																	
	10		100																	
KPAW (x1.0) KPCW (x0.6)	5 6	25	25	13,0 0																
			30																	
			40																	
			50																	
		30	30																	
			40																	
			50																	
			60																	
		40	50																	
			60																	
			80																	
	10		50																	
			60																	
			80																	
	6	50	50																	
			60																	
			100																	
	10		50																	
			60																	
			100																	
	6	60	100																	
	10		100																	
KPAE (x1.0) KPCE (x0.6)	5 6	25	25																	
			30																	
			40																	
			50																	
		30	30																	
			40																	
			50																	
			60																	
		40	50																	
			60																	
			80																	
	10		50																	
			60																	
			80																	
	6	50	50																	
			60																	
			100																	
	10		50																	
			60																	
			100																	
	6	60	100																	
	10		100																	
KPAS (x1.0)	5 6	25	25																	
			30																	
			40																	
			50																	
		30	30																	
			40																	
			50																	
			60																	
		40	50																	
			60																	
	8		50																	
			60																	
	5 6	50	50																	
			60																	
	8		50																	
			60																	







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[Technical Data]
SI (International System of Units) Excerpt from JIS Z 8203(2000)

1. International System of Units(SI)and Usage.

1-1. Scope of Application This standard specifies how to use the International System of Units(SI)and other international unitary systems, as well as units used in correlation with units from international systems, and other units which may be used.

1-2. Terms and Definitions Terminology used in this specification and definitions thereof are as follows.

(1) International System of Units(SI) Coherent system of units adopted and recommended by the International Committee on Weights and Measures. It contains base units and supplementary units, units derived from them and their integral exponents to the 10th power.

(2) SI Unit Generic term used to describe base units, supplementary units or derived units of the International System of Units(SI).

(3) 1 Base Unit Those units are given in **Table 1**.

(4) 2 Supplementary Units Those supplementary units are given in **Table 2**.

Table 1. Base Units

Base Quantity	Unit	Symbol	Definition
Length	Meter	m	A meter is the length of the path traveled by light in a vacuum during a time interval of $\frac{1}{299\ 792\ 458}$ of a second.
Mass	Kilogram	kg	A kilogram is a unit of mass(neither weight nor force), it is equal to the mass of the international prototype of the kilogram.
Time	Second	s	A second is the duration of 9 192 631 770 periods of radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium 133 atom.
Current	Ampere	A	An ampere is that constant current which, if maintained in two straight parallel conductors of infinite length, of negligible circular cross-section, and placed 1 meter apart in a vacuum, would produce between these conductors a force equal to 2×10^{-7} Newton per meter of length.
Thermodynamic Temperature	Kelvin	K	Kelvin, a unit of thermodynamic temperature, is the fraction $\frac{1}{273.16}$ of the thermodynamic temperature of the triple point of water.
Amount of Substance	Mole	mol	A mole is the amount of substance of a system that contains as many elementary particles(1) or aggregation of elementary particles as there are atoms in 0.012 kilogram of carbon 12 and when the mole is used, the elementary particles must be specified.
Luminance Intensity	Candela	cd	A candela is the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540×10^{12} hertz and that has a radiant intensity in that direction of $\frac{1}{683}$ watt per steradian.

Note(1) The elementary particles here must be atoms, molecules, ions, electrons or other particles.

Table 2. Supplementary Units

Base Quantity	Unit	Symbol	Definition
Plane Angle	Radian	rad	A radian is the plane angle between two radii of a circle that cuts off an arc on the circumference equal in length to the radius.
Solid Angle	Steradian	sr	A steradian is the solid angle which, having its vertex in the center of a sphere, cuts off an area of the surface of the sphere equal to that of a square with sides equal in length to the radius of the sphere.

(5)3 Derived Units The supplementary units algebraically expressed using mathematical symbols such as plus, minus, etc. The SI derived units with special names and symbols are given in Table 3.

Examples of SI Derived Units Expressed in Terms of Base Units

Base Quantity	Base Quantity	
	Name	Symbol
Area	Square	m^2
Volume	Cubic Meter	m^3
Velocity	Meter/Second	m/s
Acceleration	Meter/Second×2	m/s^2
Wave Number	Every Meter	m^{-1}
Density	Kilogram Every Cubic Meter	kg/m^3
Current Density	Ampere Every Square Meter	A/m^2
Magnetic Field Strength	Ampere Every Meter	A/m
Concentration (of Substance)	Mole Every Cubic Meter	mol/m^3
Specific Volume	Cubic Meter Every Kilogram	m^3/kg
Luminance	Candela Every Square Meter	cd/m^2

Table 3 SI Derived Units with Special Names and Symbols

Base Quantity	Base Quantity		Expression in Terms of Base Units or Supplementary Units, Supplementary Units or Other SI Units
	Name	Symbol	
Frequency	Hertz	Hz	1 Hz =1 s^{-1}
Force	Newton	N	1 N =1 $kg\cdot m/s^2$
Pressure, Stress	Pascal	Pa	1 Pa =1 N/m^2
Energy, Work, Heat Quantity	Joule	J	1 J =1 N·m
Work Rate, Process Rate, Power, Electric Power	Watt	W	1 W =1 J/s
Electric Charge, Quantity of Electricity	Coulomb	C	1 C =1 A·s
Electric Potential, Potential Difference, Voltage, Electromotive Force	Volts	V	1 V =1 J/C
Electrostatic Capacity, Capacitance	Farad	F	1 F =1 C/V
Electric Resistance	Ohm	Ω	1 Ω =1 V/A
Conductance	Siemens	S	1 S =1 Ω^{-1}
Magnetic Flux	Weber	Wb	1 Wb =1 V·s
Magnetic Flux Density	Tesla	T	1 T =1 Wb/m^2
Inductance	Henry	H	1 H =1 Wb/A
Celsius Temperature	Degree Celsius or Degree	℃	1 t℃ =(t+273.15)k
Luminous Flux	Lumen	lm	1 lm =1 cd·sr
Illuminance	Lux	lx	1 lx =1 lm/m^2
Radioactivity	Becquerel	Bq	1 Bq =1 s^{-1}
Absorbed Dose	Gray	Gy	1 Gy =1 J/kg
Dose Equivalent	Sievert	Sv	1 Sv =1 J/kg

1-3. Multiples of 10 of SI Units

(1)Prefix The multiples and the names and symbols of prefixes to express integer multiples of 10 of SI Units are shown in Table 4.

Table 4 Prefix.

Multiples of Unit	Prefix		Multiples of Unit	Prefix		Multiples of Unit	Prefix	
	Name	Symbol		Name	Symbol		Name	Symbol
10^{18}	Exsa	E	10^{2}	Hecto	h	10^{-9}	Nano	n
10^{15}	Peta	P	10^{1}	Deca	da	10^{-12}	Pico	p
10^{12}	Tera	T	10^{-1}	Deci	d	10^{-15}	Femto	f
10^{9}	Giga	G	10^{-2}	Centi	c	10^{-18}	Atto	a
10^{6}	Mega	M	10^{-3}	Milli	m			
10^{3}	Kilo	k	10^{-6}	Micro	μ			

2. Conversion Tables for SI and Conventional Units

(The units enclosed by thick lines are the SI units.)

	N	dyn	kgf
Force	1	1×10^{5}	$1.019\ 72\times10^{-1}$
	1×10^{-5}	1	$1.019\ 72\times10^{-6}$
	9.806 65	$9.806\ 65\times10^{5}$	1

	Pa·s	cP	P
Viscosity	1	1×10^{3}	1×10
	1×10^{-3}	1	1×10^{-2}
	1×10^{-1}	1×10^{2}	1

Note) $1P=1dyn\cdot s/cm^2=1g/cm\cdot s$
$1Pa\cdot s=1N\cdot s/m^2$, $1cP=1mPa\cdot s$

	Pa or N/m²	**MPa or N/mm²**	kgf/mm²	kgf/cm²
Stress	1	1×10^{-6}	$1.019\ 72\times10^{-7}$	$1.019\ 72\times10^{-5}$
	1×10^{6}	1	$1.019\ 72\times10^{-1}$	$1.019\ 72\times10$
	$9.806\ 65\times10^{6}$	9.806 65	1	1×10^{2}
	$9.806\ 65\times10^{4}$	$9.806\ 65\times10^{-2}$	1×10^{-2}	1

Note) $1Pa=1N/m^2$, $1MPa=1N/mm^2$

	m²/s	cSt	St
Kinematic Viscosity	1	1×10^{6}	1×10^{4}
	1×10^{-6}	1	1×10^{-2}
	1×10^{-4}	1×10^{2}	1

Note) $1St=1cm^2/s$, $1cSt=1mm^2/s$

	Pa	**kPa**	**MPa**	bar	kgf/cm²	atm	mmH_2O	mmHg or Torr
Pressure	1	1×10^{-3}	1×10^{-6}	1×10^{-5}	$1.019\ 72\times10^{-5}$	$9.869\ 23\times10^{-6}$	$1.019\ 72\times10^{-1}$	$7.500\ 62\times10^{-3}$
	1×10^{3}	1	1×10^{-3}	1×10^{-2}	$1.019\ 72\times10^{-2}$	$9.869\ 23\times10^{-3}$	$1.019\ 72\times10^{2}$	7.500 62
	1×10^{6}	1×10^{3}	1	1×10	$1.019\ 72\times10$	9.869 23	$1.019\ 72\times10^{5}$	$7.500\ 62\times10^{3}$
	1×10^{5}	1×10^{2}	1×10^{-1}	1	1.019 72	$9.869\ 23\times10^{-1}$	$1.019\ 72\times10^{4}$	$7.500\ 62\times10^{2}$
	$9.806\ 65\times10^{4}$	$9.806\ 65\times10$	$9.806\ 65\times10^{-2}$	$9.806\ 65\times10^{-1}$	1	$9.678\ 41\times10^{-1}$	1×10^{4}	$7.355\ 59\times10^{2}$
	$1.013\ 25\times10^{5}$	$1.013\ 25\times10^{2}$	$1.013\ 25\times10^{-1}$	1.013 25	1.033 23	1	$1.033\ 23\times10^{4}$	$7.600\ 00\times10^{2}$
	9.806 65	$9.806\ 65\times10^{-3}$	$9.806\ 65\times10^{-6}$	$9.806\ 65\times10^{-5}$	1×10^{-4}	$9.678\ 41\times10^{-5}$	1	$7.355\ 59\times10^{-2}$
	$1.333\ 22\times10^{2}$	$1.333\ 22\times10^{-1}$	$1.333\ 22\times10^{-4}$	$1.333\ 22\times10^{-3}$	$1.359\ 51\times10^{-3}$	$1.315\ 79\times10^{-3}$	$1.359\ 51\times10$	1

Note) $1Pa=1N/m^2$

	J	kW·h	kgf·m	kcal
Work, Energy, Heat Quantity	1	$2.777\ 78\times10^{-7}$	$1.019\ 72\times10^{-1}$	$2.388\ 89\times10^{-4}$
	$3.600\ \times10^{6}$	1	$3.670\ 98\times10^{5}$	$8.600\ 0\ \times10^{2}$
	9.806 65	$2.724\ 07\times10^{-6}$	1	$2.342\ 70\times10^{-3}$
	$4.186\ 05\times10^{3}$	$1.162\ 79\times10^{-3}$	$4.268\ 58\times10^{2}$	1

Note) $1Pa=1N/m^2$, $1MPa=1N/mm^2$

	W	kgf·m/s	PS	kcal/h
Power Heat Flow	1	$1.019\ 72\times10^{-1}$	$1.359\ 62\times10^{-3}$	$8.600\ 0\ \times10^{-1}$
	9.806 65	1	$1.333\ 33\times10^{-2}$	8.433 71
	$7.355\ \times10^{2}$	$7.5\ \times10$	1	$6.325\ 29\times10^{2}$
	1.162 79	$1.185\ 72\times10^{-1}$	$1.580\ 95\times10^{-3}$	1

Note) Note1W=1J/s, PS:French Horsepower

	W/(m·K)	kcal/(h·m·°C)
Thermal Conductivity	1	$8.600\ 0\times10^{-1}$
	1.162 79	1

	W/(m²·K)	kcal/(h·m²·°C)
Coefficient of Heat Transfer	1	$8.600\ 0\times10^{-1}$
	1.162 79	1

	J/(kg·K)	kcal/(kg·°C) cal/(g·°C)
Specific Heat	1	$2.388\ 89\times10^{-4}$
	$4.186\ 05\times10^{3}$	1

[Technical Data] Quantifiers, Unit Symbols, Chemical Symbols and Symbols of Elements Excerpts from JIS Z 8202
Calculation of Cubic Volume and Weight / Physical Properties of Materials

Greek Symbols

Uppercase	Lowercase	Pronunciation	Conventional Usage
A	α	alpha	Angle, Coefficient
B	β	beta	Angle, Coefficient
Γ	γ	gamma	Angle, Weight Per Unit Area, Relationship(Uppercase)
Δ	δ	delta	Small Change, Density, Displacement
E	ε	epsilon	Small Amount, Distortion
Z	ζ	zeta	Variable
H	η	eta	Variable
Θ	θ	theta	Angle, Temperature, Time
I	ι	iota	
K	κ	kappa	Radius of Gyration
Λ	λ	lambda	Wavelength, Characteristic Value
M	μ	mu	Friction Coefficient 10^{-6}(Micro)
N	ν	nu	Frequency
Ξ	ξ	xi	Variable
O	o	omicron	
Π	π	pi	Circle Ratio(3.14159...) Angle Symbol of Product(Uppercase)
P	ρ	rho	Radius, Density
Σ	σ	sigma	Stress, Standard Deviation Summation(Uppercase)
T	τ	tau	Time Constant, Time, Torque
Υ	υ	upsilon	
Φ	ϕ, φ	phi	Angle, Function, Diameter
X	χ	chi	
Ψ	ψ	psi	Angle, Function
Ω	ω	omega	Angular Verocity=2πf Ohm:Unit of Electric Resistance(Uppercase)

Reference unless otherwise specified, lowercase letters are the norm.

Characteristics of Materials

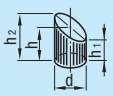
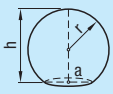
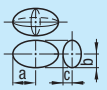
Material	Specific Gravity	Thermal Expansion Coefficient ×10⁻⁶/°C	Young's Modulus {Kgf/mm²}
Mild Steel	7.85	11.7	21000
NAK80® (Daido Steel)	7.8	12.5	20500
1.2379/X155CrVMo12-1	7.85	11.7	21000
1.2344/X40CrMoV5-1	7.75	10.8	21000
1.3343/S6-5-2	8.2	10.1	22300
Carbide V30	14.1	6.0	56000
Carbide V40	13.9	6.0	54000
Cast Iron	7.3	9.2~11.8	7500~10500
1.4301/X5CrNi18-10	8.0	17.3	19700
1.4125/X105CrMo17	7.78	10.2	20400
Oxygen Free Coppers CW008A	8.9	17.6	11700
6/4 Brass CW509L	8.4	20.8	10300
Beryllium Copper C1720	8.3	17.1	13000
Aluminum EN AW-1100	2.7	23.6	6900
Duralumin EN AW-7075	2.8	23.6	7200
Titanium	4.5	8.4	10600

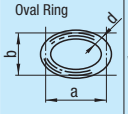
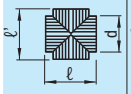
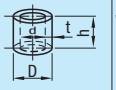
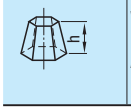
Name of Elements and Atomic Symbols

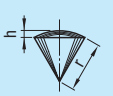
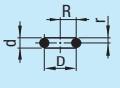
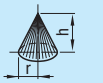
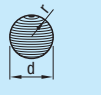
Atomic Number	Name	Symbol	Atomic Number	Name	Symbol
1	Hydrogen	H	53	Iodine	I
2	Helium	He	54	Xenon	Xe
3	Lithium	Li	55	Cesium	Cs
4	Beryllium	Be	56	Barium	Ba
5	Boron	B	57	Lanthanum	La
6	Carbon	C	58	Cerium	Ce
7	Nitrogen	N	59	Praseodymium	Pr
8	Oxygen	O	60	Neodymium	Nd
9	Fluorine	F	61	Promethium	Pm
10	Neon	Ne	62	Samarium	Sm
11	Sodium	Na	63	Europium	Eu
12	Magnesium	Mg	64	Gadolinium	Gd
13	Aluminum	Al	65	Terbium	Tb
14	Silicon	Si	66	Dysprosium	Dy
15	Phosphorous	P	67	Holmium	Ho
16	Sulfur	S	68	Erbium	Er
17	Chlorine	Cl	69	Thulium	Tm
18	Argon	Ar	70	Ytterbium	Yb
19	Potassium	K	71	Lutetium	Lu
20	Calcium	Ca	72	Hafnium	Hf
21	Scandium	Sc	73	Tantalum	Ta
22	Titanium	Ti	74	Tungsten	W
23	Vanadium	V	75	Rhenium	Re
24	Chromium	Cr	76	Osmium	Os
25	Manganese	Mn	77	Iridium	Ir
26	Iron	Fe	78	Platinum	Pt
27	Cobalt	Co	79	Gold	Au
28	Nickel	Ni	80	Mercury	Hg
29	Copper	Cu	81	Thallium	Tl
30	Zinc	Zn	82	Lead	Pb
31	Gallium	Ga	83	Bismuth	Bi
32	Germanium	Ge	84	Polonium	Po
33	Arsenic	As	85	Astatine	At
34	Selenium	Se	86	Radon	Rn
35	Bromine	Br	87	Francium	Fr
36	Krypton	Kr	88	Radium	Ra
37	Rubidium	Rb	89	Actinium	Ac
38	Strontium	Sr	90	Thorium	Th
39	Yttrium	Y	91	Protactinium	Pa
40	Zirconium	Zr	92	Uranium	U
41	Niobium	Nb	93	Neptunium	Np
42	Molybdenum	Mo	94	Plutonium	Pu
43	Technetium	Tc	95	Americium	Am
44	Ruthenium	R	96	Curium	Cm
45	Rhodium	Rh	97	Berkelium	Bk
46	Palladium	Pd	98	Californium	Cf
47	Silver	Ag	99	Einsteinium	Es
48	Cadmium	Cd	100	Fermium	Fm
49	Indium	In	101	Mendelevium	Md
50	Tin	Sn	102	Nobelium	No
51	Antimony	Sb	103	Lawrencium	Lr
52	Tellurium	T			

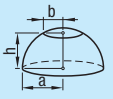
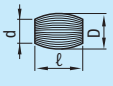
Reference This table is based on Appendix A(Names and Symbols of Elements)of ISO 31/8-1980 (Amounts and Units of Physical Chemistry and Molecular Physics) and Appendix C(Names and Symbols of Radionuclides) of ISO 31/9-1980(Amounts and Units of Atomic Physics and Nuclear Physics).

How to Calculate the Volume

Solid	Volume V
Turncated Cylinder 	$V=\frac{\pi}{4}d^2h$ $=\frac{\pi}{4}d^2\left(\frac{h_1+h_2}{2}\right)$
Pyramid 	$V=\frac{h}{3}A=\frac{h}{6}arn$ A=Area of Base r=Radius of inscribed circle a=Length of a side of a regular polygon n=Number of the sides of a regular polygon
Spherical Crown 	$V=\frac{\pi h^2}{3}(3r-h)$ $=\frac{\pi h}{6}(3a^2+h^2)$ a is the radius.
Ellipsoid 	$V=\frac{4}{3}\pi abc$ In case of spheroid (b=c) $V=\frac{4}{3}\pi ab^2$

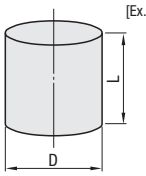
Solid	Volume V
Oval Ring 	$V=\frac{\pi^2}{4}d^2\frac{\sqrt{a^2+b^2}}{2}$
Cross Cylinder 	$V=\frac{\pi}{4}d^2\left(\ell+\ell'-\frac{d}{3}\right)$
Hollow(Cylinder) 	$V=\frac{\pi}{4}h(D^2-d^2)$ $=\pi th(D-t)$ $=\pi th(d+t)$
Turncated Pyramid 	$V=\frac{h}{3}(A+a+\sqrt{Aa})$ A.a=Area of both ends

Solid	Volume V
Spherical Segment 	$V=\frac{2}{3}\pi r^2h$ $=2.0944r^2h$
Torus 	$V=2\pi^2Rr^2$ $=19.739Rr^2$ $=\frac{\pi^2}{4}Dd^2$ $=2.4674Dd^2$
Circular Cone 	$V=\frac{\pi}{3}r^2h$ $=1.0472r^2h$
Sphere 	$V=\frac{4}{3}\pi r^3=4.1888r^3$ $=\frac{\pi}{6}d^3=0.5236d^3$

Solid	Volume V
Spherical Belt 	$V=\frac{\pi h}{6}(3a^2+3b^2+h^2)$
Barrel 	When the circumference makes a curve equal to the circular arc, $V=\frac{\pi\ell}{12}(2D^2+d^2)$ When the circumference makes a curve equal to a parabolic line, $V=0.209\ell(2D^2Dd+1/4d^2)$

How to Calculate the Weight

Weight W[g]= Volume[cm³]× Specific Gravity



[Ex.]Material:Mild Steel

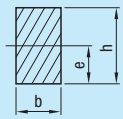
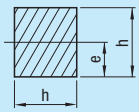
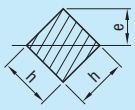
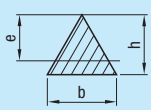
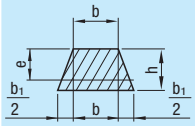
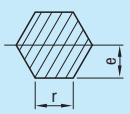
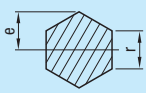
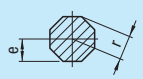
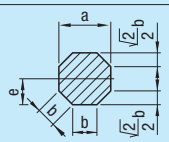
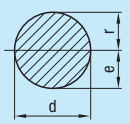
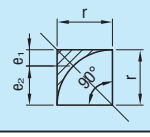
D=Ø16 L=50mm the weight is:

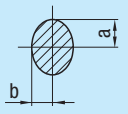
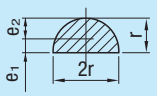
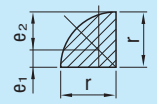
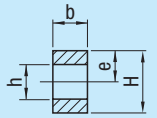
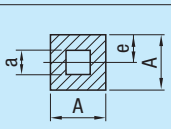
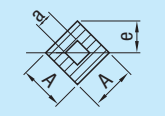
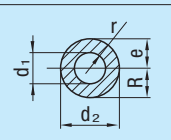
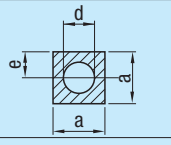
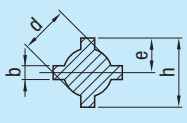
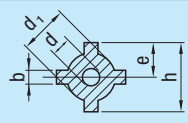
The specific gravity of W= $\frac{\pi}{4}D^2\times L\times W$

$=\frac{\pi}{4}\times1.6^2\times5\times7.85$

≈79[g]

[Technical Data]
Calculation of Area, Center of Gravity and Geometrical Moment of Inertia

Cross Section	A	e	I	Z=I/e
	bh	$\frac{h}{2}$	$\frac{bh^3}{12}$	$\frac{bh^2}{6}$
	h^2	$\frac{h}{2}$	$\frac{h^4}{12}$	$\frac{h^3}{6}$
	h^2	$\frac{h}{2}\sqrt{2}$	$\frac{h^4}{12}$	$0.1179h^3=\frac{\sqrt{2}}{12}h^3$
	$\frac{bh}{2}$	$\frac{2}{3}h$	$\frac{bh^3}{36}$	$\frac{bh^2}{24}$
	$(2b+b_1)\frac{h}{2}$	$\frac{1}{3}\times\frac{3b+2b_1}{2b+b_1}h$	$\frac{6b^2+6bb_1+b_1^2}{36(2b+b_1)}h^3$	$\frac{6b^2+6bb_1+b_1^2}{12(3b+2b_1)}h^2$
	$\frac{3\sqrt{3}}{2}r^2$ $=2.598r^2$	$\sqrt{\frac{3}{4}}r=0.886r$	$\frac{5\sqrt{3}}{16}r^4=0.5413r^4$	$\frac{5}{8}r^3$
		r		$\frac{5\sqrt{3}}{16}r^3=0.5413r^3$
	$2.828r^2$	$0.924r^2$	$\frac{1+2\sqrt{2}}{6}r^4$ $=0.6381r^4$	$0.6906r^3$
	$0.8284a^2$	$b=\frac{a}{1+\sqrt{2}}$ $=0.4142a$	$0.0547a^4$	$0.1095a^3$
	$\pi r^2=\frac{\pi d^2}{4}$	$\frac{d}{2}$	$\frac{\pi d^4}{64}=\frac{\pi r^4}{4}$ $=0.0491d^4$ $\approx 0.05d^4$ $=0.7854r^4$	$\frac{\pi d^3}{32}=\frac{\pi r^3}{4}$ $=0.0982d^3$ $\approx 0.1d^3$ $=0.7854r^3$
	$r^2\left(1-\frac{\pi}{4}\right)$ $=0.2146r^2$	$e_1=0.2234r$ $e_2=0.7766r$	$0.0075r^4$	$\frac{0.0075r^4}{e_2}$ $=0.00966r^3$ $\approx 0.01r^3$

Cross Section	A	e	I	Z=I/e
	πab	a	$\frac{\pi}{4}ba^3=0.7854\,ba^3$	$\frac{\pi}{4}ba^2=0.7854\,ba^2$
	$\frac{\pi}{2}r^2$	$e_1=0.4244r$ $e_2=0.5756r$	$\left(\frac{\pi}{8}-\frac{8}{9\pi}\right)r^4$ $=0.1098r^4$	$Z_1=0.2587r^3$ $Z_2=0.1908r^3$
	$\frac{\pi}{4}r^2$	$e_1=0.4244r$ $e_2=0.5756r$	$0.055r^4$	$Z_1=0.1296r^3$ $Z_2=0.0956r^3$
	$b(H-h)$	$\frac{H}{2}$	$\frac{b}{12}(H^3-h^3)$	$\frac{b}{6H}(H^3-h^3)$
	A^2-a^2	$\frac{A}{2}$	$\frac{A^4-a^4}{12}$	$\frac{1}{6}\frac{A^4-a^4}{A}$
	A^2-a^2	$\frac{A}{2}\sqrt{2}$	$\frac{A^4-a^4}{12}$	$\frac{A^4-a^4}{12A}\sqrt{2}$ $=\frac{0.1179(A^4-a^4)}{A}$
	$\frac{\pi}{4}(d_2^2-d_1^2)$	$\frac{d_2}{2}$	$\frac{\pi}{64}(d_2^4-d_1^4)$ $=\frac{\pi}{4}(R^4-r^4)$	$\frac{\pi}{32}\left(\frac{d_2^4-d_1^4}{d_2}\right)$ $=\frac{\pi}{4}\times\frac{R^4-r^4}{R}$
	$a^2-\frac{\pi d^2}{4}$	$\frac{a}{2}$	$\frac{1}{12}\left(a^4-\frac{3\pi}{16}d^4\right)$	$\frac{1}{6a}\left(a^4-\frac{3\pi}{16}d^4\right)$
	$2b(h-d)$ $+\frac{\pi}{4}d^2$	$\frac{h}{2}$	$\frac{1}{12}\left\{\frac{3\pi}{16}d^4+b(h^3-d^3)+b^3(h-d)\right\}$	$\frac{1}{6h}\left\{\frac{3\pi}{16}d^4+b(h^3-d^3)+b^3(h-d)\right\}$
	$2b(h-d)+$ $\frac{\pi}{4}(d_1^2-d^2)$	$\frac{h}{2}$	$\frac{1}{12}\left\{\frac{3\pi}{16}(d_1^4-d^4)+b(h^3-d_1^3)+b^3(h-d_1)\right\}$	$\frac{1}{6h}\left\{\frac{3\pi}{16}(d_1^4-d^4)+b(h^3-d_1^3)+b^3(h-d_1)\right\}$

A:Sectional area e:Distance of Center of Gravity I:Geometrical Moment of Inertia
Z=I/e:Cross Section Coefficient

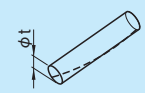
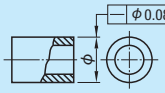
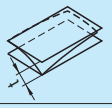
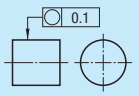
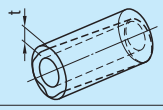
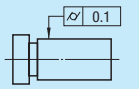
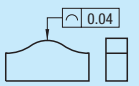
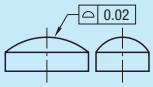
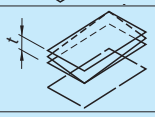
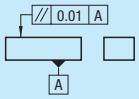
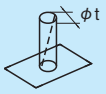
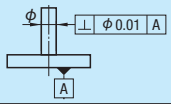
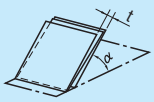
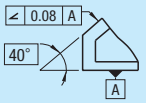
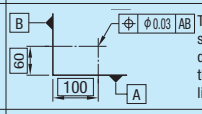
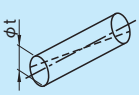
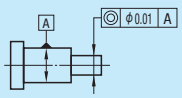
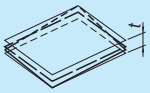
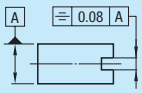
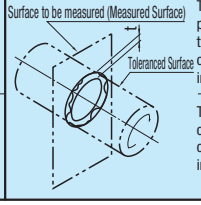
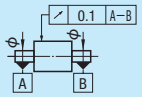
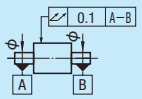
[Technical Data]
Roughness Ranges by Various Processes

Arithmetic Average Roughness Ra		0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50	100
Traditional Roughness Notations	Maximum Height Rmax.	0.1 –S	0.2 –S	0.4 –S	0.8 –S	1.6 –S	3.2 –S	6.3 –S	12.5 –S	25 –S	50 –S	100 –S	200 –S	400 –S
	Reference Value of Standard Length (mm)	0.25				0.8			2.5		8		25	
	Finish Symbol	▽▽▽▽				▽▽▽			▽▽		▽		–	
Processes	Forging								Precise					
	Casting								Precise					
	Die Casting													
	Hot Rolling													
	Cold Rolling													
	Drawing													
	Extruding													
	Tumbling													
	Sand Blasting													
	Rolling													
	Face Milling						Precise							
	Planing													
	Carving / Slotting													
	Milling						Precise							
	Precision Boring													
	Filing						Precise							
	Round Turning				Precise		Fine		Medium			Coarse		
	Boring						Precise							
	Drilling													
	Reaming					Precise								
	Broaching					Precise								
	Shaping													
	Milling			Precise	Fine		Medium			Coarse				
	Honing			Precise										
	Stone Lapping	Precise												
	Buff Finishing			Precise										
	Fine Sanding			Precise										
	Lapping	Precise												
	Hydro Honing			Precise										
	Burnishing													
	Roller Finishing													
	Sinker EDM													
	Wire EDM													
	Chemical Polishing						Precise							
	Electropolishing		Precise											

[Technical Data]
Geometric Tolerance Indications

Excerpts from JIS B0021(1984)

Geometric Tolerances and Symbols

Tolerance Types		Symbols	Definition of Tolerance Zones		Illustrated Examples and Interpretations	
Form Tolerance	Straightness	—		If the tolerance value is preceded by a Ø symbol, this tolerance zone is the range within a cylinder of diameter t.		If a tolerance frame is connected to a dimension that indicates the diameter of a cylinder, the axis line of the cylinder shall be contained within a cylinder of 0.08mm diameter.
	Flatness	▱		The tolerance zone is the area between two parallel planes separated by distance t.		This surface shall be contained within two parallel planes separated by 0.08mm.
	Circularity	○		The tolerance zone in the subject plane is the area between two concentric circles separated by distance t.		The circumference of arbitrary axis perpendicular cross sections shall be contained between two concentric circles separated by 0.1mm on the same plane.
	Cylindricity	⌭		The tolerance zone is the range contained between two coaxial cylinder surfaces separated by distance t.		The subject surface shall be contained between two coaxial cylinder surfaces separated by 0.1mm.
	Profile of Line	⌒		The tolerance zone is the range contained between the two enveloping lines formed by a circle with diameter t with the center located on the theoretically correct profile curve.		On arbitrary cross-sections parallel to the projection plane, the subject profile shall be contained between the two envelope lines formed by a 0.04mm diameter circle with the center located on the theoretically correct profile curve.
	Profile of Surface	⌓		The tolerance zone is the range contained between the two enveloping surfaces formed by a sphere with diameter t with the center located on the theoretically correct profile surface.		The subject surface shall be contained between the two enveloping surfaces formed by a 0.02mm diameter sphere with the center located on the surface containing the theoretically correct profile.
Orientation Tolerance	Parallelism	//		The tolerance zone is the range contained between two planes parallel to the datum plane separated by distance t.		The surface indicated by the arrow leader shall be contained between two planes parallel to the datum plane A separated by 0.01mm in the direction of the arrow leader.
	Perpendicularity Tolerance	⊥		If the tolerance value is preceded by a Ø symbol, the tolerance zone is the range contained within a cylinder of diameter t perpendicular to the datum plane.		The axis of the cylinder indicated by the arrow leader shall be contained within a 0.01mm cylinder perpendicular to the datum plane A.
	Angularity	∠		The tolerance zone is the range contained between two parallel planes inclined at a specified angle to the datum plane and separated from each other by distance t.		The surface indicated by the arrow leader shall be contained between two parallel planes inclined theoretically exactly by 40 degrees to the datum plane A, and separated by 0.08mm in the direction of the arrow of the leader.
Positional Tolerance	Positional Tolerance	⌖		The tolerance zone is the range contained within a circle or sphere of diameter t with its center located at theoretically true location of the subject point (True Position).		The point indicated by the arrow leader shall be contained within a 0.03mm diameter circle with its center located at the true location 60mm from the datum line A, and 100mm from the datum line B.
	Coaxiality or Concentricity	◎		If the tolerance value is preceded by a Ø symbol, the tolerance zone is the range within a cylinder of diameter t with axis coinciding matching the datum axis line.		The axis of the cylinder indicated by the arrow leader shall be contained within a cylinder of diameter 0.01mm with axis coinciding the datum axis line A.
	Symmetry	⌯		The tolerance zone is the range contained between two parallel planes separated by distance t and located symmetrically with relation to the datum plane.		The central plane indicated by the arrow leader shall be contained between two parallel planes separated by 0.08mm and located symmetrically in relation to the datum plane A.
Runout Tolerance	Runout Tolerance	↗		The tolerance zone is an arbitrary surface perpendicular to the datum axis between two concentric cylinders with centers common with the datum axis, separated in radial direction by the distance t.		The radial run-out of the cylinder surface indicated by the arrow leader shall not exceed 0.1mm on any measuring plane perpendicular to the datum axis line when the cylinder is rotated about the datum axis A-B.
	Total Runout	⌰		The tolerance zone is between two concentric cylinders with centers common with the datum axis, separated in radial direction by distance t.		The total radial runout of the cylinder surface indicated by the arrow leader shall not exceed 0.1mm at any point on the cylinder surface when the cylinder is rotated about the datum axis A-B.

The lines used in the Tolerance Zone definitions mean the following.
Thick solid or broken line: Shape Thin dash-dot line: Center line Thick dash-dot line: Datum
Thin alternating long and two short dashed line: Supplementary projection plane or cross section plane Thin solid or broken line: Tolerance range
Thick alternating long and two short dashed line: Projection of shape onto supplementary plane or cross section plane

[Technical Data]
Spring Calculations
Excerpts from JIS B 2704(2000)

1. Calculation

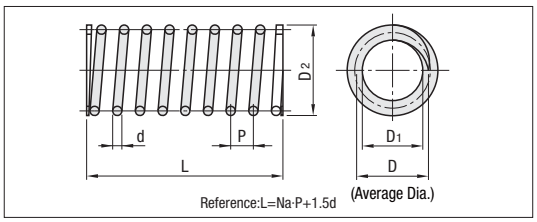
1.1 Symbols Used in Spring Design Formulae

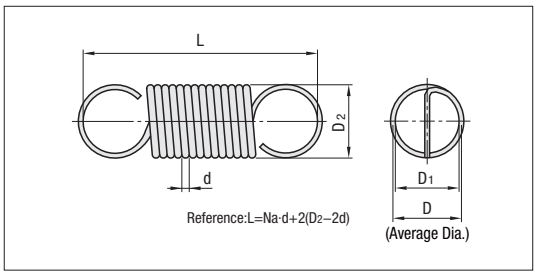
Symbols used in spring design formulae are shown in Table 1.

Table 1 Meaning of Symbols

Symbol	Meaning of Symbols	Unit
d	Diameter of Material	mm
D_1	Inner Diameter of a Coil	mm
D_2	Outer Diameter of a Coil	mm
D	Coil Mean Diameter= $\frac{D_1+D_2}{2}$	mm
N_t	Total Number of Winding	–
N_a	Number of Active Winding	–
L	Free Length(Length)	mm
Hs	Solid Length	mm
p	Pitch	mm
P_i	Initial Tension	N{kgf}
c	Spring Index $c=\frac{D}{d}$	–
G	Shear Modulus of Elasticity	N/mm²{kgf/mm²}
P	Load on Spring	N{kgf}
δ	Spring Deflection	mm
k	Spring Constant	N/mm{kgf/mm}
τ_0	Torsional Stress	N/mm²{kgf/mm²}
τ	Corrected Torsional Stress	N/mm²{kgf/mm²}
τ_i	Initial Stress	N/mm²{kgf/mm²}
χ	Stress Correction Factor	–
f	Frequency	Hz
U	Spring-Retained Energy	N·mm{kgf·mm}
ω	Per Unit Volume Material Weight	kg/mm³
W	Mass of Moving Parts	kg
g	Gravitational Acceleration (1)	mm/s²

Note (1) In spring calculations, a gravitational acceleration of 9806.65mm/s², is used.





1.2 Basic Formulae Used in Designing of Springs

1.2.1 Compression Springs, and Tension Springs without Initial Tension

$$\delta=\frac{8N_aD^3P}{Gd^4} \quad \cdots(1)$$

$$k=\frac{P}{\delta}=\frac{Gd^4}{8N_aD^3} \quad \cdots(2)$$

$$\tau_0=\frac{8DP}{\pi d^3} \quad \cdots(3)$$

$$\tau_0=\frac{Gd\delta}{\pi N_aD^2} \quad \cdots(4)$$

$$\tau=\chi\tau_0 \quad \cdots(5)$$

$$d=\sqrt[3]{\frac{8DP}{\pi\tau_0}}=\sqrt[3]{\frac{8\chi DP}{\pi\tau}} \quad \cdots(6)$$

$$N_a=\frac{Gd^4\delta}{8D^3P}=\frac{Gd^4}{8D^3k} \quad \cdots(7)$$

$$U=\frac{P\delta}{2}=\frac{k\delta^2}{2} \quad \cdots(8)$$

1.2.2 Tension Springs with Initial Tension (Where:P>Pi)

$$\delta=\frac{8N_aD^3(P-P_i)}{Gd^4} \quad \cdots(1)$$

$$k=\frac{P-Pi}{\delta}=\frac{Gd^4}{8N_aD^3} \quad \cdots(2)$$

$$\tau_0=\frac{8DP}{\pi d^3} \quad \cdots(3)$$

$$\tau_0=\frac{Gd\delta}{\pi N_aD^2}+\tau_i \quad \cdots(4)$$

$$\tau=\chi\tau_0 \quad \cdots(5)$$

$$d=\sqrt[3]{\frac{8DP}{\pi\tau_0}}=\sqrt[3]{\frac{8\chi DP}{\pi\tau}} \quad \cdots(6)$$

$$N_a=\frac{Gd^4}{8D^3k}=\frac{Gd^4\delta}{8D^3(P-P_i)} \quad \cdots(7)$$

$$U=\frac{(P+P_i)\delta}{2} \quad \cdots(8)$$

1.3 Points to Note when Designing Springs

1.3.1 Shear Modulus of Elasticity

Shear modulus of elasticity(G)listed in Table 2 is recommended for the designing of springs.

Table 2 Shear Modulus of Elasticity(G)

Material		G Value N/mm²(kgf/mm²)	Symbol
Spring Steel		$78\times10^3\{8\times10^3\}$	JIS SUP6,1.7108, JIS SUP9,1.7176, 1.8159, 1.7138,1.7102, ISO 60CrMo33
Hard Steel Wire		$78\times10^3\{8\times10^3\}$	JIS SW-B,JIS SW-C
Piano Wire		$78\times10^3\{8\times10^3\}$	JIS SWP
Oil Tempered Steel Wire		$78\times10^3\{8\times10^3\}$	SWO,SWO-V,SWOC-V, SWOSC-V,SWOSM,SWOSC-B
Stainless Steel Wire	1.6900	$69\times10^3\{7\times10^3\}$	1.6900
	1.4301		1.4301
	1.4301-N1		1.4301-N1
	1.4401		1.4401
	1.4568-J1	$74\times10^3\{7.5\times10^3\}$	1.4568-J1

1.3.2 Number of Active Winding

The number of active winding can be determined as follows.

(1) Compression Springs

$N_a=N_t-(X_1+X_2)$

Where X1 and X2: are the number of turns at each end of the coil.

(a) When only the end of the coil is in contact with the next free coil

[Corresponding to (a) ~ (c) in Fig.2]

$X_1=X_2=1$

Therefore, $N_a=N_t-2$

(b) When the end of the coil is not in contact with the next coil, and the spring end has $\frac{3}{4}$ of a turn.

[Corresponding to (a) ~ (e) in Fig.2]

$X_1=X_2=0.75$

Therefore, $N_a=N_t-1.5$

(2) Tension Springs The number of active winding can be determined as follows. But hooks are ignored.

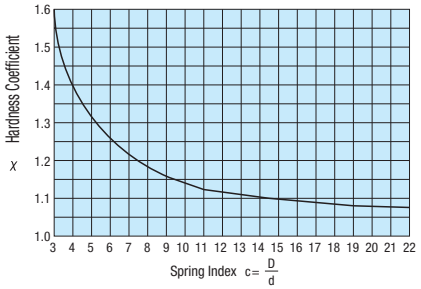
$N_a=N_t$

1.3.3 Stress Correction Factor

The stress correction factor relative to the spring index (C) can be determined by using the following formula or based on Fig.1.

$$\chi = \frac{4c-1}{4c-4} + \frac{0.615}{c} \quad \cdots\cdots (9)$$

Fig-1.Hardness Coefficient : χ



1.3.4 Solid Length

The solid length of a spring can normally be obtained by using the following simplified formula. Generally, the purchaser of a compression spring does not specify the solid length of the spring.

$$Hs=(Nt-1)d+(t_1+t_2) \quad \cdots\cdots (10)$$

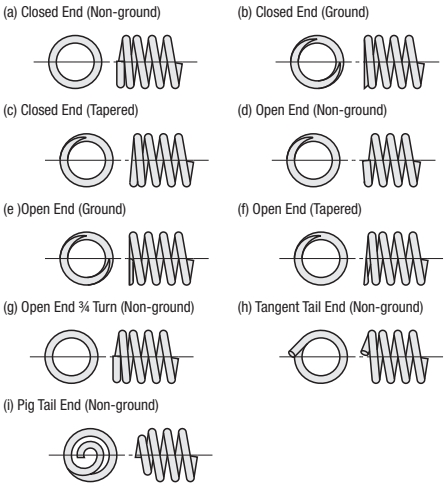
where, (t_1+t_2) : is the sum of the thicknesses of the coil ends.

As for those compression springs, both ends of which are shaped as shown in (b), (c), (e) or (f) of Figure 2 and for which the solid length needs to be specified, the following formula can be used to obtain the maximum solid length. However, the actual maximum solid length can be greater than the value thus calculated depending on the shape of the spring in question.

$$Hs=Nt\times d_{max} \quad \cdots\cdots (11)$$

where dmax : d is the material diameter with the maximum tolerance.

Fig-2. Coil End Shape



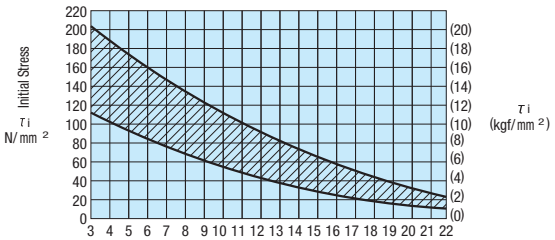
1.3.5 Initial Tension of Tension Springs

Cold-formed solid-coiled tension springs are subjected to initial tension (Pi). The initial tension can be obtained using the following formula.

$$P_i = \frac{\pi d^3}{8D}\tau_i \quad \cdots\cdots (12)$$

On solid-coiled piano wire, hard steel wire, and other steel wires that are not low-temperature annealed, the initial stress occurs within the hatched range shown in Fig.3. However, if materials other than steel wire are used, or the wire in question is low-temperature annealed, the initial stress taken from within the hatched range in Fig.3 should be corrected as follows.

Fig-3 Initial Stress : τi (Spring formed from steel coil, not low-temperature annealed)



(1) When using stainless steel wire, decrease the initial stress value for steel wire by 15%.

(2) If the spring is low-temperature annealed after being formed, decrease the value by 20~35% for springs made of piano wire, hard steel wire, or other stainless steel wires, and by 15~25% for springs made of stainless steel wire.

Reference In place of Fig.3, the following empirical formula can be used to establish the initial stress for springs before low-temperature annealing.

$$\tau_i = \frac{G}{100c}$$

The following examples are for applications of this formula to obtain the initial tension.

(1) Piano Wire / Hard Steel Wire [$G=78\times10^3$N/mm^2{8×10^3kgf/mm^2}]

Initial Stress $\tau_i = \frac{G}{100c}\times0.75$ (0.75 by 25, reduction by low-temperature annealing).

Initial Tension $P_i = \frac{\pi d^3}{8D}\tau_i = \frac{Gd^4}{255D^2}\times0.75 = \frac{229d^4}{D^2}\left\{\frac{24d^4}{D^2}\right\}$

(2) When using stainless steel wire [$G=69\times10^3$N/mm^2{7×10^3kgf/mm^2}]

Initial Stress $\tau_i = \frac{G}{100c}\times0.8$(0.8 by 20, reduction by low-temperature annealing).

Initial Tension $P_i = \frac{\pi d^3}{8D}\tau_i = \frac{Gd^4}{255D^2}\times0.8 = \frac{216d^4}{D^2}\left\{\frac{22d^4}{D^2}\right\}$

1.3.6 Surging

In order to prevent surging, the spring selected should be as that its natural frequency does not resonate with any of the natural frequencies that may act upon the spring.
The initial tension can be obtained using the following formula.

$$f=a\sqrt{\frac{kg}{W}}=a\frac{70d}{\pi N_a D^2}\sqrt{\frac{G}{\omega}} \quad \cdots\cdots (13)$$

Where, $a=\frac{i}{2}$:when both spring ends are either free or fixed

$a=\frac{2i-1}{4}$:When one spring end is fixed while the other end is free $i=1,2,3\cdots\cdots$

$G=78\times10^3$N/mm^2{8×10^3kgf/mm^2},
$w=76.93\times10^{-6}$ N/mm^3{7.85×10^{-6}kgf/mm^3} If both spring ends are either free or fixed, the natural primary frequency of a spring can be obtained as follows.

$$f_1 = 3.56\times10^5\frac{d}{N_a D^2} \quad \cdots\cdots (13)$$

1.3.7 Other Points to Note

In spring design calculations, the following points should also be taken into account.

(1) Spring Index Excessive local stress can result from too small spring index. Machinability is compromised if the spring index is too great or small. The spring index should be selected from the range of 4~15 when hot forming, and from the range of 4~22 when cold forming.

(2) Slenderness Ratio In order to ensure the correct number of active winding, the slenderness ratio for a compression spring (Ratio of free height to coil mean diameter) should be 0.8 or greater. Furthermore, buckling considered, it is generally recommended that the slenderness ratio be selected from the range of 0.8 ~ 4 to prevent buckling.

(3) Number of Active Winding The number of active winding should be 3 or more in order to stabilize spring characteristics.

(4) Pitch Generally, when the pitch exceeds 0.5D, the spring deflection (load) increases to the extent that the coil diameter changes. This requires correction of the deflection and torsional stress values obtained by the basic formulae. Therefore, the pitch should be 0.5D or smaller. The pitch can generally be estimated using the following simplified formula.

$$p=\frac{L-H_S}{N_a}+d \quad \cdots\cdots (14)$$

[Technical Data]
How to Use Coil Springs and Precautions

How to Use Coil Springs and Precautions

MISUMI is engaged in a constant effort to design coil springs(excluding Round Wire Springs)with optimum cross-sectional shape and maximum durability. When using the springs, pay due attention to the following precautions and undesirable usage that should be avoided for the sake of safety.

(1) Always Use A Spring Guide
When used without a spring guide, the coil spring may buckle or bend midway. This can cause it to break since the internal surface of the bending is subjected to concentrated high stress. Be sure to use a spring guide, such as a shaft and an outer diameter guide, with the coil spring.
*In most cases, the best results are obtained by inserting a shaft all the way through the coil spring, from top to bottom, as an inner diameter guide.

(2) Clearance between the Spring Inner Diameter and Shaft
When clearance between the spring and the shaft is insufficient, the coil spring's internal surface may come into contact with the shaft and be subject to abrasion at that point. This can lead to the spring eventually breaking at the point of wear. Excessive clearance with shaft, on the other hand, can lead to buckling of the coil spring. It is recommended that the shaft diameter be set approximately 1.0 mm smaller than the inner diameter of the coil spring.
When the coil spring has a long free length(i.e., free length/OD is 4 or larger), set up a step on the shaft as shown in Fig.-1 to prevent the coil spring's internal surface from touching the shaft when it bends.

(3) Clearance between The Spring OD and Counterbore Hole
The coil spring expands in the outward direction when it deflects. Insufficient clearance between the spring and the counterbore hole restrains expansion, and the resulting concentration of stress can cause the coil spring to break. It is recommended that the counterbore diameter be set approximately 1.5mm larger than the outer diameter of the coil spring. The counterbore configuration shown in Fig.-1 is ideal for a coil spring with a long free length.

(4) Avoid A Short Shaft Length and Shallow Counterbore Hole Depth
If the guide is too short, the coil spring may touch the guides tip when it is buckled. The resulting friction can cause the coil spring to break. It is recommended that the guide length be set longer than half of the initial height. Also make sure to chamfer the shaft to around C3 level.

(5) Do Not Use in Excess of The Maximum Deflection(300,000 times limit)or Near Its Solid Length
When the coil spring is used in excess of the 300,000 times limit, its Cross-section starts receiving stress that is higher than the theoretical value. This can cause the coil spring to break. Furthermore, when the coil spring is used at around its solid length, its active coils gradually adhere to each other, increasing the spring constant value and causing the load curve to rise, as shown in Fig.-2. Do not use the coil spring in excess of the 300,000 times limit.

(6) Set up An Initial Deflection
When there is a gap for the coil spring to move vertically, it receives an impact force that causes it to bend midway or to buckle.
Setting up an initial deflection stabilizes the top and bottom ends of the spring.

(7) Avoid Entrapment of Debris or Foreign Matter
Debris or foreign matter that becomes caught between the coils cause that part of the coil spring to stop functioning as active coils, forcing the other coils to deflect, as shown in Fig.-3. This effectively reduces the number of active coils, increasing the stress on the spring, and eventually causing it to break. Be careful not to allow debris or foreign matter to clog the coils.

(8) Keep Mounting Faces Parallel
The coil spring should be mounted properly, with its mounting faces top and bottom faces parallel to each other. Misalignment can cause the spring to bend midway, subjecting the bend to high stress. This can cause the spring to break at the point. The same applies to the dies in which the coil spring is used, if the parallel alignment between the dies is poor, as shown in Fig.-4, the coil spring can bend midway or exceed the 300,000 times limit prematurely. Keep the coil spring mounting faces as perfectly parallel as possible to prevent this from occurring.

(9) Do Not Use Coil Springs in Series
If you use two coil springs in series, they will tend to bend, as shown in Fig.-5. This can cause them to move out of the shaft, counterbore holes. If this happens, this coil spring will eventually break for the same reasons described in (1) above. Moreover, due to spring load differences, the weaker spring is overcome by, and deflects more than, the stronger spring, as shown in Fig.-6. This will make the weaker spring more prone to damage, or cause it to break.

(10) Do Not Use Two Coil Springs in Parallel
Use of two coil springs in parallel, as shown in Fig.-7, may result in the inner coils being sandwiched between the outer coils, or vice versa, when they contract. This can cause the coil springs to break for the same reason noted in (4).

(11) Do Not Use the Coil Spring Horizontally
When the coil spring is used horizontally, the internal surface of the spring will come into contact with the shaft, causing abrasion at those spots. The spring will eventually break at these weakened spots.

MISUMI Endurance Test Conditions

(1)Spring Guide Formula
Shaft Penetration
Shapt Dia.: -1.0mm less than d dimension

(2)Initial Deflection
1.0mm

(3)Amplitude
Deflection with 300,000 time limit value

(4)Velocity
180spm

*The maximum number of allowable operating times may vary depending on the service conditions.

Fig-1

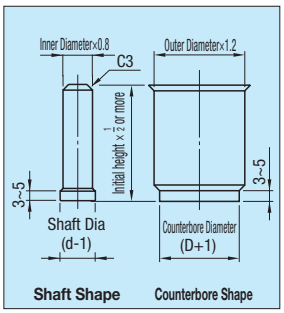


Fig-2

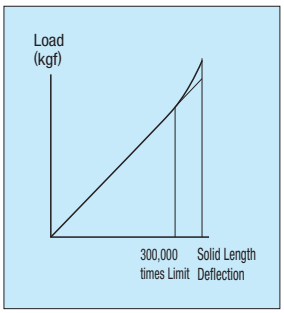


Fig-3

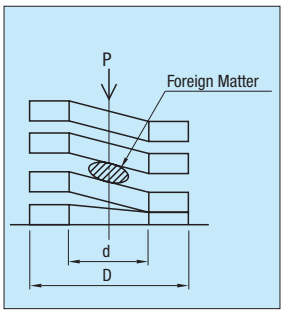


Fig-4

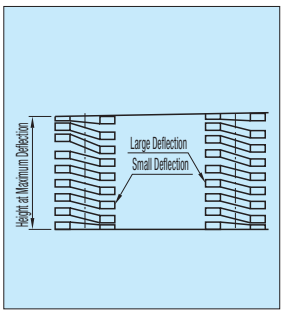


Fig-5

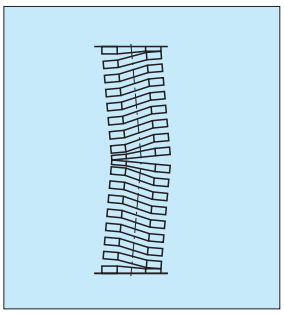


Fig-6

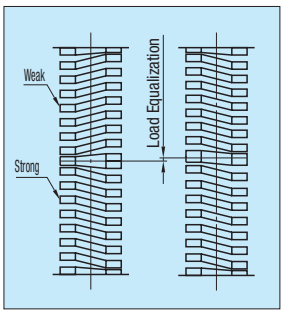
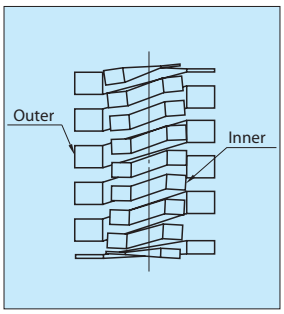


Fig-7



[Technical Data]
Regular Machining Dimension Tolerance

Excerpts from JIS B 0405, 0419(1991)

1. Regular Cut Dimension Tolerance B 0405-1991-

Tolerances in Respect of Length Excluding Chamfered Portion

Unit: mm

Tolerance Class		Classification of Reference Dimension							
Symbol	Description	0.5 (1) or More 3 or Less	More than 3 6 or Less	More than 6 30 or Less	More than 30 120 or Less	More than 120 400 or Less	More than 400 1000 or Less	More than 1000 2000 or Less	More than 2000 4000 or Less
		Tolerance							
f	Precision Grade	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5	–
m	Medium	±0.1	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2
c	Coarse	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	±4
v	Extremely Coarse	–	±0.5	±1	±1.5	±2.5	±4	±6	±8

Note (1) : A reference dimension less than 0.5 mm is followed by a tolerance.

2.Tolerances in Respect of the Length of the Chamfered Portion (Radius of rounding for edges and edge chamfering dimension)

Unit: mm

Tolerance Class		Classification of Reference Dimension		
Symbol	Description	0.5 (2) or More 3 or Less	More than 3 6 or Less	More than 6
		Tolerance		
f	Precision Grade	±0.2	±0.5	±1
m	Medium			
c	Coarse	±0.4	±1	±2
v	Extremely Coarse			

Note (2) : A reference dimension less than 0.5 mm is followed by a tolerance.

3. Angle Tolerance

Tolerance Class		Length of Shorter Side (Unit:mm)				
Symbol	Description	10 or Less	More than 10 50 or Less	More than 50 120 or Less	More than 120 400 or Less	More than 400
		Tolerance				
f	Precision Grade	±1°	±30'	±20'	±10'	± 5'
m	Medium					
c	Coarse	±1°30'	± 1°	±30'	±15'	±10'
v	Extremely Coarse	±3°	± 2°	± 1°	±30'	±20'

4. Regular Perpendicularity Tolerance B 0419-1991-

Unit: mm

Tolerance Class	Nominal Length of Shorter Side			
	100 or Less	More than 100 300 or Less	More than 300 1000 or Less	More than 1000 3000 or Less
	Perpendicularity Tolerance			
H	0.2	0.3	0.4	0.5
K	0.4	0.6	0.8	1
L	0.6	1	1.5	2

5. Regular Straightness and Flatness Tolerance

Unit: mm

Tolerance Class	Nominal Length					
	10 or Less	More than 10 30 or Less	More than 30 100 or Less	More than 100 300 or Less	More than 300 1000 or Less	More than 1000 3000 or Less
	Regular Straightness and Flatness Tolerance					
H	0.02	0.05	0.1	0.2	0.3	0.4
K	0.05	0.1	0.2	0.4	0.6	0.8
L	0.1	0.2	0.4	0.8	1.2	1.6

6. Regular Symmetry Tolerance

Unit: mm

Tolerance Class	Nominal Length			
	100 or Less	More than 100 300 or Less	More than 300 1000 or Less	More than 1000
	Symmetry Tolerance			
H	0.5			
K	0.6		0.8	1
L	0.6	1	1.5	2

[Technical Data]
Basis of Fitting Selection/Dimensional Tolerances and Fitting
Drawing Manual in JIS (How To Use) Series　Excerpts from JIS B 0401 (1998)

			H6	H7	H8	H9	Applicable Part	Functional Classification		Application Example
Can be Moved Relatively	Clearance Fit	Loose Fit				c9	Part which accommodates a wide gap or moving part which needs a gap. Part which accommodates a wide gap to facilitate assembling. Part which needs an appropriate gap even at a high temperature.	Part whose structure needs a gap. {Inflates. Large position error {Fitting length is long.		Piston Ring and the Ring Groove Fitting by means of a loose set pin.
		Light Roll Fit			d9	d9	Part which accommodates or needs a gap.	Cost needs to be reduced. {Manufacturing Cost {Maintenance Cost		Crank Web and Pin Bearing(Side) Exhaust Valve Box and the Sliding Part of a Spring Bearing Piston Ring and the Ring Groove
		Roll Fit		e7	e8	e9	Part which accommodates a wide gap or needs a gap. Fairly wide gap, well greased bearing. Bearing subjected to a high temperature, high speed and heavy load(high-degree forced lubrication).	Regular Rotary or Sliding Part (Must be well greased.)		Fitting of the Exhaust Valve Box Main Bearing for the Crank Shaft Regular Sliding Part
			f6	f7	f7 f8		Fitting so as to provide an appropriate gap to permit movement(high-quality fitting). Regular normal temperature bearing lubricated with grease or oil.	Regular Fitting (Often comes apart.)		Part in which a cooled exhaust valve box is inserted. Regular Shaft and Bushing Link Device Lever and Bushing
		Fine Roll Fit	g5	g6			Continuously revolving part of a precision machine under a light load. Fitting with a narrow gap so as to permit movement(spigot and positioning). Precision sliding part.	Part required to make a precision motion with virtually no play.		Link Device Pin and Lever Key and its Groove Precision Control Valve Rod
Cannot be Moved Relatively	Transition Fit	Sliding Fit	h5	h6	h7 h8	h9	Fitting so as to permit movement by hand, with a lubricant applied.(high-quality positioning) Special High Precision Sliding Part Unimportant Stationary Part	Can be disassembled, reassembled without damaging component parts.	Force cannot be transmitted by the fitting force alone.	Fitting a rim and a boss together Fitting the gear of a precision gear device
		Push Fit	h5 h6	js6			Fitting which accommodates a light gap. Precision fitting which locks both parts while the unit is used. Fitting which allows assembling and disassembling with a wooden or lead hammer.			Fitting Coupling Flanges Together Governor Path and Pin Fitting a Gear Rim and a Boss Together
		Driving Fit	js5	k6			Fitting which requires an iron hammer or hand press for assembling, disassembling(a key or the like is necessary to prevent inter-part shaft rotation). Precision positioning.			Fixing the Shaft of a Gear Pump and a Casing Together Reamer Bolts
			k5	m6			Same as the above for assembling and disassembling. Precision positioning which allows no gap.			Reamer Bolts Fixing the piston of hydraulic equipment and a shaft together Fitting a Coupling Flange and a Shaft Together
		Light Press Fit	m5	n6			Fitting which requires considerable force for assembling, disassembling. Precision stationary fitting(a key or the like is necessary for high torque transmission purposes)		Slight force can be transmitted by the fitting force alone.	Shaft of a Flexible Coupling and Gear(Passive Side) Precision Fitting Insertion of a Suction Valve and Valve Guide
	Interference Fit	Press Fit	n5 n6	p6			Fitting which requires much force for assembling, disassembling(a key or the like is necessary for high torque transmission). Light press fitting or the like is necessary for non-ferrous component parts. Standard press fitting is required for iron component parts and a bronze part and a copper part.	Hard to disassemble without damaging component parts.		Insertion of a Suction Valve and Valve Guide Fixing a Gear and a Shaft Together(Low Torque) Shaft of a Flexible Coupling and a Gear(Drive Side)
			p5	r6			Same as the above for assembling and disassembling Shrinkage press fitting, cold press fitting or forced press fitting is required for large component parts.			Coupling and Shaft
		Strong Press Fit, Shrinkage Fit, Freeze Fit	r5	s6 t6 u6 x6			Firmly coupled together and requires shrinkage press fitting, cold press fitting or forced press fitting. Permanent assembly, which can not come apart. Press fitting or the like is required for light alloy members.		Considerable force can be transmitted by the fitting force alone.	Attaching and Fixing a Bearing Bushing Insertion of a Suction Valve and Valve Box Fixing a Coupling Flange and a Shaft Together(High Torque) Fixing the Rim of a Drive Gear and a Boss Together Attaching and Fixing a Bearing Bushing

1.1 Fitting, with Regularly Used Hole Adopted as Reference

Reference Hole	Class of Tolerance Range for Shafts																	
	Clearance Fit							Transition Fit			Interference Fit							
H6							g5	h5	js5	k5	m5							
					f6	g6	h6	js6	k6	m6	n6*	p6*						
H7					f6	g6	h6	js6	k6	m6	n6	p6*	r6*	s6	t6	u6	x6	
				e7	f7		h7	js7										
H8					f7		h7											
				e8	f8		h8											
			d9	e9														
H9			d8	e8			h8											
		c9	d9	e9			h9											
H10	b9	c9	d9															

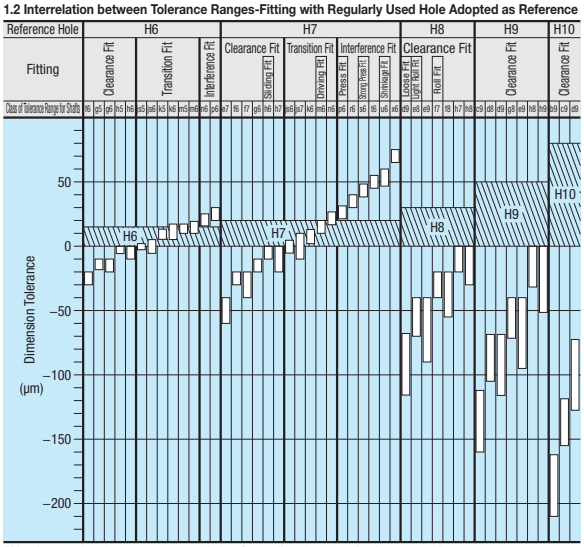
[Note]*An exception may arise according to the dimensional sectioning scheme.

2.1 Fitting, with Regularly Used Shaft Adopted as Reference

Reference Shaft	Class of Tolerance Range for Holes																	
	Clearance Fit							Transition Fit			Interference Fit							
h5							H6	JS6	K6	M6	N6*	P6						
h6					F6	G6	H6	JS6	K6	M6	N6	P6*						
					F7	G7	H7	JS7	K7	M7	N7	P7*	R7	S7	T7	U7	X7	
h7				E7	F7		H7											
					F8		H8											
h8			D8	E8	F8		H8											
			D9	E9			H9											
h9			D8	E8			H8											
		C9	D9	E9			H9											
	B10	C10	D10															

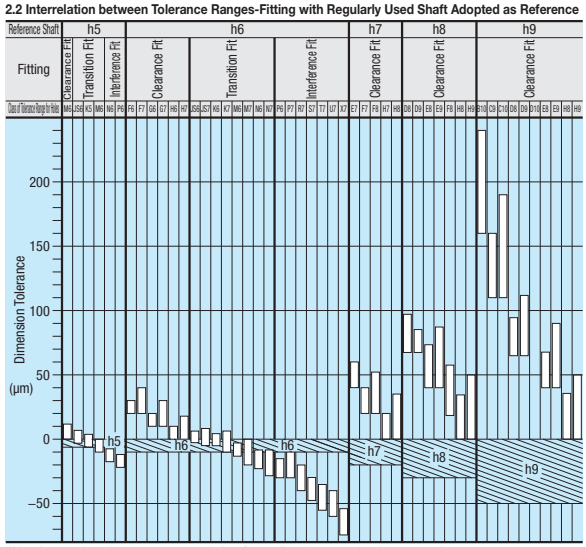
[Note]*An exception may arise according to the dimensional sectioning scheme.

1.2 Interrelation between Tolerance Ranges-Fitting with Regularly Used Hole Adopted as Reference



*Values in cases where the measurement exceeds the reference dimension 18 mm, but does not exceed 30 mm.

2.2 Interrelation between Tolerance Ranges-Fitting with Regularly Used Shaft Adopted as Reference



*Values in cases where the measurement exceeds the reference dimension 18 mm, but does not exceed 30 mm.

[Technical Data]
Dimension Tolerance for Regularly Used Fitting

Excerpts from JIS B 0401 (1999)

Dimension Tolerance of Shaft, Regularly Used Fitting

Reference Dimension (mm)		Class of Tolerance Range for Shafts																										Unit μm
More than	or Less	b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h5	h6	h7	h8	h9	js5	js6	js7	k5	k6	m5	m6	n5*	n6	p6	r6	s6	t6	u6	x6
–	3	−140 −165	−60 −85	−20 −34	−20 −45	−14 −24	−14 −28	−14 −39	−6 −12	−6 −16	−6 −20	−2 −6	−2 −8	0 −4	0 −6	0 −10	0 −14	0 −25	±2	±3	±5	+4 0	+6 0	+6 +2	+8 +2	+8 +4	+10 +4	+12 +6	+16 +10	+20 +14	–	+24 +18	+26 +20
3	6	−140 −170	−70 −100	−30 −48	−30 −60	−20 −32	−20 −38	−20 −50	−10 −18	−10 −22	−10 −28	−4 −9	−4 −12	0 −5	0 −8	0 −12	0 −18	0 −30	±2.5	±4	±6	+6 +1	+9 +1	+9 +4	+12 +4	+13 +8	+16 +8	+20 +12	+23 +15	+27 +19	–	+31 +23	+36 +28
6	10	−150 −186	−80 −116	−40 −62	−40 −76	−25 −40	−25 −47	−25 −61	−13 −22	−13 −28	−13 −35	−5 −11	−5 −14	0 −6	0 −9	0 −15	0 −22	0 −36	±3	±4.5	±7.5	+7 +1	+10 +1	+12 +6	+15 +6	+16 +10	+19 +10	+24 +15	+28 +19	+32 +23	–	+37 +28	+43 +34
10	14	−150	−95	−50	−50	−32	−32	−32	−16	−16	−16	−6	−6	0	0	0	0	0	±4	±5.5	±9	+9	+12	+15	+18	+20	+23	+29	+34	+39	–	+44	+51 +40
14	18	−193	−138	−77	−93	−50	−59	−75	−27	−34	−43	−14	−17	−8	−11	−18	−27	−43				+1	+1	+7	+7	+12	+12	+18	+23	+28		+33	+56 +45
18	24	−160	−110	−65	−65	−40	−40	−40	−20	−20	−20	−7	−7	0	0	0	0	0	±4.5	±6.5	±10.5	+11	+15	+17	+21	+24	+28	+35	+41	+48	–	+54 +41	+67 +54
24	30	−212	−162	−98	−117	−61	−73	−92	−33	−41	−53	−16	−20	−9	−13	−21	−33	−52				+2	+2	+8	+8	+15	+15	+22	+28	+35	+54 +41	+61 +48	+77 +64
30	40	−170 −232	−120 −182	−80	−80	−50	−50	−50	−25	−25	−25	−9	−9	0	0	0	0	0	±5.5	±8	±12.5	+13	+18	+20	+25	+28	+33	+42	+50	+59	+64 +48	+76 +60	–
40	50	−180 −242	−130 −192	−119	−142	−75	−89	−112	−41	−50	−64	−20	−25	−11	−16	−25	−39	−62				+2	+2	+9	+9	+17	+17	+26	+34	+43	+70 +54	+86 +70	
50	65	−190 −264	−140 −214	−100	−100	−60	−60	−60	−30	−30	−30	−10	−10	0	0	0	0	0	±6.5	±9.5	±15	+15	+21	+24	+30	+33	+39	+51	+60 +41	+72 +53	+85 +66	+106 +87	–
65	80	−200 −274	−150 −224	−146	−174	−90	−106	−134	−49	−60	−76	−23	−29	−13	−19	−30	−46	−74				+2	+2	+11	+11	+20	+20	+32	+62 +43	+78 +59	+94 +75	+121 +102	
80	100	−220 −307	−170 −257	−120	−120	−72	−72	−72	−36	−36	−36	−12	−12	0	0	0	0	0	±7.5	±11	±17.5	+18	+25	+28	+35	+38	+45	+59	+73 +51	+93 +71	+113 +91	+146 +124	–
100	120	−240 −327	−180 −267	−174	−207	−107	−126	−159	−58	−71	−90	−27	−34	−15	−22	−35	−54	−87				+3	+3	+13	+13	+23	+23	+37	+76 +54	+101 +79	+126 +104	+166 +144	
120	140	−260 −360	−200 −300																										+88 +63	+117 +92	+147 +122		
140	160	−280 −380	−210 −310	−145 −208	−145 −245	−85 −125	−85 −148	−85 −185	−43 −68	−43 −83	−43 −106	−14 −32	−14 −39	0 −18	0 −25	0 −40	0 −63	0 −100	±9	±12.5	±20	+21 +3	+28 +3	+33 +15	+40 +15	–	+52 +27	+68 +43	+90 +65	+125 +100	+159 +134	–	–
160	180	−310 −410	−230 −330																										+93 +68	+133 +108	+171 +146		
180	200	−340 −455	−240 −355																										+106 +77	+151 +122			
200	225	−380 −495	−260 −375	−170 −242	−170 −285	−100 −146	−100 −172	−100 −215	−50 −79	−50 −96	−50 −122	−15 −35	−15 −44	0 −20	0 −29	0 −46	0 −72	0 −115	±10	±14.5	±23	+24 +4	+33 +4	+37 +17	+46 +17	–	+60 +31	+79 +50	+109 +80	+159 +130	–	–	–
225	250	−420 −535	−280 −395																										+113 +84	+169 +140			
250	280	−480 −610	−300 −430	−190	−190	−110	−110	−110	−56	−56	−56	−17	−17	0	0	0	0	0	±11.5	±16	±26	+27	+36	+43	+52	–	+66	+88	+126 +94	–	–	–	–
280	315	−540 −670	−330 −460	−271	−320	−162	−191	−240	−88	−108	−137	−40	−49	−23	−32	−52	−81	−130				+4	+4	+20	+20		+34	+56	+130 +98				
315	355	−600 −740	−360 −500	−210	−210	−125	−125	−125	−62	−62	−62	−18	−18	0	0	0	0	0	±12.5	±18	±28.5	+29	+40	+46	+57	–	+73	+98	+144 +108	–	–	–	–
355	400	−680 −820	−400 −540	−299	−350	−182	−214	−265	−98	−119	−151	−43	−54	−25	−36	−57	−89	−140				+4	+4	+21	+21		+37	+62	+150 +114				
400	450	−760 −915	−440 −595	−230	−230	−135	−135	−135	−68	−68	−68	−20	−20	0	0	0	0	0	±13.5	±20	±31.5	+32	+45	+50	+63	–	+80	+108	+166 +126	–	–	–	–
450	500	−840 −995	−480 −635	−327	−385	−198	−232	−290	−108	−131	−165	−47	−60	−27	−40	−63	−97	−155				+5	+5	+23	+23		+40	+68	+172 +132				

Dimension Tolerance of Hole, Regularly Used Fitting

Reference Dimension (mm)		Class of Tolerance Range for Holes																										Unit μm
More than	or Less	B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N6	N7	P6	P7	R7	S7	T7	U7	X7
–	3	+180 +140	+85 +60	+100 +60	+34 +20	+45 +20	+60 +20	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	+8 +2	+12 +2	+6 0	+10 0	+14 0	+25 0	+40 0	±3	±5	0 −6	0 −10	−2 −8	−2 −12	−4 −10	−4 −14	−6 −12	−6 −16	−10 −20	−14 −24	–	−18 −28	−20 −30
3	6	+188 +140	+100 +70	+118 +70	+48 +30	+60 +30	+78 +30	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+8 0	+12 0	+18 0	+30 0	+48 0	±4	±6	+2 −6	+3 −9	−1 −9	0 −12	−5 −13	−4 −16	−9 −17	−8 −20	−11 −23	−15 −27	–	−19 −31	−24 −36
6	10	+208 +150	+116 +80	+138 +80	+62 +40	+76 +40	+98 +40	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	+14 +5	+20 +5	+9 0	+15 0	+22 0	+36 0	+58 0	±4.5	±7.5	+2 −7	+5 −10	−3 −12	0 −15	−7 −16	−4 −19	−12 −21	−9 −24	−13 −28	−17 −32	–	−22 −37	−28 −43
10	14	+220	+138	+165	+77	+93	+120	+50	+59	+75	+27	+34	+43	+17	+24	+11	+18	+27	+43	+70	±5.5	±9	+2	+6	−4	0	−9	−5	−15	−11	−16	−21	–	−26	−33 −51
14	18	+150	+95	+95	+50	+50	+50	+32	+32	+32	+16	+16	+16	+6	+6	0	0	0	0	0			−9	−12	−15	−18	−20	−23	−26	−29	−34	−39		−44	−38 −56
18	24	+244	+162	+194	+98	+117	+149	+61	+73	+92	+33	+41	+53	+20	+28	+13	+21	+33	+52	+84	±6.5	±10.5	+2	+6	−4	0	−11	−7	−18	−14	−20	−27	–	−33	−46 −67
24	30	+160	+110	+110	+65	+65	+65	+40	+40	+40	+20	+20	+20	+7	+7	0	0	0	0	0			−11	−15	−17	−21	−24	−28	−31	−35	−41	−48	−33 −54	−40 −61	−56 −77
30	40	+270 +170	+182 +120	+220 +120	+119	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25	+39	+62	+100	±8	±12.5	+3	+7	−4	0	−12	−8	−21	−17	−25	−34	−39 −64	−51 −76	–
40	50	+280 +180	+192 +130	+230 +130	+80	+80	+80	+50	+50	+50	+25	+25	+25	+9	+9	0	0	0	0	0			−13	−18	−20	−25	−28	−33	−37	−42	−50	−59	−45 −70	−61 −86	
50	65	+310 +190	+214 +140	+260 +140	+146	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30	+46	+74	+120	±9.5	±15	+4	+9	−5	0	−14	−9	−26	−21	−30 −60	−42 −72	−55 −85	−76 −106	–
65	80	+320 +200	+224 +150	+270 +150	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0	0	0	0			−15	−21	−24	−30	−33	−39	−45	−51	−32 −62	−48 −78	−64 −94	−91 −121	
80	100	+360 +220	+257 +170	+310 +170	+174	+207	+260	+107	+126	+159	+58	+71	+90	+34	+47	+22	+35	+54	+87	+140	±11	±17.5	+4	+10	−6	0	−16	−10	−30	−24	−38 −73	−58 −93	−78 −113	−111 −146	–
100	120	+380 +240	+267 +180	+320 +180	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0	0	0	0			−18	−25	−28	−35	−38	−45	−52	−59	−41 −76	−66 −101	−91 −126	−131 −166	
120	140	+420 +260	+300 +200	+360 +200																											−48 −88	−77 −117	−107 −147			
140	160	+440 +280	+310 +210	+370 +210	+208 +145	+245 +145	+305 +145	+125 +85	+148 +85	+185 +85	+68 +43	+83 +43	+106 +43	+39 +14	+54 +14	+25 0	+40 0	+63 0	+100 0	+160 0	±12.5	±20	+4 −21	+12 −28	−8 −33	0 −40	−20 −45	−12 −52	−36 −61	−28 −68	−50 −90	−85 −125	−119 −159	–	–	
160	180	+470 +310	+330 +230	+390 +230																											−53 −93	−93 −133	−131 −171			
180	200	+525 +340	+355 +240	+425 +240																											−60 −106	−105 −151				
200	225	+565 +380	+375 +260	+445 +260	+242 +170	+285 +170	+355 +170	+146 +100	+172 +100	+215 +100	+79 +50	+96 +50	+122 +50	+44 +15	+61 +15	+29 0	+46 0	+72 0	+115 0	+185 0	±14.5	±23	+5 −24	+13 −33	−8 −37	0 −46	−22 −51	−14 −60	−41 −70	−33 −79	−63 −109	−113 −159	–	–	–
225	250	+605 +420	+395 +280	+465 +280																											−67 −113	−123 −169				
250	280	+690 +480	+430 +300	+510 +300	+271	+320	+400	+162	+191	+240	+88	+108	+137	+49	+69	+32	+52	+81	+130	+210	±16	±26	+5	+16	−9	0	−25	−14	−47	−36	−74 −126	–	–	–	–
280	315	+750 +540	+460 +330	+540 +330	+190	+190	+190	+110	+110	+110	+56	+56	+56	+17	+17	0	0	0	0	0			−27	−36	−41	−52	−57	−66	−79	−88	−78 −130				
315	355	+830 +600	+500 +360	+590 +360	+299	+350	+440	+182	+214	+265	+98	+119	+151	+54	+75	+36	+57	+89	+140	+230	±18	±28.5	+7	+17	−10	0	−26	−16	−51	−41	−87 −144	–	–	–	–
355	400	+910 +680	+540 +400	+630 +400	+210	+210	+210	+125	+125	+125	+62	+62	+62	+18	+18	0	0	0	0	0			−29	−40	−46	−57	−62	−73	−87	−98	−93 −150				
400	450	+1010 +760	+595 +440	+690 +440	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63	+97	+155	+250	±20	±31.5	+8	+18	−10	0	−27	−17	−55	−45	−103 −166	–	–	–	–
450	500	+1090 +840	+635 +480	+730 +480	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0	0	0	0			−32	−45	−50	−63	−67	−80	−95	−108	−109 −172				

Reference In each column, the upper value is the upper dimensional tolerance, and the lower figure is the lower one. [Note]*:n5 is the previous version of JIS. Presented here because many MISUMI products conform to this version.

[Technical Data]
Surface Roughness

JIS B 0601(1994)
Excerpts from JIS B 0031(1994)

1. Varieties of Surface Roughness Indicators

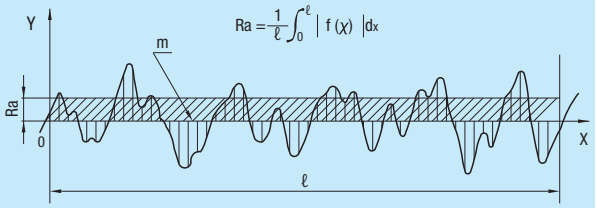
Definitions and presentations of arithmetic average roughness(Ra), maximum height(Ry), 10 spot average roughness(Rz), average concave to convex distance(Sm), average distance between local peaks S and load length rate tp are given as parameters indicating the surface roughness of an industrial product. Surface roughness is the arithmetical average of values at randomly extracted spots on the surface of an object.

[Centerline average roughness(Ra_{75})is defined in the supplements to JIS B 0031 and JIS B 0601.]

Typical calculations of surface roughness

Arithmetic Average Roughness Ra

A portion stretching over a reference length in the direction in which the average line extends is cut out from the roughness curve. This portion is presented in a new graph with the X axis extending in the same direction as the average line and the Y axis representing the magnitude. Ra is represented by the equation shown at right, in microns(μm).

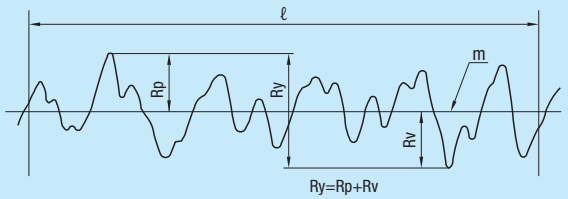


$$Ra = \frac{1}{\ell}\int_0^{\ell} |f(x)|dx$$

Maximum Height Ry

A portion stretching over a reference length in the direction in which the average line extends is cut out from the roughness curve. The gap between the peak line and the trough line is measured in the direction in which the magnitude axis extends, in microns(μm).

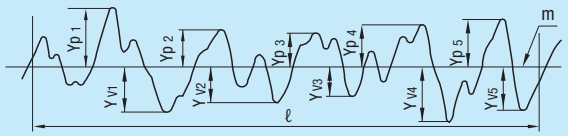
Reference A portion without an abnormally high peak or abnormally low trough, which may be regarded as a flaw, is cut out over the reference length.



Ry=Rp+Rv

Ten-spot Average Roughness Rz

A portion stretching over a reference length in the direction in which the average line extends is cut out from the roughness curve. The average of the levels(Yp)of the highest peak to the fifth highest peak as measured from the average line and the average of the levels(Yp)of the lowest trough to the fifth lowest trough similarly measured in the said portion are added together. Rz is this sum, in microns(μm).



$$Rz = \frac{|Yp_1 + Yp_2 + Yp_3 + Yp_4 + Yp_5| + |Yv_1 + Yv_2 + Yv_3 + Yv_4 + Yv_5|}{5}$$

$Yp_1, Yp_2, Yp_3, Yp_4, Yp_5$: Levels of the highest peak to the fifth highest peak in the said portion with the reference length ℓ.

$Yv_1, Yv_2, Yv_3, Yv_4, Yv_5$: Levels of the lowest trough to the fifth lowest trough in the said portion with the reference length ℓ.

Reference Relation between Arithmetic Average Roughness(Ra)and Conventional Parameters

Arithmetic Average Roughness Ra			Maximum Height Ry	Ten-spot Average Roughness Rz	Reference Length of Ry(Rz) ℓ(mm)	Conventional Finish Symbol
Standard Series	Cut-off Value c(mm)	Graphical Representation of Surface Texture	Standard Series			
0.012 a 0.025 a 0.05 a 0.1 a 0.2 a	0.08 0.25 0.8	0.012 ~ 0.2	0.05 s 0.1 s 0.2 s 0.4 s 0.8 s	0.05 z 0.1 z 0.2 z 0.4 z 0.8 z	0.08 0.25 0.8	
0.4 a 0.8 a 1.6 a		0.4 ~ 1.6	1.6 s 3.2 s 6.3 s	1.6 z 3.2 z 6.3 z		
3.2 a 6.3 a	2.5	3.2 ~ 6.3	12.5 s 25 s	12.5 z 25 z	2.5	
12.5 a 25 a	8	12.5 ~ 25	50 s 100 s	50 z 100 z	8	
50 a 100 a	–	50 ~ 100	200 s 400 s	200 z 400 z	–	~

*Interrelations among the three types shown here are not precise, and are presented for convenience only.

*Ra:The evaluation values of Ry and Rz are the cut-off value and the reference length each multiplied by five, respectively.

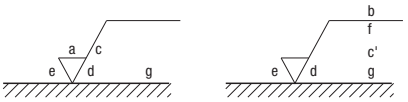
[Technical Data]
Drawing Indications of Surface Texture

Excerpts from JISB0031(1994)

1. Positions of Auxiliary Symbols for Surface Symbol

A surface roughness value, cut-off value or reference length, machining method, grain direction, surface undulation, etc. are indicated around the surface symbol as shown in Fig. 1 below.

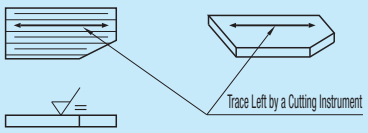
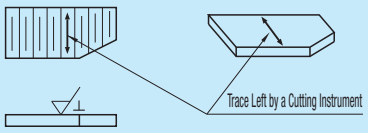
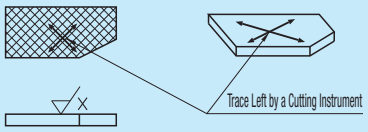
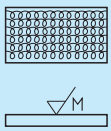
Fig. 1 Positions of Auxiliary Symbols



a : Ra Value
b : Machining Method
c : Cut-Off Value, Evaluation Length
c : Reference Length, Evaluation Length
d : Grain Direction
f : Parameter other than Ra(tp:Parameter/Cut-Off Level)
g : Surface Undulation(JIS B 0610)

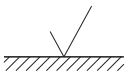
Reference These symbols except a and f are provided when they are needed.

Reference Under ISO 1302, a finish range should be indicated as e in Fig. 1.

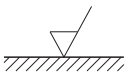
Code	Meaning	Illustration
=	The trace left by a cutting instrument is parallel to the projection plane in the drawing. Ex. Shaped Surface	
⊥	The trace left by a cutting instrument is perpendicular to the projection plane in the drawing. Ex. Shaped Surface(Side View) Circular Cut, Cylindrical Cut	
X	The pattern left by a cutting instrument diagonally crosses the projection plane in the drawing. Ex. Honed Surface	
M	The pattern left by a cutting instrument crosses in various directions or has no grain direction. Ex. Lapped Surface, Superfinished Surface and Surface Finished with a Front Mill or End Mill	
C	The pattern left by a cutting instrument is virtually concentric around the center of the plane in the drawing. Ex. Faced Surface	
R	The pattern left by a cutting instrument is virtually radial around the center of the plane in the drawing.	

■ Examples of Graphical Representation of Surface Texture

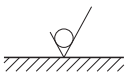
Surface Symbol



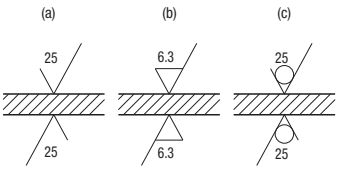
Removal of Material by Machining is required



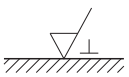
Removal of Material is Prohibited



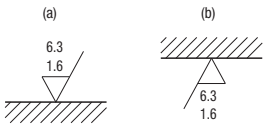
Upper Limit of Ra



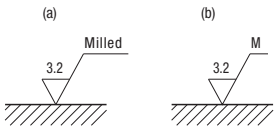
Grain Direction



Upper and Lower Limits of Ra



Machining Method



[Technical Data]
Hardness Conversion Table (SAEJ417) *Revised in 1983

Approximate Conversion of Rockwell C Hardness Values for Steel(1)

(HRC) Rockwell C-Scale Hardness	(HV) Vickers Hardness	Brinell Hardness (HB) 10mm Ball , Load 3000kgf		Rockwell Hardness(3)			Rockwell Superficial Hardness Diamond Cone Indenter			(Hs) Shore Hardness	Tensile Strength (Approximated Value) Mpa (kgf/mm²) (2)	Rockwell C-Scale Hardness (3)
		Standard Sphere	Tungsten Carbide Sphere	(HRA) A Scale, Load 60kgf, Diamond Cone Indenter	(HRB) B Scale, Load100kgf, Diameter1.6mm (1/16in)Sphere	(HRD) D Scale, Load 100kgf, Diamond Cone Indenter	15-N Scale Load 15kgf	30-N Scale Load 30kgf	45-N Scale Load 45kgf			
68	940	–	–	85.6	–	76.9	93.2	84.4	75.4	97	–	68
67	900	–	–	85.0	–	76.1	92.9	83.6	74.2	95	–	67
66	865	–	–	84.5	–	75.4	92.5	82.8	73.3	92	–	66
65	832	–	(739)	83.9	–	74.5	92.2	81.9	72.0	91	–	65
64	800	–	(722)	83.4	–	73.8	91.8	81.1	71.0	88	–	64
63	772	–	(705)	82.8	–	73.0	91.4	80.1	69 9	87	–	63
62	746	–	(688)	82.3	–	72.2	91.1	79.3	68.8	85	–	62
61	720	–	(670)	81.8	–	71.5	90.7	78.4	67.7	83	–	61
60	697	–	(654)	81.2	–	70.7	90.2	77.5	66.6	81	–	60
59	674	–	(634)	80.7	–	69.9	89.8	76.6	65.5	80	–	59
58	653	–	615	80.1	–	69.2	89.3	75.7	64.3	78	–	58
57	633	–	595	79.6	–	68.5	88.9	74.8	63.2	76	–	57
56	613	–	577	79.0	–	67.7	88.3	73.9	62.0	75	–	56
55	595	–	560	78.5	–	66.9	87.9	73.0	60.9	74	2075(212)	55
54	577	–	543	78.0	–	66.1	87.4	72.0	59.8	72	2015(205)	54
53	560	–	525	77.4	–	65.4	86.9	71.2	58.5	71	1950(199)	53
52	544	(500)	512	76.8	–	64.6	86.4	70.2	57.4	69	1880(192)	52
51	528	(487)	496	76.3	–	63.8	85.9	69.4	56.1	68	1820(186)	51
50	513	(475)	481	75.9	–	63.1	85.5	68.5	55.0	67	1760(179)	50
49	498	(464)	469	75.2	–	62.1	85.0	67.6	53.8	66	1695(173)	49
48	484	451	455	74.7	–	61.4	84.5	66.7	52.5	64	1635(167)	48
47	471	442	443	74.1	–	60.8	83.9	65.8	51.4	63	1580(161)	47
46	458	432	432	73.6	–	60.0	83.5	64.8	50.3	62	1530(156)	46
45	446	421	421	73.1	–	59.2	83.0	64.0	49.0	60	1480(151)	45
44	434	409	409	72.5	–	58.5	82.5	63.1	47.8	58	1435(146)	44
43	423	400	400	72.0	–	57.7	82.0	62.2	46.7	57	1385(141)	43
42	412	390	390	71.5	–	56.9	81.5	61.3	45.5	56	1340(136)	42
41	402	381	381	70.9	–	56.2	80.9	60.4	44.3	55	1295(132)	41
40	392	371	371	70.4	–	55.4	80.4	59.5	43.1	54	1250(127)	40
39	382	362	362	69.9	–	54.6	79.9	58.6	41.9	52	1215(124)	39
38	372	353	353	69.4	–	53.8	79.4	57.7	40.8	51	1180(120)	38
37	363	344	344	68.9	–	53.1	78.8	56.8	39.6	50	1160(118)	37
36	354	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	1115(114)	36
35	345	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	1080(110)	35
34	336	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	1055(108)	34
33	327	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	1025(105)	33
32	318	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	1000(102)	32
31	310	294	294	65.8	(106.0)	48.4	75.6	51.3	32.7	43	980(100)	31
30	302	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	950 (97)	30
29	294	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	930 (95)	29
28	286	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	910 (93)	28
27	279	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	880 (90)	27
26	272	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	860 (88)	26
25	266	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	840 (86)	25
24	260	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	825 (84)	24
23	254	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	805 (82)	23
22	248	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	785 (80)	22
21	243	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	770 (79)	21
20	238	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	760 (77)	20
(18)	230	219	219	–	96.7	–	–	–	–	33	730 (75)	(18)
(16)	222	212	212	–	95.5	–	–	–	–	32	705 (72)	(16)
(14)	213	203	203	–	93.9	–	–	–	–	31	675 (69)	(14)
(12)	204	194	194	–	92.3	–	–	–	–	29	650 (66)	(12)
(10)	196	187	187	–	90.7	–	–	–	–	28	620 (63)	(10)
(8)	188	179	179	–	89.5	–	–	–	–	27	600 (61)	(8)
(6)	180	171	171	–	87.1	–	–	–	–	26	580 (59)	(6)
(4)	173	165	165	–	85.5	–	–	–	–	25	550 (56)	(4)
(2)	166	158	158	–	83.5	–	–	–	–	24	530 (54)	(2)
(0)	160	152	152	–	81.7	–	–	–	–	24	515 (53)	(0)

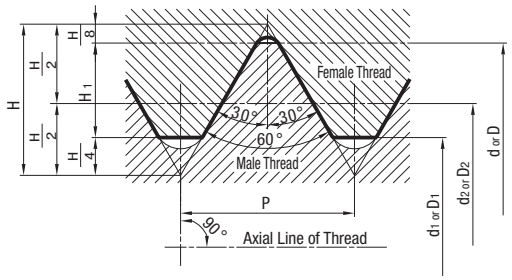
Note(1): Blue figures: Based on ASTM E 140, Table 1 (Jointly coordinated by SAE, ASM and ASTM.)

(2): The units and figures shown in brackets are the results of conversion from psi figures by reference to JIS Z 8413 and Z 8438 conversion tables. Moreover, 1MPa=1N/mm²

(3): The figures in brackets are in ranges not frequently used. They are given as referential data.

[Technical Data]
Metric Coarse Screw Threads

Excerpts from JIS B0205 (2001)



$H = 0.866025P$ $\quad D = d$

$H_1 = 0.541266P$ $\quad D_2 = d_2$

$\quad D_1 = d_1$

$d_2 = d - 0.649519P$

$d_1 = d - 1.082532P$

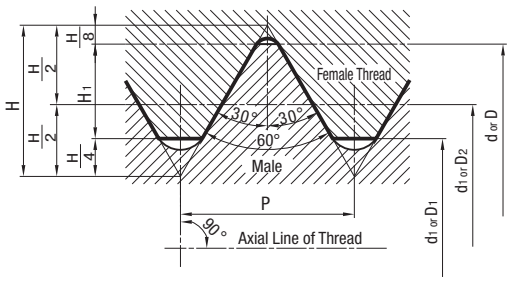
Unit:mm

Nominal of Thread(1)*			Pitch P	Height of Engagement H_1	Female Thread		
					Minor Dia. D	Effective Dia. D_2	Inner Dia. D_1
					Male Thread		
Column 1	Column 2	Column 3			Outer Dia. d	Effective Dia. d_2	Inner Dia. d_1
M 1			0.25	0.135	1.000	0.838	0.729
	M 1.1		0.25	0.135	1.100	0.938	0.829
M 1.2			0.25	0.135	1.200	1.038	0.929
	M 1.4		0.3	0.162	1.400	1.205	1.075
M 1.6			0.35	0.189	1.600	1.373	1.221
	M 1.8		0.35	0.189	1.800	1.573	1.421
M 2			0.4	0.217	2.000	1.740	1.567
	M 2.2		0.45	0.244	2.200	1.908	1.713
M 2.5			0.45	0.244	2.500	2.208	2.013
M 3			0.5	0.271	3.000	2.675	2.459
	M 3.5		0.6	0.325	3.500	3.110	2.850
M 4			0.7	0.379	4.000	3.545	3.242
	M 4.5		0.75	0.406	4.500	4.013	3.688
M 5			0.8	0.433	5.000	4.480	4.134
M 6			1	0.541	6.000	5.350	4.917
		M 7	1	0.541	7.000	6.350	5.917
M 8			1.25	0.677	8.000	7.188	6.647
		M 9	1.25	0.677	9.000	8.188	7.647
M10			1.5	0.812	10.000	9.026	8.376
		M11	1.5	0.812	11.000	10.026	9.376
M12			1.75	0.947	12.000	10.863	10.106
	M14		2	1.083	14.000	12.701	11.835
M16			2	1.083	16.000	14.701	13.835
	M18		2.5	1.353	18.000	16.376	15.294
M20			2.5	1.353	20.000	18.376	17.294
	M22		2.5	1.353	22.000	20.376	19.294
M24			3	1.624	24.000	22.051	20.752
	M27		3	1.624	27.000	25.051	23.752
M30			3.5	1.894	30.000	27.727	26.211
	M33		3.5	1.894	33.000	30.727	29.211
M36			4	2.165	36.000	33.402	31.670
	M39		4	2.165	39.000	36.402	34.670
M42			4.5	2.436	42.000	39.077	37.129
	M45		4.5	2.436	45.000	42.077	40.129
M48			5	2.706	48.000	44.752	42.587
	M52		5	2.706	52.000	48.752	46.587
M56			5.5	2.977	56.000	52.428	50.046
	M60		5.5	2.977	60.000	56.428	54.046
M64			6	3.248	64.000	60.103	57.505
	M68		6	3.248	68.000	64.103	61.505

*Priority should be given to Column 1. If required, select items in Column 2 and 3, in that order.

[Technical Data]
Metric Fine Screw Threads

Excerpts from JIS B 0207 (1999)



$H = 0.866025P$ $\quad D = d$

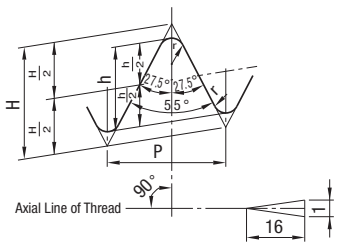
$H_1 = 0.541266P$ $\quad D_2 = d_2$

$\quad\quad\quad

[Technical Data]
Taper Pipe Threads Excerpts from JIS B 0203 (1999)

Reference Thread Shape and Reference Dimension

Reference Thread Shape and Basic Dimension for a Tapered Male/Female Thread



Thick Solid Lines: Reference Thread Shape

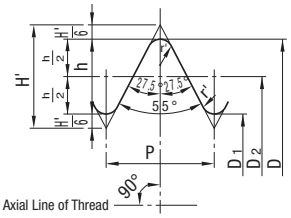
$P=\frac{25.4}{n}$

$H=0.960237P$

$h=0.640327P$

$r=0.137278P$

Reference Thread Shape for a Parallel Female Thread



Thick Solid Lines: Reference Thread Shape

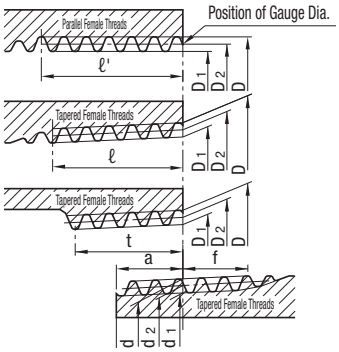
$P=\frac{25.4}{n}$

$H'=0.960491P$

$h=0.640327P$

$r'=0.137329P$

Fitting together a tapered female thread or parallel female thread and a tapered male thread.



Unit: mm

Nominal of Thread (1)	Thread: Number of Threads (in 25.4 mm / n)	Thread: Pitch P	Thread: Thread Height (Reference) h	Thread: Roundness r or r'	Gauge Dia.: Male Thread: Outer Dia. d	Gauge Dia.: Male Thread: Effective Dia. d_2	Gauge Dia.: Male Thread: Minor Dia. d_1	Gauge Dia.: Female Thread: Minor Dia. D	Gauge Dia.: Female Thread: Effective Dia. D_2	Gauge Dia.: Female Thread: Inner Dia. D_1	Position of Gauge Dia.: Male Thread: From Pipe End: Reference Length a	Position of Gauge Dia.: Male Thread: From Pipe End: Axial Tolerance b	Position of Gauge Dia.: Female Thread: Pipe End: Axial Tolerance c	D, D_2 and D_1 Tolerances of Parallel Female Threads	Length of Effective Thread (Min.): Male Thread: From Position of Gauge Dia. Spot to Major Dia. Spot f	Length of Effective Thread (Min.): Female Thread: With Incomplete Threaded Portion: Tapered Female Threads: From Position of Gauge Dia. Spot to Minor Dia. Spot ℓ	Length of Effective Thread (Min.): Female Thread: With Incomplete Threaded Portion: Parallel Female Threads: From pipe end or pipe fitting end ℓ' (Reference)	Length of Effective Thread (Min.): Female Thread: Without Incomplete Threaded Portion: Tapered Female Threads, Parallel Female Threads t(2)	Carbon Steel for Piping Size of Steel Pipe (Reference): Outer Diameter	Carbon Steel for Piping Size of Steel Pipe (Reference): Thickness
$R^1/_{16}$	28	0.9071	0.581	0.12	7.723	7.142	6.561	7.723	7.142	6.561	3.97	±0.91	±1.13	±0.071	2.5	6.2	7.4	4.4	–	–
$R^1/_8$	28	0.9071	0.581	0.12	9.728	9.147	8.566	9.728	9.147	8.566	3.97	±0.91	±1.13	±0.071	2.5	6.2	7.4	4.4	10.5	2.0
$R^1/_4$	19	1.3368	0.856	0.18	13.157	12.301	11.445	13.157	12.301	11.445	6.01	±1.34	±1.67	±0.104	3.7	9.4	11.0	6.7	13.8	2.3
$R^3/_8$	19	1.3368	0.856	0.18	16.662	15.806	14.950	16.662	15.806	14.950	6.35	±1.34	±1.67	±0.104	3.7	9.7	11.4	7.0	17.3	2.3
$R^1/_2$	14	1.8143	1.162	0.25	20.955	19.793	18.631	20.955	19.793	18.631	8.16	±1.81	±2.27	±0.142	5.0	12.7	15.0	9.1	21.7	2.8
$R^3/_4$	14	1.8143	1.162	0.25	26.441	25.279	24.117	26.441	25.279	24.117	9.53	±1.81	±2.27	±0.142	5.0	14.1	16.3	10.2	27.2	2.8
R1	11	2.3091	1.479	0.32	33.249	31.770	30.291	33.249	31.770	30.291	10.39	±2.31	±2.89	±0.181	6.4	16.2	19.1	11.6	34	3.2
$R1^1/_4$	11	2.3091	1.479	0.32	41.910	40.431	38.952	41.910	40.431	38.952	12.70	±2.31	±2.89	±0.181	6.4	18.5	21.4	13.4	42.7	3.5
$R1^1/_2$	11	2.3091	1.479	0.32	47.803	46.324	44.845	47.803	46.324	44.845	12.70	±2.31	±2.89	±0.181	6.4	18.5	21.4	13.4	48.6	3.5
R2	11	2.3091	1.479	0.32	59.614	58.135	56.656	59.614	58.135	56.656	15.88	±2.31	±2.89	±0.181	7.5	22.8	25.7	16.9	60.5	3.8
$R2^1/_2$	11	2.3091	1.479	0.32	75.184	73.705	72.226	75.184	73.705	72.226	17.46	±3.46	±3.46	±0.216	9.2	26.7	30.1	18.6	76.3	4.2
R3	11	2.3091	1.479	0.32	87.884	86.405	84.926	87.884	86.405	84.926	20.64	±3.46	±3.46	±0.216	9.2	29.8	33.3	21.1	89.1	4.2
R4	11	2.3091	1.479	0.32	113.030	111.551	110.072	113.030	111.551	110.072	25.40	±3.46	±3.46	±0.216	10.4	35.8	39.3	25.9	114.3	4.5
R5	11	2.3091	1.479	0.32	138.430	136.951	135.472	138.430	136.951	135.472	28.58	±3.46	±3.46	±0.216	11.5	40.1	43.5	29.3	139.8	4.5
R6	11	2.3091	1.479	0.32	163.830	162.351	160.872	163.830	162.351	160.872	28.58	±3.46	±3.46	±0.216	11.5	40.1	43.5	29.3	165.2	5.0

Note(1): The nominal of a tapered male thread is given here. For a taper female thread or parallel female thread, R should be replaced with Rc or Rp. (Refer to*)

(2): Tapered thread: length from position of gauge dia. spot to a minor dia. spot. /Parallel female thread: length from a pipe end or pipe fitting end.

Reference 1. The threads should be at right angles to the central axial line, and the pitch should be measured along the central axial line.

2. The length of the effective thread means the length over which threads are fully provided. A pipe or a pipe fitting may be left in place on the crests of the last few threads. A chamfered end, if any, of a pipe or a pipe fitting should be included in the length of the effective thread.

3. When the value of a, f and t does not meet the requirements, the criteria of other standard is provided.

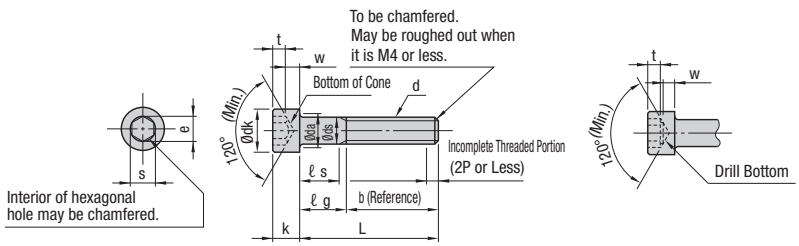
(*) Tapered threads type for a pipe are specified as taper male thread for a pipe, taper female thread and parallel female thread for a pipe.

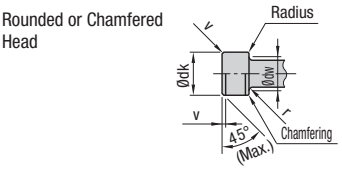
The parallel female thread for a pipe should be mated with a tapered male thread for a pipe, and differs in dimension tolerances from the parallel female thread specified by JIS B 0202.

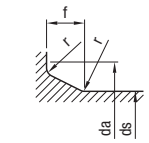
[Technical Data]
Hexagon Socket Head Cap Screws

Excerpts from JIS B 1176 (1999, 2000)

1. Dimensions of Sections







f(Max.)=1.7r(Max.)

$$r(Max.)=\frac{da(Max.)-ds(Max.)}{2}$$

r(Min.)= Value in the Attached Table

Unit: mm

Nominal of Thread(d)(2)		M2	M2.5	M3	M4	M5	M6	M8	M10	M12	(M14)	M16	(M18)	M20	(M22)	M24	(M27)	M30
Pitch of Thread(P)		0.4	0.45	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2.5	2.5	3	3	3.5
b	Reference	16	17	18	20	22	24	28	32	36	40	44	48	52	56	60	66	72
dk	Max.(Basis)*	3.8	4.5	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
	Max.**	3.98	4.68	5.68	7.22	8.72	10.22	13.27	16.27	18.27	21.33	24.33	27.33	30.33	33.39	36.39	40.39	45.39
	Min.	3.62	4.32	5.32	6.78	8.28	9.78	12.73	15.73	17.73	20.67	23.67	26.67	29.67	32.61	35.61	39.61	44.61
da	Max.	2.6	3.1	3.6	4.7	5.7	6.8	9.2	11.2	13.7	15.7	17.7	20.2	22.4	24.4	26.4	30.4	33.4
ds	Max.(Basis)	2	2.5	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
	Min.	1.86	2.36	2.86	3.82	4.82	5.82	7.78	9.78	11.73	13.73	15.73	17.73	19.67	21.67	23.67	26.67	29.67
e	Min.	1.73	2.30	2.87	3.44	4.58	5.72	6.86	9.15	11.43	13.72	16.00	16.00	19.44	19.44	21.73	21.73	25.15
f	Max.	0.51	0.51	0.51	0.60	0.60	0.68	1.02	1.02	1.45	1.45	1.45	1.87	2.04	2.04	2.04	2.89	2.89
k	Max.(Basis)	2	2.5	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
	Min.	1.86	2.36	2.86	3.82	4.82	5.70	7.64	9.64	11.57	13.57	15.57	17.57	19.48	21.48	23.48	26.48	29.48
r	Min.	0.1	0.1	0.1	0.2	0.2	0.25	0.4	0.4	0.6	0.6	0.6	0.6	0.8	0.8	0.8	1	1
s	Nominal(Basis)	1.5	2	2.5	3	4	5	6	8	10	12	14	14	17	17	19	19	22
	Min.	1.52	2.02	2.52	3.02	4.02	5.02	6.02	8.025	10.025	12.032	14.032	14.032	17.05	17.050	19.065	19.065	22.065
	Max. (1) Column 1	1.560	2.060	2.580	3.080	4.095	5.140	6.140	8.175	10.175	12.212	14.212	14.212	17.230	17.230	19.275	19.275	22.275
	Max. (1) Column 2	1.545	2.045	2.560	3.080	4.095	5.095	6.095	8.115	10.115	12.142	14.142	14.142					
t	Min.	1	1.1	1.3	2	2.5	3	4	5	6	7	8	9	10	11	12	13.5	15.5
v	Max.	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.7	3
dw	Min.	3.40	4.18	5.07	6.53	8.03	9.38	12.33	15.33	17.23	20.17	23.17	25.87	28.87	31.81	34.81	38.61	43.61
w	Min.	0.55	0.85	1.15	1.4	1.9	2.3	3.3	4	4.8	5.8	6.8	7.7	8.6	9.5	10.4	12.1	13.1

Note (1): Column 1 for s (max.) is applicable to strength class 8.8, 10.9, A 2-50 and A 2-70; Column 2 should be applied to strength class 12.9.
Column 1 may be applicable to strength class 12.9 in accordance with an agreement made between the delivering and receiving sides.
When the nominal of thread is M20 or larger, s (max.) should be applied to all strength classes.

Note (2): Nominal of thread in brackets should not be used unless it is absolutely necessary.

Reference 1. A side of the head should be knurled into a straight line or crisscross pattern [refer to JIS B 0951 (knurling pattern)]. dk(max.) should be the value marked with**.
If no knurled pattern is needed, purchasers can indicate that. However, dk(max.) should be the value marked with*.

2. Recommended nominal lengths (L) for individual nominal of thread are shown within the bold lines.
If L is shorter than the dotted line, the thread should be fully threaded, and the incompletely threaded part length beneath the neck should be approximately 3P.

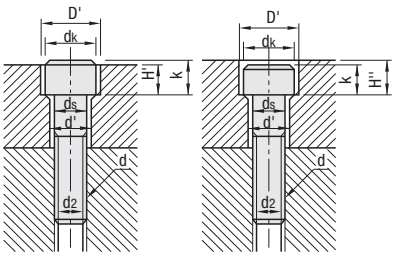
3. ℓg (max.) and ℓg (min.) for a screw, whose length (L) exceeds the dotted line, are obtained by the equations below:
ℓg(Max)=Nominal Length(L)-b
ℓs(Min)=ℓg(Max)-5P

2. L, s and g of Hexagon Socket Head Cap Screws

Unit: mm

Nominal of Thread (d)	L		M2		M2.5		M3		M4		M5		M6		M8		M10		M12		M14		M16		(M18)		M20		(M22)		M24		(M27)		M30	
			ℓs min and ℓg max																																	
Nominal Length	min	max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max	ℓs min	ℓg max
5	4.76	5.24																																		
6	5.76	6.24																																		
8	7.71	8.29																																		
10	9.71	10.29																																		
12	11.65	12.35																																		
16	15.65	16.35																																		
20	19.58	20.42	2	4																																
25	24.58	25.42			5.75	8	4.5	7																												
30	29.58	30.42					9.5	12	6.5	10	4	8																								
35	34.5	35.5							11.5	15	9	13	6	11																						
40	39.5	40.5							16.5	20	14	18	11	16	5.75	12																				
45	44.5	45.5									19	23	16	21	10.75	17	5.5	13																		
50	49.5	50.5									24	28	21	26	15.75	22	10.5	18																		
55	54.4	55.6											26	31	20.75	27	15.5	23	10.25	19																
60	59.4	60.6											31	36	25.75	32	20.5	28	15.25	24	10	20														
65	64.4	65.6													30.75	37	25.5	33	20.25	29	15	25	11	21	4.5	17										
70	69.4	70.6													35.75	42	30.5	38	25.25	34	20	30	16	26	9.5	22										
80	79.4	80.6													45.75	52	40.5	48	35.25	44	30	40	26	36	19.5	32	15.5	28	11.5	24						
90	89.3	90.7															50.5	58	45.25	54	40	50	36	46	29.5	42	25.5	38	21.5	34	15	30	9	24		
100	99.3	100.7															60.5	68	55.25	64	50	60	46	56	39.5	52	35.5	48	31.5	44	25	40	19	34		
110	109.3	110.7																	66.25	74	60	70	56	66	49.5	62	45.5	58	41.5	54	35	50	29	44	20.5	38
120	119.3	120.7																	75.25	84	70	80	66	76	59.5	72	55.5	68	51.5	64	45	60	39	54	30.5	48
130	129.2	130.8																			80	90	76	86	69.5	82	65.5	78	61.5	74	55	70	49	64	40.5	58
140	139.2	140.8																			90	100	86	96	79.5	92	75.5	88	71.5	84	65	80	59	74	50.5	68
150	149.2	150.8																					96	106	89.5	102	85.5	98	81.5	94	75	90	69	84	60.5	78
160	159.2	160.8																					106	116	99.5	112	95.5	108	91.5	104	85	100	79	94	70.5	88
180	179.2	180.8																							119.5	132	115.5	128	111.5	124	105	120	99	114	90.5	108
200	199.05	200.95																									135.5	148	131.5	144	125	140	119	134	110.5	128
220	219.05	220.95																															139	154	130.5	148
240	239.05	240.95																															159	174	150.5	168
260	258.95	261.05																															179	194	170.5	188
280	278.95	281.05																															199	214	190.5	208
300	298.95	301.05																															219	234	210.5	228

Reference: Dimensions of Counterboring and Bolt Hole for the Hexagon Socket Head Cap Screws



Unit: mm

Nominal of Thread (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
ds	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
d	3.4	4.5	5.5	6.6	9	11	14	16	18	20	22	24	26	30	33
dk	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
D'	6.5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
k	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H'	2.7	3.6	4.6	5.5	7.4	9.2	11	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H''	3.3	4.4	5.4	6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32
d2	2.6	3.4	4.3	5.1	6.9	8.6	10.4	12.2	14.2	15.7	17.7	19.7	21.2	24.2	26.7

[Technical Data]
Proper Bolt Axial Tightening Force and Proper Tightening Torque

■Axial Tightening Force for Bolt and Fatigue Limit

- The proper axial tightening force for a bolt should be calculated within an elasticity range up to 70% of the rated yield strength when the torque method is used.
- The fatigue strength of bolt under repeated load should not exceed the specified tolerance.
- Do not let the seat of a bolt or nut dent the contact area.
- Do not break the tightened piece by tightening.

A bolt is tightened by torque, torque inclination, rotating angle, stretch measurement and other methods. The torque method is widely used due to its simplicity and convenience.

■Calculation of Axial Tightening Force and Tightening Torque

The relation between the axial tightening force and Ff is represented by Equation(1)below:

$Ff=0.7\times\sigma y\times As$……(1)

Tightening torque TfA can be obtained by using the following formula(2).

$T_{fA}=0.35k(1+1/Q)\sigma y \cdot As \cdot d$……(2)

k : Torque Coefficient
d : Nominal Diameter of Bolt[cm]
Q : Tightening Coefficient
σy : Tensile strength(When the strength class is 12.9, it is 112kgf/mm^2)
As : Effective Sectional Area of the Bolt[mm^2]

■Calculation Example

Proper torque and axial force for Mild steel pieces tightened together by means of a hexagon socket head cap screw, M6(strength class 12.9), with the pieces lubricated with oil can be calculated.

· Proper Torque, by using Equation(2)

$T_{fA}=0.35k\ (1+1/Q)\ \sigma y \cdot As \cdot d$
$=0.35 \cdot 0.17\ (1+1/1.4)\ 1098 \cdot 20.1 \cdot 0.6$
$=1351[N \cdot cm]\ \{138[kgf \cdot cm]\}$

· Axial Force Ff, by using Equation(1)

$Ff=0.7\times\sigma y\times As$
$=0.7\times1098\times20.1$
$=15449[N]\ \{1576[kgf]\}$

■Surface Treatment for Bolt and Torque Coefficient Dependent on the Combination of Material for Area to be Fastened and Material of Female Thread

Bolt Surface Treatment Lubrication	Torque Coefficient k	Combination of material for area to be fastened and material for female thread (a) (b)
Steel Bolt Black Oxided Film Oil Lubrication	0.145	SCM–FC FC–FC SUS–FC
	0.155	1.0301–FC SCM–1.0301 SCM–SCM FC–1.0301 FC–SCM
	0.165	SCM–SUS FC–SUS AL–FC SUS–1.0301 SUS–SCM SUS–SUS
	0.175	1.0301–1.0301 1.0301–SCM 1.0301–SUS AL–1.0301 AL–SCM
	0.185	SCM–AL FC–AL AL–SUS
	0.195	1.0301–AL SUS–AL
	0.215	AL–AL
Steel Bolt Black Oxided Film Unlubricated	0.25	1.0301–FC SCM–FC FC–FC
	0.35	1.0301–SCM SCM–SCM FC–1.0301 FC–SCM AL–FC
	0.45	1.0301–1.0301 SCM–1.0301 AL–1.0301 AL–SCM
	0.55	SCM–AL FC–AL AL–AL

1.0301:Mild steel not thermally refined SCM:Thermally Refined Steel(35HRC) FC:Cast Iron(FC200)AL:Aluminum SUS:Stainless Steel

■Standard Value of Tightening Coefficient Q

Tightening Coefficient Q	Tightening Method	Surface Condition		Lubrication
		Bolts	Nuts	
1.25	Torque Wrench	Manganese Phosphate	Not treated or Treated with Phosphate.	Lubricated with oil or MoS2 paste
1.4	Torque Wrench	Not treated or Treated with Phosphate.		
	Limited-Torque Wrench			
1.6	Impact Wrench			
1.8	Torque Wrench	Not treated or Treated with Phosphate.	No Treatment	Unlubricated
	Limited-Torque Wrench			

Strength Class
Ex. 12.9
- Tensile Strength(Yield Stress):90% of the minimum value of tensile strength
- The minimum value of tensile strength is 1220N/mm^2 { 124kgf/mm^2 }

10.9
- Tensile Strength(Yield Stress):90% of the minimum value of tensile strength
- The minimum value of tensile strength is 1040N/mm^2 { 106kgf/mm^2 }

■Initial Tightening Force and Tightening Torque

Nominal of Thread	Effective Sectional Area As mm^2	Strength Class 12.9			10.9			8.8		
		Yield Load N {kgf}	Initial Tightening Force N {kgf}	Tightening Torque N · cm {kgf · cm}	Yield Load N {kgf}	Initial Tightening Force N {kgf}	Tightening Torque N · cm {kgf · cm}	Yield Load N {kgf}	Initial Tightening Force N {kgf}	Tightening Torque N · cm {kgf · cm}
M 3×0.5	5.03	5517{ 563}	3861{ 394}	167{ 17}	4724{ 482}	3312{ 338}	147{ 15}	3214{ 328}	2254{ 230}	98{ 10}
M 4×0.7	8.78	9633{ 983}	6742{ 688}	392{ 40}	8252{ 842}	5772{ 589}	333{ 34}	5615{ 573}	3930{ 401}	225{ 23}
M 5×0.8	14.2	15582{ 1590}	10907{ 1113}	794{ 81}	13348{ 1362}	9339{ 953}	676{ 69}	9085{ 927}	6360{ 649}	461{ 47}
M 6×1	20.1	22060{ 2251}	15445{ 1576}	1352{ 138}	18894{ 1928}	13220{ 1349}	1156{ 118}	12867{ 1313}	9006{ 919}	784{ 80}
M 8×1.25	36.6	40170{ 4099}	28116{ 2869}	3273{ 334}	34398{ 3510}	24079{ 2457}	2803{ 286}	23422{ 2390}	16395{ 1673}	1911{ 195}
M10×1.5	58	63661{ 6496}	44561{ 4547}	6497{ 663}	54508{ 5562}	38161{ 3894}	5557{ 567}	37113{ 3787}	25980{ 2651}	3783{ 386}
M12×1.75	84.3	92532{ 9442}	64768{ 6609}	11368{ 1160}	79223{ 8084}	55458{ 5659}	9702{ 990}	53949{ 5505}	37759{ 3853}	6605{ 674}
M14×2	115	126224{ 12880}	88357{ 9016}	18032{ 1840}	108084{ 11029}	75656{ 7720}	15484{ 1580}	73598{ 7510}	51519{ 5257}	10486{ 1070}
M16×2	157	172323{ 17584}	117982{ 12039}	28126{ 2870}	147549{ 15056}	103282{ 10539}	24108{ 2460}	100470{ 10252}	70325{ 7176}	16366{ 1670}
M18×2.5	192	210739{ 21504}	147519{ 15053}	38710{ 3950}	180447{ 18413}	126312{ 12889}	33124{ 3380}	126636{ 12922}	88641{ 9045}	23226{ 2370}
M20×2.5	245	268912{ 27440}	188238{ 19208}	54880{ 5600}	230261{ 23496}	161181{ 16447}	46942{ 4790}	161592{ 16489}	113112{ 11542}	32928{ 3360}
M22×2.5	303	332573{ 33936}	232799{ 23755}	74676{ 7620}	284768{ 29058}	199332{ 20340}	63896{ 6520}	199842{ 20392}	139885{ 14274}	44884{ 4580}
M24×3	353	387453{ 39536}	271215{ 27675}	94864{ 9680}	331759{ 33853}	232231{ 23697}	81242{ 8290}	232819{ 23757}	162974{ 16630}	57036{ 5820}

(Note) · Tightening Conditions:Use of a torque wrench(Lubricated with Oil, Torque Coefficient k=0.17, Tightening Coefficient Q=1.4)
· The torque coefficient varies with the conditions of use. Values in this table should be used as rough referential values.
· The table is an excerpt from a catalog of Kyokuto Seisakusho Co., Ltd.

[Technical Data]
Strength of Bolts, Screw Plugs and Dowel Pins

■Strength of Bolt

1)Tensile Load Bolt

$P=\sigma t \times As$ ·····(1)

$=\pi d^2 \sigma t/4$ ·····(2)

Pt : Tensile Load in the Axial Direction [N]
σb : Yield Stress of the Bolt [N/mm²]
σt : Allowable Stress of the Bolt [N/mm²]
($\sigma t=\sigma b$/Safety Factorα)
As : Effective Sectional Area of the Bolt [mm²]
$As=\pi d^2/4$
d : Effective Dia. of the Bolt (Core Dia.) [mm]

■Safety Factorα of Unwin Based on Tensile Strength

Materials	Static Load	Repeated Load		Impact Load
		Pulsating	Reversed	
Steel	3	5	8	12
Cast Iron	4	6	10	15
Copper, Soft Metal	5	5	9	15

$\text{Allowable Stress} = \frac{\text{Reference Strength}}{\text{Safety Factor}\alpha}$ Reference Strength:Yield Stress for Ductile Material
Fracture Stress for Fragile Material

(Ex.)The proper size of a hexagon socket head cap screws, which is to bear a repeated tensile load(pulsating) at P=1960N {200 kgf} , should be determined.(The hexagon socket head cap screws are 1.7220, 38 to 43 HRC, strength class 12.9)

(1)Using Equation

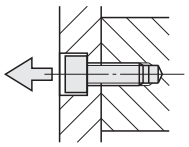
$As=Pt/\sigma t$

$=1960/219.6$

$=8.9\ [mm^2]$

∴By finding a value greater than the result of the equation in the Effective Sectional Area column in the table on the right, M5, 14.2[mm²], should be selected.

M6, allowable load of 2087N {213 kgf} , should be selected from the column for strength class 12.9, with the fatigue strength taken into account.



The yield stress, strength class 12.9, isσb=1098[N/mm²] {112[kgf/mm²]}.
Allowable Stress $\sigma t = \sigma b$/Safety Factor(from the above table Safety Factor 5)
=1098/5
=219.6[N/mm²] {22.4[kgf/mm²]}

2) If the bolt, like a stripper bolt, is to bear a tensile impact load, the right size should be selected from the fatigue strength column.(Under a load of 1960N {200kgf}, stripper bolt made of 1.7220, 33 to 38 HRC, strength class 10.9)

By finding a value greater than the allowable load of 1960N {200 kgf} in the Strength Class 10.9 column in the table on right, M8, 3116[N] {318[kgf]} , should be selected. Hence, MSB10 with the M8 threaded portion and an axial diameter of 10 mm should be selected.

If it is to bear a shearing load, a dowel pin should also be used.

■Fatigue Strength of Bolt(Thread:Fatigue Strength is 2 million times)

Nominal of Thread	Effective Sectional Area As mm²	Strength Class 12.9 Fatigue Strength† N/mm² [kgf/mm²]	12.9 Allowable Load N {kgf}	10.9 Fatigue Strength† N/mm² [kgf/mm²]	10.9 Allowable Load N {kgf}
M 4	8.78	128{ 13.1}	1117{ 114}	89{ 9.1}	774{ 79}
M 5	14.2	111{ 11.3}	1568{ 160}	76{ 7.8}	1088{ 111}
M 6	20.1	104{ 10.6}	2087{ 213}	73{ 7.4}	1460{ 149}
M 8	36.6	87{ 8.9}	3195{ 326}	85{ 8.7}	3116{ 318}
M10	58	73{ 7.4}	4204{ 429}	72{ 7.3}	4145{ 423}
M12	84.3	66{ 6.7}	5537{ 565}	64{ 6.5}	5370{ 548}
M14	115	60{ 6.1}	6880{ 702}	59{ 6}	6762{ 690}
M16	157	57{ 5.8}	8928{ 911}	56{ 5.7}	8771{ 895}
M20	245	51{ 5.2}	12485{ 1274}	50{ 5.1}	12250{ 1250}
M24	353	46{ 4.7}	16258{ 1659}	46{ 4.7}	16258{ 1659}

Fatigue strength* is a revision of an excerpt from "Estimated Fatigue Limits of Small Screws, Bolts and Metric Screws for Nuts" (Yamamoto).

■Strength of Screw Plug

When screw plug MSW30 is to bear an impact load, allowable load P should be determined. (The materials of MSW30 are 1.1191, 34 to 43 HRC, tensile strength σt 637N/mm² {65kgf/mm².})

If M S W is shorn at a spot within the root diameter section and is broken, allowable load P can be calculated as shown below.

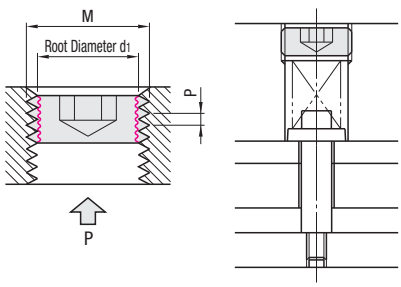
Allowable Load $P=\tau t \times A$

$=3.9\times107.4$

$=40812[N]\ \{4164[kgf]\}$

Find the allowable shearing force base on the core diameter of female thread if a tap is made of soft material.

Area A=Root Diameter $d_1\times\pi\times L$
(Root Diameter $d_1\approx M-P$)
$A=(M-P)\pi L=(30-1.5)\pi\times12$
$=1074\ [mm^2]$
Yield Stress≈0.9×Tensile Strength $\sigma b=0.9\times637=573[N/mm^2]$
Shearing Stress≈0.8×Yield Stress
$=459\ [N/mm^2]$
Allowable Shearing Stress τt=Shearing Stress/Safety Factor12
$=459/12=38\ [N/mm^2]\ \{3.9\ [kgf/mm^2]\}$



■Strength of Dowel Pins

The proper size of a dowel pin under repeated shearing load of 7840N {800 kgf} (Pulsating) should be determined.(The material of Dowel Pins is SUJ2. Hardness 58HRC~)

$P=A\times\tau$

$=\pi D^2\tau/4$

$D=\sqrt{(4P)/(\pi\tau)}$

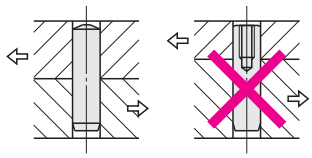
$=\sqrt{(4\times7840)/(3.14\times188)}$

≈7.3

∴D8 or a larger size should be selected for MS.

If the dowel pins are of a roughly uniform size, the number of the necessary tools and extra pins can be reduced.

Yield Stress for SUJ2 $\sigma b=1176\ [N/mm^2]\ \{120\ [kgf/mm^2]\}$
Allowable Shearing Strength $\tau=\sigma b\times0.8$/Safety Factor α
$=1176\times0.8/5$
$=188\ [N/mm^2]\ \{19.2\ [kgf/mm^2]\}$

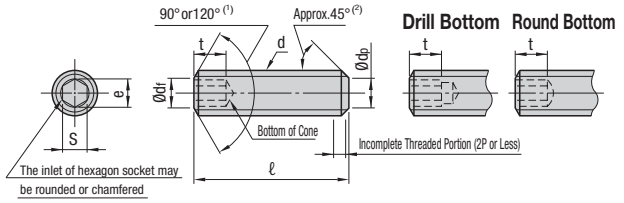


The dowel pin must not be loaded.

Typical strength calculations are presented here. In practice, further conditions including hole-to-hole pitch precision, hole perpendicularity, surface roughness, circularity, plate material, parallelism, quenching or non-quenching, precision of the press, product output, wear of tools should be considered. Hence the values in these examples are typical but not guaranteed values.

[Technical Data]
Hexagon Socket Set Screws Flat Type

1. Shape and Dimension of Hexagon Socket Set Screws and Its Flat End (JIS B 1177-1997).



Note (1): Should be chamfered to 120° if I falls short of the dotted line, which forms stairs, in the table.
(2): 45° Slanted portion below the trough diameter line of the male thread.

Nominal of Thread(d)			M2	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24
Pitch(P)			0.4	0.5	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0
d_p	Max.(Reference		1.0	2.0	2.5	3.5	4.0	5.5	7.0	8.5	12.0	15.0	18.0
	Min.		0.75	1.75	2.25	3.2	3.7	5.2	6.64	8.14	11.57	14.57	17.57
d_f	Approx.		Thread Bottom Diameter of Male Thread										
e	Min.(3)		1.003	1.73	2.30	2.87	3.44	4.58	5.72	6.86	9.15	11.43	13.72
s	Nominal(Reference		0.9	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0
	Max.		0.902	1.545	2.045	2.560	3.080	4.095	5.095	6.095	8.115	10.115	12.142
	Min.		0.889	1.520	2.020	2.520	3.020	4.020	5.020	6.020	8.025	10.025	12.032
t	Min.(4)	Column 1	0.8	1.2	1.5	2.0	2.0	3.0	4.0	4.8	6.4	8.0	10.0
		Column 2	1.7	2.0	2.5	3.0	3.5	5.0	6.0	8.0	10.0	12.0	15.0
ℓ(5)			Approx. Mass Per 1000 Units										
Nominal Length(Reference Dimension)	Min.	Max.	Unit:kg (Density:7.85kg/dm³)										
2	1.8	2.2	0.029	0.059									
2.5	2.3	2.7	0.037	0.08	0.099								
3	2.8	3.2	0.044	0.1	0.14	0.2							
4	3.7	4.3	0.059	0.14	0.22	0.32	0.41						
5	4.7	5.3	0.074	0.18	0.3	0.44	0.585	0.945					
6	5.7	6.3	0.089	0.22	0.38	0.56	0.76	1.26	1.77				
8	7.7	8.3	0.119	0.3	0.54	0.8	1.11	1.89	2.78	4			
10	9.7	10.3	0.148	0.38	0.7	1.04	1.46	2.52	3.78	5.4	8.5		
12	11.6	12.4		0.46	0.86	1.28	1.81	3.15	4.78	6.8	11.1	15.8	
16	15.6	16.4		0.62	1.18	1.76	2.51	4.41	6.78	9.6	16.3	24.1	30
20	19.6	20.4			1.49	2.24	3.21	5.67	8.76	12.4	21.5	32.3	42
25	24.6	25.4				2.84	4.09	7.25	11.2	15.9	28	42.6	57
30	29.6	30.4					4.97	8.82	13.7	19.4	34.6	52.9	72
35	34.5	35.5						10.4	16.2	22.9	41.1	63.2	87
40	39.5	40.5						12	18.7	26.4	47.7	73.5	102
45	44.5	45.5							21.2	29.9	54.2	83.8	117
50	49.5	50.5							23.7	33.4	60.7	94.1	132
55	54.4	55.6								36.8	67.3	104	147
60	59.4	60.6								40.3	73.7	115	162

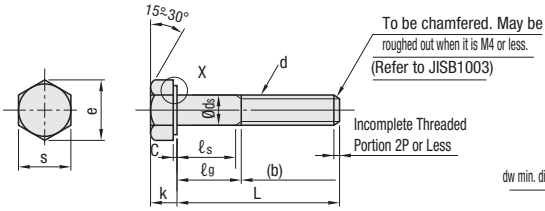
Note (3): when **e** min.=1.14×s(min.) Excluding nominal of thread M25 or less for screws.
(4): The values in Column 1 for **t** min. are applicable to the nominal lengths (ℓ) falling short of the dotted border, and the values in Column 2 to the nominal lengths beyond the border.
(5): Min.rand max. are based on JIS B 1021. They are rounded to the first digit below zero.

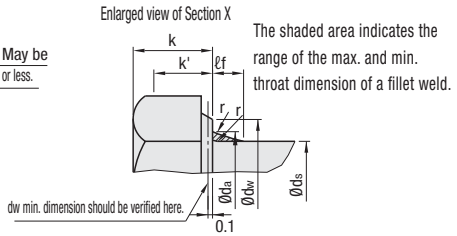
Reference
1. Recommended nominal lengths (ℓ) for individual nominal of thread are enclosed by thick lines.
If the required ℓ-value is not given in the table, it should be specified by the ordering side.
2. The shape and dimensions of the flat end of the screw are based on JIS B 1003 (shape and dimensions of the end of the screw).
3. The shape of the hexagon socket bottom may be a conical, drill or round bottom.

The shape and dimensions indicated in the reference table are based on ISO 4026-1977.

[Technical Data]
Hexagon Bolts Excerpts from JIS B 1180 (1999)

1. Shape and Dimensions of Hexagon Bolt (Parts Grade A)





The shaded area indicates the range of the max. and min. throat dimension of a fillet weld.

Unit: mm

Nominal of Thread d		M2	M3	M4	M5	M6	M8	M10	M12	–	M16	M20	M24
	Coarse Thread Column Ⅰ	M2	M3	M4	M5	M6	M8	M10	M12	–	M16	M20	M24
	Coarse Thread Column Ⅱ	–	–	–	–	–	–	–	–	M14	–	–	–
	Coarse Thread Pitch P	0.4	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	3
	Fine Thread Column Ⅰ	–	–	–	–	–	M8×1	M10×1	M12×1.5	–	M16×1.5	M20×1.5	M24×2
	Fine Thread Column Ⅱ	–	–	–	–	–	–	M10×1.25	M12×1.25	M14×1.5	–	M20×2	–
b (Reference)	L≤125mm	10	12	14	16	18	22	26	30	34	38	46	54
	125<L≤150mm	–	–	–	–	–	–	–	–	40	44	52	60
c	Min.	0.1	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.2	0.2	0.2
	Max.	0.25	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.8	0.8	0.8
d_a	Max.	2.6	3.6	4.7	5.7	6.8	9.2	11.2	13.7	15.7	17.7	22.4	26.4
d_s	Reference Dimension=Max.	2	3	4	5	6	8	10	12	14	16	20	24
	Min.	1.86	2.86	3.82	4.82	5.82	7.78	9.78	11.73	13.73	15.73	19.67	23.67
d_w	Min.	3.07	4.57	5.88	6.88	8.88	11.63	14.63	16.63	*19.64	22.49	28.19	33.61
e	Min.	4.32	6.01	7.66	8.79	11.05	14.38	17.77	20.03	23.36	26.75	33.53	39.98
ℓf	Max.	0.8	1	1.2	1.2	1.4	2	2	3	3	3	4	4
k	Reference Dimension=Nominal	1.4	2	2.8	3.5	4	5.3	6.4	7.5	8.8	10	12.5	15
	Min.	1.275	1.875	2.675	3.35	3.85	5.15	6.22	7.32	8.62	9.82	12.285	14.785
	Max.	1.525	2.125	2.925	3.65	4.15	5.45	6.58	7.68	8.98	10.18	12.715	15.215
k	Min.	0.89	1.31	1.87	2.35	2.7	3.61	4.35	5.12	6.03	6.87	8.6	10.35
r	Min.	0.1	0.1	0.2	0.2	0.25	0.4	0.4	0.6	0.6	0.6	0.8	0.8
s	Reference Dimension=Max.	4	5.5	7	8	10	13	16	18	21	24	30	36
	Min.	3.82	5.32	6.78	7.78	9.78	12.73	15.73	17.73	20.67	23.67	29.67	35.38

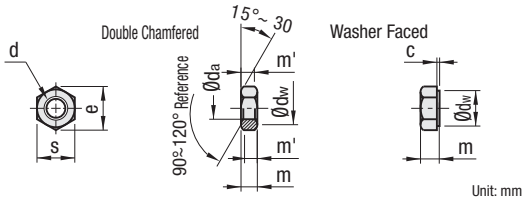
Length of Bolt L			ℓs and ℓg																							
Nominal Length (Reference Dimension)	Min.	Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.	ℓs Min.	ℓg Max.
16	15.65	16.35	4	6																						
20	19.58	20.42	8	10	5.5	8																				
25	24.58	25.42			10.5	13	7.5	11	5	9																
30	29.58	30.42			15.5	18	12.5	16	10	14	7	12														
35	34.5	35.5					17.5	21	15	19	12	17														
40	39.5	40.5					22.5	26	20	24	17	22	11.75	18												
45	44.5	45.5							25	29	22	27	16.75	23	11.5	19										
50	49.5	50.5							30	34	27	32	21.75	28	16.5	24	11.25	20								
55	54.4	55.6									32	37	26.75	33	21.5	29	16.25	25								
60	59.4	60.6									37	42	31.75	38	26.5	34	21.25	30	16	26						
65	64.4	65.6											36.75	43	31.5	39	26.25	35	21	31	17	27				
70	69.4	70.6											41.75	48	36.5	44	31.25	40	26	36	22	32				
80	79.4	80.6											51.75	58	46.5	54	41.25	50	36	46	32	42	21.5	34		
90	89.3	90.7													56.5	64	51.25	60	46	56	42	52	31.5	44	21	36
100	99.3	100.7													66.5	74	61.25	70	56	66	52	62	41.5	54	31	46
110	109.3	110.7															71.25	80	66	76	62	72	51.5	64	41	56
120	119.3	120.7															81.25	90	76	86	72	82	61.5	74	51	66
130	129.2	130.8																	80	90	76	86	65.5	78	55	70
140	139.2	140.8																	90	100	86	96	75.5	88	65	80
150	149.2	150.8																			96	106	85.5	98	75	90

Reference
1. Priority should be given to the nominal of thread in Column Ⅰ. The screw size codes are based on JIS B 0123.
2. Recommended nominal lengths(L)for individual nominal of thread are enclosed by thick lines.
3. When the thread part length (b) of a bolt exceeds the max. nominal value given within the thick lines, the tolerance of the thread part length should be agreed upon by the delivering and receiving sides, corresponding to JIS B 1021.
4. Max. value ℓg and Min. value ℓs as follows: ℓg max Nominal Length(L)-b, ℓs min.=ℓg max-5P(P=Coarse Thread Pitch)
5. da and r in this table are based on JIS B 1005.
6. "Chamfered" and "Unpointed", the shape of the end screw should be decided according to JIS B 1003.
7. The asterisked figures in the table are values after correction with the relevant international standard.

*With some of the hexagon bolts and hexagon nuts for M10 and M12 distributed at present, the opposite side S is based on JIS prior to the revision.

[Technical Data]
Hexagon Nuts/Cotter Pins
Excerpts from JIS B 1181 (1995)　Excerpts from JIS B 1351 (1987)

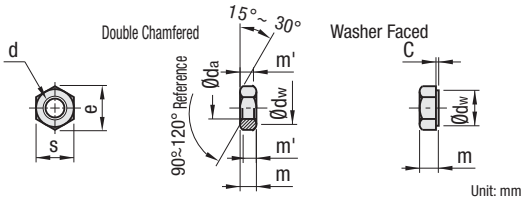
1. Shape and Dimensions of Hexagon Nuts Style Ⅰ (Parts Grade A)



Unit: mm

Nominal of Thread d		M2	M3	M4	M5	M6	M8	M10	M12	(M14)	M16
Pitch P		0.4	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2
c	Max.	0.2	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.8
	Min.	0.1	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.2
da	Min.(Reference Dimension)	2	3	4	5	6	8	10	12	14	16
	Max.	2.3	3.45	4.6	5.75	6.75	8.75	10.8	13	15.1	17.3
dw	Min.	3.07	4.6	5.9	6.9	8.9	11.6	14.6	16.6	19.6	22.5
e	Min.	4.32	6.01	7.66	8.79	11.05	14.38	17.77	20.03	23.35	26.75
m	Max.(Reference Dimension)	1.6	2.4	3.2	4.7	5.2	6.8	8.4	10.8	12.8	14.8
	Min.	1.35	2.15	2.9	4.4	4.9	6.44	8.04	10.37	12.1	14.1
m'	Min.	1.08	1.72	2.32	3.52	3.92	5.15	6.43	8.3	9.68	11.28
s	Max.(Reference Dimension)	4	5.5	7	8	10	13	16	18	21	24
	Min.	3.82	5.32	6.78	7.78	9.78	12.73	15.73	17.73	20.67	23.67

2. Shape and Dimensions of Hexagon Nuts Style Ⅱ (Parts Grade A)



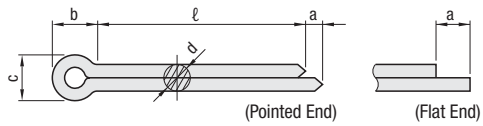
Unit: mm

Nominal of Thread d		M5	M6	M8	M10	M12	(M14)	M16
Pitch P		0.8	1	1.25	1.5	1.75	2	2
c	Max.	0.5	0.5	0.6	0.6	0.6	0.6	0.8
	Min.	0.15	0.15	0.15	0.15	0.15	0.15	0.2
da	Min.(Reference Dimension)	5	6	8	10	12	14	16
	Max.	5.75	6.75	8.75	10.8	13	15.1	17.3
dw	Min.	6.9	8.9	11.6	14.6	16.6	19.6	22.5
e	Min.	8.79	11.05	14.38	17.77	20.03	23.35	26.75
m	Max.(Reference Dimension)	5.1	5.7	7.5	9.3	12	14.1	16.4
	Min.	4.8	5.4	7.14	8.94	11.57	13.4	15.7
m'	Min.	3.84	4.32	5.71	7.15	9.26	10.7	12.6
s	Max.(Reference Dimension)	8	10	13	16	18	21	24
	Min.	7.78	9.78	12.73	15.73	17.73	20.67	23.67

Reference 1. Nominal of thread in brackets should not be used unless it is absolutely necessary.
2. The shape of nuts, unless otherwise designated, shall be "double chamfered", and the "washer faced" shall be as designated by the purchaser. Chamfering for the "washer faced" threads shall based on the chamfered dimensions for "double chamfered".

*With some of the hexagon bolts and hexagon nuts for M10 and M12 distributed at present, the opposite side S is based on JIS prior to the revision.

3.Shape and Dimensions of Cotter Pins



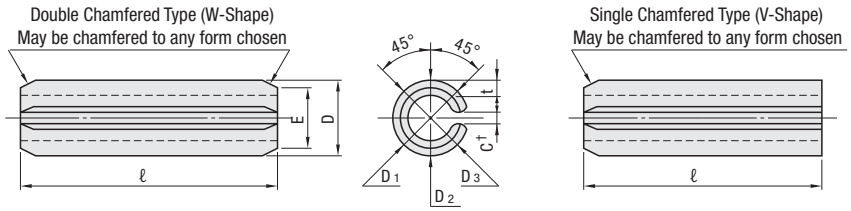
Unit: mm

Nominal Diameter		0.6	0.8	1	1.2	1.6	2	2.5	3.2	4	5	6.3	8	10	13	16	20
d	Reference Dimension	0.5	0.7	0.9	1	1.4	1.8	2.3	2.9	3.7	4.6	5.9	7.5	9.5	12.4	15.4	19.3
	Tolerance	0 −0.1						0 −0.2							0 −0.3		
c	Reference Dimension	1	1.4	1.8	2	2.8	3.6	4.6	5.8	7.4	9.2	11.8	15	19	24.8	30.8	38.6
	Tolerance	0 −0.1	0 −0.2		0 −0.3	0 −0.4		0 −0.6	0 −0.7	0 −0.9	0 −1.2	0 −1.5	0 −1.9	0 −2.4	0 −3.1	0 −3.8	0 −4.8
b	Approx.	2	2.4	3	3	3.2	4	5	6.4	8	10	12.6	16	20	26	32	40
a	Approx.	1.6	1.6	1.6	2.5	2.5	2.5	2.5	3.2	4	4	4	4	6.3	6.3	6.3	6.3
Diameter of Applicable Bolts and Pins — Bolts	Over than	–	2.5	3.5	4.5	5.5	7	9	11	14	20	27	39	56	80	120	170
Bolts	or Less	2.5	3.5	4.5	5.5	7	9	11	14	20	27	39	56	80	120	170	–
Clevis Pin	Over than	–	2	3	4	5	6	8	9	12	17	23	29	44	69	110	160
Clevis Pin	or Less	2	3	4	5	6	8	9	12	17	23	29	44	69	110	160	–
Dia. of Pin Hole	(Reference)	0.6	0.8	1	1.2	1.6	2	2.5	3.2	4	5	6.3	8	10	13	16	20

ℓ	
4	
5	
6	±0.5
8	
10	±0.5
12	
14	±0.5
16	
18	±0.5
20	±0.8
22	
25	±0.8
28	
32	±0.8
36	
40	±1.2
45	
50	±1.2
56	
63	±1.2
71	
80	±2
90	
100	±2
112	
125	
140	±2
160	
180	±2
200	
224	±2
250	
280	

Reference 1. The nominal diameter is dependent on the diameter of the pin hole.
2. d is a value for a spot somewhere between the end and the ℓ/2 spot.
3. The end may be pointed or flat. If a pointed end or a flat one is needed, it should be specified.
4. The length (ℓ) should be one enclosed by thick lines. The value in an enclosed area is a tolerance. If the required r-value is not given in the table, it should be specified by the ordering side.
5. The head must not tilt excessively from the axial center.

Shape and Dimensions of Spring Pins



*The size of Gap C should be able to avoid the contact between the spring pin and the hole in which the pin is to be inserted.

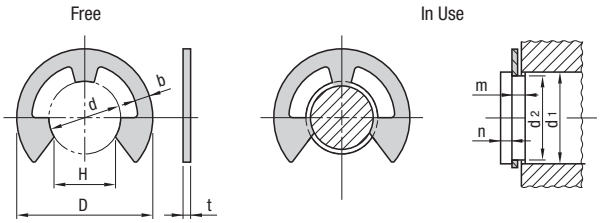
Unit: mm

Nominal Diameter			1	1.2	1.4	1.5	1.6	2	2.5	3	4	5	6	8	10	13
Spring Pins	D(1)	Max.	1.2	1.4	1.6	1.7	1.8	2.25	2.75	3.25	4.4	5.4	6.4	8.6	10.6	13.7
		Min.	1.1	1.3	1.5	1.6	1.7	2.15	2.65	3.15	4.2	5.2	6.2	8.3	10.3	13.4
	t (Reference)	For General Use	0.2	0.25	0.28	0.3	0.3	0.4	0.5	0.6	0.8	1	1.2	1.6	2	2.5
		Light Load	0.1	0.12	0.15	0.15	0.15	0.2	0.25	0.3	0.4	0.5	0.6	–	–	–
	E	(Max.)	0.9	1.1	1.3	1.4	1.5	1.9	2.4	2.9	3.9	4.8	5.8	7.8	9.8	12.7
	Double Shearing Load kN{kgf} Minimum Value	For General Use	0.69 {70}	1.02 {104}	1.35 {138}	1.55 {158}	1.68 {171}	2.76 {281}	4.31 {440}	6.20 {633}	10.80 {1130}	17.25 {1760}	24.83 {2532}	44.13 {4500}	68.94 {7030}	112.78 {11500}
		Light Load	0.38 {39}	0.56 {57}	0.80 {82}	0.87 {89}	0.93 {95}	1.55 {158}	2.42 {247}	3.49 {356}	6.21 {633}	9.70 {989}	13.96 {1424}	– –	– –	– –
Applicable Holes		Diameter	1	1.2	1.4	1.5	1.6	2	2.5	3	4	5	6	8	10	13
		Dimensional Tolerance	+0.08 0					+0.09 0			+0.12 0			+0.15 0		+0.2 0

ℓ	Dimensional Tolerance	Nominal Diameter 1	1.2	1.4	1.5	1.6	2	2.5	3	4	5	6	8	10	13
4	+0.5 0	0	0	0	0	0									
5		0	0	0	0	0	0	0							
6		0	0	0	0	0	0	0	0						
8		0	0	0	0	0	0	0	0	0					
10		0	0	0	0	0	0	0	0	0	0				
12	+1.0 0		0	0	0	0	0	0	0	0	0	0			
14				0	0	0	0	0	0	0	0	0			
16						0	0	0	0	0	0	0	0		
18							0	0	0	0	0	0	0	0	
20							0	0	0	0	0	0	0	0	
22								0	0	0	0	0	0	0	0
25								0	0	0	0	0	0	0	0
28									0	0	0	0	0	0	0
32									0	0	0	0	0	0	0
36										0	0	0	0	0	0
40										0	0	0	0	0	0
45											0	0	0	0	0
50											0	0	0	0	0
56	+1.5 0											0	0	0	0
63												0	0	0	0
70													0	0	0
80													0	0	0
90														0	0
100														0	0
110															0
125															0
140															0

Note(1): Maximum value for D is the maximum value on the pin's circumference, and the minimum value for D is the average of D_1, D_2 and D_3.
Reference: t is in accordance with JSMA (Japan Spring Manufactures Association Standard)No.6.

Shape and Dimensions of Retaining Ring-E Type



Reference: Typical shape is shown.

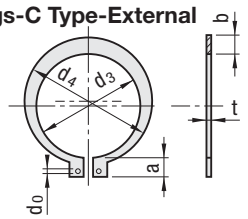
Unit: mm

Nominal	Retaining Rings d(1) Reference Dimension	d(1) Tolerance	D Reference Dimension	D Tolerance	H Reference Dimension	H Tolerance	t Reference Dimension	t Tolerance	b Approx.	Applicable Shaft (Reference) Classification of d1 More than	d1 or Less	d2 Reference Dimension	d2 Tolerance	m Reference Dimension	m Tolerance	n Min.
0.8	0.8	−0.08	2	±0.1	0.7		0.2	±0.02	0.3	1	1.4	0.8	+0.05 −0.05	0.3		0.4
1.2	1.2		3		1		0.3	±0.025	0.4	1.4	2	1.2		0.4	+0.05 0	0.6
1.5	1.5	0 −0.09	4		1.3	0 −0.25	0.4	±0.03	0.6	2	2.5	1.5	+0.06 0	0.5		0.8
2	2		5		1.7		0.4		0.7	2.5	3.2	2				1
2.5	2.5		6		2.1		0.4		0.8	3.2	4	2.5				
3	3		7		2.6		0.6		0.9	4	5	3		0.7		
4	4	0 −0.12	9	±0.2	3.5	0 −0.3	0.6		1.1	5	7	4	+0.075 0		+0.1 0	1.2
5	5		11		4.3		0.6		1.2	6	8	5				
6	6		12		5.2		0.8	±0.04	1.4	7	9	6		0.9		
7	7	0 −0.15	14		6.1	0 −0.35	0.8		1.6	8	11	7	+0.09 0			1.5
8	8		16		6.9		0.8		1.8	9	12	8				1.8
9	9		18		7.8		0.8		2.0	10	14	9				2
10	10		20		8.7		1.0	±0.05	2.2	11	15	10		1.15		
12	12	0 −0.18	23	±0.3	10.4		1.0		2.4	13	18	12	+0.11 0		+0.14 0	2.5
15	15		29		13	0 −0.45	1.6(2)	±0.06	2.8	16	24	15		(2)		3
19	19	0 −0.21	37		16.5		1.6(2)		4.0	20	31	19	+0.13 0	1.75		3.5
24	24		44		20.8	−0.5	2.0	±0.07	5.0	25	38	24		2.2		4

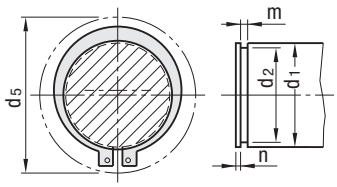
Note(1): d should be measured with a limit plug gauge.
Note(2): thickness(t)=1.6mm, may be kept at 1.5mm for the time being. m should be 1.65mm.
Reference: The recommended dimensions of the applicable shaft are given here for reference.

[Technical Data]
Retaining Rings C Type
Excerpts from JIS B 2804(2001)

1. Retaining Rings-C Type-External



The hole with diameter d_0 should be positioned to protrude out of the groove when the retaining ring is inserted in the shaft.



d_5 is the max. outer diameter when the retaining ring is fitted onto the shaft.

Retaining Rings-C Type-External

Unit: mm

Nominal(1)	Retaining Rings							Applicable Shaft (Reference)						
	d_3		t		b	a	d_0	d_5	d_1	d_2		m		n
	Reference Dimension	Tolerance	Reference Dimension	Tolerance	(Approx.)	(Approx.)	(Min.)			Reference Dimension	Tolerance	Reference Dimension	Tolerance	(Min.)
10	9.3	±0.15	1	±0.05	1.6	3	1.2	17	10	9.6	$^{0}_{-0.09}$	1.15	+0.14 0	1.5
(11)	10.2				1.8	3.1		18	11	10.5	0 −0.11			
12	11.1	±0.18			1.8	3.2	1.5	19	12	11.5				
(13)	12				1.8	3.3		20	13	12.4				
14	12.9				2	3.4	1.7	22	14	13.4				
15	13.8				2.1	3.5		23	15	14.3				
16	14.7				2.2	3.6		24	16	15.2				
17	15.7				2.2	3.7		25	17	16.2				
18	16.5		1.2	±0.06	2.6	3.8	2	26	18	17		1.35		
(19)	17.5				2.7	3.8		27	19	18				
20	18.5	±0.2			2.7	3.9		28	20	19	0 −0.21			
(21)	19.5				2.7	4		30	21	20				
22	20.5				2.7	4.1		31	22	21				
(24)	22.2				3.1	4.2		33	24	22.9				
25	23.2				3.1	4.3		34	25	23.9				
(26)	24.2				3.1	4.4		35	26	24.9				
28	25.9		1.6(2)		3.1	4.6		38	28	26.6		1.75		
(29)	26.9				3.5	4.7		39	29	27.6				
30	27.9				3.5	4.8		40	30	28.6				
32	29.6				3.5	5	2.5	43	32	30.3	0 − 0.25			
(34)	31.5	±0.25			4	5.3		45	34	32.3				
35	32.2				4	5.4		46	35	33				
(36)	33.2		1.8	±0.07	4	5.4		47	36	34		1.95		2
(38)	35.2				4.5	5.6		50	38	36				
40	37	±0.4			4.5	5.8		53	40	38				
(42)	38.5				4.5	6.2		55	42	39.5				
45	41.5				4.8	6.3		58	45	42.5				
(48)	44.5				4.8	6.5		62	48	45.5				
50	45.8		2		5	6.7		64	50	47		2.2		
(52)	47.8				5	6.8		66	52	49				
55	50.8	±0.45			5	7		70	55	52	0 −0.3			
(56)	51.8				5	7		71	56	53				
(58)	53.8				5.5	7.1		73	58	55				
60	55.8				5.5	7.2		75	60	57				
(62)	57.8				5.5	7.2		77	62	59				
(63)	58.8				5.5	7.3		78	63	60				
65	60.8		2.5	±0.08	6.4	7.4		81	65	62		2.7		2.5
(68)	63.5				6.4	7.8		84	68	65				
70	65.5				6.4	7.8		86	70	67				
(72)	67.5				7	7.9		88	72	69				
75	70.5				7	7.9		92	75	72				
(78)	73.5				7.4	8.1		95	78	75				
80	74.5				7.4	8.2		97	80	76.5				

Note(1): Priority should be given to values not in ( ). A value in ( ) may be used if necessary.

Note(2): Thickness(t)=1.6mm, may be kept at 1.5mm for the time being. m should be 1.65mm.

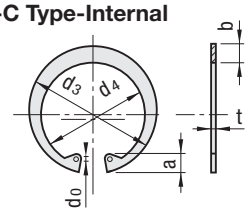
Reference: 1. The minimum width of the ring of the retaining ring should be less than the plate thickness t.

2. The recommended dimensions of the applicable shaft are given here for reference.

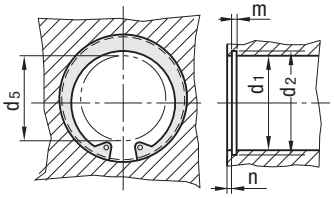
3. d_4 (mm) should preferably be equal to $d_4=d_3+(1.4\sim1.5)b$.

Reference: The thickness t, conforms to the Japan Spring Manufactures Association Standard, JSMA No. 6-1976 (steel belt for a spring).

2. Retaining Rings-C Type-Internal



The hole with diameter d_0 should be positioned to protrude out of the groove when the retaining ring is inserted in the hole.



d_5 is the minimum diameter of the internal circumference when the retaining ring is fitted.

Retaining Rings-C Type-Internal

Unit: mm

Nominal(1)	Retaining Rings							Applicable Shaft (Reference)						
	d_3		t		b	a	d_0	d_5	d_1	d_2		m		n
	Reference Dimension	Tolerance	Reference Dimension	Tolerance	(Approx.)	(Approx.)	(Min.)			Reference Dimension	Tolerance	Reference Dimension	Tolerance	(Min.)
10	10.7	±0.18	1	±0.05	1.8	3.1	1.2	3	10	10.4	+0.11 0	1.15	+0.14 0	1.5
11	11.8				1.8	3.2		4	11	11.4				
12	13				1.8	3.3	1.5	5	12	12.5				
(13)	14.1				1.8	3.5		6	13	13.6				
14	15.1				2	3.6	1.7	7	14	14.6				
15	16.2				2	3.6		8	15	15.7				
16	17.3				2	3.7		8	16	16.8				
(17)	18.3	±0.2			2	3.8		9	17	17.8				
18	19.5				2.5	4		10	18	19	+0.21 0			
19	20.5				2.5	4	2	11	19	20				
20	21.5				2.5	4		12	20	21				
(21)	22.5				2.5	4.1		12	21	22				
22	23.5				2.5	4.1		13	22	23				
(24)	25.9		1.2	±0.06	2.5	4.3		15	24	25.2		1.35		
25	26.9				3	4.4		16	25	26.2				
(26)	27.9				3	4.6		16	26	27.2				
28	30.1	±0.25			3	4.6		18	28	29.4				
30	32.1				3	4.7		20	30	31.4	+0.25 0			
32	34.4				3.5	5.2	2.5	21	32	33.7				
(34)	36.5		1.6(2)		3.5	5.2		23	34	35.7		1.75		2
35	37.8				3.5	5.2		24	35	37				
(36)	38.8				3.5	5.2		25	36	38				
37	39.8				3.5	5.2		26	37	39				
(38)	40.8				4	5.3		27	38	40				
40	43.5	±0.4	1.8	±0.07	4	5.7		28	40	42.5		1.95		
42	45.5				4	5.8		30	42	44.5				
45	48.5				4.5	5.9		33	45	47.5				
47	50.5	±0.45			4.5	6.1		34	47	49.5				
(48)	51.5				4.5	6.2		35	48	50.5	+0.3 0			
50	54.2		2		4.5	6.5		37	50	53		2.2		
52	56.2				5.1	6.5		39	52	55				
55	59.2				5.1	6.5		41	55	58				
(56)	60.2				5.1	6.6		42	56	59				
(58)	62.2				5.1	6.8		44	58	61				
60	64.2				5.5	6.8		46	60	63				
62	66.2				5.5	6.9		48	62	65				
(63)	67.2				5.5	6.9		49	63	66				
(65)	69.2		2.5	±0.08	5.5	7		50	65	68		2.7		2.5
68	72.5				6	7.4		53	68	71				
(70)	74.5				6	7.4		55	70	73				
72	76.5				6.6	7.4		57	72	75				
75	79.5				6.6	7.8		60	75	78				
(78)	82.5	±0.55			6.6	8		62	78	81	+0.35 0			
80	85.5				7	8		64	80	83.5				

Note(1): Priority should be given to values not in( ). A value in( )may be used if necessary.

Note(2): Thickness(t)=1.6mm, may be kept at 1.5mm for the time being. m should be 1.65mm.

Reference: 1. The minimum width of the ring of the retaining ring should be less than the plate thickness t.

2. The recommended dimensions of the applicable shaft are given here for reference.

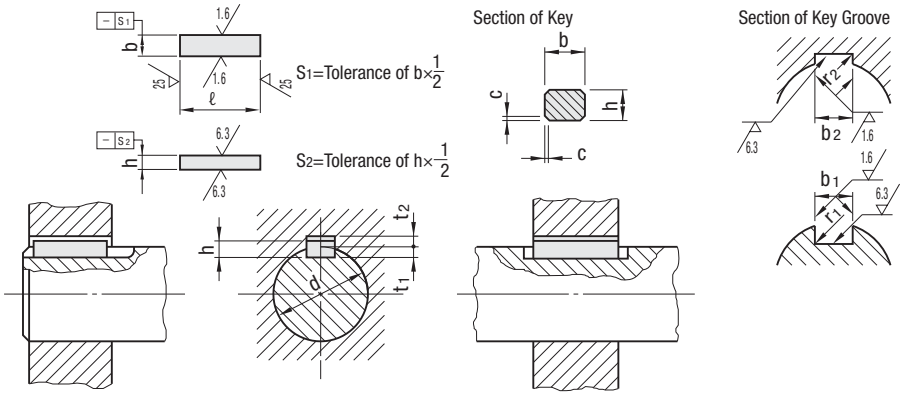
3. d_4(mm)should preferably be equal to $d_4=d_3-(1.4\sim1.5)b$.

Reference: The thickness t, conforms to the Japan Spring Manufactures Association Standard, JSMA No. 6-1976 (steel belt for a spring).

[Technical Data]
Machine Keys and Key Grooves

Excerpts from JIS B 1301 (1996)

1. Parallel Keys and Key Grooves



Unit: mm

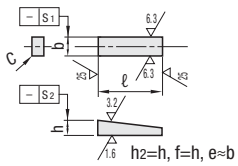
Key Nominal Dimension b×h	Dimension of Key Groove										Reference
	Reference Dimension of b1, b2	(Sliding Type)		Standard		Precision Class	r1 and r2	Reference Dimension of t1	Reference Dimension of t2	Reference Dimension of t2, t1	Applicable Shaft Dia.(1) d
		b1	b2	b1	b2	b1 and b2					
		Tolerance (H9)	Tolerance (D10)	Tolerance (N9)	Tolerance (Js9)	Tolerance (P9)					
2×2	2	+0.025 0	+0.060 +0.020	−0.004 −0.029	±0.0125	−0.006 −0.031	0.08~0.16	1.2	1.0	+0.1 0	6~8
3×3	3							1.8	1.4		8~10
4×4	4	+0.030 0	+0.078 +0.030	0 −0.030	±0.0150	−0.012 −0.042		2.5	1.8		10~12
5×5	5						0.16~0.25	3.0	2.3		12~17
6×6	6							3.5	2.8		17~22
(7×7)	7	+0.036 0	+0.098 +0.040	0 −0.036	±0.0180	−0.015 −0.051		4.0	3.0	+0.2 0	20~25
8×7	8							4.0	3.3		22~30
10×8	10						0.25~0.40	5.0	3.3		30~38
12×8	12	+0.043 0	+0.120 +0.050	0 −0.043	±0.0215	−0.018 −0.061		5.0	3.3		38~44
14×9	14							5.5	3.8		44~50
(15×10)	15							5.0	5.0		50~55
16×10	16							6.0	4.3		50~58
18×11	18							7.0	4.4		58~65
20×12	20	+0.052 0	+0.149 +0.065	0 −0.052	±0.0260	−0.022 −0.074	0.40~0.60	7.5	4.9		65~75
22×14	22							9.0	5.4		75~85
(24×16)	24							8.0	8.0		80~90
25×14	25							9.0	5.4		85~95
28×16	28							10.0	6.4		95~110
32×18	32	+0.062 0	+0.180 +0.080	0 −0.062	±0.0310	−0.026 −0.088		11.0	7.4		110~130
(35×22)	35						0.70~1.00	11.0	11.0	+0.3 0	125~140
36×20	36							12.0	8.4		130~150
(38×24)	38							12.0	12.0		140~160
40×22	40							13.0	9.4		150~170
(42×26)	42							13.0	13.0		160~180
45×25	45							15.0	10.4		170~200
50×28	50							17.0	11.4		200~230
56×32	56	+0.074 0	+0.220 +0.100	0 −0.074	±0.0370	−0.032 −0.106	1.20~1.60	20.0	12.4		230~260
63×32	63							20.0	12.4		260~290
70×36	70							22.0	14.4		290~330
80×40	80						2.00~2.50	25.0	15.4		330~380
90×45	90	+0.087 0	+0.260 +0.120	0 −0.087	±0.0435	−0.037 −0.124		28.0	17.4		380~440
100×50	100							31.0	19.5		440~500

Note(1) The applicable shaft diameter is calculated from the torque corresponding to the strength of the key, for presentation as referential data for general-purpose use. When the key is of an appropriate size relative to the torque to be transmitted, a shaft thicker than the applicable shaft diameter may be used. In some cases, t_1 and t_2 should be adjusted so that a side of the key will come into uniform contact with the shaft and the hub. A shaft narrower than the applicable shaft diameter should not be used.

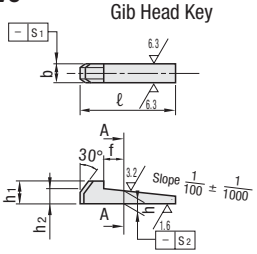
Reference The nominal sizes given in ( ) do not conform to the relevant international standard and must not be used in new design.

2. Slope Key, Gib Head Key and Key Groove

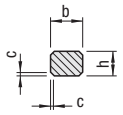
Slope Key (Code T)



Gib Head Key



Section of Key (A-A)

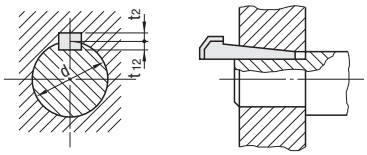


S_1=Tolerance of b×$\frac{1}{2}$

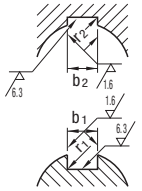
S_2=Tolerance of h×$\frac{1}{2}$

h_2=h, f≈h, e=b

h_2=h, f=h, e≈b



Section of Key Groove



Unit: mm

Key Nominal Dimension b×h	Dimension of Key Groove								Dimension of Key Groove						Reference
	b		h			h_1	c	ℓ(1)	b_1 and b_2		r_1 and r_2	Reference Dimension of t_1	Reference Dimension of t_2	Reference Dimension of t_2, t_1	Applicable Shaft Dia.(2) d
	Reference Dimension	Tolerance (h9)	Reference Dimension	Tolerance					Reference Dimension	Tolerance (D10)					
2×2	2	0 −0.025	2	0 −0.025	h9	–	0.16 ~0.25	6~30	2	+0.060 +0.020	0.08 ~0.16	1.2	0.5	+0.05 0	6~8
3×3	3		3			–		6~36	3			1.8	0.9		8~10
4×4	4	0 −0.030	4	0 −0.030		7		8~45	4	+0.078 +0.030		2.5	1.2	+0.1 0	10~12
5×5	5		5			8	0.25 ~0.40	10~56	5		0.16 ~0.25	3.0	1.7		12~17
6×6	6		6			10		14~70	6			3.5	2.2		17~22
(7×7)	7	0 −0.036	7.2	0 −0.036		10		16~80	7	+0.098 +0.040		4.0	3.0		20~25
8×7	8		7	0 −0.090	h11	11		18~90	8			4.0	2.4	+0.2 0	22~30
10×8	10		8			12	0.40 ~0.60	22~110	10		0.25 ~0.40	5.0	2.4		30~38
12×8	12	0 −0.043	8			12		28~140	12	+0.120 +0.050		5.0	2.4		38~44
14×9	14		9			14		36~160	14			5.5	2.9		44~50
(15×10)	15		10.2	0 −0.070	h10	15		40~180	15			5.0	5.0	+0.1 0	50~55
16×10	16		10	0 −0.090	h11	16		45~180	16			6.0	3.4	+0.2 0	50~58
18×11	18		11	0 −0.110		18		50~200	18			7.0	3.4		58~65
20×12	20	0 −0.052	12			20	0.60 ~0.80	56~220	20	+0.149 +0.065	0.40 ~0.60	7.5	3.9		65~75
22×14	22		14			22		63~250	22			9.0	4.4		75~85
(24×16)	24		16.2	0 −0.070	h10	24		70~280	24			8.0	8.0	+0.1 0	80~90
25×14	25		14	0 −0.110	h11	22		70~280	25			9.0	4.4	+0.2 0	85~95
28×16	28		16			25		80~320	28			10.0	5.4		95~110
32×18	32	0 −0.062	18			28		90~360	32	+0.180 +0.080	0.70 ~1.00	11.0	6.4		110~130
(35×22)	35		22.3	0 −0.084	h10	32	1.00 ~1.20	100~400	35			11.0	11.0	+0.15 0	125~140
36×20	36		20	0 −0.130	h11			–	36			12.0	7.1	+0.3 0	130~150
(38×24)	38		24.3	0 −0.084	h10	36		–	38			12.0	12.0	+0.15 0	140~160
40×22	40		22	0 −0.130	h11	36		–	40			13.0	8.1	+0.3 0	150~170
(42×26)	42		26.3	0 −0.084	h10	40		–	42			13.0	13.0	+0.15 0	160~180
45×25	45		25	0 −0.130	h11	40		–	45			15.0	9.1	+0.3 0	170~200
50×28	50		28			45		–	50			17.0	10.1		200~230
56×32	56	0 −0.074	32	0 −0.160		50	1.60 ~2.00	–	56	+0.220 +0.100	1.20 ~1.60	20.0	11.1		230~260
63×32	63		32			50		–	63			20.0	11.1		260~290
70×36	70		36			56		–	70			22.0	13.1		290~330
80×40	80		40			63	2.50 ~3.00	–	80		2.00 ~2.50	25.0	14.1		330~380
90×45	90	0 −0.087	45			70		–	90	+0.260 +0.120		28.0	16.1		380~440
100×50	100		50			80		–	100			31.0	18.1		440~500

Note(1): From the values for ℓ given below, which are in the appropriate range in the table, one should be selected.
The tolerance for l should be h12 under JIS B0401 (dimension tolerance and fitting), in principle.
6,8,10,12,14,16,18,20,22,25,28,32,36,40,45,50,56,63,70,80,90,100,110,125,140,160,180,200,220,250,280,320,360,400

Note(2): The appropriate shaft diameter should be matched with the torque corresponding to the strength of the key.

Reference: The nominal sizes given in ( ) should not be used unless they are absolutely necessary.
The groove for the boss should be slanted to 1/100, in principle.

Metal Table EN - JIS 1

EN Material No.	EN Denomination	JIS Material No.	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
1.0028	S205G1T (USt.34)	SS330	unalloyed mild steel				195	330~430	26		
1.0034	S205G2T (RSt.34)	STKM11A	unalloyed mild steel								
1.0035	S185 (St.33)	SGP	unalloyed construction steel / pipe steel				175~185	290			
1.0035	S185 (St.33)	SGPW	unalloyed construction steel / pipe steel / galvanized					290			
1.0038	S235JRG2 (RSt.37.2)	STKM12[A/C]	unalloyed mild steel			killed	215	340~470		HB	120
1.0040	Ust.42.2	SS400[D]	unalloyed structural steel			unkilled		400~510			
1.0042	RSt.42.2	SS400[D]	unalloyed mild steel					400~510			
1.0050	E295 (St.50.2)	SS490	unalloyed mild steel				265~295	470~610	20		
1.0060	E335 (St.60.2)	SS540	unalloyed mild steel					>540			
1.0136	St.42.3	SS400[D]	unalloyed mild steel					400~510			
1.0254	S235 (St.37)	STPG370	unalloyed construction steel / pipe steel								
1.0255	St.37-4	STPT370	unalloyed construction steel / pipe steel for high temperature			(<350°C)					
1.0301	C10	S10C	unalloyed construction steel / for case hardening				290~380	400~650			
1.0303	C4C (QSt.32.3)	SWRCH	cold formed steel / for steel wires								
1.0305	P235G1TH (St.35.8)	STPT370	unalloyed construction steel / pipe steel for high temperature			(<350°C)					
1.0320	St.22	SPHC	unalloyed steel / deep drawable / [hot coiled]					270	27~31		
1.0330	DC01 (St.12)	SPCC[SD]	unalloyed steel / deep drawable / [solid drawn]				140~280	270~410	28~39	HB	90~120
1.0401	C15R	S15C	unalloyed construction steel / for case hardening				430	600~750			
1.0402	C22	S20C	unalloyed construction steel / for quenching and tempering / for heat treatment		16		340	470~620	22		
1.0406	C25	S20C	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	370	500~650	23		
1.0480	H240LA	STKM13A	unalloyed construction steel / pipe steel				240~310	340	27		
1.0501	1C35 (C35)	S35C	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	430	630~780			
1.0503	C45	S45C	unalloyed construction steel / for quenching and tempering / for heat treatment			case hardened		650~800		HRc	49~55
1.0503	C45	S45C	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	305~340	580	16		
1.0503	C45	S45C	unalloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	340~390	640~790			
1.0511	C40	S40C	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	320	580			
1.0511	C40	S40C	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	460	650~800	16		
1.0535	C55	S55C	unalloyed construction steel / for quenching and tempering / for heat treatment				550	800~950			
1.0601	C60	S58C	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	340~380	670~710	11		
1.0702	U10S10	SUM11	unalloyed steel / free cutting steel								
1.0710	15S10	SUM31[L]	unalloyed steel / free cutting steel					400~560			
1.0711	9S20	SUM21	unalloyed steel / free cutting steel					370~450		HB	100~130
1.0715	9SMn28	SUM22[L]	unalloyed steel / free cutting steel							HB	110~170
1.0718	9SMnPb28	SUM24L	unalloyed steel / free cutting steel					390~580		HRc	35~41
1.0723	15S20	SUM32	unalloyed steel / free cutting steel								
1.0736	9SMn36	SUM25	unalloyed steel / free cutting steel					<500			
1.1121	2C10 (C10E; Ck10)	S09CK	unalloyed construction steel / for case hardening				295~390	490~640	16		
1.1133	20Mn5	SMnC420[H]	structural / heat treatment steel [increased Carbon content]					<800			
1.1141	C15E (Ck15)	S15C	unalloyed construction steel / for case hardening			case hardened	355	590~780	14	HRc	49~55
1.1149	3C22 (Cm22/C22R)	S22C	unalloyed construction steel / for quenching and tempering / for heat treatment				340	470~620			
1.1151	C22E (Ck22)	S20C	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	290~340	470~620	22		
1.1151	C22E (Ck22)	S20C	unalloyed construction steel / for quenching and tempering / for heat treatment				210~340	410~500			
1.1158	C25E (Ck25)	S25C	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	370	550~700	21		
1.1160	22Mn6	SMn420[H]	structural / heat treatment steel [increased Carbon content]								
1.1165	30Mn5	SMn433[H]	structural / nitriding steel / heat treatment steel [increased Carbon content]					<900			
1.1166	34Mn5	SMn433[H]	structural / nitriding steel / heat treatment steel [increased Carbon content]					750~950			
1.1167	36Mn5	SMn438[H]	structural / heat treatment steel [increased Carbon content]					800			
1.1175	41Mn4	SMn443[H]	structural / heat treatment steel [increased Carbon content]								
1.1178	C30	S30C	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	280	510			
1.1178	C30	S30C	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	400	600~750			
1.1181	C35E (Ck35)	S35C	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	270~300	520	19		
1.1191	C45E (Ck45)	S45[CD]	unalloyed construction steel / for quenching and tempering / for heat treatment [cold drawn]		16	QT	490	700~850	14		
1.1191	C45E	S45-D	unalloyed construction steel / for quenching and tempering / for heat treatment								
1.1203	C55E (Ck55)	S55C	unalloyed construction steel / for quenching and tempering / for heat treatment				550	800~950			
1.1206	C50E (Ck50)	S50C	unalloyed construction steel / for quenching and tempering / for heat treatment				520	750			
1.1207	C10R	S10C	unalloyed construction steel / for case hardening					400			
1.1210	C53E (Ck53)	S53C	unalloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	370	630~780			
1.1213	C50	S50C	unalloyed construction steel / for quenching and tempering / for heat treatment					640			
1.1221	C60E (Ck60)	S58C	unalloyed construction steel / for quenching and tempering / for heat treatment			QT	580	850~1000			
1.1223	C60R	S58C	unalloyed construction steel / for quenching and tempering / for heat treatment			case hardened	450~580	800~950	13	HRc	49~55
1.1262	C82D2	SUP3	alloyed construction steel / for quenching and tempering / for heat treatment								
1.1525	C80W1	SK5	unalloyed tool steel for cold work								
1.1545	C105W1	SK3	unalloyed tool steel for cold work							HRc	52~58
1.1625	C80W2	SK6	unalloyed tool steel for cold work							HRc	52~58
1.1645	C105W2	SK3	unalloyed tool steel for cold work								
1.1740	C60W	SK7	unalloyed tool steel for cold work					1000			
1.1830	C85W	SK5	unalloyed tool steel for cold work								
1.2008	140Cr3 (~~)	SKS8	unalloyed tool steel for cold work								
1.2067	102Cr6	SUJ2	unalloyed tool steel / ball bearing steel			annealed		675		HB	230
1.2080	X210Cr12	SKD1	unalloyed tool steel								
1.2083	X42Cr13	SUS420J2	alloyed stainless steel / acid proof			C1		850~1000	10	HRc	>68
1.2343	X38CrMoV5-1	SKD6	unalloyed tool steel for cold work					1550			
1.2344	X40CrMoV5-1	SKD61	unalloyed tool steel for cold and hot work					1180~1770		HRc	>68
1.2363	X100CrMoV5-1	SKD12	unalloyed tool steel for cold work							HRc	>68
1.2365	X32CrMoV3-3	SKD7	unalloyed tool steel for hot work								
1.2379	X155CrVMo12-1	SKD11	unalloyed tool steel for cold work							HRc	>68
1.2419	105WCr6	SKS2/3/31	unalloyed tool steel for cold work			hardened		<1000		HRc	58~64
1.2510	100MnCrW4 (~~)	SKS3	unalloyed tool steel for cold work								
1.2541	35WCrV7	SKS41	unalloyed tool steel for cold work								
1.2542	45WCrV7	SKS41	unalloyed tool steel for cold work								
1.2552	80WCrV8	SKS42	unalloyed tool steel for cold work								
1.2567	X30WCrV5-3	SKD4	unalloyed tool steel for hot work								
1.2581	X30WCrV9-3	SKD5	unalloyed tool steel for hot work								

JIS denomination is binding for orders. EN denominations are started as comparative material. (Partly there is no existing equivalent EN material for JIS material existing or contrary).
All information ist based on values and properties which are achieved typically and are only for assessment of materials (typical values). Properties herein shall not be located directly to a product and there is no supposition that any product achieves these values. For proof values own checks are necessary or you may request the direct related value from Misumi.

EN Material No.	EN Denomination	JIS Material No.	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
1.2713	55NiCrMoV6	SKT3/SKT4	unalloyed tool steel for cold and hot work					930~1420		HRc	55~60
1.2833	100V1	SKS43	unalloyed tool steel for cold work					<1000			
1.3202	S12-1-4-5	SKH10	alloyed high speed steel with Co								
1.3207	S10-4-3-10	SKH57	alloyed high speed steel with Co								
1.3243	S6-5-2-5	SKH55	alloyed high speed steel with Co								
1.3247	S2-10-1-8	SKH59	alloyed high speed steel with Co								
1.3343	S6-5-2	SKH51/SUH3	alloyed high speed steel without Co			hardened		≤1000		HRc	60~68
1.3344	S6-5-3	SKH52/SKH53	alloyed high speed steel without Co								
1.3355	S18-0-1	SKH2	alloyed high speed steel without Co								
1.3505	100Cr6	SUJ2	unalloyed tool steel / ball bearing steel			annealed		675		HB	230
1.3505	100Cr6	SUJ2	unalloyed tool steel / ball bearing steel			hardened		≤850		HRC	58~65
1.3565	48CrMo4	SNC836	unalloyed bearing steel					1080			
1.4000	X6Cr13	SUS403	alloyed stainless steel / acid proof			F		600			
1.4001	X7Cr14	SUS429	alloyed stainless steel / acid proof			F		530~680			
1.4002	X6CrAl13	SUS405	alloyed stainless steel / acid proof / heat resistant			F			10		
1.4005	X12CrS13	SUS416	alloyed stainless steel / acid proof			M		540	25		
1.4006	X10Cr13	SUS410	alloyed steel / stainless and acidproof / for cold extrusion			C1		730	20		
1.4006	X10Cr13	SUS410	alloyed steel / stainless and acidproof steel / for cold extrusion			QT		1200	7	HRc	37
1.4006	X10Cr13	SUS410	alloyed steel / stainless and acidproof steel / for cold extrusion					380	45		
1.4016	X6(8)Cr17	SUS430	alloyed stainless steel / acid proof / heat resistant			F1	240	450~630	12~20	HB	130~170
1.4021	X20Cr13	SUS420J	alloyed stainless steel / acid proof			C1		800~1000	8~12	HRc	40
1.4024	X15Cr13	SUS410J1	alloyed steel / stainless and acidproof steel / for cold extrusion								
1.4029	X29CrS13	SUS420	alloyed stainless steel / acid proof								
1.4029	X29CrS13	SUS420F	alloyed stainless steel / acid proof			M					
1.4031	X38Cr13	SUS420J2	alloyed stainless steel / acid proof			C1		800			
1.4034	X46Cr13	SUS420J2	alloyed stainless steel / acid proof			C1			11		
1.4057	X17CrNi16-2	SUS431	alloyed stainless steel / acid proof			C3		800~950	12~14		
1.4057	X17CrNi16-2	SUS431	alloyed stainless steel / acid proof				280	980		HB	280
1.4104	X12CrMoS17-2	SUS430F	alloyed stainless steel / acid proof / heat resistant			F		840			
1.4112	X90CrMoV18	SUS440B	alloyed stainless steel / acid proof			C				HRc	>68
1.4113	X6CrMo17-1	SUS434	alloyed steel / stainless and acidproof steel / for cold extrusion			F1		450~630	18		
1.4125	X105CrMo17	SUS440C	alloyed stainless steel / acid proof			C3 QT		780	15	HRc	50
1.4131	X1CrMo26-1	SUSXM27	alloyed stainless steel					570	25		
1.4301	X5CrNi18-10	SUS304	alloyed stainless steel / acid proof			A2	190	540~750	45		
1.4301	X5CrNi18-10	SUS304-CSP	alloyed stainless steel / acid proof / spring steel / cold coild								
1.4301	X5CrNi18-10	SUS304-D	alloyed stainless steel / acid proof								
1.4301	X5CrNi18-10	SUS304-H	alloyed stainless steel / acid proof								
1.4301	X5CrNi18-10	SUS304-TP	alloyed stainless steel / acid proof								
1.4301	X5CrNi18-10	SUS304-WPB	alloyed stainless steel / acid proof								
1.4301	X5CrNi18-10	SUS304-WPC	alloyed stainless steel / acid proof / spring steel			(>180 °C)		700			
1.4301	X5CrNi18-10	SUS316-TP	alloyed stainless steel / acid proof								
1.4303	X4CrNi18-12	SUS305[J1]	alloyed stainless steel / acid proof			A2		500/650	45		
1.4305	X10CrNiS18-9	SUS303	alloyed stainless steel / acid proof			A1		520	40	HRc	>68
1.4305	X8CrNi18-9	SUS303	alloyed stainless steel / acid proof			A1	190	500~750	35		
1.4306	X2CrNi19-11	SUS304L	alloyed stainless steel / acid proof			A2		520~670	40~45		
1.4308	G-X6CrNi18-9	SCS13	stainless steel casting								
1.4310	X10CrNi18-8	SUS301J1-[CSP]	alloyed steel / stainless and acidproof steel / for cold extrusion			A	195	500~750			
1.4311	X2CrNiN18-10	SUS304LN	alloyed stainless steel / acid proof			A	270	550~760			
1.4319	X3CrNiN17-8	SUS301	alloyed steel / stainless and acidproof steel / for cold extrusion			A		500~750			
1.4371	X2CrMnNiN17-7-5	SUS202	alloyed stainless steel						40		
1.4401	G-X5CrNiMo17-12-2	SCS22	stainless steel casting								
1.4401	X5CrNiMo17-12-2	SUS316	alloyed stainless steel / acid proof				220	520~700	40	HB	130~180
1.4401	X5CrNiMo17-12-2	SUS316-WPA	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
1.4401	X5CrNiMo17-12-2	SUS316-WPB	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
1.4404	X2CrNiMo17-12-2	SUS316L	alloyed stainless steel / acid proof			A4		530~680	40		
1.4406	X2CrNiMoN17-12-2	SUS316LN	alloyed stainless steel / acid proof			A4					
1.4429	X2CrNiMoN17-13-3	SUS316LN	alloyed stainless steel / acid proof			A4	220	500~700	40	HB	130~170
1.4435	X2CrNiMo18-14-3	SUS316L	alloyed stainless steel / acid proof			A4		500~700	40	HV	120
1.4436	X3CrNiMo17-13-3	SUS316	alloyed stainless steel / acid proof			A4		550~700	40		
1.4438	X2CrNiMo18-15-4	SUS316	alloyed stainless steel / acid proof			A4		550~700	40		
1.4438	X2CrNiMo18-16-4	SUS317L	alloyed stainless steel / acid proof					550~700			
1.4449	X3CrNiMo18-12-3	SUS317	alloyed stainless steel			A					
1.4460	X8CrNiMo27-5	SUS329J1	alloyed stainless steel / acid proof			AF					
1.4510	X6CrTi17	SUS430LX	alloyed stainless steel / acid proof / heat resistant								
1.4511	X8CrNb17	SUS430LX	alloyed stainless steel / acid proof / heat resistant								
1.4512	X5CrTi12	SUH409[L]	alloyed stainless steel / acid proof / heat resistant			F					
1.4522	X2CrMoTi18-2	SUS444	alloyed stainless steel / valve steel / highly heat resistant / weldable without treatment					450	35		
1.4541	X6CrNiTi18-10	SUS321	alloyed stainless steel / weldable without treatment / tough to subzero temperature			A2	200	520~720	40	HB	130~190
1.4542	X5CrNiCuNb16-4	SUS630	alloyed stainless steel / acid proof / complete hardenable			aged		1030~1300	10~11	HRc	41~42
1.4542	X5CrNiCuNb16-4	SUS630	alloyed stainless steel / acid proof / complete hardenable					800	14	HV	250
1.4550	X6CrNiNb18-10	SUS347	alloyed stainless steel / acid proof			A2		520~720	40	HB	130~190
1.4550	X10CrNiNb18-9	SUS347	alloyed stainless steel / acid proof					520~750			
1.4567	X3CrNiCu18-9-4	SUSXM7	alloyed stainless steel / acid proof / with special elements								
1.4568	X7CrNiAl17-7	SUS631	alloyed stainless steel / acid proof / complete hardenable					1230			
1.4568	X7CrNiAl17-7	SUS631J1-WPC	alloyed stainless steel / acid proof / spring steel / complete hardenable			(>340 °C)		1400~2200			
1.4718	X45CrSi9-3	SUH1	alloyed valve steel / heat resistant			C					
1.4720	X6CrTi12	SUH409[L]	alloyed stainless steel / acid proof / heat resistant			F					
1.4724	X10CrAl11-3	SUS405	alloyed stainless steel / acid proof / heat resistant			F					
1.4731	X40CrSiMo10-2	SUH3	alloyed high speed steel without Co								
1.4742	X10CrAl(Si)18	SUS430	alloyed stainless steel / acid proof / heat resistant				270	500~700	15		
1.4747	X80CrNiSi20	SUH4	alloyed stainless steel / acid proof / heat resistant			C					
1.4762	X10CrAlSi25	SUH446	alloyed stainless steel / acid proof / heat resistant			F	280	520~720	10		
1.4828	X15CrNiSi20-12	SUH309	heatresistant steel			A	230~290	500~750	30~40	HB	130~220

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Metal Table EN - JIS 3

EN Material No.	EN Denomination	JIS Material No.	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
1.4833	X12CrNi23-13	SUS309S	alloyed stainless steel / acid proof / heat resistant			A					
1.4833	X7CrNi23-14	SUS309S	alloyed stainless steel / acid proof / heat resistant								
1.4841	X15CrNiSi25-20	SUH310	alloyed stainless steel / acid proof / heat resistant			A	230~300	550~750	30~40		
1.4845	X12CrNi25-21	SUH310	alloyed stainless steel / acid proof / heat resistant			A	230~300	550~750	30~40		
1.4871	X53CrMnNiN21-9	SUH35/SUH36	alloyed stainless steel / valve steel / highly heat resistant								
1.4873	X45CrNiW18-9	SUH31	alloyed stainless steel / valve steel / heat resistant								
1.4878	X8CrNiTi18-10	SUS321	alloyed stainless steel / acid proof			A	190	500~720	40		
1.4935	X20CrMoWV12-1	SUH616	alloyed stainless steel / valve steel / highly heat resistant			C					
1.4943	X4NiCrTi25-15	SUH660	alloyed stainless steel / valve steel / highly heat resistant / weldable without treatment			A					
1.4971	X12CrCoNi21-20	SUH661	alloyed stainless steel / valve steel / highly heat resistant			A					
1.5026	56Si7	SUP7	alloyed construction steel / valve steel / warm drawn spring steel						45		
1.5710	36NiCr6	SNC236	alloyed structural steel								
1.5732	14NiCr10	SNC415[H]	alloyed construction steel / case hardening steel / higher carbon content					575			
1.5736	36NiCr10	SNC631[H]	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content		40	QT	780	1030~1180			
1.5736	36NiCr10	SNC631[H]	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content	40	100	QT	690	880~1030			
1.5736	36NiCr10	SNC631[H]	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content	100	250	QT	590	740~880			
1.5752	14NiCr14	SNC815[H]	alloyed construction steel / case hardening steel / higher carbon content					930~1230			
1.5755	31NiCr14	SNC836	alloyed bearing steel		40	QT	840	980~1130	11		
1.5755	31NiCr14	SNC836	alloyed bearing steel	40	100	QT	740	880~1030	12		
1.5755	31NiCr14	SNC836	alloyed bearing steel	100	250	QT	590	790~930	14		
1.6511	36CrNiMo4	SNCM447	alloyed construction steel / for quenching and tempering / for heat treatment			QT	800~1000	1100~1300	10		
1.6511	36CrNiMo4	SNCM447	alloyed construction steel / for quenching and tempering / for heat treatment			QT	≥1000	1200~1400	9	HB	355~410
1.6523	20NiCrMo2-2	SNCM220[H]	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content				590	980~1270	10		
1.6546	40NiCrMo2-2	SNCM240	alloyed construction steel / for quenching and tempering / for heat treatment								
1.6562	40NiCrMo8-4	SNB23 [1-5]	alloyed construction steel / for quenching and tempering / for heat treatment								
1.6565	40NiCrMo6	SNCM616	alloyed construction steel / for quenching and tempering / for heat treatment								
1.6580	30CrNiMo8	SNCM431	alloyed construction steel / for quenching and tempering / for heat treatment			QT	1050	1250~1450			
1.6582	34CrNiMo6	SNCM439	alloyed construction steel / for quenching and tempering / for heat treatment			QT	700~900	1000~1200	11		
1.6587	17CrNiMo8	SNCM420[H]	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content								
1.6657	14NiCrMo34	SNCM815	alloyed construction steel / for quenching and tempering / for heat treatment								
1.6900	X12CrNi18-9	SUS302	alloyed stainless steel / acid proof			A					
1.6901	X12CrNi18-10	SUS301-WPA	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
1.6902	X12CrNi18-11	SUS301-WPB	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
1.7015	15Cr3	SCr415[H]	alloyed construction steel / case hardening steel / higher carbon content								
1.7016	17Cr3	SCr415[H]	alloyed construction steel / case hardening steel / higher carbon content				450	800~1050	11		
1.7027	20Cr4	SCr420[H]	alloyed construction steel / case hardening steel / higher carbon content					<1000			
1.7033	34Cr4	SCr430	alloyed construction steel / for quenching and tempering / for heat treatment				635	780	18		
1.7033	34Cr4	SCr430[H]	alloyed construction steel / for quenching and tempering / for heat treatment				700~740	880~1000	15		
1.7034	37Cr4	SCr435[H]	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	650	880~1080			
1.7035	41Cr4/42Cr4	SCr440	alloyed construction steel / for quenching and tempering / for heat treatment				785	930	13		
1.7035	41Cr4/42Cr4	SCr440[H]	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	780	950~1150	11		
1.7102	54SiCr6	SUP12	alloyed construction steel / for quenching and tempering / for heat treatment / hot rolled spring steel				1130	1320~1570	6		
1.7108	60SiCr7	SUP7	alloyed construction steel / valve steel / warm drawn spring steel				1130	1320~1570	6		
1.7138	52MnCrB3	SUP11A	alloyed construction steel / for quenching and tempering / for heat treatment								
1.7147	20MnCr5	SMnC420[H]	structural / heat treatment steel [increased Carbon content]				685	1080~1370	8	HB	215
1.7176	55Cr3 (~~)	SUP9A	alloyed construction steel / for quenching and tempering / for heat treatment								
1.7218	25CrMo4	SCM430	alloyed construction steel / for quenching and tempering / for heat treatment		16	QT	700	900~1100	18	HRc	58
1.7218	25CrMo4	SCM430	alloyed construction steel / for quenching and tempering / for heat treatment		16	QT	680	550~700	12	HB	215~260
1.7218	25CrMo4	SCM430	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	600	800~950	14	HB	215~260
1.7218	25CrMo4	SCM430	alloyed construction steel / for quenching and tempering / for heat treatment	40	100	QT	450	700~850	15	HB	215~260
1.7220	34CrMo4	SCM435[H]	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content				800	1000~1200			
1.7220	34CrMo4	SCM440	alloyed construction steel / / for quenching and tempering / for heat treatment / for flame-induction hardening				835	980	12		
1.7223	41CrMo4	SCM440H	alloyed construction steel / / for quenching and tempering / for heat treatment / for flame-induction hardening				880	980~1180			
1.7223	41CrMo4	SNB21 [1-5]	alloyed construction steel / for quenching and tempering / for heat treatment			QT	880	980~1180			
1.7223	41CrMo4	SNB22 [1-5]	alloyed construction steel / for quenching and tempering / for heat treatment			QT	450~700	700~900			
1.7225	42CrMo4	SCM440H	alloyed construction steel / / for quenching and tempering / for heat treatment / for flame-induction hardening				900	1100~1300			
1.7225	42CrMo4	SNB7	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	650~900	900~1200	11	HRc	38
1.7242	16CrMo4	SCM415[H]	alloyed construction steel / case hardening steel / higher carbon content								
1.7243	18CrMo4	SCM418[H]	alloyed construction steel / case hardening steel / higher carbon content		16	case hardened	850	1100~1350	9		
1.7243	18CrMo4	SCM418[H]	alloyed construction steel / case hardening steel / higher carbon content	16	40	case hardened	690	950~1300	9		
1.7243	18CrMo4	SCM418[H]	alloyed construction steel / case hardening steel / higher carbon content	40	100	case hardened	600	800~1150	10		
1.7258	24CrMo5	SCM420H	alloyed construction steel / case hardening steel / higher carbon content					800~950			
1.7262	16CrMo4	SCM445	alloyed construction steel / for quenching and tempering / for heat treatment								
1.7262	16CrMo4	SNCM415	alloyed construction steel / for quenching and tempering / for heat treatment								
1.7264	20CrMo5	SCM420	alloyed construction steel / case hardening steel		16		600	1000	12		
1.7264	20CrMo5	SCM420	alloyed construction steel / case hardening steel	16	40		500	850	14		
1.7264	20CrMo5	SCM420	alloyed construction steel / case hardening steel	40	100		400	750	16		
1.7264	20CrMo5	SCM421	alloyed construction steel / case hardening steel								
1.7350	22CrMo44	SCM822	alloyed construction steel / for quenching and tempering / for heat treatment								
1.7711	40CrMoV4-7	SNB16	alloyed construction steel / for quenching and tempering / for heat treatment			QT	470~700	850~1000	14		
1.8159	50CrV4/51CrV 4	SUP10	alloyed construction steel / for quenching and tempering / for heat treatment				1180	1350~1600			
ZP0401 (2.2141)	ZnAl4Cu1	ZDC1	zinc die cast								
3.7035	Ti99.5 (Ti2)	TP340	titanium				min.215	390~540	22		
1.2083 (~~)	X42Cr12+S (~~)	PX5	mould steel, (Daido), (AISI: modificated P20)								
1.2085 (~~)	X3CrMo16-1 (~~)	G-Star	(AISI: mod.420);easy machinable special mould steel (Daido)							HRc	ca. 37
1.2316 (~~)	X36CrMo17+S (~~)	PX5	mould steel, (Daido), (AISI: modificated P20)								
1.4605 (~~)	X2CrAlTi18-2 (~~)	KCF	alloyed stainless steel / acid proof / with special elements								
CC491K	CuSn5Zn5(RG5)	CAC406C	bronce cast (BC6)			H12		50	35		
CC491K	CuSn5Zn5(RG5)	CAC406C	bronce cast (BC6)			0		40	60		
CC491K	CuSn5Zn5(RG5)	CAC406C	bronce cast (BC6)	2	60	R340	230	340	45	HB	100
CC491K	CuSn5Zn5(RG5)	CAC406C	bronce cast (BC6)	2	40	R400	250	400	26	HB	125
CC491K	CuSn5Zn5(RG5)	CAC406C	bronce cast (BC6)	2	12	R470	350	470	15	HB	170
CC491K	CuSn5Zn5(RG5)	CAC406C	bronce cast (BC6)	2	6	R550	500	550		HB	200

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CC762S	CuZn25Al5	CAC304	bronce cast				450~480	750	10		
CC766S	CuZn37Al1	C6782	brass				170	450	25		
CW004A	Cu-ETP	C1100	pure copper				50~150	245~300	45		
CW008A	Cu-OF	C1020	pure copper / oxygen free				50~150	245~300	45		
CW024A	Cu-DHP (SF-Cu)	C1220	pure phosphorous desoxidated copper								
CW101C	CuBe2	C1730	copper beryllium alloy for springs				1200	1300			
CW452K	CuSn6P	C5191[B]	phosphorus bronce (PBC2)				300~600	350~650		HB	75~190
CW505L	CuZn30	C2600	brass				160~470	270~520		HB	55~150
CW505L	CuZn30	C2600	brass				130~810	300~830		HB	65~200
CW508L	CuZn37	C2700	brass				150~580	300~610		HB	55~190
CW509L	CuZn40	C2801	brass				240~390	340~500		HB	75~130
CW509L	CuZn40	C2801	brass				270~500	350~550	10		
CW614N	CuZn39Pb3	C3602[BD]	brass			F		315			
CW614N	CuZn39Pb3	C3604	brass			F 37; 44, 51	250~390	360~500	90~145		
CW617N	CuZn40Pb2	C3771	brass				200	315~390	15		
CW617N	CuZn40Pb2	C3771	brass					510		HB	145
CW617N	CuZn40Pb2	C3771	brass				300~570	380~610		HB	90~165
EN AC-42100	G-AlSi10Mg	AC4A	aluminium cast alloy			T6	190~210	230~290	2~4		
EN AC-42100	G-AlSi10Mg	AC4A	aluminium cast alloy			T64	180	250	8	HB	75~90
EN AC-46100	G-AlSi12Cu	ADC12	aluminium cast alloy (~ALSi11Cu2,5Fe)				186	296	2		
EN AC-46100	G-AlSi12Cu	ADC12	aluminium cast alloy (~ALSi11Cu2,5Fe)				80~150	150~220	1~4	HB	60~90
EN AC-51300	G-AlMg5	AC7A	aluminium cast alloy			F	105	245	5.3	HB	80
EN AC-51300	G-AlMg5	AC7A	aluminium cast alloy				90~100	140~150	2	HB	55~70
EN AC-51400	AlMgSi0,7	A6N01	special alloy for extrusion moulding (~AlSi0,5Mg)			T5	214.2	255	8		
EN AC-51400	AlMgSi0,7	A6N01	special alloy for extrusion moulding (~AlSi0,5Mg)			T6	261	277	8~12		
EN AC-51400	AlMgSi0,7	A6N01	special alloy for extrusion moulding (~AlSi0,5Mg)			0	ca.48	ca.120			
EN AW 6060	AlMgSi	A6N01	special alloy for extrusion moulding (~AlSi0,5Mg)								
EN AW-1050A	Al99,5	A1050	pure aluminium / non heat-treatable			0	20~60	60~95	23		
EN AW-1050A	Al99,5	A1050	pure aluminium / non heat-treatable				55~130	65~170	~40	HB	20~45
EN AW-2011	AlCu6BiPb	A2011	duraluminium / treatable			T3	296	379	15	HB	ca.105
EN AW-2011	AlCu6BiPb	A2011	duraluminium / treatable			T4	145	310	20	HB	ca.95
EN AW-2017	AlCu4MgSi	A2017	duraluminium / treatable			T3	250	400	10		
EN AW-2017	AlCu4MgSi	A2017	duraluminium / treatable			T4	240	390	12		
EN AW-4032	AlSi12,5MgCuNi	A4032	aluminium wrought alloy / non heat-treatable								
EN AW-5052	AlMg2,5	A5052	aluminium wrought alloy / non heat-treatable			H112	125	220	20	HB	65
EN AW-5052	AlMg2,5	A5052	aluminium wrought alloy / non heat-treatable			0	90	193	25		
EN AW-5056A	AlMg5	A5056A	aluminium wrought alloy / non heat-treatable			0	152	290	35		
EN AW-5056A	AlMg5	A5056A	aluminium wrought alloy / non heat-treatable			H38	345	414	15		
EN AW-5056A	AlMg5	A5056A	aluminium wrought alloy / non heat-treatable			0	110	240	15	HB	55
EN AW-5083	AlMg4,5Mn0,7	A5083	aluminium wrought alloy / non heat-treatable			H111	200	317	18		
EN AW-5083	AlMg4,5Mn0,7	A5083	aluminium wrought alloy / non heat-treatable			H112	125~140	275~300	12~15		
EN AW-5083	AlMg4,5Mn0,7	A5083	aluminium wrought alloy / non heat-treatable			0	110	270	12	HB	60
EN AW-6063	AlMg0,7Si	A6063	aluminium wrought alloy / treatable			0	50	100	27	HB	25
EN AW-6063	AlMg0,7Si	A6063	aluminium wrought alloy / treatable			T5	145	193	12		
EN AW-6063	AlMg0,7Si	A6063	aluminium wrought alloy / treatable			T6	214	241	12		
EN AW-7020	AlZn4,5Mg1	A7020	aluminium wrought alloy / treatable				140~270	320~350	9~15	HB	45~105
EN AW-7075	AlZn5,5MgCu	A7075	aluminium wrought alloy / treatable			0	103	228	17		
EN AW-7075	AlZn5,5MgCu	A7075	aluminium wrought alloy / treatable			T6	500	570	10		
EN AW-7075	AlZn5,5MgCu	A7075	aluminium wrought alloy / treatable			T651	490	550	12	HB	160
EN AW-7075	AlZn5,5MgCu (~)	ANP79	AlZnMgCu aluminium alloy (Daido)								
EN-AC 42200	G-AlSi7Mg	AC4C	aluminium cast alloy			T5	170~230	210~270	4~7	HB	75~90
EN-JL1030	EN-GJL-200 (GG-20)	FC200	grey cast iron; flake-graphite cast iron				210	200			
EN-JL1030	EN-GJL-200 (GG-20)	FC200	grey cast iron; flake-graphite cast iron				Rp0.1/>165	200~300			
EN-JL1040	EN-GJL-250 (GG-25)	FC250	grey cast iron; flake-graphite cast iron				240	250			
EN-JL1040	EN-GJL-250 (GG-25)	FC250	grey cast iron; flake-graphite cast iron				Rp0.1/>230	250~350			
EN-JL1050	EN-GJL-300	FC300	grey cast iron; flake-graphite cast iron								
EN-JM1130 (~~)	EN-GJMB 350-10 (~~)	FCMB270	black-heart malleable cast iron								
EN-JS1040	EN-GJS400 (GGG-40)	FCD450	nodular cast iron; ductile cast Iron				310	<450			
EN-JS1060	EN-GJS600 (GGG-60)	FCD600	nodular cast iron; ductile cast Iron				370	<600	3		
ZC0400	ZnAl4	ZDC2	zinc die cast				230	300	7		
(JIS)	untranslateable	DC53	general purpose cold work tool/mold steel (Daido)								
(JIS)	untranslateable	NAK55	pre-hardened mold steel (Daido)								
(JIS)	untranslateable	S12C	unalloyed construction steel / for case hardening								
ISO	TC140	SK1	unalloyed tool steel for cold work								
ISO	TC120	SK2	unalloyed tool steel for cold work								
ISO	TC90	SK4	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKD8	unalloyed tool steel								
(JIS)	untranslateable	SKS11	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKS21	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKS44	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKS5	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKS7	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKS93	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKS94	unalloyed tool steel for cold work								
(JIS)	untranslateable	SKS95	unalloyed tool steel for cold work								
(JIS)	C43 (~~)	SMF5040	sintered carbon mould steel								
(JIS)	untranslateable	SNCM625	alloyed construction steel / for quenching and tempering / for heat treatment								
(JIS)	untranslateable	SNCM630	alloyed construction steel / for quenching and tempering / for heat treatment			QT		1150	10	HRc	35
(JIS)	untranslateable	SSPR	structural steel								
(JIS)	untranslateable	SSPSR	structural steel								
(JIS)	untranslateable	STPS2	seamless pipe for hydraulic fluids				180	450	30		
(JIS)	untranslateable	SUH11	alloyed valve steel / heat resistant			M					
(JIS)	untranslateable	SUH37	alloyed stainless steel / acid proof / heat resistant								

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Metal Table EN - JIS 5

EN Material No.	EN Denomination	JIS Material No.	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
(JIS)	untranslateable	SUH38	alloyed stainless steel / acid proof / heat resistant								
(JIS)	untranslateable	SUH600	alloyed construction steel / for quenching and tempering / for heat treatment / heat resistant			M					
(JIS)	untranslateable	SUJ1	unalloyed tool steel (~SUJ2 however 0.9-1.2%cr)								
(JIS)	untranslateable	SUJ3	unalloyed tool steel (~SUJ2 however 0.4-0.7%Si)								
(JIS)	untranslateable	SUJ4	unalloyed tool steel								
(JIS)	untranslateable	SUJ5	unalloyed tool steel								
(JIS)	untranslateable	SUM12	unalloyed steel / free cutting steel								
(JIS)	untranslateable	SUM41	unalloyed steel / free cutting steel								
(JIS)	untranslateable	SUM42	unalloyed steel / free cutting steel								
ISO	44SMn28	SUM43	unalloyed free cutting steel / for case hardening				420	630~850	16		
ISO	60CrMo33	SUP13	alloyed construction steel / for quenching and tempering / for heat treatment						35		
(JIS)	untranslateable	SUP6	alloyed steel for special purpose								
ISO	X3NiCr18-16	SUS384	alloyed stainless steel / acid proof								
(JIS)	X100CrMo17 (~)	SUS440	alloyed stainless steel / acid proof								
(JIS)	untranslateable	SWB	universal spring steel	Ø 0,8	Ø 1,4	(> 110°C)		2010~1620			
(JIS)	untranslateable	SWB	universal spring steel	Ø 1,6	Ø 2,6	(> 110°C)		1570~1420			
(JIS)	untranslateable	SWB	universal spring steel	Ø 2,9	Ø 4,5	(> 110°C)		1620~1320			
(JIS)	untranslateable	SWB	universal spring steel	Ø 5	Ø 7	(> 110°C)		1520~1180			
(JIS)	untranslateable	SWC	universal spring for high quality springs	Ø 5	Ø 7	(> 110°C)		1720~1370			
(JIS)	untranslateable	SWC	universal spring for high quality springs	Ø 0,8	Ø 1,4	(> 110°C)		2300~1860			
(JIS)	untranslateable	SWC	universal spring for high quality springs	Ø 1,6	Ø 2,6	(> 110°C)		2060~1520			
(JIS)	untranslateable	SWC	universal spring for high quality springs	Ø 2,9	Ø 4,5	(> 110°C)		1860~1520			
(JIS)	untranslateable	SWCH8[A]	cold formed steel / for steel wires					450			
(JIS)	untranslateable	SWO-A	heat treaded spring steel for general purpose springs			(>120°C)					
(JIS)	untranslateable	SWO-B	heat treaded spring steel for general purpose springs			(>120°C)					
(JIS)	untranslateable	SWOCV-V	heat treaded Q&T / Cr-V spring and valve steel for impact load			(>220°C)					
(JIS)	untranslateable	SWOSC-V	heat treaded Q&T / Cr-V spring and valve steel for impact load			(>245°C)					
(JIS)	untranslateable	SWO-V	heat treaded Q&T spring steel for general purpose springs			(>120°C)					
(JIS)	untranslateable	SWP-A	hight strength cold drawn spring steel			(> 110°C)					
(JIS)	untranslateable	SWP-B	hight strength cold drawn spring steel			(> 110°C)					
(JIS)	C43 (~~)	SWRH42A	carbon spring steel hardened								
(JIS)	C43 (~~)	SWRH57	carbon spring steel hardened								
(JIS)	C43 (~~)	SWRH6	carbon spring steel hardened								
(JIS)	C43 (~~)	SWRH62	carbon spring steel hardened								
(JIS)	untranslateable	SWRM	contstructional steel wire								

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Metal Table JIS - EN 1

JIS Material No.	EN Material No.	EN Denomination	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
A1050	EN AW-1050A	**Al99,5**	pure aluminium / non heat-treatable			0	20~60	60~95	23		
A1050	EN AW-1050A	**Al99,5**	pure aluminium / non heat-treatable				55~130	65~170	~40	HB	20~45
A2011	EN AW-2011	**AlCu6BiPb**	duraluminium / treatable			T3	296	379	15	HB	ca.105
A2011	EN AW-2011	**AlCu6BiPb**	duraluminium / treatable			T4	145	310	20	HB	ca.95
A2017	EN AW-2017	**AlCu4MgSi**	duraluminium / treatable			T3	250	400	10		
A2017	EN AW-2017	**AlCu4MgSi**	duraluminium / treatable			T4	240	390	12		
A4032	EN AW-4032	**AlSi12,5MgCuNi**	aluminium wrought alloy / non heat-treatable								
A5052	EN AW-5052	**AlMg2,5**	aluminium wrought alloy / non heat-treatable			H112	125	220	20	HB	65
A5052	EN AW-5052	**AlMg2,5**	aluminium wrought alloy / non heat-treatable			0	90	193	25		
A5056A	EN AW-5056A	**AlMg5**	aluminium wrought alloy / non heat-treatable			0	152	290	35		
A5056A	EN AW-5056A	**AlMg5**	aluminium wrought alloy / non heat-treatable			H38	345	414	15		
A5056A	EN AW-5056A	**AlMg5**	aluminium wrought alloy / non heat-treatable			0	110	240	15	HB	55
A5083	EN AW-5083	**AlMg4,5Mn0,7**	aluminium wrought alloy / non heat-treatable			H111	200	317	18		
A5083	EN AW-5083	**AlMg4,5Mn0,7**	aluminium wrought alloy / non heat-treatable			H112	125~140	275~300	12~15		
A5083	EN AW-5083	**AlMg4,5Mn0,7**	aluminium wrought alloy / non heat-treatable			0	110	270	12	HB	60
A6063	EN AW-6063	**AlMg0,7Si**	aluminium wrought alloy / treatable			0	50	100	27	HB	25
A6063	EN AW-6063	**AlMg0,7Si**	aluminium wrought alloy / treatable			T5	145	193	12		
A6063	EN AW-6063	**AlMg0,7Si**	aluminium wrought alloy / treatable			T6	214	241	12		
A6N01	EN AC-51400	**AlMgSi0,7**	special alloy for extrusion moulding (~AlSi0,5Mg)			T5	214.2	255	8		
A6N01	EN AC-51400	**AlMgSi0,7**	special alloy for extrusion moulding (~AlSi0,5Mg)			T6	261	277	8~12		
A6N01	EN AC-51400	**AlMgSi0,7**	special alloy for extrusion moulding (~AlSi0,5Mg)			0	ca.48	ca.120			
A6N01	EN AW 6060	**AlMgSi**	special alloy for extrusion moulding (~AlSi0,5Mg)								
A7020	EN AW-7020	**AlZn4,5Mg1**	aluminium wrought alloy / treatable				140~270	320~350	9~15	HB	45~105
A7075	EN AW-7075	**AlZn5,5MgCu**	aluminium wrought alloy / treatable			0	103	228	17		
A7075	EN AW-7075	**AlZn5,5MgCu**	aluminium wrought alloy / treatable			T6	500	570	10		
A7075	EN AW-7075	**AlZn5,5MgCu**	aluminium wrought alloy / treatable			T651	490	550	12	HB	160
AC4A	EN AC-42100	**G-AlSi10Mg**	aluminium cast alloy			T6	190~210	230~290	2~4		
AC4A	EN AC-42100	**G-AlSi10Mg**	aluminium cast alloy			T64	180	250	8	HB	75~90
AC4C	EN-AC 42200	**G-AlSi7Mg**	aluminium cast alloy			T5	170~230	210~270	4~7	HB	75~90
AC7A	EN AC-51300	**G-AlMg5**	aluminium cast alloy			F	105	245	5.3	HB	80
AC7A	EN AC-51300	**G-AlMg5**	aluminium cast alloy				90~100	140~150	2	HB	55~70
ADC12	EN AC-46100	**G-AlSi12Cu**	aluminium cast alloy (~ALSi11Cu2,5Fe)				186	296	2		
ADC12	EN AC-46100	**G-AlSi12Cu**	aluminium cast alloy (~ALSi11Cu2,5Fe)				80~150	150~220	1~4	HB	60~90
ANP79	EN AW-7075	**AlZn5,5MgCu (~)**	AlZnMgCu aluminium alloy (Daido)								
C1020	CW008A	**Cu-OF**	pure copper / oxygen free				50~150	245~300	45		
C1100	CW004A	**Cu-ETP**	pure copper				50~150	245~300	45		
C1220	CW024A	**Cu-DHP (SF-Cu)**	pure phosphorous desoxidated copper								
C1730	CW101C	**CuBe2**	copper beryllium alloy for springs				1200	1300			
C2600	CW505L	**CuZn30**	brass				160~470	270~520		HB	55~150
C2600	CW505L	**CuZn30**	brass				130~810	300~830		HB	65~200
C2700	CW508L	**CuZn37**	brass				150~580	300~610		HB	55~190
C2801	CW509L	**CuZn40**	brass				240~390	340~500		HB	75~130
C2801	CW509L	**CuZn40**	brass				270~500	350~550	10		
C3602[BD]	CW614N	**CuZn39Pb3**	brass			F		315			
C3604	CW614N	**CuZn39Pb3**	brass			F 37; 44, 51	250~390	360~500	90~145		
C3771	CW617N	**CuZn40Pb2**	brass				200	315~390	15		
C3771	CW617N	**CuZn40Pb2**	brass					510		HB	145
C3771	CW617N	**CuZn40Pb2**	brass				300~570	380~610		HB	90~165
C5191[B]	CW452K	**CuSn6P**	phosphorus bronce (PBC2)				300~600	350~650		HB	75~190
C6782	CC766S	**CuZn37Al1**	brass				170	450	25		
CAC304	CC762S	**CuZn25Al5**	bronce cast				450~480	750	10		
CAC406C	CC491K	**CuSn5Zn5(RG5)**	bronce cast (BC6)			H12		50	35		
CAC406C	CC491K	**CuSn5Zn5(RG5)**	bronce cast (BC6)			0		40	60		
CAC406C	CC491K	**CuSn5Zn5(RG5)**	bronce cast (BC6)	2	60	R340	230	340	45	HB	100
CAC406C	CC491K	**CuSn5Zn5(RG5)**	bronce cast (BC6)	2	40	R400	250	400	26	HB	125
CAC406C	CC491K	**CuSn5Zn5(RG5)**	bronce cast (BC6)	2	12	R470	350	470	15	HB	170
CAC406C	CC491K	**CuSn5Zn5(RG5)**	bronce cast (BC6)	2	6	R550	500	550		HB	200
DC53	(JIS)	**untranslateable**	general purpose cold work tool/mold steel (Daido)								
FC200	EN-JL1030	**EN-GJL-200 (GG-20)**	grey cast iron; flake-graphite cast iron				210	200			
FC200	EN-JL1030	**EN-GJL-200 (GG-20)**	grey cast iron; flake-graphite cast iron				Rp0.1/>165	200~300			
FC250	EN-JL1040	**EN-GJL-250 (GG-25)**	grey cast iron; flake-graphite cast iron				240	250			
FC250	EN-JL1040	**EN-GJL-250 (GG-25)**	grey cast iron; flake-graphite cast iron				Rp0.1/>230	250~350			
FC300	EN-JL1050	**EN-GJL-300**	grey cast iron; flake-graphite cast iron								
FCD450	EN-JS1040	**EN-GJS400 (GGG-40)**	nodular cast iron; ductile cast Iron				310	<450			
FCD600	EN-JS1060	**EN-GJS600 (GGG-60)**	nodular cast iron; ductile cast Iron				370	<600	3		
FCMB270	EN-JM1130 (~~)	**EN-GJMB 350-10 (~~)**	black-heart malleable cast iron								
G-Star	1.2085 (~~)	**X3CrMo16-1 (~~)**	(AISI: mod.420);easy machinable special mould steel (Daido)							HRc	ca. 37
KCF	1.4605 (~~)	**X2CrAlTi18-2 (~~)**	alloyed stainless steel / acid proof / with special elements								
NAK55	(JIS)	**untranslateable**	pre-hardened mold steel (Daido)								
PX5	1.2083 (~~)	**X42Cr12+S (~~)**	mould steel, (Daido), (AISI: modificated P20)								
PX5	1.2316 (~~)	**X36CrMo17+S (~~)**	mould steel, (Daido), (AISI: modificated P20)								
S09CK	1.1121	**2C10 (C10E; Ck10)**	unalloyed construction steel / for case hardening				295~390	490~640	16		
S10C	1.0301	**C10**	unalloyed construction steel / for case hardening				290~380	400~650			
S10C	1.1207	**C10R**	unalloyed construction steel / for case hardening					400			
S12C	(JIS)	**untranslateable**	unalloyed construction steel / for case hardening								
S15C	1.0401	**C15R**	unalloyed construction steel / for case hardening				430	600~750			
S15C	1.1141	**C15E (Ck15)**	unalloyed construction steel / for case hardening			case hardened	355	590~780	14	HRc	49~55
S20C	1.0402	**C22**	unalloyed construction steel / for quenching and tempering / for heat treatment		16		340	470~620	22		
S20C	1.0406	**C25**	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	370	500~650	23		
S20C	1.1151	**C22E (Ck22)**	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	290~340	470~620	22		
S20C	1.1151	**C22E (Ck22)**	unalloyed construction steel / for quenching and tempering / for heat treatment				210~340	410~500			
S22C	1.1149	**3C22 (Cm22/C22R)**	unalloyed construction steel / for quenching and tempering / for heat treatment				340	470~620			
S25C	1.1158	**C25E (Ck25)**	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	370	550~700	21		

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Metal Table JIS - EN 2

JIS Material No.	EN Material No.	EN Denomination	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
S30C	1.1178	**C30**	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	280	510			
S30C	1.1178	**C30**	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	400	600~750			
S35C	1.0501	**1C35 (C35)**	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	430	630~780			
S35C	1.1181	**C35E (Ck35)**	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	270~300	520	19		
S40C	1.0511	**C40**	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	320	580			
S40C	1.0511	**C40**	unalloyed construction steel / for quenching and tempering / for heat treatment		16	QT	460	650~800	16		
S45[CD]	1.1191	**C45E (Ck45)**	unalloyed construction steel / for quenching and tempering / for heat treatment [cold drawn]		16	QT	490	700~850	14		
S45C	1.0503	**C45**	unalloyed construction steel / for quenching and tempering / for heat treatment			case hardened		650~800		HRc	49~55
S45C	1.0503	**C45**	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	305~340	580	16		
S45C	1.0503	**C45**	unalloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	340~390	640~790			
S45-D	1.1191	**C45E**	unalloyed construction steel / for quenching and tempering / for heat treatment								
S50C	1.1206	**C50E (Ck50)**	unalloyed construction steel / for quenching and tempering / for heat treatment				520	750			
S50C	1.1213	**C50**	unalloyed construction steel / for quenching and tempering / for heat treatment					640			
S53C	1.1210	**C53E (Ck53)**	unalloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	370	630~780			
S55C	1.0535	**C55**	unalloyed construction steel / for quenching and tempering / for heat treatment				550	800~950			
S55C	1.1203	**C55E (Ck55)**	unalloyed construction steel / for quenching and tempering / for heat treatment				550	800~950			
S58C	1.0601	**C60**	unalloyed construction steel / for quenching and tempering / for heat treatment			annealed	340~380	670~710	11		
S58C	1.1221	**C60E (Ck60)**	unalloyed construction steel / for quenching and tempering / for heat treatment			QT	580	850~1000			
S58C	1.1223	**C60R**	unalloyed construction steel / for quenching and tempering / for heat treatment			case hardened	450~580	800~950	13	HRc	49~55
SCM415[H]	1.7242	**16CrMo4**	alloyed construction steel / case hardening steel / higher carbon content								
SCM418[H]	1.7243	**18CrMo4**	alloyed construction steel / case hardening steel / higher carbon content		16	case hardened	850	1100~1350	9		
SCM418[H]	1.7243	**18CrMo4**	alloyed construction steel / case hardening steel / higher carbon content	16	40	case hardened	690	950~1300	9		
SCM418[H]	1.7243	**18CrMo4**	alloyed construction steel / case hardening steel / higher carbon content	40	100	case hardened	600	800~1150	10		
SCM420	1.7264	**20CrMo5**	alloyed construction steel / case hardening steel		16		600	1000	12		
SCM420	1.7264	**20CrMo5**	alloyed construction steel / case hardening steel	16	40		500	850	14		
SCM420	1.7264	**20CrMo5**	alloyed construction steel / case hardening steel	40	100		400	750	16		
SCM420H	1.7258	**24CrMo5**	alloyed construction steel / case hardening steel / higher carbon content					800~950			
SCM421	1.7264	**20CrMo5**	alloyed construction steel / case hardening steel								
SCM430	1.7218	**25CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment		16	QT	700	900~1100	18	HRc	58
SCM430	1.7218	**25CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment		16	QT	680	550~700	12	HB	215~260
SCM430	1.7218	**25CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	600	800~950	14	HB	215~260
SCM430	1.7218	**25CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment	40	100	QT	450	700~850	15	HB	215~260
SCM435[H]	1.7220	**34CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content				800	1000~1200			
SCM440	1.7220	**34CrMo4**	alloyed construction steel / / for quenching and tempering / for heat treatment / for flame-induction hardening				835	980	12		
SCM440H	1.7223	**41CrMo4**	alloyed construction steel / / for quenching and tempering / for heat treatment / for flame-induction hardening				880	980~1180			
SCM440H	1.7225	**42CrMo4**	alloyed construction steel / / for quenching and tempering / for heat treatment / for flame-induction hardening				900	1100~1300			
SCM445	1.7262	**16CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment								
SCM822	1.7350	**22CrMo44**	alloyed construction steel / for quenching and tempering / for heat treatment								
SCr415[H]	1.7015	**15Cr3**	alloyed construction steel / case hardening steel / higher carbon content								
SCr415[H]	1.7016	**17Cr3**	alloyed construction steel / case hardening steel / higher carbon content				450	800~1050	11		
SCr420[H]	1.7027	**20Cr4**	alloyed construction steel / case hardening steel / higher carbon content					<1000			
SCr430	1.7033	**34Cr4**	alloyed construction steel / for quenching and tempering / for heat treatment				635	780	18		
SCr430[H]	1.7033	**34Cr4**	alloyed construction steel / for quenching and tempering / for heat treatment				700~740	880~1000	15		
SCr435[H]	1.7034	**37Cr4**	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	650	880~1080			
SCr440	1.7035	**41Cr4/42Cr4**	alloyed construction steel / for quenching and tempering / for heat treatment				785	930	13		
SCr440[H]	1.7035	**41Cr4/42Cr4**	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	780	950~1150	11		
SCS13	1.4308	**G-X6CrNi18-9**	stainless steel casting								
SCS22	1.4401	**G-X5CrNiMo17-12-2**	stainless steel casting								
SGP	1.0035	**S185 (St.33)**	unalloyed construction steel / pipe steel				175~185	290			
SGPW	1.0035	**S185 (St.33)**	unalloyed construction steel / pipe steel / galvanized					290			
SK1	ISO	**TC140**	unalloyed tool steel for cold work								
SK2	ISO	**TC120**	unalloyed tool steel for cold work								
SK3	1.1545	**C105W1**	unalloyed tool steel for cold work							HRc	52~58
SK3	1.1645	**C105W2**	unalloyed tool steel for cold work								
SK4	ISO	**TC90**	unalloyed tool steel for cold work								
SK5	1.1525	**C80W1**	unalloyed tool steel for cold work								
SK5	1.1830	**C85W**	unalloyed tool steel for cold work								
SK6	1.1625	**C80W2**	unalloyed tool steel for cold work							HRc	52~58
SK7	1.1740	**C60W**	unalloyed tool steel for cold work					1000			
SKD1	1.2080	**X210Cr12**	unalloyed tool steel								
SKD11	1.2379	**X155CrVMo12-1**	unalloyed tool steel for cold work							HRc	>68
SKD12	1.2363	**X100CrMoV5-1**	unalloyed tool steel for cold work							HRc	>68
SKD4	1.2567	**X30WCrV5-3**	unalloyed tool steel for hot work								
SKD5	1.2581	**X30WCrV9-3**	unalloyed tool steel for hot work								
SKD6	1.2343	**X38CrMoV5-1**	unalloyed tool steel for cold work					1550			
SKD61	1.2344	**X40CrMoV5-1**	unalloyed tool steel for cold and hot work					1180~1770		HRc	>68
SKD7	1.2365	**X32CrMoV3-3**	unalloyed tool steel for hot work								
SKD8	(JIS)	**untranslateable**	unalloyed tool steel								
SKH10	1.3202	**S12-1-4-5**	alloyed high speed steel with Co								
SKH2	1.3355	**S18-0-1**	alloyed high speed steel without Co								
SKH51/SUH3	1.3343	**S6-5-2**	alloyed high speed steel without Co			hardened		≤1000		HRc	60~68
SKH52/SKH53	1.3344	**S6-5-3**	alloyed high speed steel without Co								
SKH55	1.3243	**S6-5-2-5**	alloyed high speed steel with Co								
SKH57	1.3207	**S10-4-3-10**	alloyed high speed steel with Co								
SKH59	1.3247	**S2-10-1-8**	alloyed high speed steel with Co								
SKS11	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKS2/3/31	1.2419	**105WCr6**	unalloyed tool steel for cold work			hardened		<1000		HRc	58~64
SKS21	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKS3	1.2510	**100MnCrW4 (~~)**	unalloyed tool steel for cold work								
SKS41	1.2541	**35WCrV7**	unalloyed tool steel for cold work								
SKS41	1.2542	**45WCrV7**	unalloyed tool steel for cold work								
SKS42	1.2552	**80WCrV8**	unalloyed tool steel for cold work								
SKS43	1.2833	**100V1**	unalloyed tool steel for cold work					<1000			

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JIS Material No.	EN Material No.	EN Denomination	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
SKS44	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKS5	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKS7	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKS8	1.2008	**140Cr3 (~~)**	unalloyed tool steel for cold work								
SKS93	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKS94	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKS95	(JIS)	**untranslateable**	unalloyed tool steel for cold work								
SKT3/SKT4	1.2713	**55NiCrMoV6**	unalloyed tool steel for cold and hot work					930~1420		HRc	55~60
SMF5040	(JIS)	**C43 (~~)**	sintered carbon mould steel								
SMn420[H]	1.1160	**22Mn6**	structural / heat treatment steel [increased Carbon content]								
SMn433[H]	1.1165	**30Mn5**	structural / nitriding steel / heat treatment steel [increased Carbon content]					<900			
SMn433[H]	1.1166	**34Mn5**	structural / nitriding steel / heat treatment steel [increased Carbon content]					750~950			
SMn438[H]	1.1167	**36Mn5**	structural / heat treatment steel [increased Carbon content]					800			
SMn443[H]	1.1175	**41Mn4**	structural / heat treatment steel [increased Carbon content]								
SMnC420[H]	1.1133	**20Mn5**	structural / heat treatment steel [increased Carbon content]					<800			
SMnC420[H]	1.7147	**20MnCr5**	structural / heat treatment steel [increased Carbon content]				685	1080~1370	8	HB	215
SNB16	1.7711	**40CrMoV4-7**	alloyed construction steel / for quenching and tempering / for heat treatment			QT	470~700	850~1000	14		
SNB21 [1-5]	1.7223	**41CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment			QT	880	980~1180			
SNB22 [1-5]	1.7223	**41CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment			QT	450~700	700~900			
SNB23 [1-5]	1.6562	**40NiCrMo8-4**	alloyed construction steel / for quenching and tempering / for heat treatment								
SNB7	1.7225	**42CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment	16	40	QT	650~900	900~1200	11	HRc	38
SNC236	1.5710	**36NiCr6**	alloyed structural steel								
SNC415[H]	1.5732	**14NiCr10**	alloyed construction steel / case hardening steel / higher carbon content					575			
SNC631[H]	1.5736	**36NiCr10**	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content		40	QT	780	1030~1180			
SNC631[H]	1.5736	**36NiCr10**	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content	40	100	QT	690	880~1030			
SNC631[H]	1.5736	**36NiCr10**	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content	100	250	QT	590	740~880			
SNC815[H]	1.5752	**14NiCr14**	alloyed construction steel / case hardening steel / higher carbon content					930~1230			
SNC836	1.3565	**48CrMo4**	unalloyed bearing steel					1080			
SNC836	1.5755	**31NiCr14**	alloyed bearing steel		40	QT	840	980~1130	11		
SNC836	1.5755	**31NiCr14**	alloyed bearing steel	40	100	QT	740	880~1030	12		
SNC836	1.5755	**31NiCr14**	alloyed bearing steel	100	250	QT	590	790~930	14		
SNCM220[H]	1.6523	**20NiCrMo2-2**	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content				590	980~1270	10		
SNCM240	1.6546	**40NiCrMo2-2**	alloyed construction steel / for quenching and tempering / for heat treatment								
SNCM415	1.7262	**16CrMo4**	alloyed construction steel / for quenching and tempering / for heat treatment								
SNCM420[H]	1.6587	**17CrNiMo8**	alloyed construction steel / for quenching and tempering / for heat treatment / higher carbon content								
SNCM431	1.6580	**30CrNiMo8**	alloyed construction steel / for quenching and tempering / for heat treatment			QT	1050	1250~1450			
SNCM439	1.6582	**34CrNiMo6**	alloyed construction steel / for quenching and tempering / for heat treatment			QT	700~900	1000~1200	11		
SNCM447	1.6511	**36CrNiMo4**	alloyed construction steel / for quenching and tempering / for heat treatment			QT	800~1000	1100~1300	10		
SNCM447	1.6511	**36CrNiMo4**	alloyed construction steel / for quenching and tempering / for heat treatment			QT	≥1000	1200~1400	9	HB	355~410
SNCM616	1.6565	**40NiCrMo6**	alloyed construction steel / for quenching and tempering / for heat treatment								
SNCM625	(JIS)	**untranslateable**	alloyed construction steel / for quenching and tempering / for heat treatment								
SNCM630	(JIS)	**untranslateable**	alloyed construction steel / for quenching and tempering / for heat treatment			QT		1150	10	HRc	35
SNCM815	1.6657	**14NiCrMo34**	alloyed construction steel / for quenching and tempering / for heat treatment								
SPCC[SD]	1.0330	**DC01 (St.12)**	unalloyed steel / deep drawable / [solid drawn]				140~280	270~410	28~39	HB	90~120
SPHC	1.0320	**St.22**	unalloyed steel / deep drawable / [hot coiled]					270	27~31		
SS330	1.0028	**S205G1T (USt.34)**	unalloyed mild steel				195	330~430	26		
SS400[D]	1.0040	**Ust.42.2**	unalloyed structural steel			unkilled		400~510			
SS400[D]	1.0042	**RSt.42.2**	unalloyed mild steel					400~510			
SS400[D]	1.0136	**St.42.3**	unalloyed mild steel					400~510			
SS490	1.0050	**E295 (St.50.2)**	unalloyed mild steel				265~295	470~610	20		
SS540	1.0060	**E335 (St.60.2)**	unalloyed mild steel					>540			
SSPR	(JIS)	**untranslateable**	structural steel								
SSPSR	(JIS)	**untranslateable**	structural steel								
STKM11A	1.0034	**S205G2T (RSt.34)**	unalloyed mild steel								
STKM12[A/C]	1.0038	**S235JRG2 (RSt.37.2)**	unalloyed mild steel			killed	215	340~470		HB	120
STKM13A	1.0480	**H240LA**	unalloyed construction steel / pipe steel				240~310	340	27		
STPG370	1.0254	**S235 (St.37)**	unalloyed construction steel / pipe steel								
STPS2	(JIS)	**untranslateable**	seamless pipe for hydraulic fluids				180	450	30		
STPT370	1.0255	**St.37-4**	unalloyed construction steel / pipe steel for high temperature			(<350°C)					
STPT370	1.0305	**P235G1TH (St.35.8)**	unalloyed construction steel / pipe steel for high temperature			(<350°C)					
SUH1	1.4718	**X45CrSi9-3**	alloyed valve steel / heat resistant			C					
SUH11	(JIS)	**untranslateable**	alloyed valve steel / heat resistant			M					
SUH3	1.4731	**X40CrSiMo10-2**	alloyed high speed steel without Co								
SUH309	1.4828	**X15CrNiSi20-12**	heatresistant steel			A	230~290	500~750	30~40	HB	130~220
SUH31	1.4873	**X45CrNiW18-9**	alloyed stainless steel / valve steel / heat resistant								
SUH310	1.4841	**X15CrNiSi25-20**	alloyed stainless steel / acid proof / heat resistant			A	230~300	550~750	30~40		
SUH310	1.4845	**X12CrNi25-21**	alloyed stainless steel / acid proof / heat resistant			A	230~300	550~750	30~40		
SUH35/SUH36	1.4871	**X53CrMnNiN21-9**	alloyed stainless steel / valve steel / highly heat resistant								
SUH37	(JIS)	**untranslateable**	alloyed stainless steel / acid proof / heat resistant								
SUH38	(JIS)	**untranslateable**	alloyed stainless steel / acid proof / heat resistant								
SUH4	1.4747	**X80CrNiSi20**	alloyed stainless steel / acid proof / heat resistant			C					
SUH409[L]	1.4512	**X5CrTi12**	alloyed stainless steel / acid proof / heat resistant			F					
SUH409[L]	1.4720	**X6CrTI12**	alloyed stainless steel / acid proof / heat resistant			F					
SUH446	1.4762	**X10CrAlSi25**	alloyed stainless steel / acid proof / heat resistant			F	280	520~720	10		
SUH600	(JIS)	**untranslateable**	alloyed construction steel / for quenching and tempering / for heat treatment / heat resistant			M					
SUH616	1.4935	**X20CrMoWV12-1**	alloyed stainless steel / valve steel / highly heat resistant			C					
SUH660	1.4943	**X4NiCrTi25-15**	alloyed stainless steel / valve steel / highly heat resistant / weldable without treatment			A					
SUH661	1.4971	**X12CrCoNi21-20**	alloyed stainless steel / valve steel / highly heat resistant			A					
SUJ1	(JIS)	**untranslateable**	unalloyed tool steel (~SUJ2 however 0.9-1.2%cr)								
SUJ2	1.2067	**102Cr6**	unalloyed tool steel / ball bearing steel			annealed		675		HB	230
SUJ2	1.3505	**100Cr6**	unalloyed tool steel / ball bearing steel			annealed		675		HB	230
SUJ2	1.3505	**100Cr6**	unalloyed tool steel / ball bearing steel			hardened		≤850		HRC	58~65
SUJ3	(JIS)	**untranslateable**	unalloyed tool steel (~SUJ2 however 0.4-0.7%Si)								

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Metal Table JIS - EN 4

JIS Material No.	EN Material No.	EN Denomination	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
SUJ4	(JIS)	**untranslateable**	unalloyed tool steel								
SUJ5	(JIS)	**untranslateable**	unalloyed tool steel								
SUM11	1.0702	**U10S10**	unalloyed steel / free cutting steel								
SUM12	(JIS)	**untranslateable**	unalloyed steel / free cutting steel								
SUM21	1.0711	**9S20**	unalloyed steel / free cutting steel					370~450		HB	100~130
SUM22[L]	1.0715	**9SMn28**	unalloyed steel / free cutting steel							HB	110~170
SUM24L	1.0718	**9SMnPb28**	unalloyed steel / free cutting steel					390~580		HRc	35~41
SUM25	1.0736	**9SMn36**	unalloyed steel / free cutting steel					<500			
SUM31[L]	1.0710	**15S10**	unalloyed steel / free cutting steel					400~560			
SUM32	1.0723	**15S20**	unalloyed steel / free cutting steel								
SUM41	(JIS)	**untranslateable**	unalloyed steel / free cutting steel								
SUM42	(JIS)	**untranslateable**	unalloyed steel / free cutting steel								
SUM43	ISO	**44SMn28**	unalloyed free cutting steel / for case hardening				420	630~850	16		
SUP10	1.8159	**50CrV4/51CrV 4**	alloyed construction steel / for quenching and tempering / for heat treatment				1180	1350~1600			
SUP11A	1.7138	**52MnCrB3**	alloyed construction steel / for quenching and tempering / for heat treatment								
SUP12	1.7102	**54SiCr6**	alloyed construction steel / for quenching and tempering / for heat treatment / hot rolled spring steel				1130	1320~1570	6		
SUP13	ISO	**60CrMo33**	alloyed construction steel / for quenching and tempering / for heat treatment						35		
SUP3	1.1262	**C82D2**	alloyed construction steel / for quenching and tempering / for heat treatment								
SUP6	(JIS)	**untranslateable**	alloyed steel for special purpose								
SUP7	1.5026	**56Si7**	alloyed construction steel / valve steel / warm drawn spring steel						45		
SUP7	1.7108	**60SiCr7**	alloyed construction steel / valve steel / warm drawn spring steel				1130	1320~1570	6		
SUP9A	1.7176	**55Cr3 (~~)**	alloyed construction steel / for quenching and tempering / for heat treatment								
SUS202	1.4371	**X2CrMnNiN17-7-5**	alloyed stainless steel						40		
SUS301	1.4319	**X3CrNiN17-8**	alloyed steel / stainless and acidproof steel / for cold extrusion			A		500~750			
SUS301J1-[CSP]	1.4310	**X10CrNi18-8**	alloyed steel / stainless and acidproof steel / for cold extrusion			A	195	500~750			
SUS301-WPA	1.6901	**X12CrNi18-10**	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
SUS301-WPB	1.6902	**X12CrNi18-11**	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
SUS302	1.6900	**X12CrNi18-9**	alloyed stainless steel / acid proof			A					
SUS303	1.4305	**X10CrNiS18-9**	alloyed stainless steel / acid proof			A1		520	40	HRc	>68
SUS303	1.4305	**X8CrNi18-9**	alloyed stainless steel / acid proof			A1	190	500~750	35		
SUS304	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof			A2	190	540~750	45		
SUS304-CSP	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof / spring steel / cold coild								
SUS304-D	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof								
SUS304-H	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof								
SUS304L	1.4306	**X2CrNi19-11**	alloyed stainless steel / acid proof			A2		520~670	40~45		
SUS304LN	1.4311	**X2CrNiN18-10**	alloyed stainless steel / acid proof			A	270	550~760			
SUS304-TP	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof								
SUS304-WPB	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof								
SUS304-WPC	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof / spring steel			(>180 °C)		700			
SUS305[J1]	1.4303	**X4CrNi18-12**	alloyed stainless steel / acid proof			A2		500/650	45		
SUS309S	1.4833	**X12CrNi23-13**	alloyed stainless steel / acid proof / heat resistant			A					
SUS309S	1.4833	**X7CrNi23-14**	alloyed stainless steel / acid proof / heat resistant								
SUS316	1.4401	**X5CrNiMo17-12-2**	alloyed stainless steel / acid proof				220	520~700	40	HB	130~180
SUS316	1.4436	**X3CrNiMo17-13-3**	alloyed stainless steel / acid proof			A4		550~700	40		
SUS316	1.4438	**X2CrNiMo18-15-4**	alloyed stainless steel / acid proof			A4		550~700	40		
SUS316L	1.4404	**X2CrNiMo17-12-2**	alloyed stainless steel / acid proof			A4		530~680	40		
SUS316L	1.4435	**X2CrNiMo18-14-3**	alloyed stainless steel / acid proof			A4		500~700	40	HV	120
SUS316LN	1.4406	**X2CrNiMoN17-12-2**	alloyed stainless steel / acid proof			A4					
SUS316LN	1.4429	**X2CrNiMoN17-13-3**	alloyed stainless steel / acid proof			A4	220	500~700	40	HB	130~170
SUS316-TP	1.4301	**X5CrNi18-10**	alloyed stainless steel / acid proof								
SUS316-WPA	1.4401	**X5CrNiMo17-12-2**	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
SUS316-WPB	1.4401	**X5CrNiMo17-12-2**	alloyed stainless steel / acid proof / spring steel			A (>290°C)					
SUS317	1.4449	**X3CrNiMo18-12-3**	alloyed stainless steel			A					
SUS317L	1.4438	**X2CrNiMo18-16-4**	alloyed stainless steel / acid proof					550~700			
SUS321	1.4541	**X6CrNiTi18-10**	alloyed stainless steel / weldable without treatment / tough to subzero temperature			A2	200	520~720	40	HB	130~190
SUS321	1.4878	**X8CrNiTi18-10**	alloyed stainless steel / acid proof			A	190	500~720	40		
SUS329J1	1.4460	**X8CrNiMo27-5**	alloyed stainless steel / acid proof			AF					
SUS347	1.4550	**X6CrNiNb18-10**	alloyed stainless steel / acid proof			A2		520~720	40	HB	130~190
SUS347	1.4550	**X10CrNiNb18-9**	alloyed stainless steel / acid proof					520~750			
SUS384	ISO	**X3NiCr18-16**	alloyed stainless steel / acid proof								
SUS403	1.4000	**X6Cr13**	alloyed stainless steel / acid proof			F		600			
SUS405	1.4002	**X6CrAl13**	alloyed stainless steel / acid proof / heat resistant			F			10		
SUS405	1.4724	**X10CrAl11-3**	alloyed stainless steel / acid proof / heat resistant			F					
SUS410	1.4006	**X10Cr13**	alloyed steel / stainless and acidproof / for cold extrusion			C1		730	20		
SUS410	1.4006	**X10Cr13**	alloyed steel / stainless and acidproof steel / for cold extrusion			QT		1200	7	HRc	37
SUS410	1.4006	**X10Cr13**	alloyed steel / stainless and acidproof steel / for cold extrusion					380	45		
SUS410J1	1.4024	**X15Cr13**	alloyed steel / stainless and acidproof steel / for cold extrusion								
SUS416	1.4005	**X12CrS13**	alloyed stainless steel / acid proof			M		540	25		
SUS420	1.4029	**X29CrS13**	alloyed stainless steel / acid proof								
SUS420F	1.4029	**X29CrS13**	alloyed stainless steel / acid proof			M					
SUS420J	1.4021	**X20Cr13**	alloyed stainless steel / acid proof			C1		800~1000	8~12	HRc	40
SUS420J2	1.2083	**X42Cr13**	alloyed stainless steel / acid proof			C1		850~1000	10	HRc	>68
SUS420J2	1.4031	**X38Cr13**	alloyed stainless steel / acid proof			C1		800			
SUS420J2	1.4034	**X46Cr13**	alloyed stainless steel / acid proof			C1			11		
SUS429	1.4001	**X7Cr14**	alloyed stainless steel / acid proof			F		530~680			
SUS430	1.4016	**X6(8)Cr17**	alloyed stainless steel / acid proof / heat resistant			F1	240	450~630	12~20	HB	130~170
SUS430	1.4742	**X10CrAl(Si)18**	alloyed stainless steel / acid proof / heat resistant				270	500~700	15		
SUS430F	1.4104	**X12CrMoS17-2**	alloyed stainless steel / acid proof / heat resistant			F		840			
SUS430LX	1.4510	**X6CrTi17**	alloyed stainless steel / acid proof / heat resistant								
SUS430LX	1.4511	**X8CrNb17**	alloyed stainless steel / acid proof / heat resistant								
SUS431	1.4057	**X17CrNi16-2**	alloyed stainless steel / acid proof			C3		800~950	12~14		
SUS431	1.4057	**X17CrNi16-2**	alloyed stainless steel / acid proof				280	980		HB	280
SUS434	1.4113	**X6CrMo17-1**	alloyed steel / stainless and acidproof steel / for cold extrusion			F1		450~630	18		

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JIS Material No.	EN Material No.	EN Denomination	Material Description	Ø min.	Ø max.	Condition	Re-Rp0,2 in MPa	Rm in MPa	A in %	Hardness Unit	Hardness Value
SUS440	(JIS)	**X100CrMo17 (~)**	alloyed stainless steel / acid proof								
SUS440B	1.4112	**X90CrMoV18**	alloyed stainless steel / acid proof			C				HRc	>68
SUS440C	1.4125	**X105CrMo17**	alloyed stainless steel / acid proof			C3 QT		780	15	HRc	50
SUS444	1.4522	**X2CrMoTi18-2**	alloyed stainless steel / valve steel / highly heat resistant / weldable without treatment					450	35		
SUS630	1.4542	**X5CrNiCuNb16-4**	,alloyed stainless steel / acid proof / complete hardenable			aged		1030~1300	10~11	HRc	41~42
SUS630	1.4542	**X5CrNiCuNb16-4**	alloyed stainless steel / acid proof / complete hardenable					800	14	HV	250
SUS631	1.4568	**X7CrNiAl17-7**	alloyed stainless steel / acid proof / complete hardenable					1230			
SUS631J1-WPC	1.4568	**X7CrNiAl17-7**	alloyed stainless steel / acid proof / spring steel / complete hardenable			(>340 °C)		1400~2200			
SUSXM27	1.4131	**X1CrMo26-1**	alloyed stainless steel					570	25		
SUSXM7	1.4567	**X3CrNiCu18-9-4**	alloyed stainless steel / acid proof / with special elements								
SWB	(JIS)	**untranslateable**	universal spring steel	Ø 0,8	Ø 1,4	(> 110°C)		2010~1620			
SWB	(JIS)	**untranslateable**	universal spring steel	Ø 1,6	Ø 2,6	(> 110°C)		1570~1420			
SWB	(JIS)	**untranslateable**	universal spring steel	Ø 2,9	Ø 4,5	(> 110°C)		1620~1320			
SWB	(JIS)	**untranslateable**	universal spring steel	Ø 5	Ø 7	(> 110°C)		1520~1180			
SWC	(JIS)	**untranslateable**	universal spring for high quality springs	Ø 5	Ø 7	(> 110°C)		1720~1370			
SWC	(JIS)	**untranslateable**	universal spring for high quality springs	Ø 0,8	Ø 1,4	(> 110°C)		2300~1860			
SWC	(JIS)	**untranslateable**	universal spring for high quality springs	Ø 1,6	Ø 2,6	(> 110°C)		2060~1520			
SWC	(JIS)	**untranslateable**	universal spring for high quality springs	Ø 2,9	Ø 4,5	(> 110°C)		1860~1520			
SWCH8[A]	(JIS)	**untranslateable**	cold formed steel / for steel wires					450			
SWO-A	(JIS)	**untranslateable**	heat treaded spring steel for general purpose springs			(>120°C)					
SWO-B	(JIS)	**untranslateable**	heat treaded spring steel for general purpose springs			(>120°C)					
SWOCV-V	(JIS)	**untranslateable**	heat treaded Q&T / Cr-V spring and valve steel for impact load			(>220°C)					
SWOSC-V	(JIS)	**untranslateable**	heat treaded Q&T / Cr-V spring and valve steel for impact load			(>245°C)					
SWO-V	(JIS)	**untranslateable**	heat treaded Q&T spring steel for general purpose springs			(>120°C)					
SWP-A	(JIS)	**untranslateable**	hight strength cold drawn spring steel			(> 110°C)					
SWP-B	(JIS)	**untranslateable**	hight strength cold drawn spring steel			(> 110°C)					
SWRCH	1.0303	**C4C (QSt.32.3)**	cold formed steel / for steel wires								
SWRH42A	(JIS)	**C43 (~~)**	carbon spring steel hardened								
SWRH57	(JIS)	**C43 (~~)**	carbon spring steel hardened								
SWRH6	(JIS)	**C43 (~~)**	carbon spring steel hardened								
SWRH62	(JIS)	**C43 (~~)**	carbon spring steel hardened								
SWRM	(JIS)	**untranslateable**	contstructional steel wire								
TP340	3.7035	**Ti99.5 (Ti2)**	titanium				min.215	390~540	22		
ZDC1	ZP0401 (2.2141)	**ZnAl4Cu1**	zinc die cast								
ZDC2	ZC0400	**ZnAl4**	zinc die cast				230	300	7		

JIS denomination is binding for orders. EN denominations are started as comparative material. (Partly there is no existing equivalent EN material for JIS material existing or contrary).
All information ist based on values and properties which are achieved typically and are only for assessment of materials (typical values). Properties herein shall not be located directly to a product and there is no supposition that any product achieves these values. For proof values own checks are necessary or you may request the direct related value from Misumi.

Plastic Table 1

iPlastics

Abreviation (DIN ISO 1629)	common denomination	typical technical values
CR (ISO)	Chlorbutadien-Rubber	Operating Temperature: -40°C ~ +110°C (short time use +130°C), Density: 1.25 g/cm³
Good resistance against mineral oil, very good resistance against ageing by exposure to exposure to ozone, resistance against acid and alkalines, good abrasion resistance, high flame resistant, restricted lightwigthed fuel resistance. (Similar to NBR in chem. and phys. area: smaller resistance against mineral oil, better resistance against ageing by exposure to ozone, resistance against acid and alkalines).		
CFK CRP (ISO)	Carbon Reinforced Plastic	
Carbon fibres are Fibres with very high strength and rigidity and very small elongation at break. Carbonization temperatures for the fibres are in the area from 1300 - 1500 °C, whereby the carbon content is increasing to 96% -%98%. In cooperation with thermoset resin or thermoplastic resin CFK's enable to create light, stiff and high strength composite materiale with small elongation. The properties of composite materiales are adjustable in a wide range depending on typ of plastic, lenth of fibres and thickness of fibres. Temperature resistance is primary depending on the basic plastic.		
EPDM (ISO)	PolyEthylenePropyleneDieneRubber	Operating Temperature: -40°C~+130°C (short time use +150A), steam up to 200°C, hot water / air up to 150°C; Density: 1.05~1.2 g/cm³
Exelent resistance against weathering, agening, exposure to ozone, chemicals, hot water and vapour. good resistance against medium like acetone, mathanol, acids, alkaline solutions, ketones and flame resistant hydraulic fluids. Small permeability to vapour, good thermal stability, excessively deep embrittlement temperature. very good electr. insulating properties.		
EPM (ISO) EPR	Ethylen Propylen Rubber	Operating Temperature: -25 °C~+200°C, short time use +250°C, (-40°C at static load), Density: 1.8 g/cm³
Properties as far as possible same to EPDM. EPR. Often used as insulator for wires and conduction.		
FPM (ISO) FKM (ASTM)	Fluorcarbon Fluorrubber Polyfluoralkylmethylen	Operating Temperature: -25°C~+200°C, short time use +250°C (-40°C at static load), Density: 1.8 g/cm³
Very good Oil- and Chemical resistance, very good heat resistance, exelent exposure to ozone-, agening- and weathering resistance, high resistance against inflammation. very small elasticity, middlesized mechanical strength. Permeability to gas ist very small and similar to permeability of Butylrubber.		
GFK GRP (ISO)	glass reinforced plastic	Operating Temperature: 120°C+180°C max. 2h, bis 500A for high temperature resistant types (Epoxy basic), Density: 1.8 - 2.2 g/cm³
Glasfibres are fibres with high strength and stiffness and small elongation at break. In cooperation with thermoset resin or thermoplastic resin light, stable and strength composite materials with small elongation. The properties of composite materiales are adjustable in a wide range depending on typ of plastic, lenth of fibres and thickness of fibres. Temperature resistance is primary depending on the basic plastic.		
IIR (ISO)	Butyl-Rubber Isopren-Rubber Isobutylen-Rubber Polyisobutylen-isoprene	Operating Temperature: -40°C~+130°C, short time use +150°C, Density: 1.5 g/cm³
Good resistance against acids and alkaline solutions, very good agening resistance, exposure to ozone, very good electric insulating properties, small permeability to gas. Low elasticity and no resistance against oil and grease. Extremly damping properties for aperiodic vibrations. Middlesized mechanical properties.		

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Abreviation (DIN ISO 1629)	common denomination	typical technical values
NBR (ISO)	Acrylnitrilbutadiene Rubber Acrylnitril Rubber Nitrilrubber Polyacrylnitrilbutathen	Operating Temperature: Fluids up to +70°C, air up to +90°C, temp. depending on ACN-content max. -50°C, Density: 1.6 g/cm³, Elongation at Break: 100~350%
Acrylnitril content (small, middle, high). High Acrylnitril content = high Resistance against aromatic hydrocarbon. Small Acrylnitril content = high flexibility at low temperatures. The typ with normaly best combination in normal using areas has a middlesized Acrylnitril content. Permeability to gas nearly same to IIR. Very good resistance against mineral oil.		
NR (ISO)	Natural Rubber Polyisoprene	Operating Temperature: -45°C~+100°C, Density: 1.2 g/cm³
Good mechanical properties(very high strength, high elongation at break and very high impact resilience, good abrasion resistance). No resistance against mineral oil and mineral grease; poor exposure to ozone and agening. Natural rubber is comparable to with Polyisoprene. Permeability to gas for NR is approx 20 times higher IIR.		
PA (ISO)	Polyamide	Operating Temperature: +80°C~+110°C (short time use +140°C~+170°C), Density: 1.17 g/cm³
Semicrystalline thermoplastic resin, i.e. PA 6 and PA 6,6. The number is representing the amount of carbon atomes within amine- and acid monomeres. Low temperature resistance, shock restistant and impact resistant, even on rough surfaces abrasion resistant, high internal working capacity.		
PBT (ISO) PBTP	Polbutylenterephthalat Dimethyl Terephthalat und Butandiol Polyester	Operating Temperature: -30°C~+100°C (160°C short time use), Density: 1.3 g/cm³
Small tendency for leakage current, very high stability for dimensions (better than POM), low slip friction, high strength and stiffness (smaller than POM and PET, but higher impact resistance), very good abrasion resistance.		
PC (ISO)	Polycarbonate Lexan	Operating Temperature: -130°C~+130°C, Density: 1.2 g/cm³, Elongation at Break: 90~120%
Extremly high impact resistance, high strength, high temperature resistance, good optical properties and self-extinguishing. Sensibel against chemicals and sensible for stress cracking, not usable for continunous endurance above 20 Mpa, under temperature effect continuous load up to maximum 10 MPa, unusable at higher dynamic load , at edges and stepped shapes with small and sharp edges very notch sensitive.		
PE (ISO)	Polyethylene	Operating Temperature: ~+80°C (short time use +100°C), Density: hard condition: 0.95 g/cm³, soft condition: 0.92 g/cm³ / HDT/A42-49 (HDUHMW)
Waxy and non adhasive surface. Low density high tenacity, low strength and hardness, exelent chemical resistance, poor temperature resistance for steam and permeable for Oxygen, Carbon dioxide and aromatic substances.		
PET (ISO)	Polyethylenterephthalat Poly(ethylendioxytereftaloyl) Polyester	Operating Temperature: -50°C~+110°C (short tim use 180°C), Density: 1.34 g/cm³
Dimensionally stable (better than POM), low sliding resistance, high strength and stiffness (worse than POM), very good abrasion resistance.		

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Plastic Table 3

Abreviation (DIN ISO 1629)	common denomination	typical technical values
PF (ISO)	Phenolformaldehyd Bakelite	-50~+100, up to 2h at 130°C, at 180°C breakdown, Density: 1.4 g/cm³
Hard and brittle, insoluble, infusible, flame-resistant, self-extinguishing, resistant against agening. By Polycondensation from carbolicum acidum with formaldehyde manfactured phenoplast.		
PMMA (ISO)	Polymethylmethacrylate	Operating Temperature: -40°C~+90°C (short time use +100°C), Density: 1.2 g/cm³, HDT/A 95, HDT/B 100
Lightfast, glas clear, nearly unbreakable, sensitive against dust, scratch-resistant, UV-resistant, resistantant against weak acids and alkaline solutions, resistant against mineral oil and gasoline, partially resistant to solvent.		
Polyolefine		
Polymer out of hydrocarbon (formula CnH2n) built up in one double link. (polymerized alkene). Polyolefines are semikrisalline thermoplastic resins, distinguished by good chemical resistance and good electrical insulation properties. This group is very reasonable in price and can be manufactured by conventional procedures. That's the reason for often use and that they are one of the most important group of plastics. In polymeric conditon the Polyolefine are robust and flexible plastics with numerous possibilities in use. Inherent plastics: PE (Polyethylene), PP (Polypropylene), PB (Polybenzimidazol), PMP (Poly-4-methylpenten), PB (Polybuten-1), PIB (Polyisobuten). {Olefine = artificial word from fr. olefiant which is built out of lat. oleum and fiacre. Alkene = unsuturated, aliphatic hydrocarbon with one double link inside molecule}		
POM (ISO) POM-C	Polyformaldehyd Polyoxymethylen Copolymer Polyacetal	Operating Temperature: -40°C~+110°C (short time use +150°C), Density: 1.4 g/cm³
Low frictional resistance, good abrasion resistance, very good endurance limit, high insulating strength, good chemical resistance (especially against solvents), robust against stress fracturing.		
PP (ISO)	Polypropylene Neoprene® (DuPont)	Operating Temperature: 0°C~max. +110°C (embrittlement in cold condition), Density: 0.90 g/cm³
Higher stiffnes, hardness and strength than PE, however lower than PA, average value for impact strength, low density, very good chemical resistance, high bending stress fatigue limit, good stress fracturing resistance(better than PE), very limited properties in cold condition, very good dielectric strength.		
PPO (ISO) PPE	Polyphenyleneoxide	Operating Temperature: -20°C~+90°C (short time use -35°C~ +130°C), HDT/A 88A, HDT/B 93°C
Stiff, high strength and dimension stable, good electrical and thermal properties, good hydrolysis- and chemical resistance, resistance against deformation at high temperatures and high humidity. For parts where humidity and temperature is a criterion but on the other hand difficult to machine.		
PPS (ISO)	Polyphenylensulfid	Operating Temperature: +200°C~+240°C (short time use +300°C), Density: 1.6 g/cm³
High hardness and stiffness, good abrasion resistance, low absorbtion of humidity, favorable insulation properties, small dielectric loss, high flame resistance, high chemical resistance.		
PTFE (ISO)	Polytetrafluorethylen Polytetrafluorethen Polytetrafluoräthylen	Operating Temperature: -270°C~+260°C (short time use +300°C, over 400°C toxic outgassing!), Density: 2.17 g/cm³
Resistant against nearly all organic and inorganic chemicals (except elementary fluor under pressure at high temperatures, lowest coefficient of friction (stat. 0.03; dyn. dry 0,05 - 0,20), not in any way adhasiv.		

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Plastic Table 4, Ceramics Table

Abreviation (DIN ISO 1629)	common denomination	typical technical values
PU (ISO) AU (ISO)	Polyurethan Esterbase Polyurethan Etherbase	Operating Temperature: -40°C (from approx. -20°C increasing stiffness) ~+80°C (+120°C short time use), charing at +500°C, Density: 1.2 g/cm³, Elongation at Break: 350-700%
Very good wear resistance, high resilience, good up to very good resistance against weathering, good UV-resistance and good exposure to ozone (Yellowing due to influnce of wathering over longer time incl. small surface brittleness and small reduction of mechanical values), flexible in a wide temperature range, high buccklingstrength and tensile strength(high tear growth resistance), good dynamic load properties, hydrolysis- and mikrobe resistance (for polyether typ), oil resistant, grease resistant, solvent resistant (especially at higher aromatic content). No resistance to hot water! There is an endangering for typ without microbe resistance, to be destingerated by longer existing infestation by microbes. Humidity together with heat and a higher amount of organism can push up this process. Due to released enzymes the Ester links will be divided and the material will be destroyed. Mostly there is a selective infestation, in opposite to hydrolytic infestation, which takes place on the whole surface. (Hydrolys		
PVAC (ISO)	Polyvinylacetate	Operating Temperature: +30°C, max. 80°C afterwards softening, Density: g/cm³
Soft, at normal temperatures elastic up to hard, resistant against weathering and light resistant, no solubility in water, oil and paraffines, soluble in organic solvent, aromatic and halogenated hydrocarbon).		
SIR (ISO) MVQ (ISO)	Silicon (SIR) Silicon Rubber Styrol - Isopren - Rubber Polysiloxan (MVQ)	Operating Temperature: -90°C~+180°C (short time use +250°C), without influence of water or steam, Density: 1.2 g/cm³
High heat resistance, soft and high flexibility, exelent properties in cold use , very good resistance against oxygen, very good exposure to ozone and resistance against UV and weathering, very good electrical insulation properties, no physiological effect, bad gas tightness, normal mechanical properties, low abrasion resistance.		
All information is based on values and properties which are achieved typically and are only for assessment of materials (typical values). Properties herein shall not be located directly to a product and there is no supposition that any product achieves these values. For proof values own checks are necessary or you may request the direct related value from Misumi.		

iCeramics

Abreviation (DIN ISO 1629)	Familar denominations and names	Typical technical values
Al2O3	Aluminiumoxide	Operating Temperature: max. 1200°C, Density: 3.7 g/cm³, Compression Strength: 1450~2450 N/mm², Resistance to Bending 250~350 N/mm², Hardness: 2300 HV, Thermal Conductivity: 30 W/m•K, 1014 Ohm•cm
High strength and hardness, high wear resistance, very good chemical resistance and corrosion resistance, high thermal conductivity, high thermal shock resistance, high electric insulation values.		
ZrO2	Zirkonoxide	Operating Temperature: max. 800°C, Density: 6.0 g/cm³, Compression Strength: 2100 N/mm², Resistance to Bending 900~1000 N/mm², Hardness: 1300 HV, Thermal Conductivity: 2.5 W/m•K, 1010 Ohm•cm
High strength and hardness, high wear resistance, very good chemical resistance and corrosion resistance, high thermal conductivity, high thermal shock resistance, high electric insulation values.		

Surface Treatments

Anodizing– /Hard Anodizing

ELOXAL is a contrived word and the abbreviation for ELectrolytic Oxidized ALuminum. During anodic or electrolytic oxidation of aluminum and its alloys, anodically charged aluminum (Al = pos. pole) is converted by passing electric current through a cooled acidic solution onto a surface as an Al203 (aluminum oxide) layer. This oxide shift is many times stronger (x 100) than a natural oxide layer. Its strength is defined and limited by the specific process used. While a layer can be deposited from the bath onto the surface of the workpiece in conventional electroplating (purely layer by layer build up), aluminum oxide can only be built up from the inside out from the boundary surface between the oxide layer and metallic aluminum. Metallic aluminum is also acquired from the conversion process and is continuously removed and converted. [Al203 directly forms aluminum (2/3 inwards, 1/3 outwards).]

Properties:

Type:	oxide layer, hard and dense
Color:	colorless/natural colors, colored or black
Hardness:	approx. 250 ~ 300 HVH
Layer thickness:	~ 5-25 Om.
Corrosion protection:	Protection against weather and corrosive attack.
Miscellaneous:	Special wear protection properties occur in hard anodizing due to the increased layer thickness.

Black Oxiding

In black oxiding a dense, black and adhesive iron oxide layer is created on a steel surface. After subsequent immersion in oil, the shine is highlighted and an optically appropriate corrosion protection is achieved, which is, however, limited in its protective effectiveness. Black oxided surfaces do not change the dimensional accuracy of the workpiece. Black oxiding is a chemical process. The workpiece is immersed in a 135-145°C alkali and oxidizing solution (sodiumhydroxide solution and oxidizing agent) a thin oxide layer of black iron oxide (Fe304) is created on the surface of the part.

Properties:

Type:	Oxide layer
Color:	black surface
Layer thickness:	~ 0.5 to 2 Om.

Chromating/Passavating

Chromating and passivating are secondary treatment methods (often after zink plating) in which the workpiece is treated without an external electrical supply. This process creates transparent, shiny, yellow, olive-green, blue, black and other color top coats. They are used as corrosion and tarnish protection layers or for improving adhesion of subsequent painting. Passivated conversion layers occur from a chemical reaction with chrome containing acids, where a reaction occurs between the workpiece surface and the solution. Chromates are salts from chromic acid H2CrO4 and are derived from CrO3 (chromium (VI) oxide). They are highly poisonous. Chromating and passivating are differentiated visually according to color (e.g. blue, yellow chromating and olive-green passivating). In technical terms typically only III-value bonds are used for passivating and only VI-value bonds for chromating. Looked at closely, however, even chromates can also be from group III bonds. Yellow chromates are the most common and in them the chromium is usually in the group VI bonding form. However, recently also yellow chromates are on the market based on group III bonds. Blue chromates are usually based on group III chromium bonds, however some are also group IV bonds. Thick film passivates (olive-green chromates) are foodstuff compatible “chromates” . Here the layer is formed from chrome-III ions (Cr2O3 [chromium (III) oxide]). Therefore, on the basis of the color or designation alone, no definite conclusion is possible.

Properties:

Type:	Non-metallic coating, conversion layer
Layer thickness:	~ 15 Om.

Black chromium-plating properties:

Color:	deep black matte layer
Light return:	good absorption properties
Friction/abrasion:	Abrasion resistance lower than with bright finish or hard chromium
Hardness:	HRC 68-74. All coated steel parts <HRC 36 should be tempered after coating with 190°C +/- 25°C.

Hard chromium-plating properties:

Color:	metal colored
Corrosion:	very good corrosion resistance
Friction/abrasion:	high abrasion and wear resistance
Hardness:	800 - 1100 HV
Miscellaneous:	high temperature resistance

Chrome Plating (Chromium-Plating)

Bright chromium-plating:
There is a differentia here between mirror finish chromium-plating (ground and polished before electroplating, where a mirror finish surface is the goal after processing) and technical chromium-plating (the pretreatment is eliminated and machining marks can be seen, for example).

Industrial chromium-plating:
Chromium-plating without pretreatment and copper-plate is referred to here. A matte surface (light gray) can also be the result of chromium-plating. A relatively inexpensive process, since the cost-intensive work is eliminated. Hard chromium-plating is the direct deposit of thicker chromium layers without an intermediate layer.

Black chromium-plating:
Using a very high current density, black chromium can be deposited at room temperature. The deposited layers have a high oxygen content. It is assumed that they contain approx. 60% chromium and approx. 40% chromium(III)-oxide.

Dicoat

Refer to: TD coating (Toyota diffusion)

Elektroless Nickel-plating

The nickel is dissolved in the electrolyte and is not available as a metal plate. The advantage is in the contour definition. Chemical nickel-plating is a process in which the workpiece can be coated with high contour conformity and dissolved nickel penetrates everywhere. In contrast to electroplated deposited nickel, the layer in this process is applied absolutely uniformly, even in less accessible areas. This layer distribution therefore guarantees an exceptionally high corrosion resistance. Chemical nickel-plating is carried out without external power supply, normally with sodium-hypophosphite as a reducing agent. The bath temperature is approx. 95°C. The chemical nickel-layer contains 6-10% phosphorous, which results in high hardness and outstanding corrosion protection. The disadvantage is in the significantly higher price. Today layers to 50 Om thick can be deposited with 5 µm accuracy.

Properties:

Type:	metallic pore-free
Color:	light shiny
Hardness:	600 HV (In deposited condition significantly harder than electroplated nickel and other layers), through thermal treatment up to 1200 HV Phosphorous contents: 10-12 %
Resistance:	60-70 Oq (insulating layer function)

KANIGEN® (chem. Nickel)

KaNiGen: Catalytic nickel generation. KANIGEN coating was originally a process developed by the General American Transportation Company (GATC in USA). (It is currently patented in many countries). In comparison to other mech. coating processes hydrogen embrittlement is avoided with this chem. nickel deposition. The process is comparatively expensive, offset by a high degree of corrosion resistance and the better soft satin finish appearance.

Microstructure:	shapeless, amorphous, (amorphous layer which crystallizes when heated over 300°C).
Density:	7.75 kg/dm³
Melting point:	890°C
Coercivity/magnetism:	Magnetism does not exist at room temperature, but can occur by heating the part over 300°C.
Hardness:	500HV; (HRC 49) after coating at 20°C, 900HV (HRC 67) after heat treatment at 400°C and 1hr, 1100 HV (HRC 70) maximum.
Coefficient of friction:	KANIGEN against steel; 0.13 lubricated, 0.4 unlubricated. (It prevents scoring and burning-in based on friction between metals such as titanium and austenitic stainless steel).
Attachment/adhesion:	It does not chip off like electroplated nickel. Even if a part is bent after coating the layer stays adhered. The same applies to heating. Max. adhesion is 240 N/mm² for soft steel (up to 400 N/mm² max.).
Layer thickness: Particular	emphasis should be placed on the uniformity of the layer, similar to chemical nickel plating.
Corrosion resistance:	The corrosion resistance is outstanding. The reason is that it is available as an alloy. It is not attacked by most organic liquids and demonstrates high resistance especially to organic acids, salts, alkaline etching fluids and dilute inorganic acids. It protects iron and steel from oxidation at high temperatures. In particular, spot corrosion is avoided.
Other properties:	It effectively prevents material removal due to cavitation.
Wear resistance/abrasion:	Much better than nickel plating. Better wear resistance results after heat treatment at 650°C, similar to hard chrome. In general heat treatment above 400°C is recommended.

LTBC Plating

Low Temperature Black Chrome Plating
Coating technology by which an alloyed surface is formed by an electrochem. reaction below 0°C. A part of this surface forms an alloy like time diffusion layer in the periphery of the metal. This way the base material and layer are completely integrated into each other and are joined “permanently”. Through this total integration into the base material, the layer can neither flake or peel off. The resulting surface consists of a uniform film and forms an rust protection film based on chromium ceramic.

Advantages:
No hydrogen embrittlement, no tempering process necessary (material’s original properties are retained completely)/ improved relationship between hardness and elasticity/ most suitable film for carbon steels (C45)/ most resistant and effective rust protection layer of all conventional processes/ in friction or wear resistant applications no peeled particles occur/ ideal option to increase service life of parts in rust protection and abrasion applications.

LTBC as some general treatment is avaible in 2 layer versions.
Layer thickness: 1~2 µm (without fluoropolymer layor on top)
Layer thickness: 5µm (with fluoropolymer layer on top)

Friction/abrasion:	very resistant, since no particles can be flaked or peeled of
Miscellaneous:	No change in microstructure during the process

Nickel plating

Nickel electroplating is used for corrosion protection reasons and also for decorative purposed. Basically: The thicker the nickel layer the more reliable the corrosion protection. Nickel is a prized coating material because of its specific chemical and physical properties and is today perhaps the most significant metal deposited by electroplating.

Properties:
Higher degree of gloss
Increased corrosion resistance
Very good ductility (without separating particles)
Low tarnish
Good resistance to acids and alkali
Can passivate in the air (significantly higher resistance against corrosive influences)
Weldable, magnetic and can be polished
Hardness is located between 450 - 600HV, depending on the layer thickness (with good formability)

Phosphating

In phosphatizing a phosphoric acid solution is used to form a thin, finecrystalline, water insoluble phosphate on part surfaces. Depending on the solution used, iron, manganese, zinc or zinc/calcium-phosphate layers are formed on the surface. These light to dark grey phosphate layers have pores and capillaries because of their fine-crystalline structure, which in the next step fill with oil or wax. High corrosion resistance results. Besides high corrosion resistance, phosphatizing is also used to reach an optimum paint adhesion. Furthermore, frictional forces which occur with pulling and forming processes are reduced.

Properties (Manganese phosphate process):

Type:	Phosphate based, fine-crystalline
Color:	dark gray to black
Corrosion protection:	significantly improved by oiling or waxing
Friction:	improved sliding properties
Miscellaneous:	Corrosion protection by oil absorption

TD coating (Toyota diffusion)

Development by Toyota Central Research Institute Co. Ltd. Coating with properties similar to TiCN, however coating process is carried out by heat treatment diffusion at 1020°C and an insoluble surface layer (typically vanadium carbide) forms. Common names: Dicoat, TD-VC COATING, TD thermoreactive diffusion. In this process the part is immersed in a salt bath. Active vanadium combined with C atoms in steel now form the vanadium carbide layer and simultaneously an enormous adhesion of the layer occurs. Layer thickness can be precisely controlled by processing times, bath temperature and substrate composition. This multiple step coating process consists of a pre-heat to a given temperature, coating, ultrasonic cleaning and heat treating. TD coatings are found in similar areas of application as CVD coatings due to their similar properties. However, there are areas where their advantages are put to full use, e.g. for Al and Zn die casting, hot forging tools and forming die for stainless steel.

Properties:
Coated parts can be coated again multiple times (up to 9 times is known of).

Hardness:	Surface harden between 3200 HV and 3800 HV
Layer thickness:	from 5µm ~ 10µm are common
Miscellaneous:	Particularly resistant to abrasion and wear. TD coatings increases ductility (in hardened steel even the toughness)


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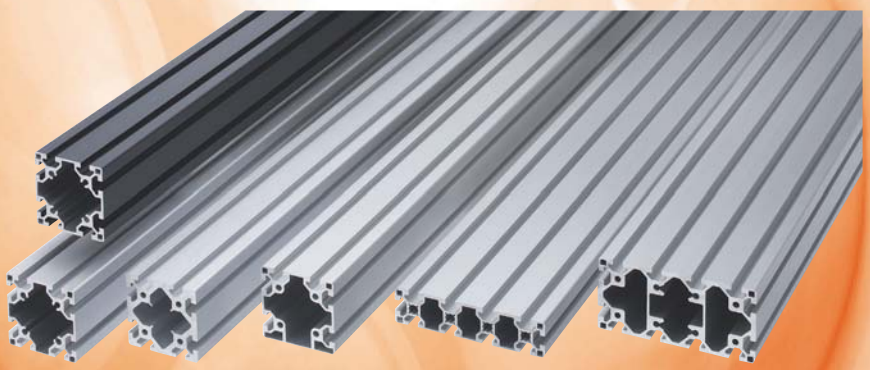

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(S)(1)(2)(3)(4)(5)(6)(7)(8)(9)(10) are the numbers of business days to ship. (T)(A)(B)(C) indicate available express services.
Production time for each product differs depending on specifications. Please refer to the corresponding page for exact number of days.
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(S)(1)(2)(3)(4)(5)(6)(7)(8)(9)(10) are the numbers of business days to ship. (T)(A)(B)(C) indicate available express services.
Production time for each product differs depending on specifications. Please refer to the corresponding page for exact number of days.
Printed in Red:New Products Printed in Blue:From our previous catalog Printed in Black:Discontinued, Modified
Website:These products are no longer shown in this catalog. Products are still available for sale.

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Production time for each product differs depending on specifications. Please refer to the corresponding page for exact number of days.
Printed in Red:New Products Printed in Blue:From our previous catalog Printed in Black:Discontinued, Modified
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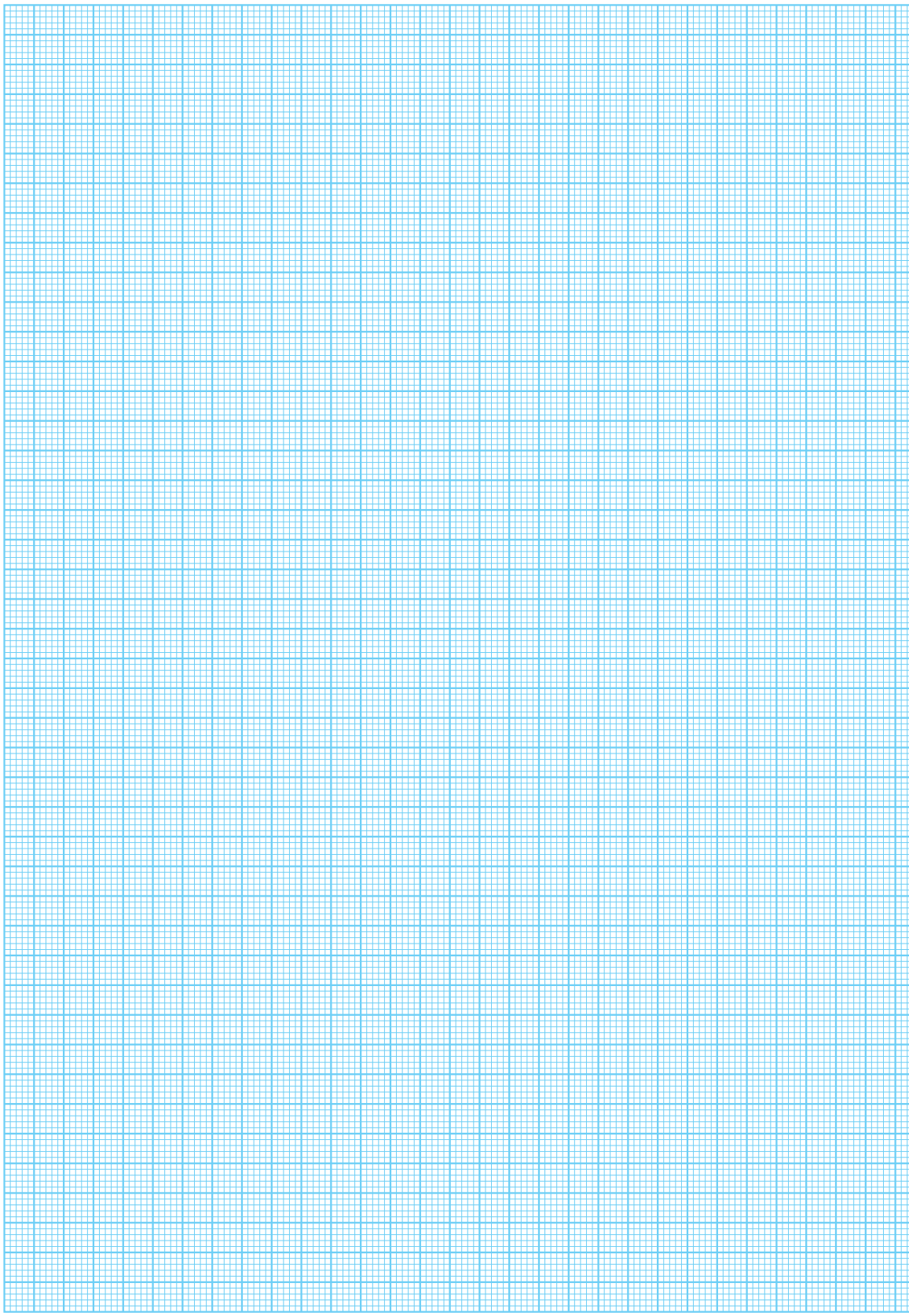

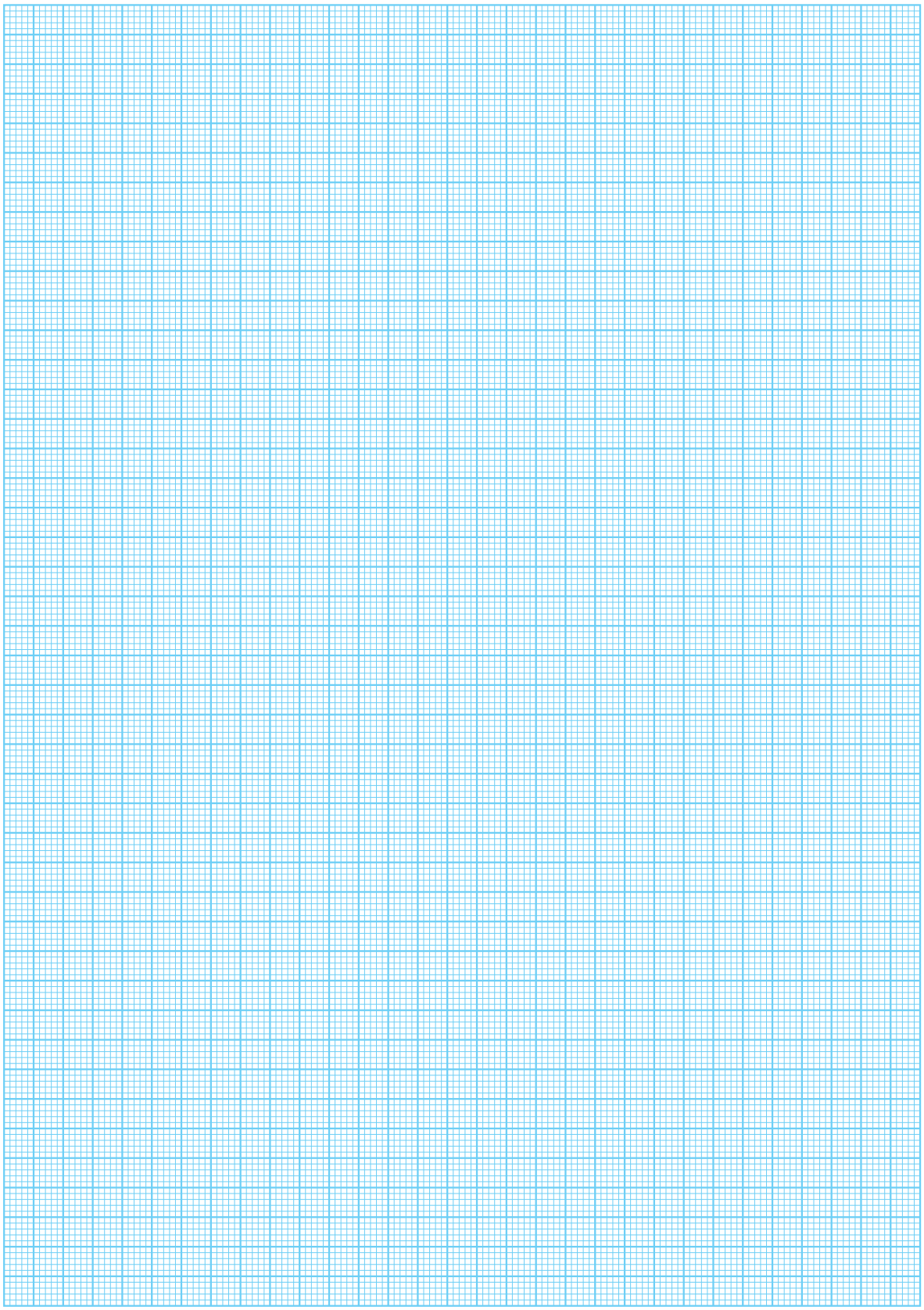

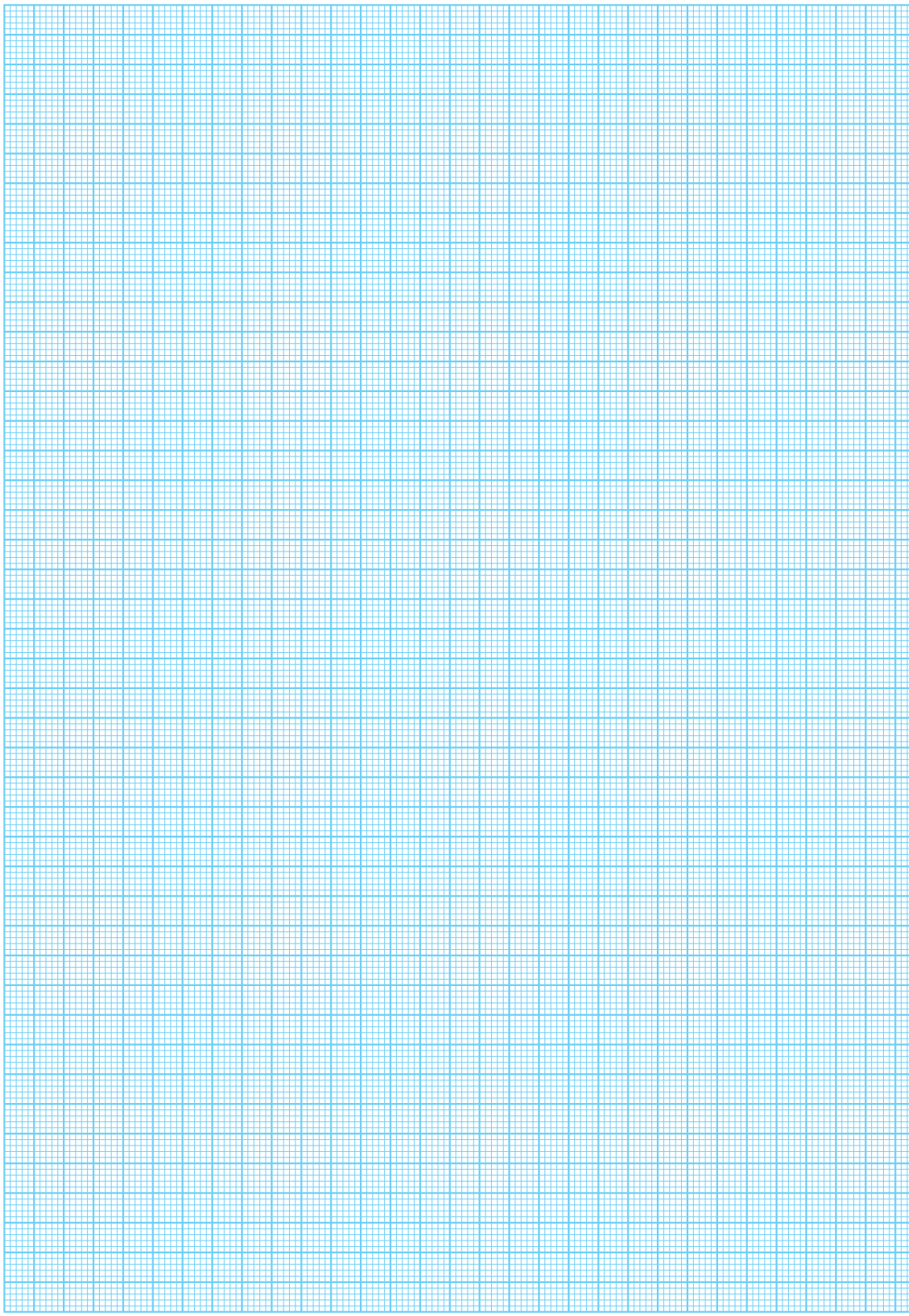

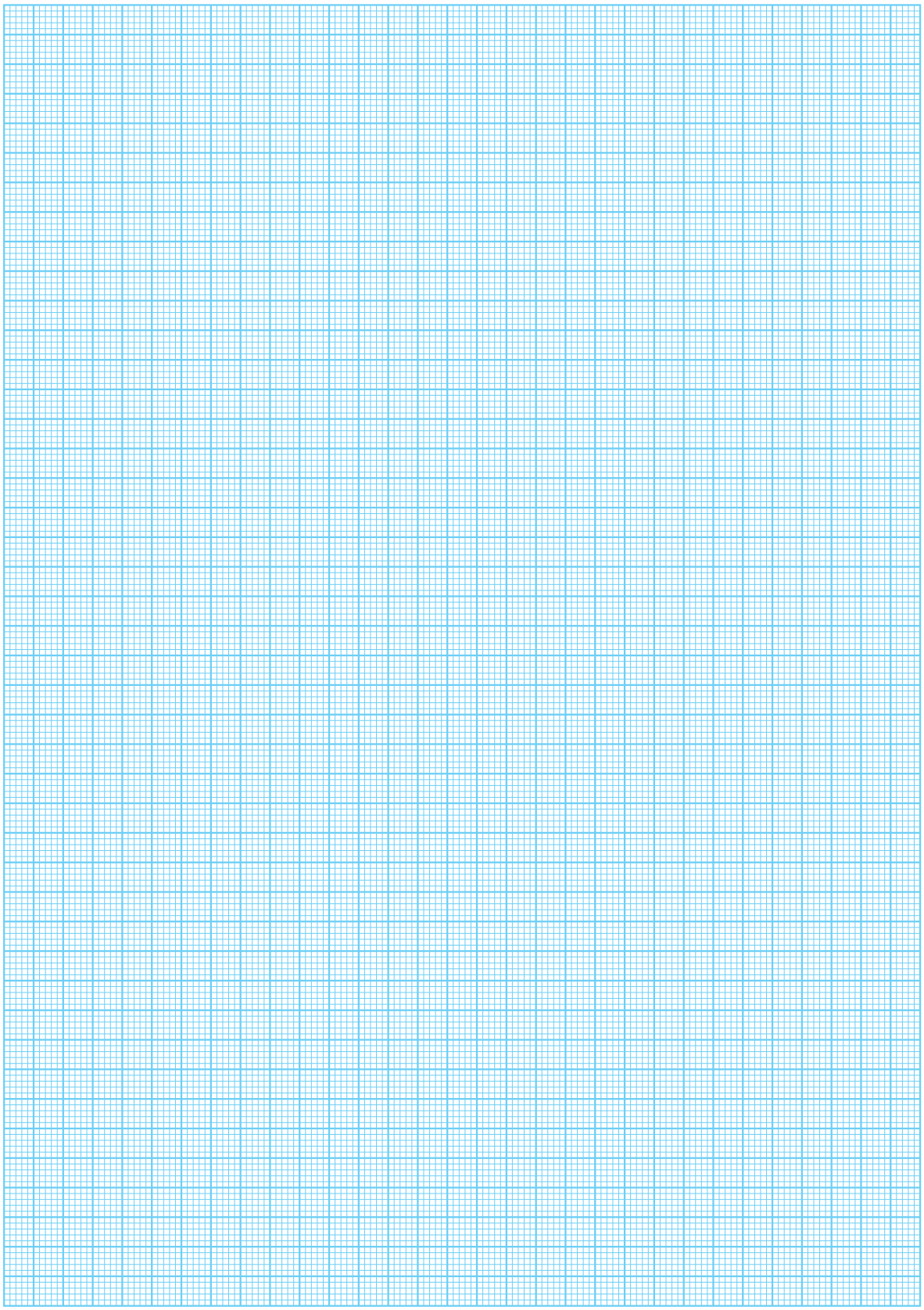

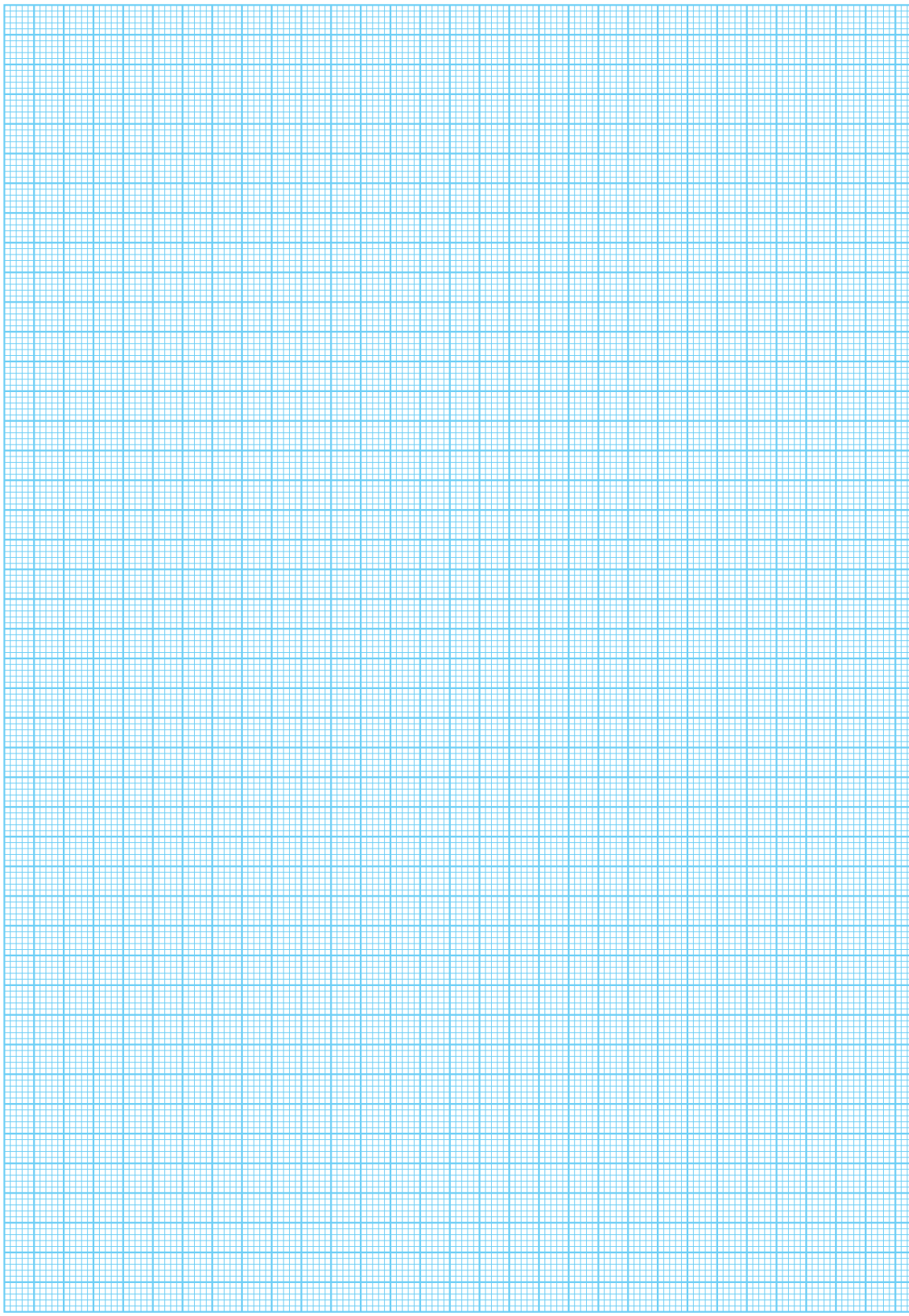

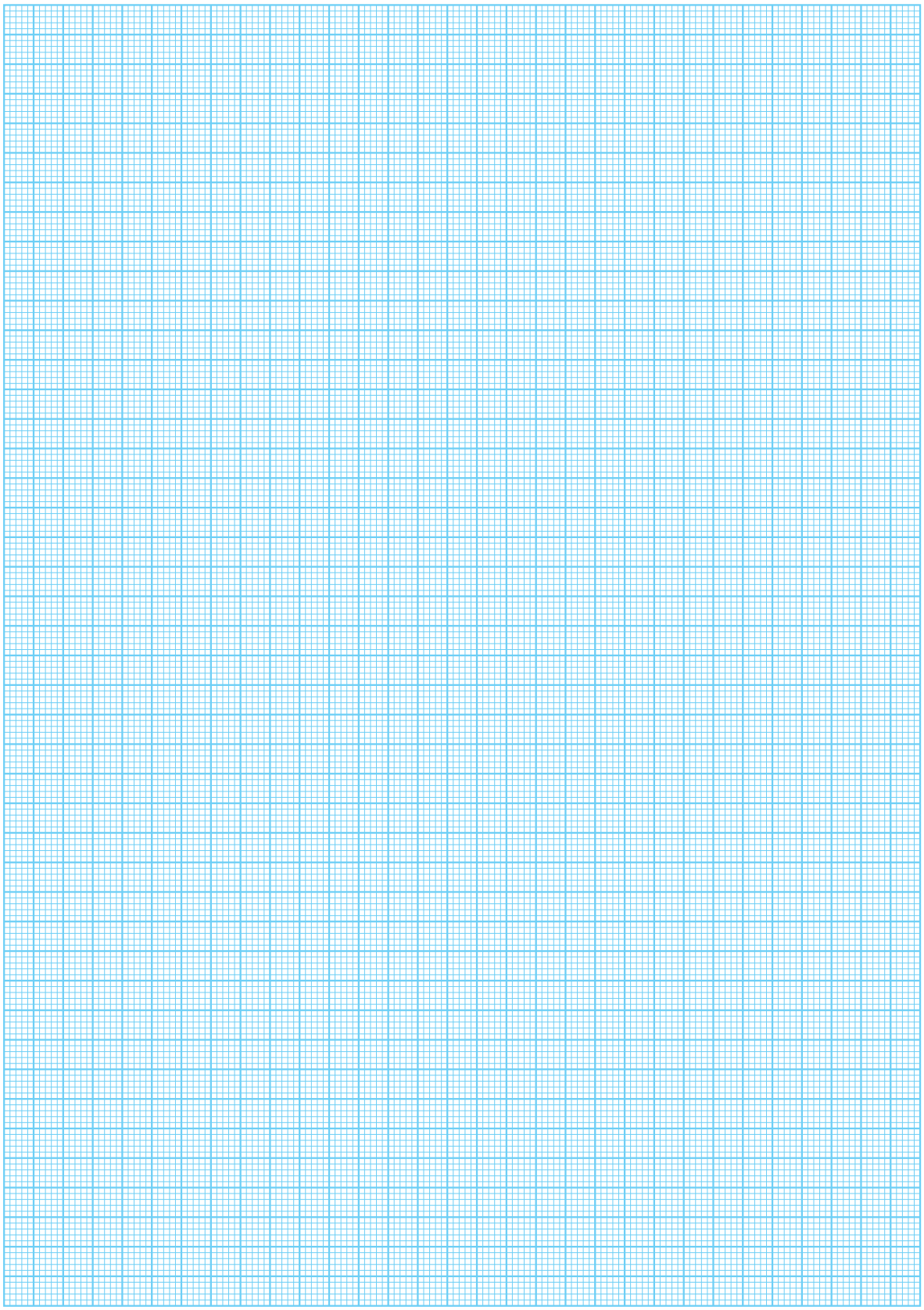

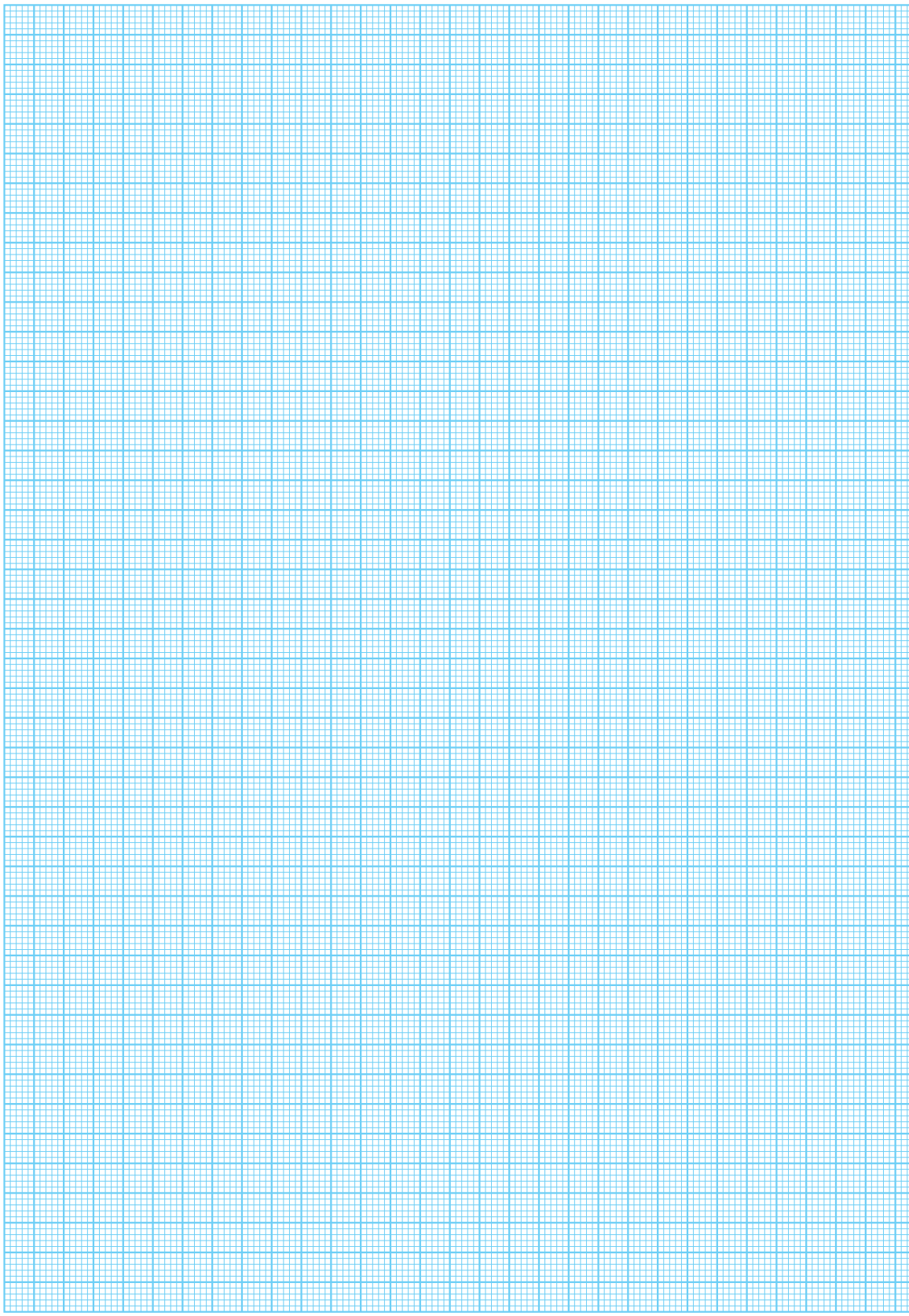

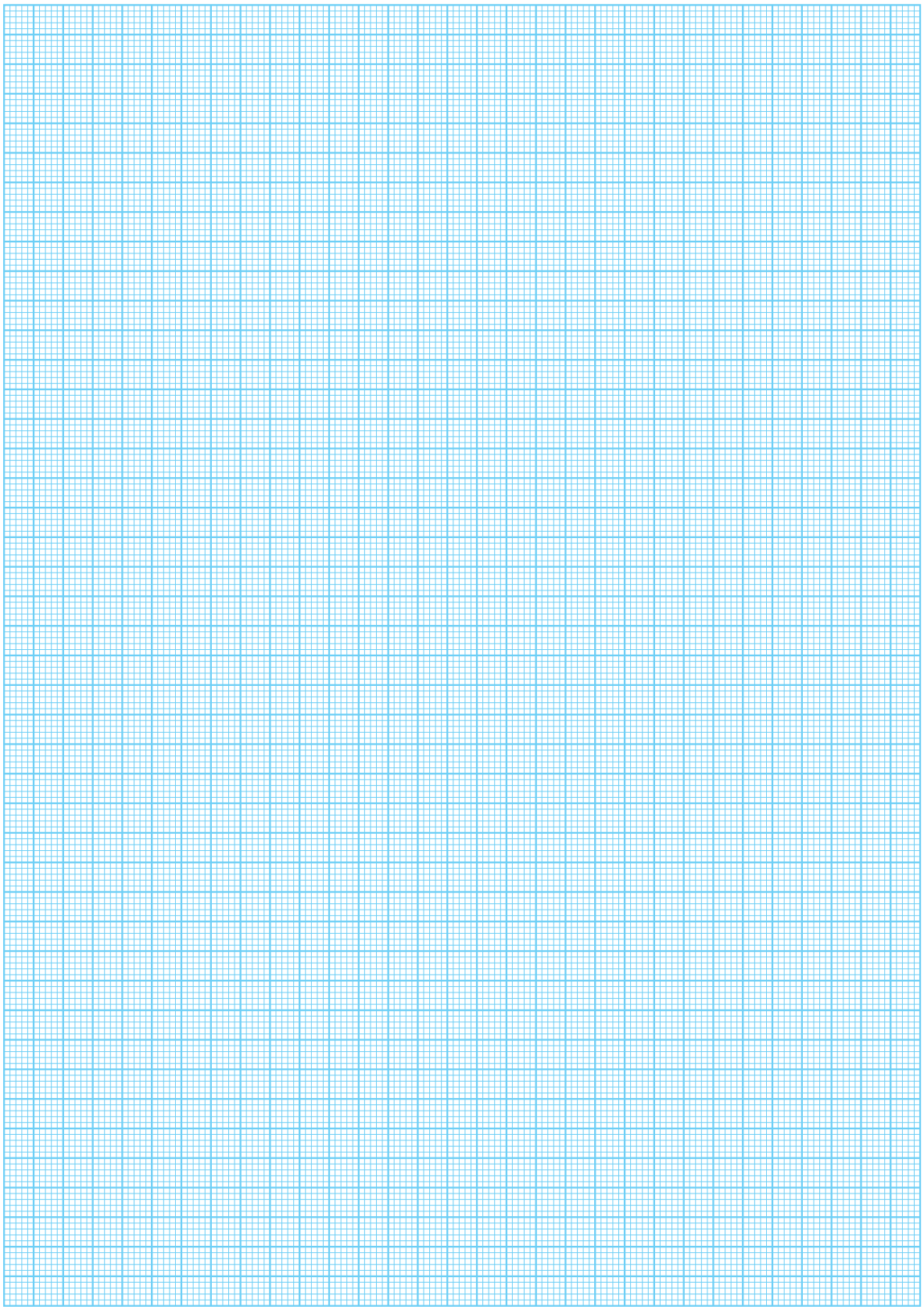

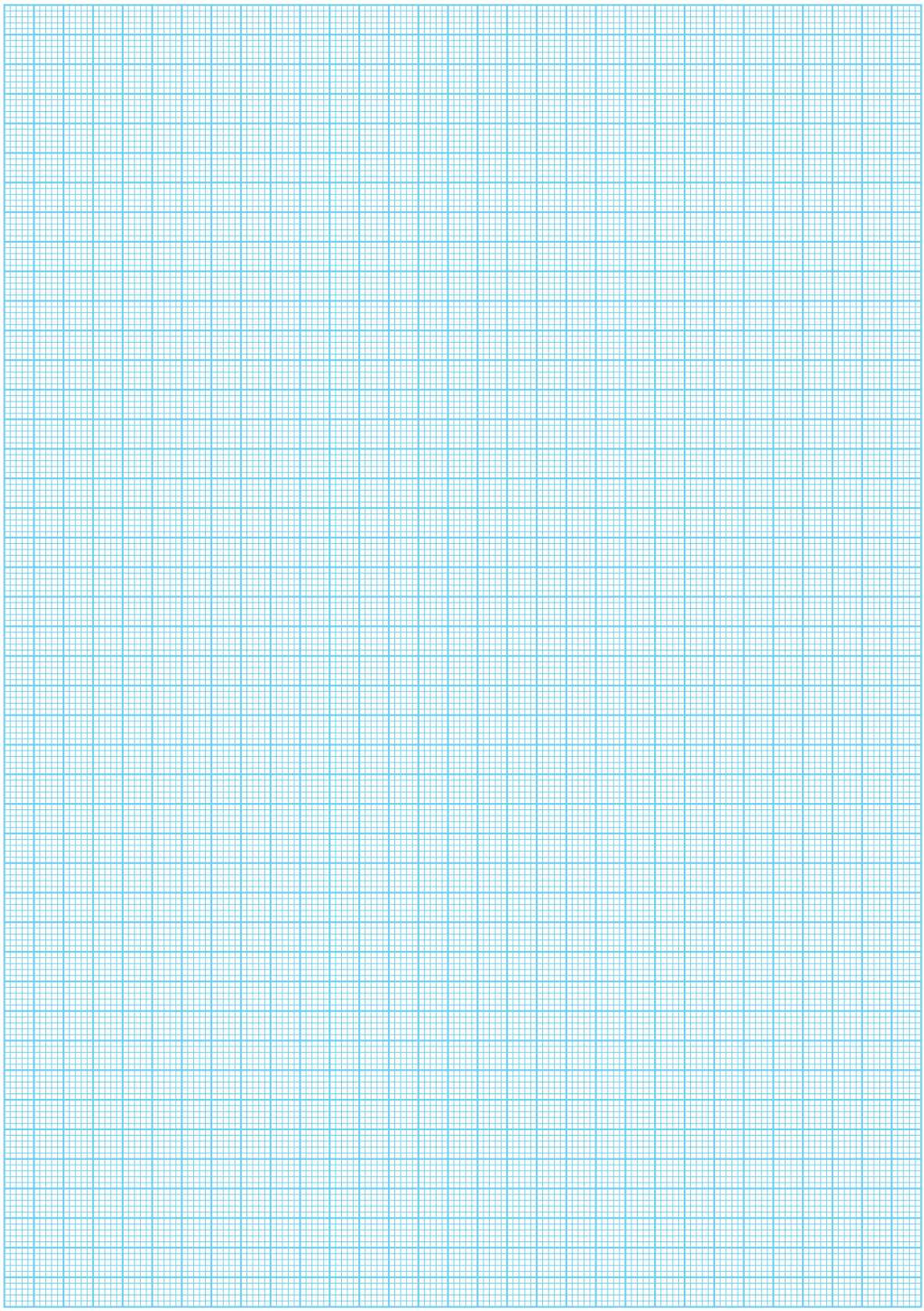

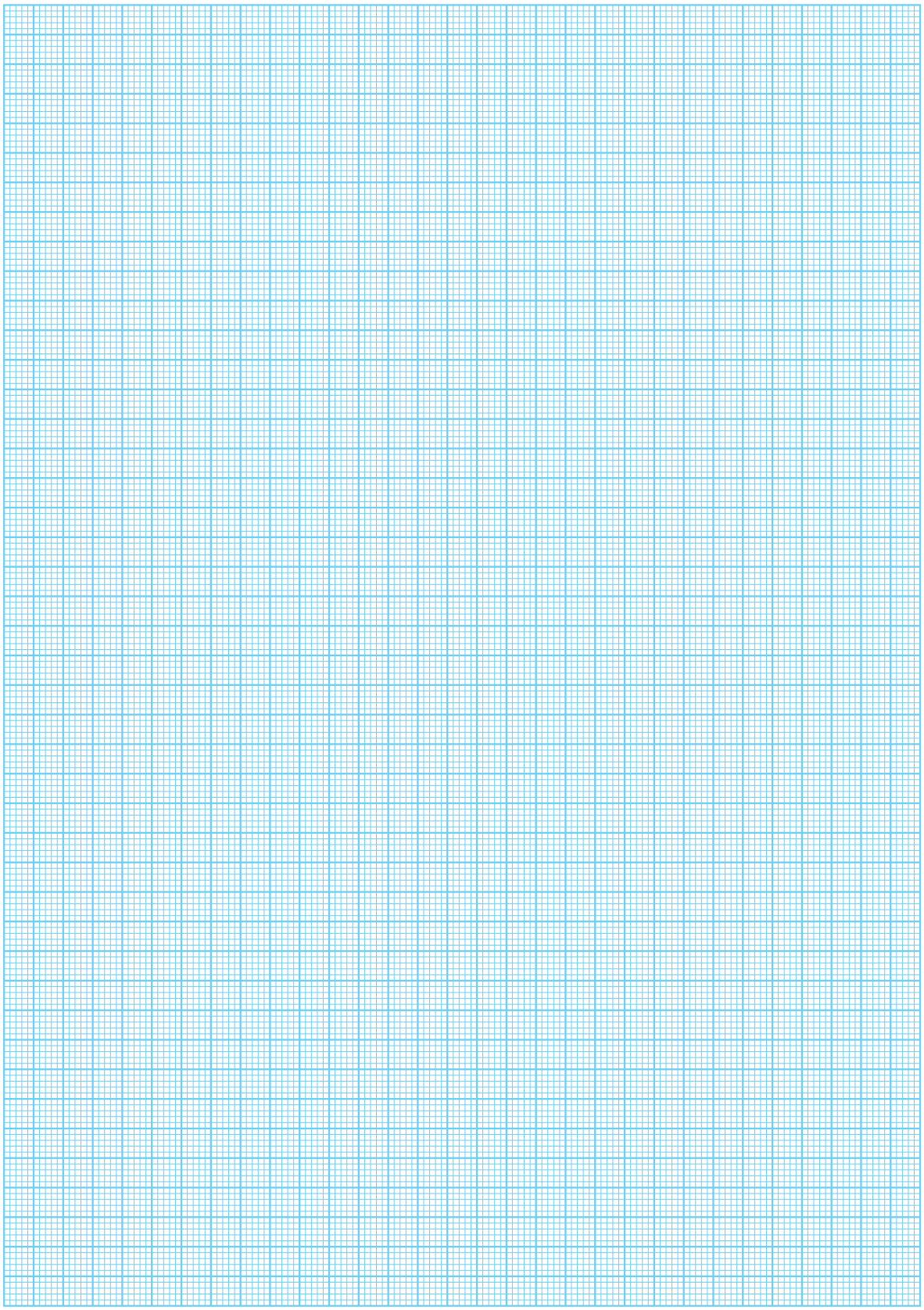

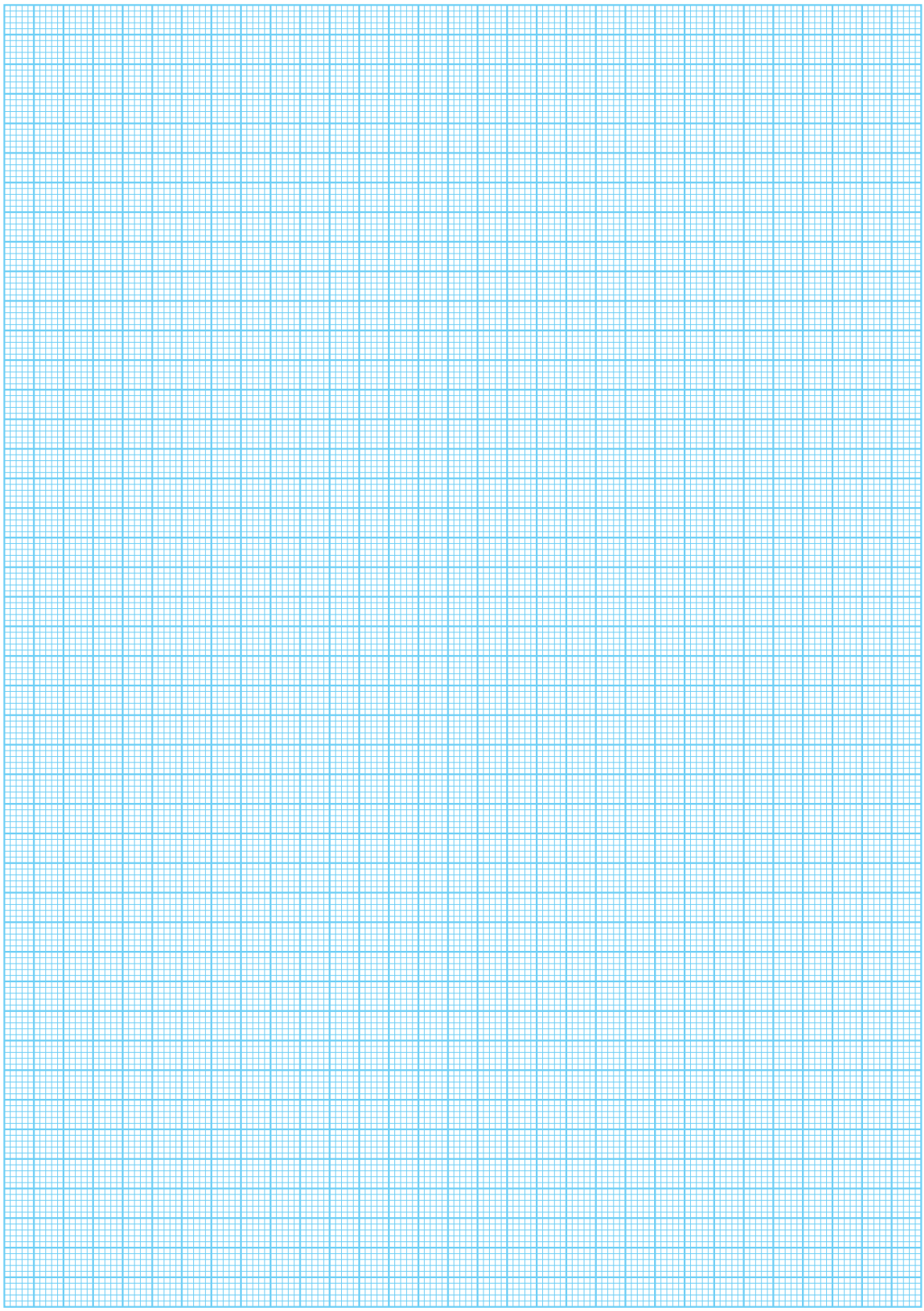

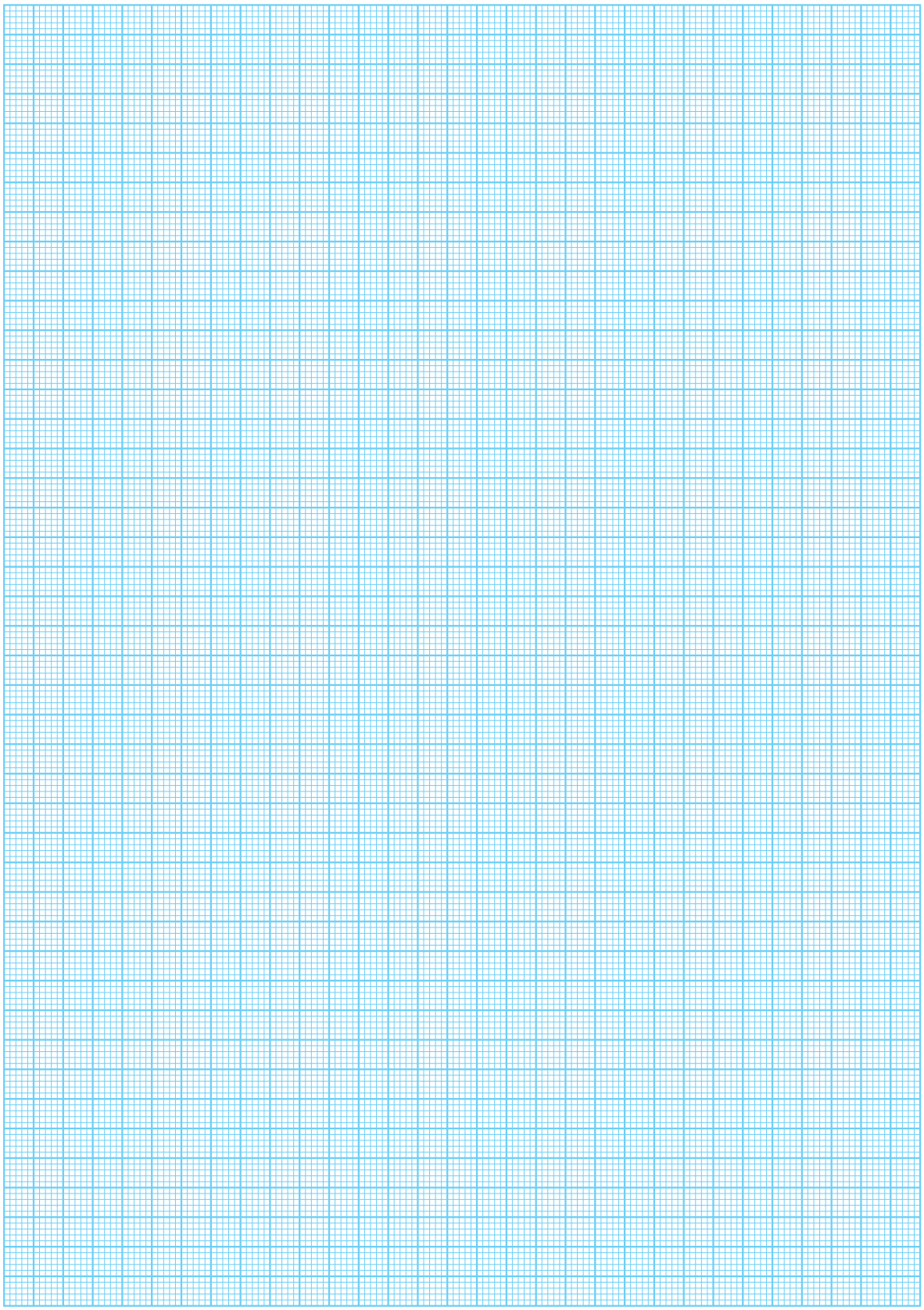

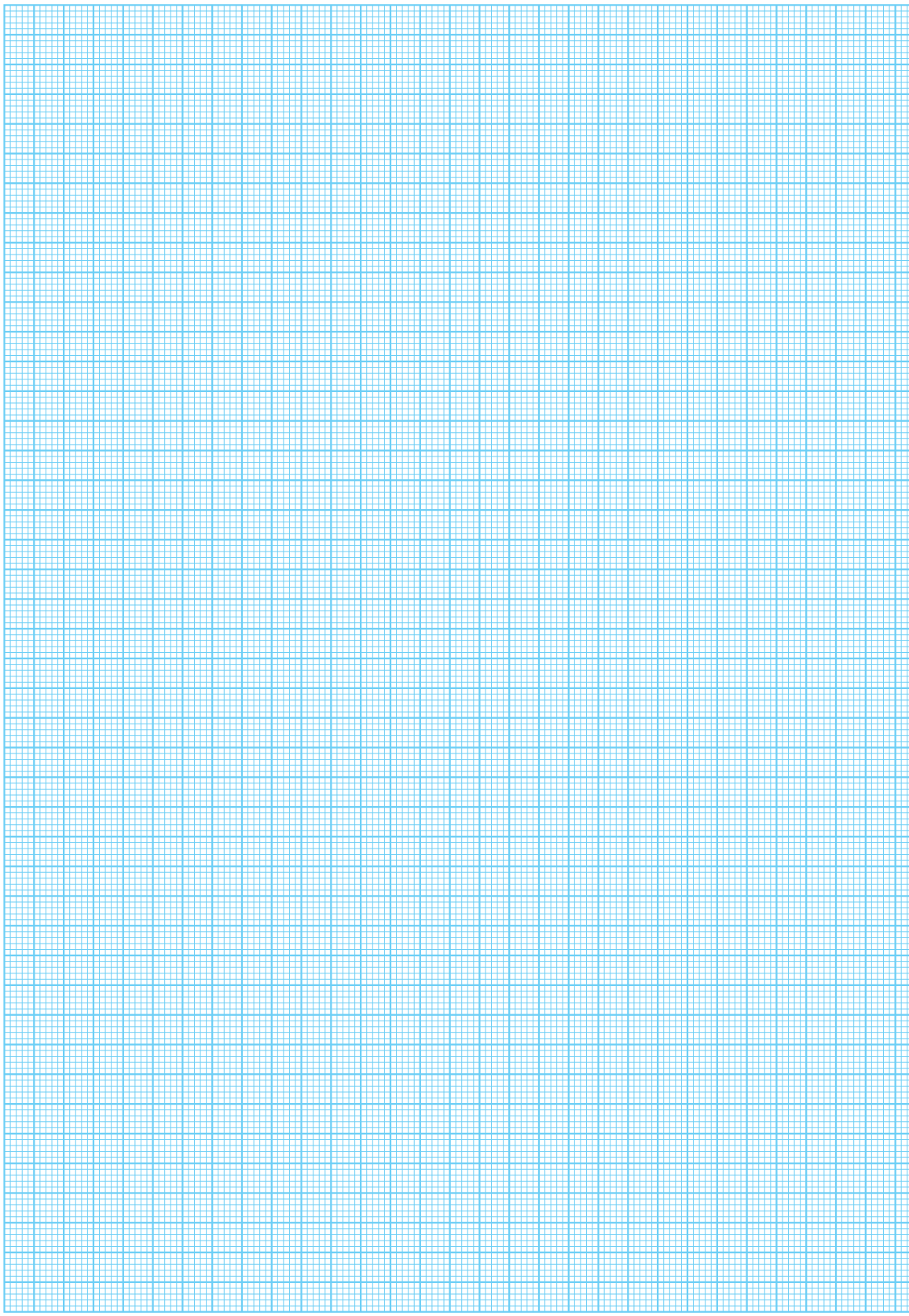

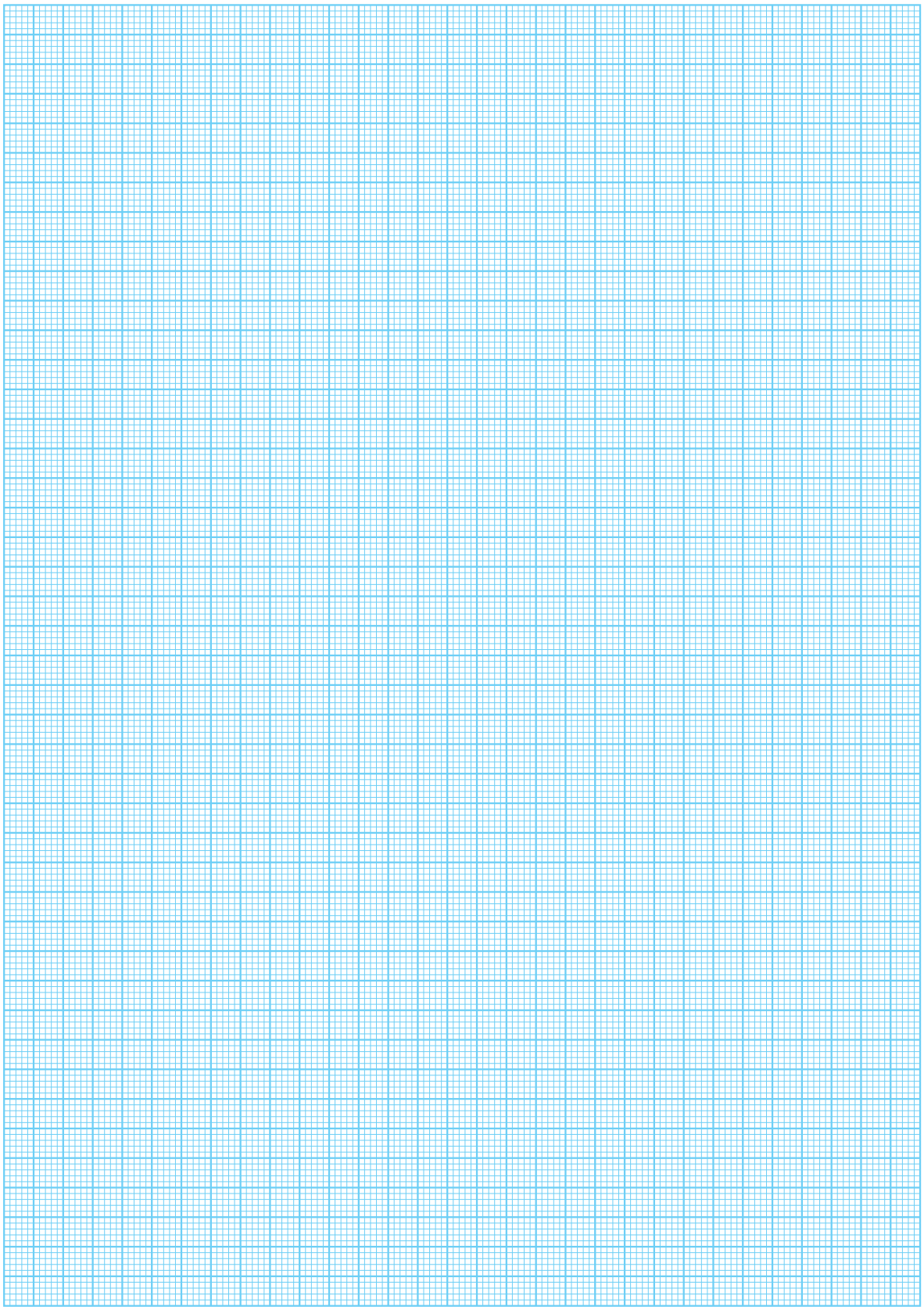

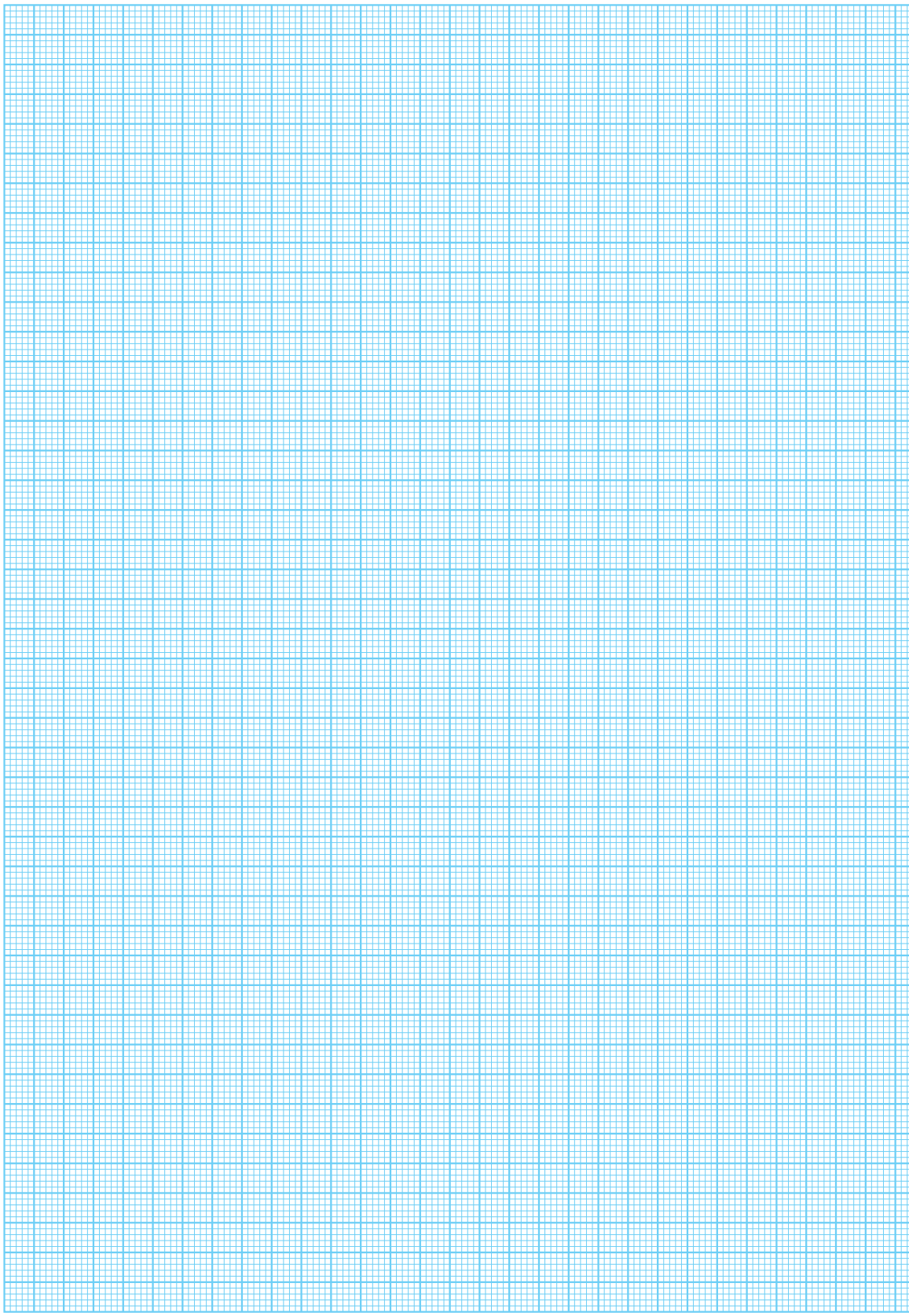

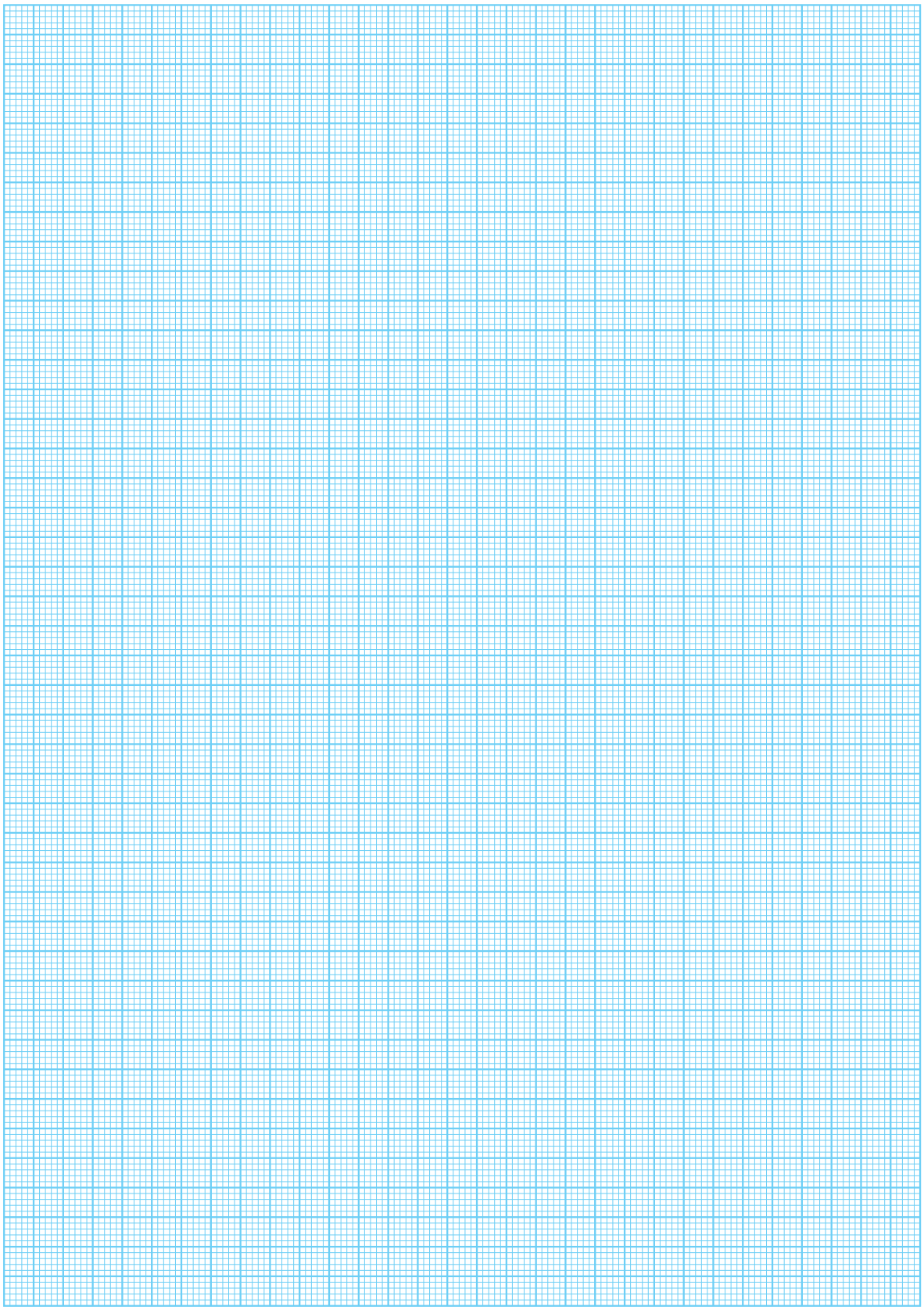

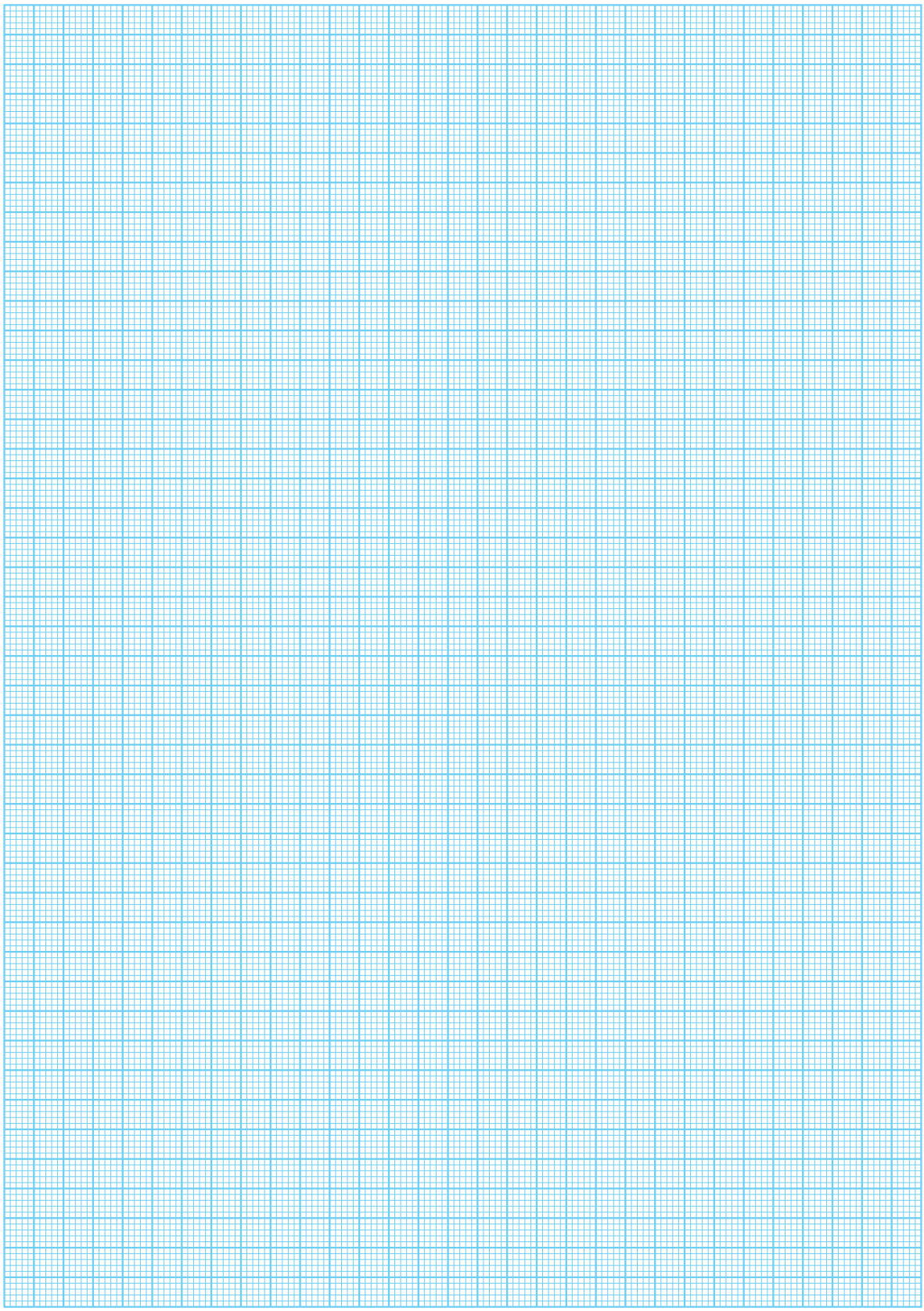

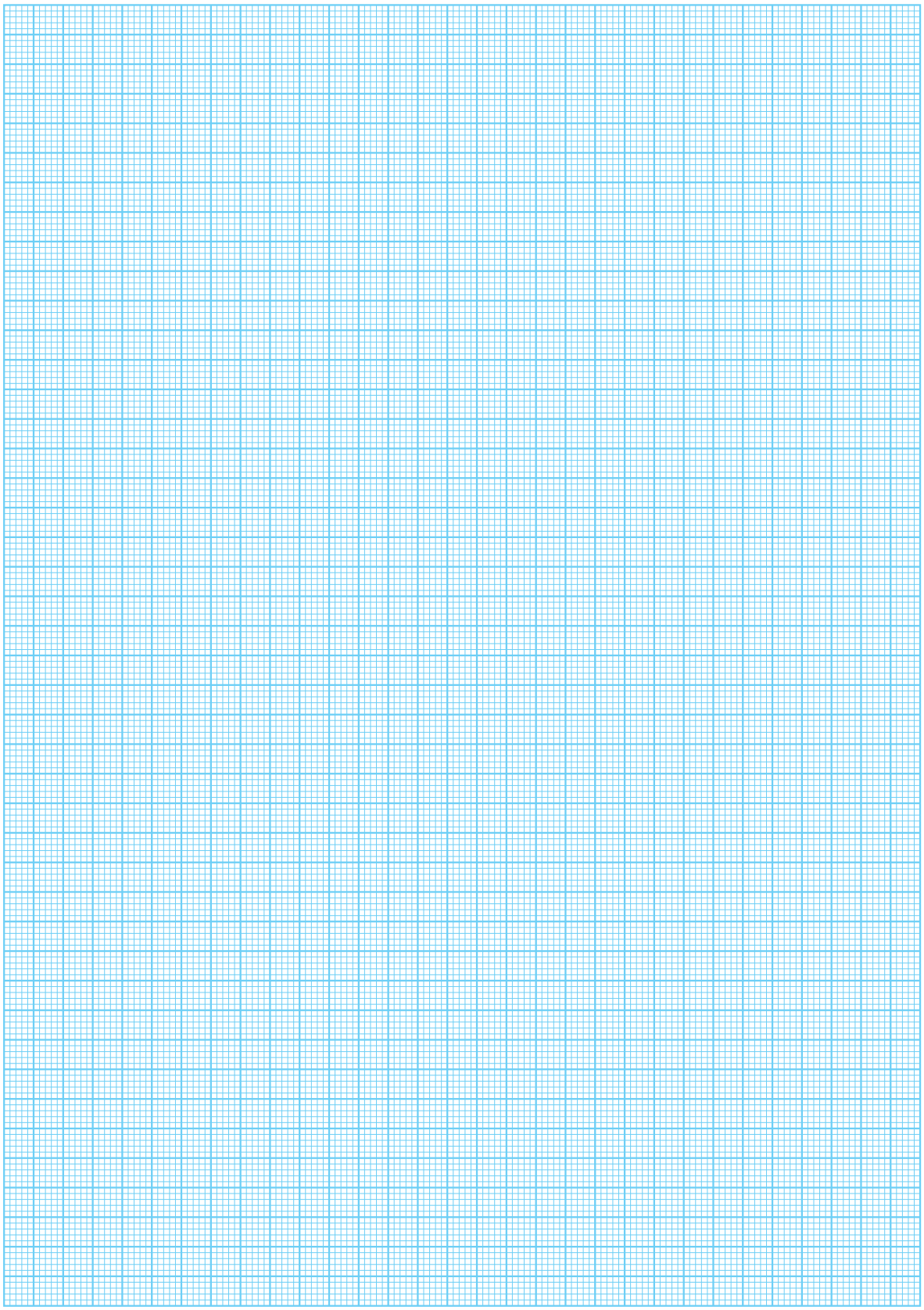

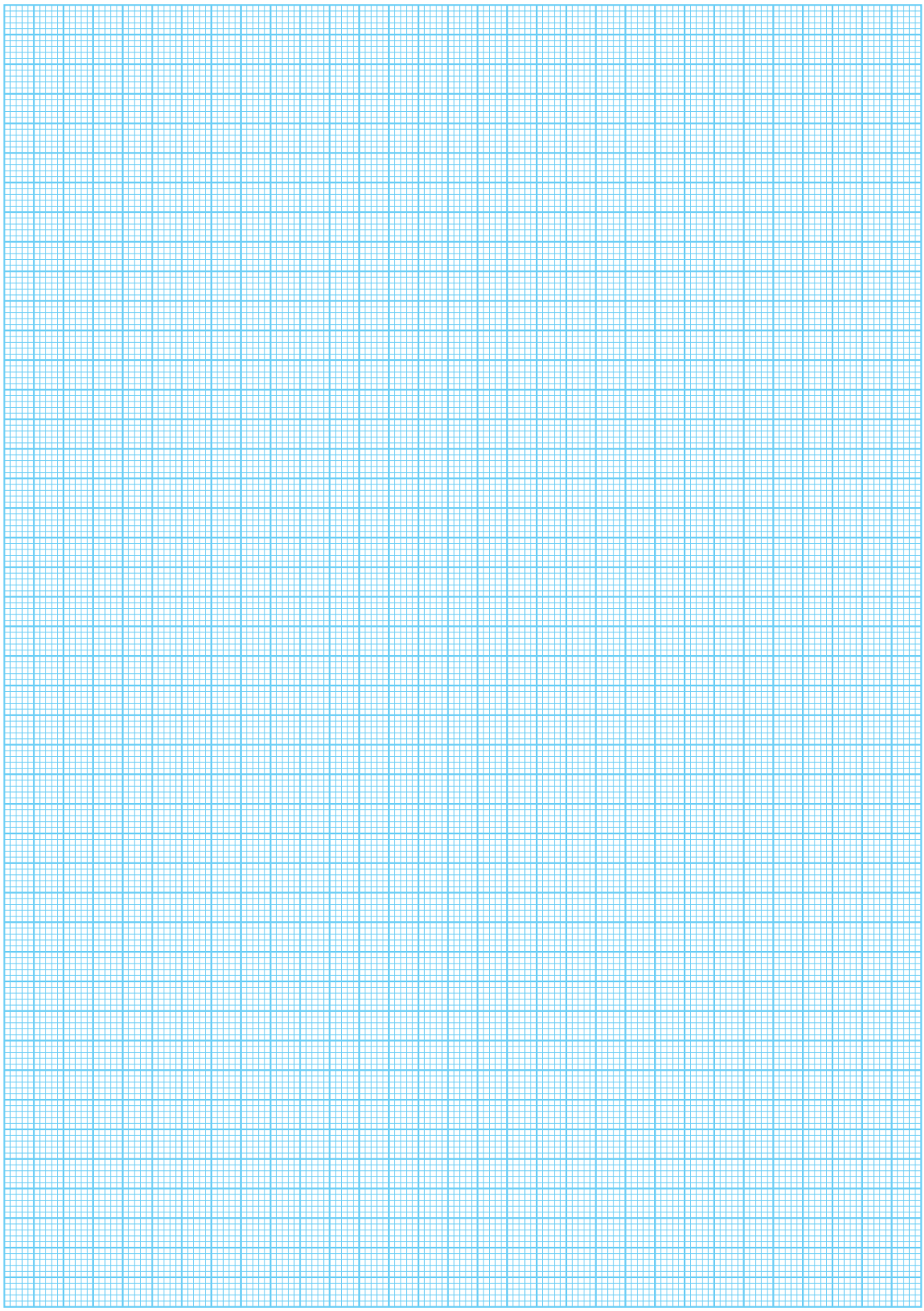

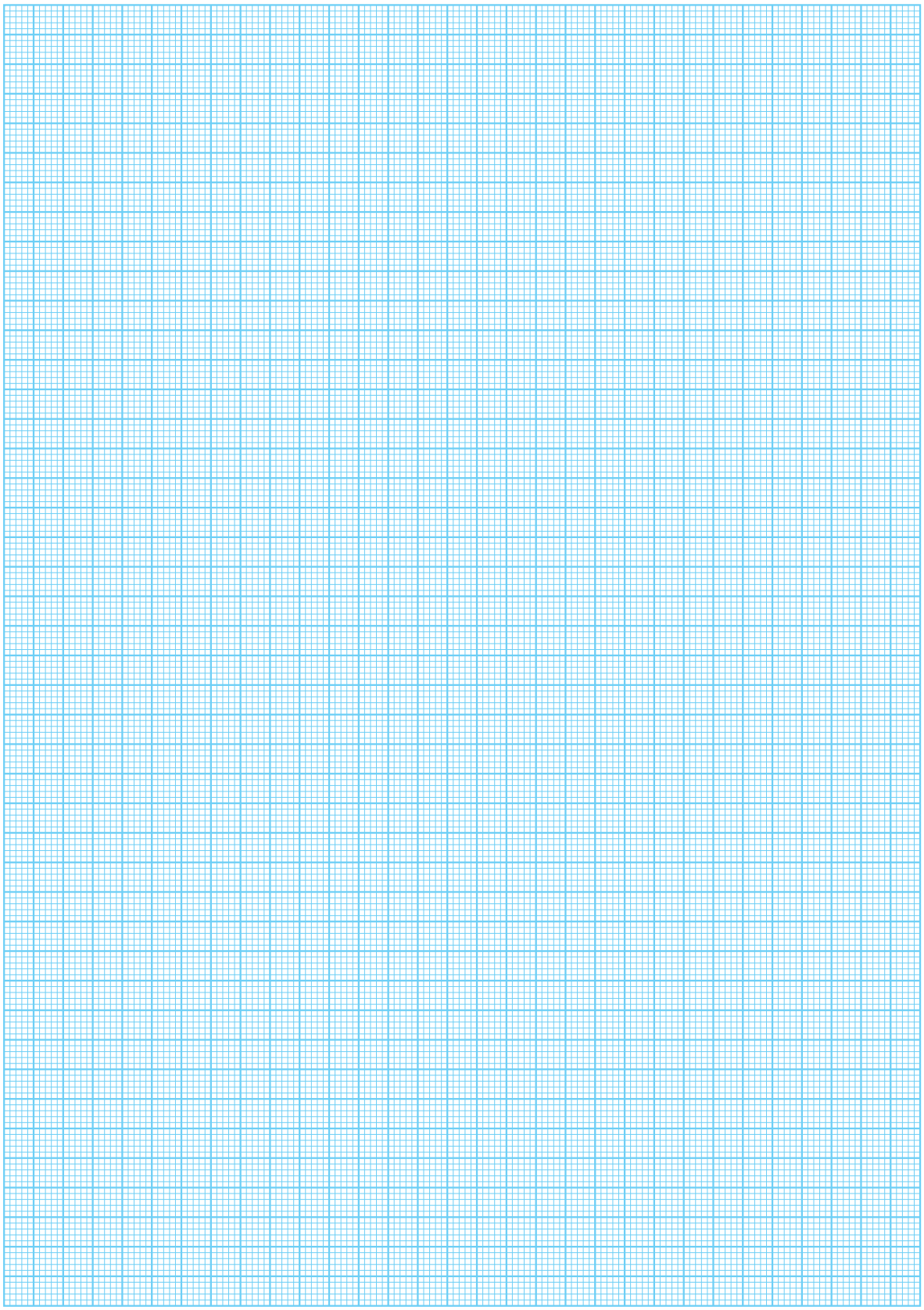

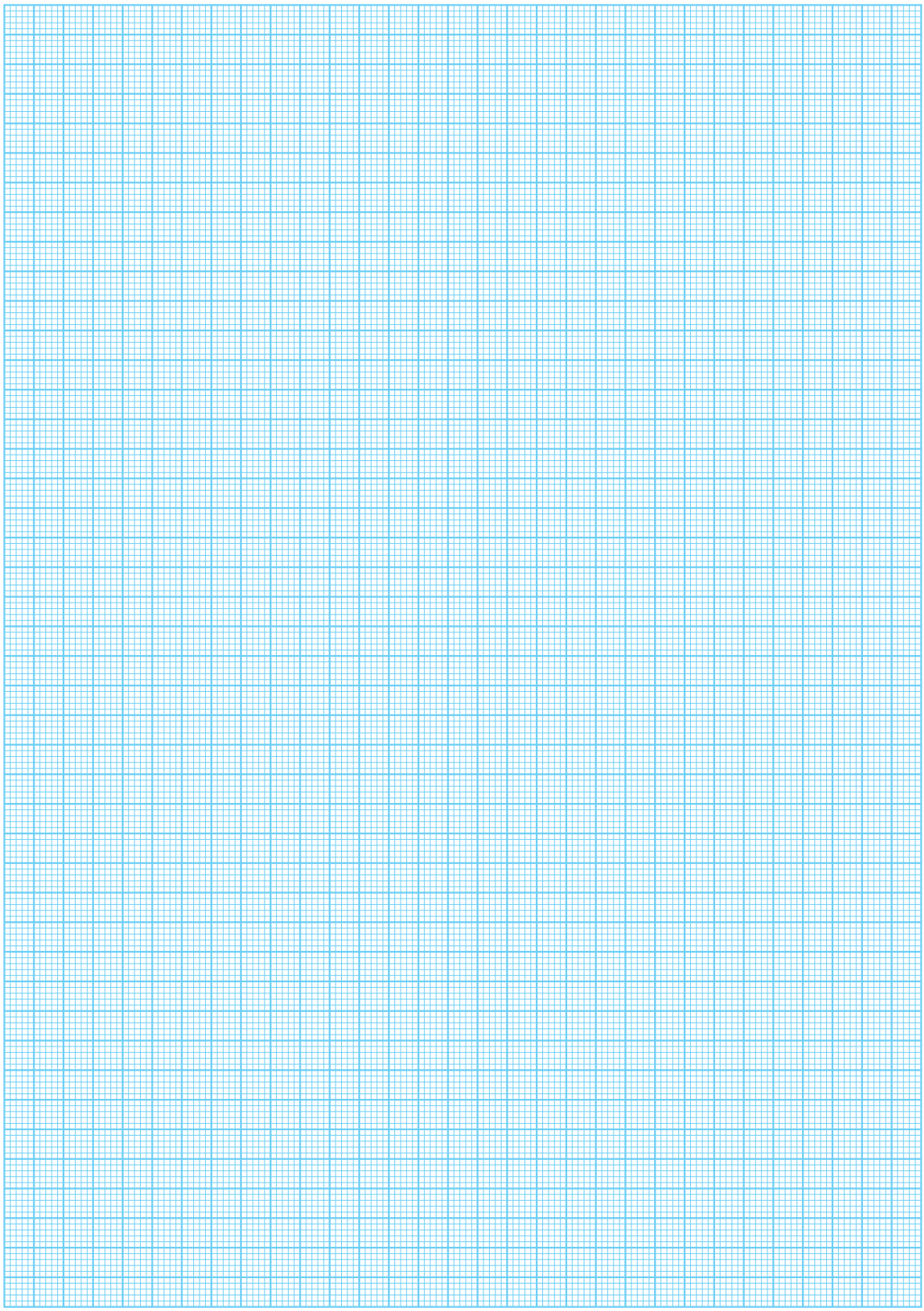

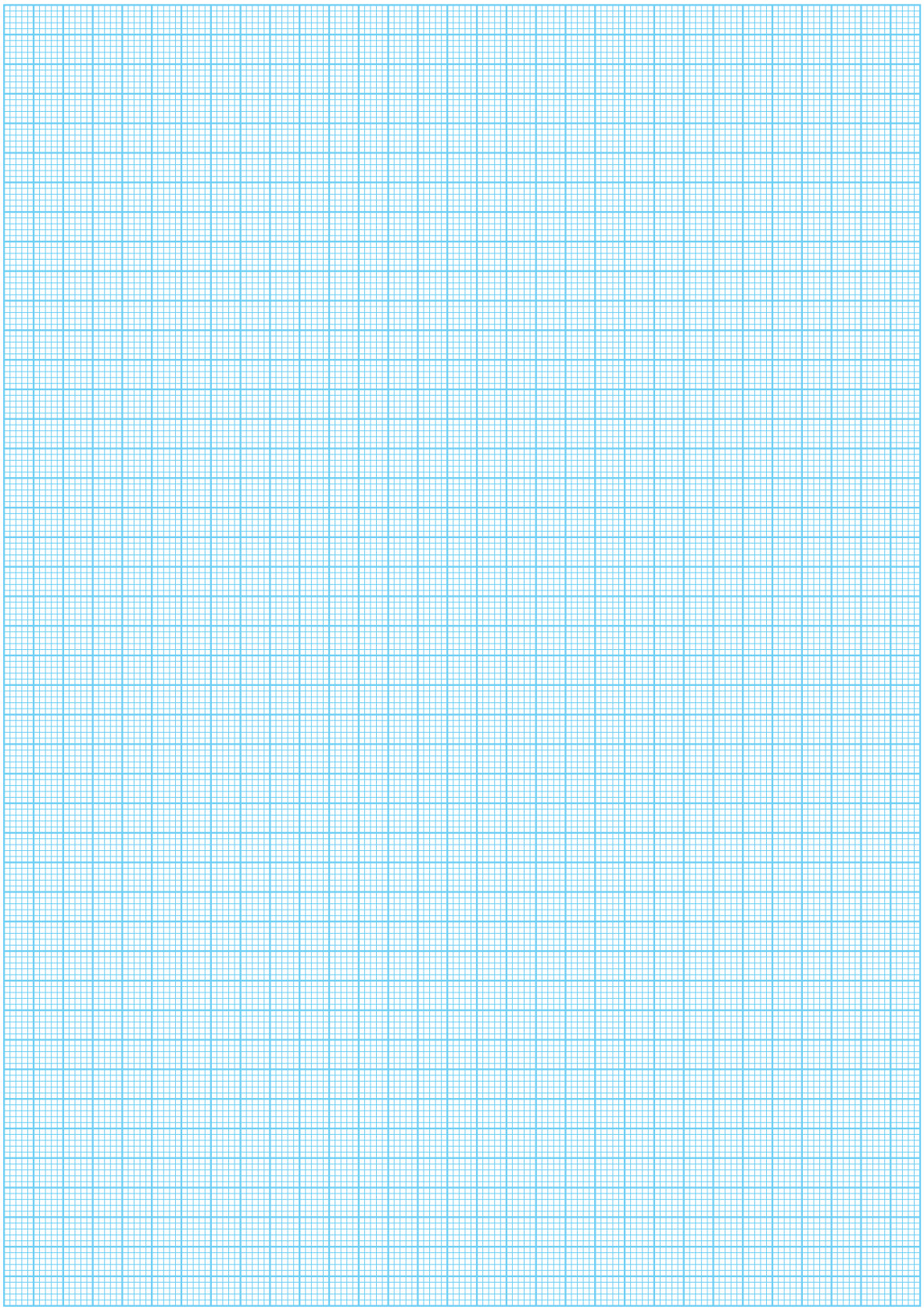

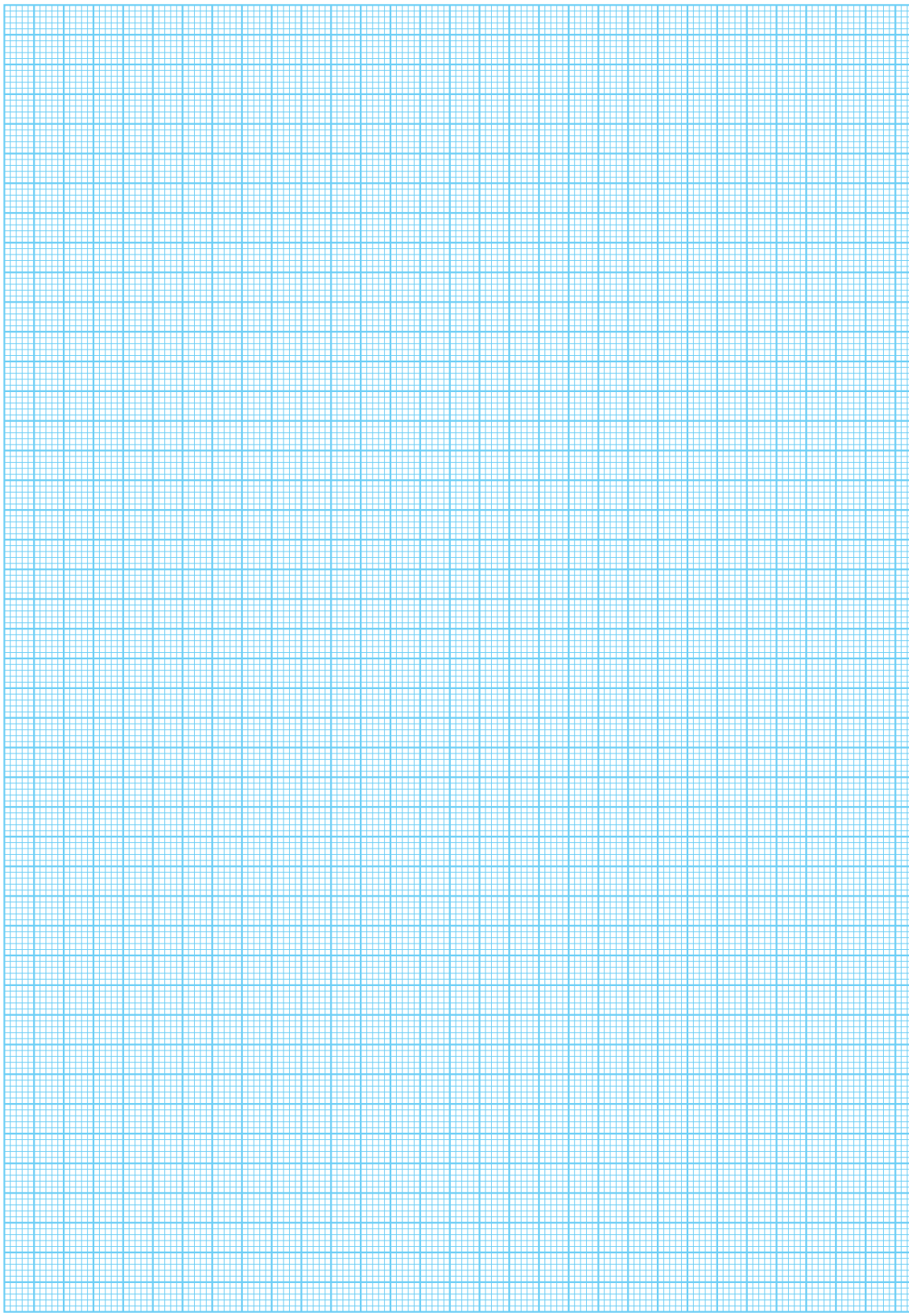

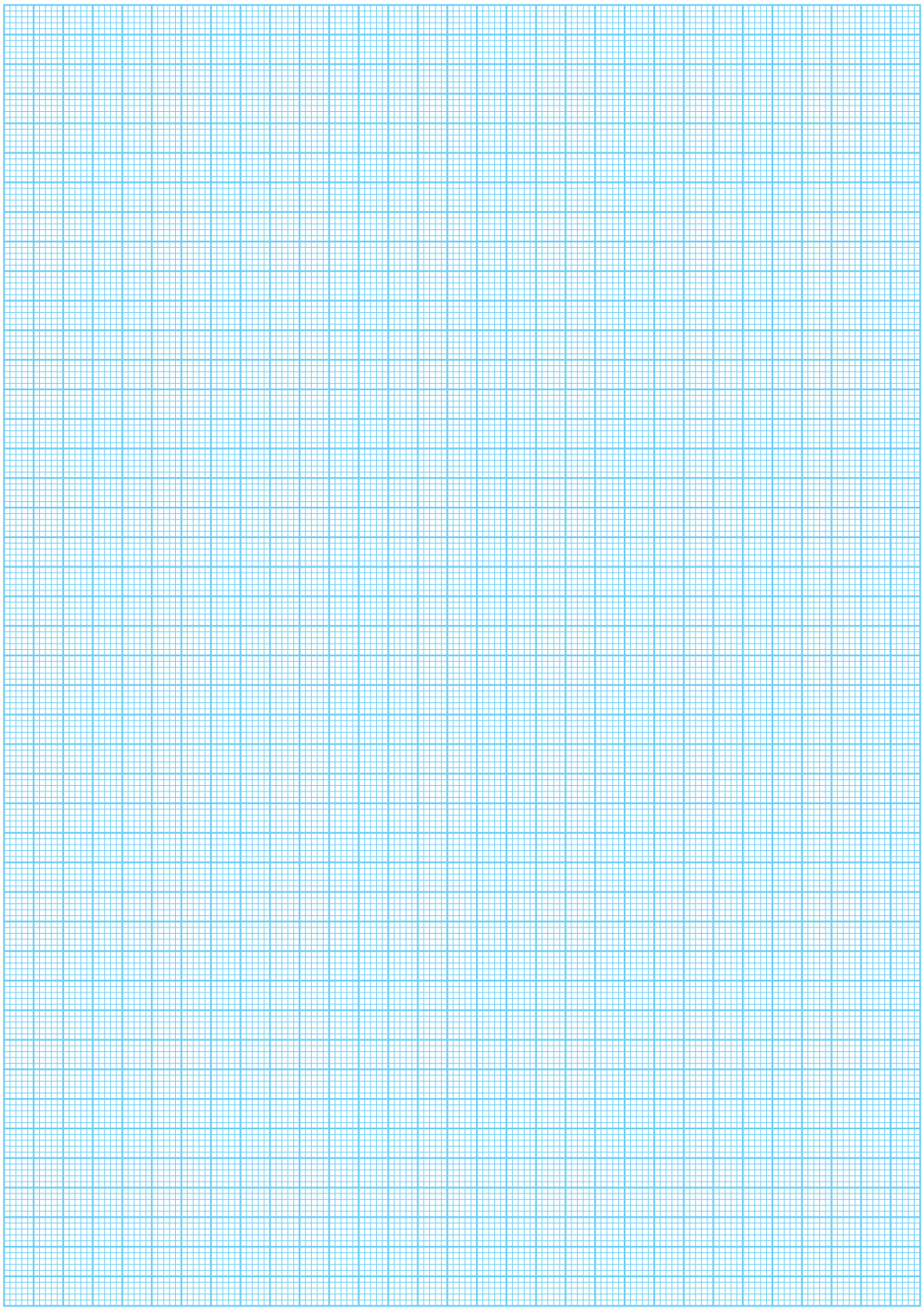

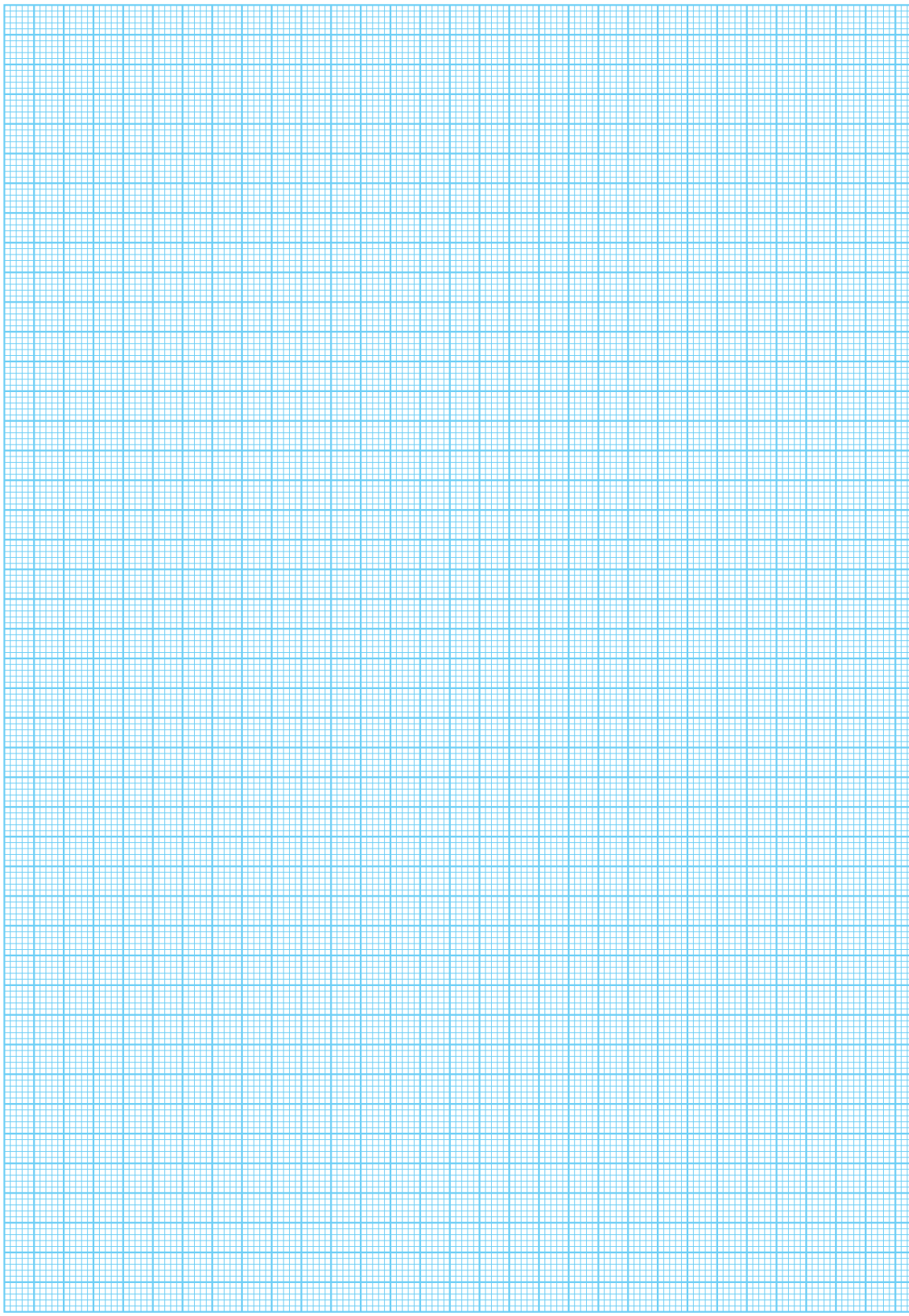

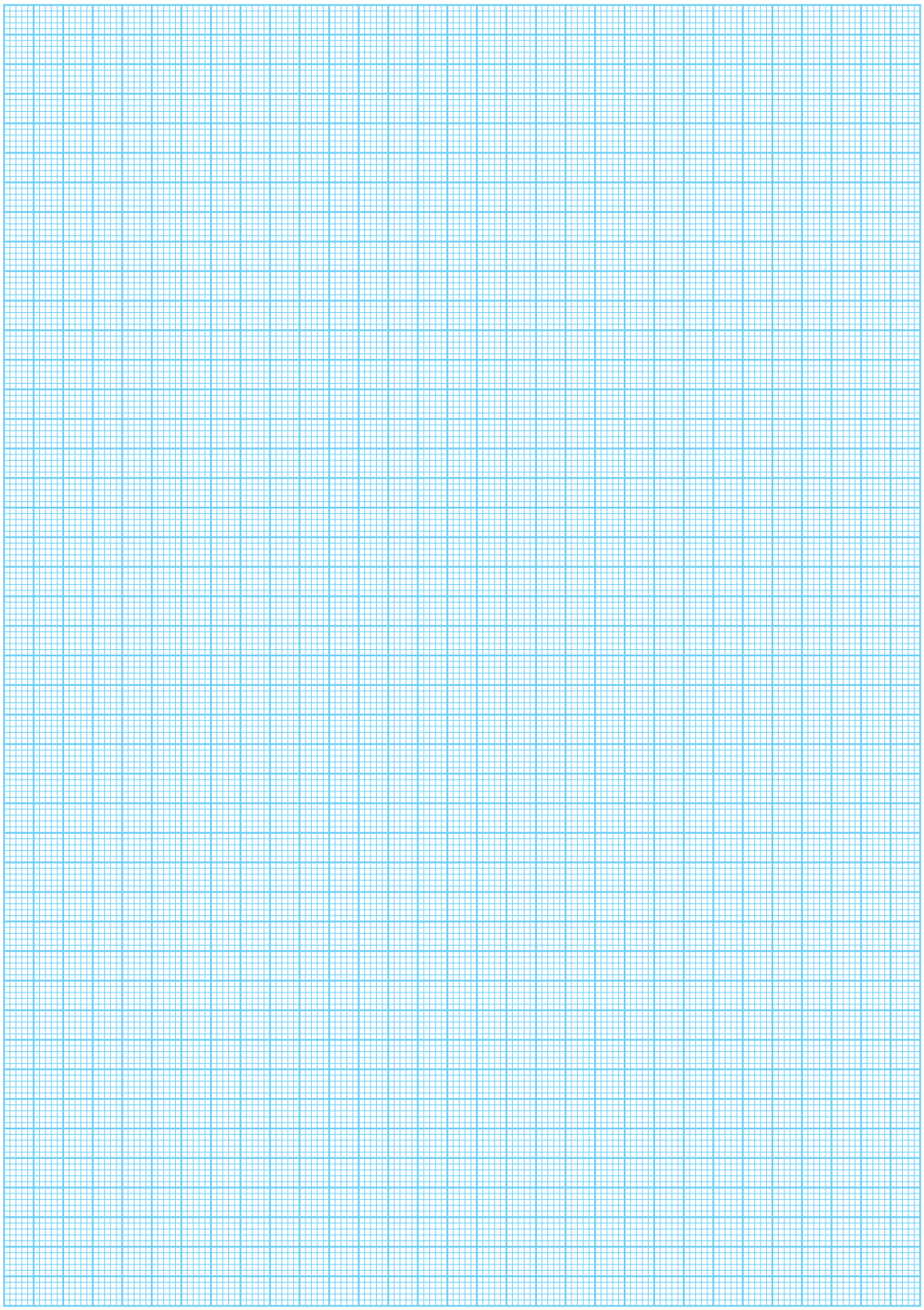

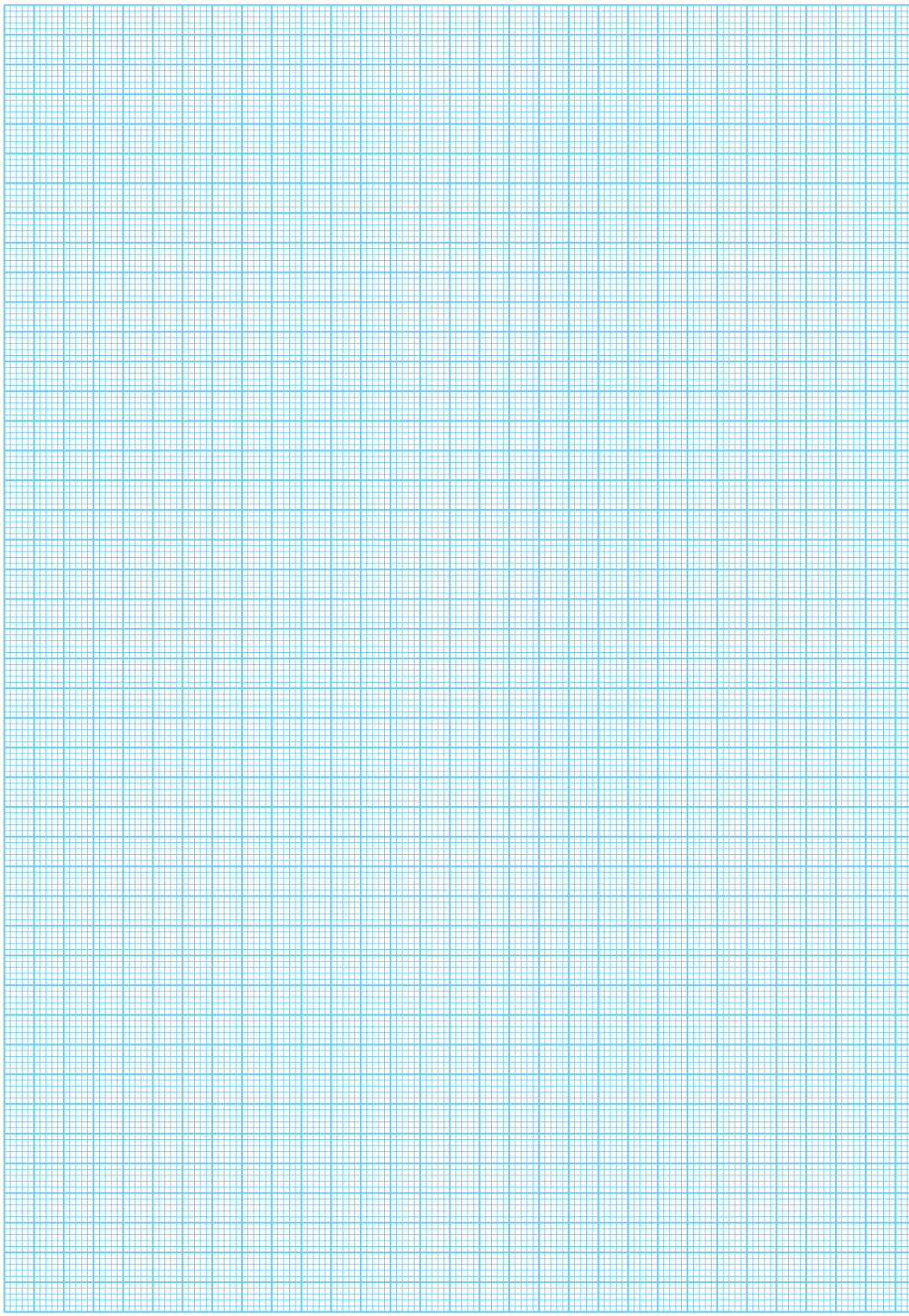

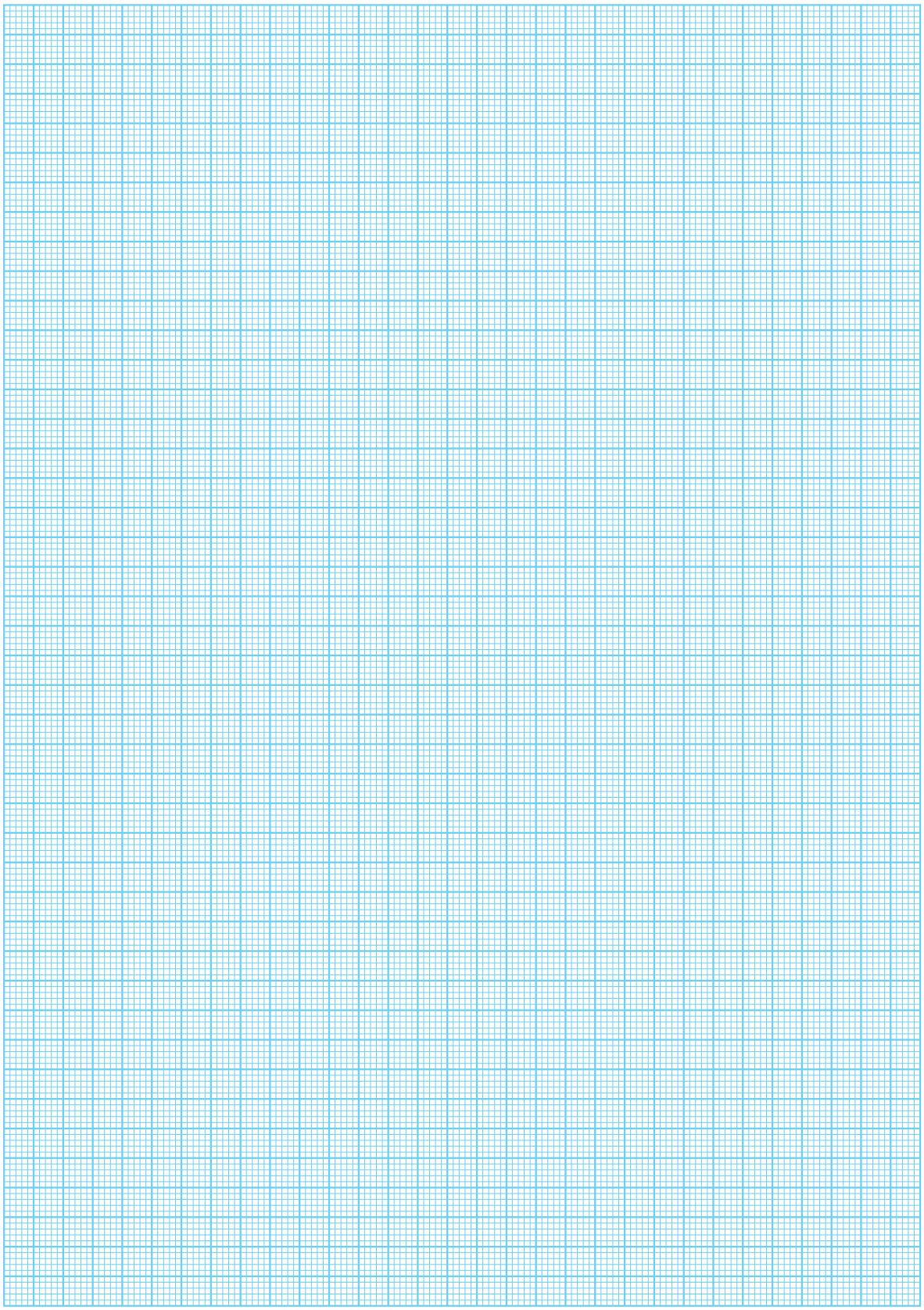

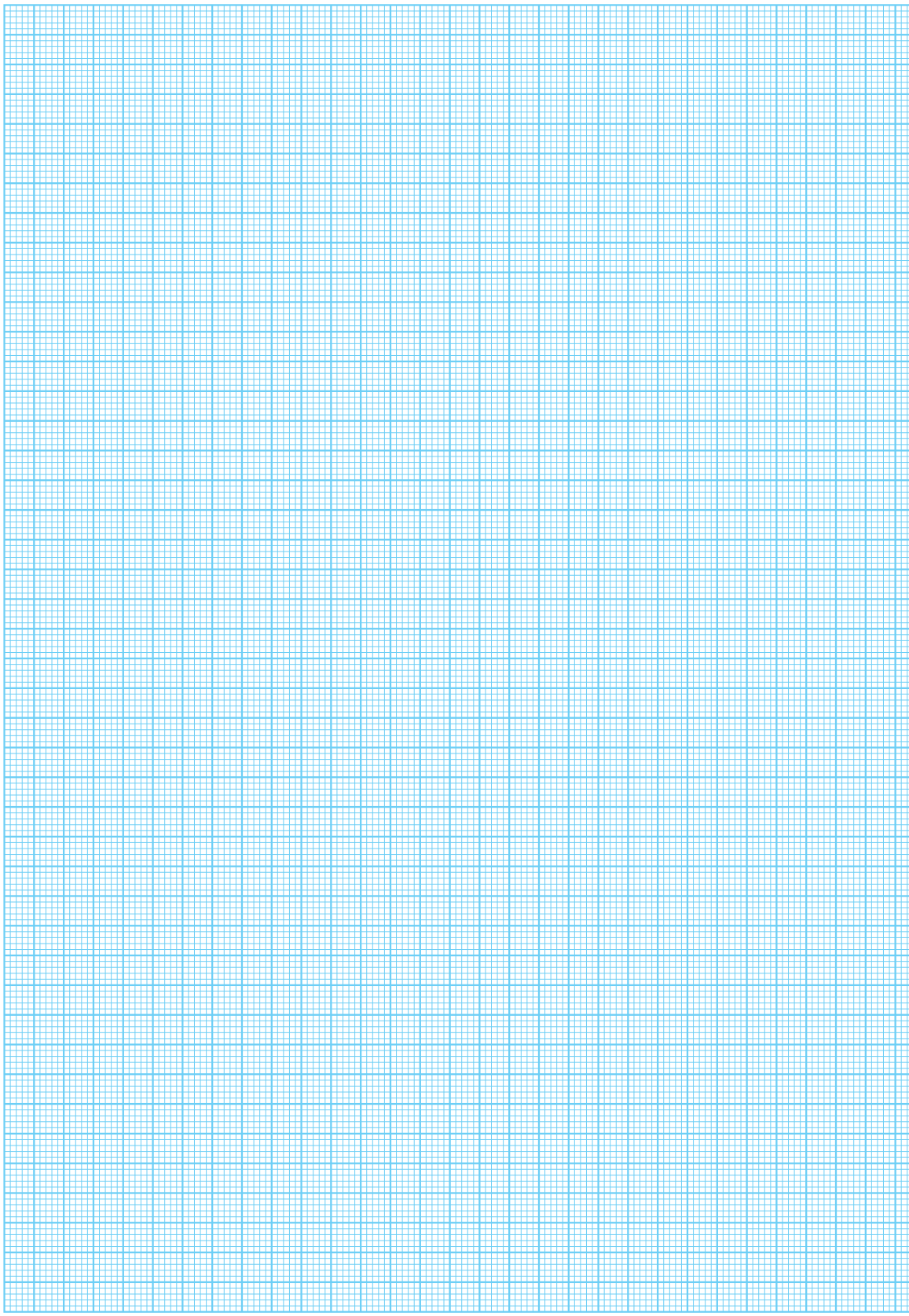

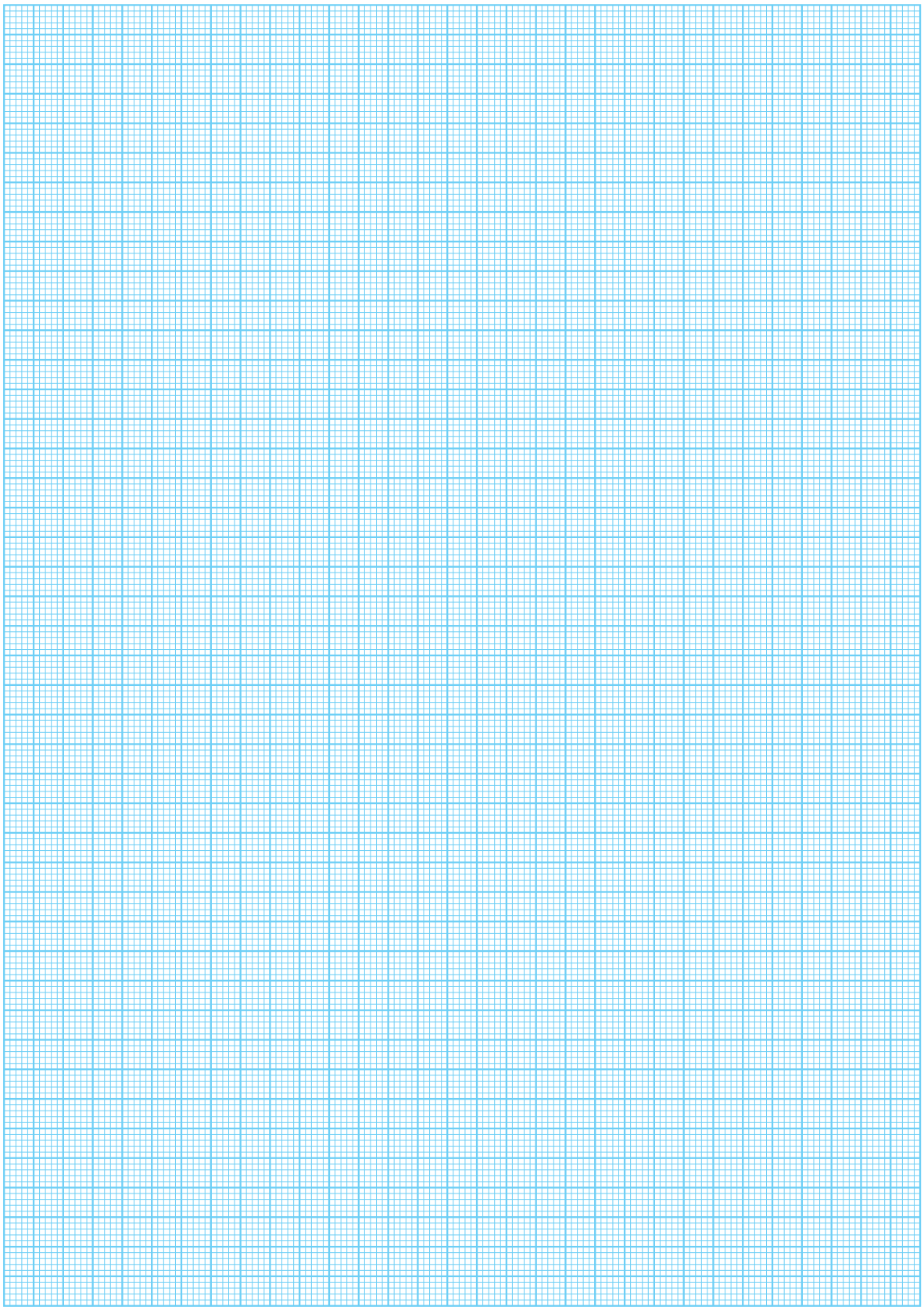

GENERAL TERMS AND CONDITIONS for BUSINESS of MISUMI Europa GmbH

1. Purchases of products (the "Products") from MISUMI Europa GmbH (hereinafter referred to as the "Company") , including (without limitation) such purchases of products related to the Mechanical Standard Components for Factory Automation Catalog (the "Catalog") and special orders by the customer (the „Customer") (see Article10) will be governed by these Terms and Conditions for Business (the "Terms and Conditions"). Purchasers who utilize the Catalog service (the "Service") must strictly adhere to these Terms and Conditions.

2. These Terms and Conditions shall exclusively apply, save changes made by express agreement accepted in writing by both parties. The offer, order acknowledgement, order acceptance of sale of any Products, whether through the Service or otherwise, are subject to these Terms and Conditions. Any conditional or different terms proposed by the Customer are not recognized and will not be binding upon the Company unless agreed upon in writing by the Company.

3. These Terms and Conditions shall apply to every future individual purchase transaction between the Customer and the Company (each a „Contract"), unless overriding written agreements have been made by the parties. Any typographical, clerical or other error or omission in any sales literature, quotation, price list, acceptance of offer, invoice or other document of information issued by the Company shall be subject to correction without any liability on the part of the Company.

4. These Terms and Conditions shall exclusively apply to Customers that are merchants and/or registered companies. The sale of products to private individuals is excluded.

Article 1 Registration

1. Customers must complete all appropriate registration applications and procedures established by the Company prior to any use of the Service. After the Customer has properly completed the registration process, and has subsequently been approved by the Company as a registered Customer, the Company shall then issue the Customer a customer identification number that will enable the Customer to use and access the Service.

2. The Company reserves the exclusive right, in its sole discretion, to deny approval of any Customer's application, for any reason, including without limitation, the following:

   (a) the Customer is not a duly registered company;

   (b) the Customer is a previously registered customer with the Service;

   (c) the Customer's principal place of business or postal address at the time of registration is outside of the European Union (the „EU") or outside those countries that Company has sent the Catalog;

   (d) the Customer has previously had its registration revoked by the Company;

   (e) the Customer has provided untrue, inconsistent or false statements in connection with its registration application; and

   (f) any other reason (including, without limitation, the Customer's credit situation and business category) that the Company deems appropriate by its sole discretion.

3. When ordering Products from the Company, the Customer must provide the customer identification number issued to it at the time of registration as a registered Customer under Article 1.1.

4. The Company may notify Customers via facsimile, mail or electronic mail, from time to time, with respect to upcoming sales campaigns and other related Company matters. Such notification will be not sent if so requested by the Customer in writing.

5. The Customer is responsible for maintaining the security of its registered Customer identification number.

6. The Customer may not transfer, lend or disclose its registered Customer identification number to any third-party

Article 2 Details of Service

1. The Customer may purchase Products listed in Catalog using the Service subject to the provisions of these Terms and Conditions (including, without limitation, specifications, price, delivery date, and terms of use). However, due to the nature of the Products, the Customer's business or other standards prescribed by the Company, or at the discretion of the original manufacturer or Company, some Products may be discontinued, modified, improved, replaced, or declared as obsolete without prior notice or warning to the Customer.

2. The Service is provided within the EU and those countries outside the EU within which the Company has distributed a catalogue. For the avoidance of doubt, the Service is not available in countries or areas to which deliveries by the Company are not made. Any inquiries regarding delivery locations should be directed to the Company.

Article 3 Ordering Products

1. A Customer may apply to use the Service by utilizing the following methods as set forth in Catalog. The Company may restrict the ordering method with respect to special orders (see Article 10) or based on the type or quantity of the Products ordered. The date and time the Company may receive an application are set forth in the Catalog.

2. If the Customer sends its order via email, the Company shall confirm receipt of the order with a return email or via an alternative appropriate means. This acknowledgement of receipt of the order does not constitute acceptance of the Customer‘s order by the Company.

3. Internet orders: Customers may access the Company's website at www.misumi-europe.com and should enter information in all of the required entry fields. Users of the Company's website should also see the Company's Website Terms and Conditions of Use and Privacy Policy prior to any use of the Company's website. Any inquiries with respect to the Company's website should be directed to the Company.

4. Verbal orders are not possible.

5. A quotation by the Company does not constitute an offer. The Company reserves the right to withdraw or revise any quotation at any time prior to the Company's acceptance of the Customer's order.

6. Each order for Products submitted by the Customer to the Company shall be deemed to be an offer by the Customer to purchase Products subject to these Terms and Conditions. The Company shall not be obliged to accept any order for Products. The Contract shall be formed when acceptance of the Customer's order is confirmed in writing by the Company.

7. Please be aware that the Company may claim from the Customer any associated expenses (including, without limitation, insurance and special delivery), which the Company incurs in connection with requests from the Customer.

Article 4 Obligations regarding Use of Products

1. The Customer is referred to the following with respect to the nature of the Products:

   (a) the Products are only suitable to be used in general production equipment. (General production equipment means: automatic assembly equipment; devices for machine processing; inspection equipment and devices; and plant automation machines).

   (b) the Products are, in particular, not appropriate for use in the following types of equipment:

      I. transportation equipment, including semi trucks, ships, railed vehicles,airplanes, etc.;

      II. all types of medical devices or equipment;

      III. all types of commercial goods that are sold to customers or will be sold to customers;

      IV. aeronautics and aerospace equipment;

      V. equipment for use in nuclear energy production; and/or

      VI. military products (for example: weapons, rifles, etc.)

2. The parties agree that the inherent nature of the Products renders them suitable to use only according to the terms in Article 4.1(a)

3. Use of the Products in the areas list above in Article 4.1(b) is prohibited.

4. In general, the Customer should bear in mind and observe all of the duties and obligations listed in the catalog in regard to the Products as well as all details and descriptions in the written material sent with products (or accessories). These duties and obligations include (but are not limited to) product specifications, intended usage, terms and conditions of use, and/or product markings.

Article 5 Delivery Time

1. The number of days required for Products to be delivered to the Customer, -- meaning the number of days required to deliver Products as set out on the relevant page of Catalog (the “Delivery Time”) -- depend on the type and quantity of the Products ordered (such as when Products cannot be delivered right away or there is a large order). The Delivery Time set out in the Catalog is an estimate only and is not binding.

2. The Delivery Time set out in the offer, order acknowledgement, order acceptance is an estimate only and is not binding unless explicitly otherwise agreed upon.

3. Compliance with duty of delivery further assumes that the Customer has fulfilled its obligations in a timely and proper way. Defense under non-fulfillment of contract shall remain reserved.

4. Should the Customer be in default of acceptance, or should it culpably infringe any other duties of collaboration, the Company shall be entitled to claim restitution of such damages as it has suffered thereby, including any additional expenditure. Further claims are hereby reserved.

5. The Company shall be liable in accordance with statutory regulations should deliveries be in default due to a malicious or grossly negligent infringement of contract for which it is responsible; a fault committed by its representative or vicarious agent shall be attributed to the Company itself. Providing that such defaults of delivery are not due to any malicious infringement or grossly negligent infringement of contract for which it is responsible, its liability for damages shall be restricted to foreseeable, typical damage.

6. The Company shall also be liable in accordance with statutory regulations should any defaults of delivery for which it is responsible be due to culpable infringement of a major contractual duty. In this case, however, when such infringement is not malicious, its liability for damages shall be restricted to foreseeable, typical damage.

7. In other cases of defaults of delivery for which it is responsible, the Company's liability for damages shall be restricted to a maximum of the value of said delivery.

8. The above restrictions shall not apply to liability for damage to life, body or health.

9. All further statutory rights and claims of the Customer shall be reserved, excepting claim for damages.

10. The regulations contained in Article 15 shall not be affected by the above regulations.

Article 6 Delivery of Products

1. The place of fulfillment for all obligations of the contractual relationship is the Company's location unless explicitly otherwise agreed upon.

2. The products are shipped to the Customer at its risk and cost according to the following regulations. The means of delivery and the packaging material are subject to the sole discretion of the Company.

3. Delivery will be made to the Customer's address, which is provided in the order acknowledgement. For orders within Germany, the Company will pay applicable delivery charges. The Company has the right to choose the way of transportation.

4. For deliveries outside of Germany, the Customer is responsible for paying the shipping and handling charges per the Company's price list at the time.

5. Responsibility and risk for loss or damage to the Products are passed on to the Customer upon transfer of the Products to the shipper, freight carrier, or designated third party assigned with delivery. The beginning of the loading of the Products will be used to determine when these risks and responsibilities are transferred.

6. The Company will add transportation insurance only when requested by the Customer. The Customer shall be responsible for paying for this insurance.

7. The Customer is responsible for import clearance as well as for all costs related to import clearance.

Article 7 Retention of Title

1. Notwithstanding delivery and the transfer of risks for the Products, or any other provision of these conditions, ownership of the Products shall not pass to the Customer until the Company has received payment in full for the price of the Products and all other Products agreed to be sold by the Company to the Customer for which payment is then due.

2. The Company shall have absolute authority to retake, sell or otherwise deal with or dispose of all or any part of the Products in which title remains vested in the Company.

3. Until such time as ownership passes to the Customer, the Customer shall hold the Products as the Company's fiduciary agent, and shall keep the Products properly stored, protected and insured. The Customer may use or resell processed Products by way of its normal business operations until such time as full payment has been made, but the Customer must hold any proceeds from the sale of such Products for the benefit of the Company and keep such moneys separate from the Customer's own assets and those of third parties. However, the Customer cedes to the Company here and now all receivables to the final sum (including VAT) of such Company's receivable due to the Customer by way of resale or transfer to a its customer or third parties, irrespective of whether or not, the item purchased has been resold after being processed. The Customer shall be empowered to collect this receivable even after cession. The right of the Company to collect this receivable itself shall not be thereby affected. However, the Company shall have a duty not to collect such receivable as long as the Customer fulfils the duties of payment arising from the agreed proceeds, is not in default of payment, and provided in particular that no application has been made to institute a creditors' composition or to open insolvency proceedings and no suspension of payments has been declared. Should this be the case, however, the Company may require the Customer to inform the Company of ceded receivables and debtors, to provide all information needed for collection, to hand over all related documents, and to inform all debtors (Third Parties) of such cession.

4. If the Products are processed or reshaped by the Customer and if processing is done with Products that the Company does not own, the Company shall become co-owner of the Products. The same shall apply if the Company's Products are completely reshaped and mixed with other Products.

5. If third parties take up steps to pledge to otherwise dispose of the Products, the Customer shall immediately notify the Company in order to enable the Company to seek a court injunction. If the Customer fails to do so in due time it will be held liable for any damages caused.

6. The Company shall on demand of the Customer release any part of the collateral if the value of the collateral held in favor of the Company exceeds the value of the claims being secured. The Company may decide to release whichever parts of the collateral it deems suitable.

Article 8 Duty to examine

1. The Customer must examine the Products promptly following delivery by the Company insofar as this is practicable in the proper course of business, and promptly notify the Company of any defects or mistakes in the delivery.

2. If the Customer fails to advise the Company of any defect or mistake within a reasonable period of time following delivery, the Products are deemed to have been accepted (approved) by the Customer, unless there is a defect which was not apparent during the examination.

3. When such a defect becomes apparent at a later time, notice must be given promptly following the discovery, otherwise, the Products are to be deemed accepted (approved) by the Customer, also with regard to this defect.

Article 9 Excess Products

If the Company delivers to the Customer a greater quantity of Products than that which Customer ordered and such mistake is attributable to Company, the Customer will inform the Company within one (1) week of delivery and agrees to return the surplus Products to the Company. In such case, the Company will pay applicable shipping costs to return the excess Products. The Customer shall maintain the excess Products with reasonable care from the time it receives such Products until the Products are returned to Company.

Article 10 Special Orders

1. The Customer may place special orders for Products with specifications set out in schematic drawings provided by Customer, specifications other than those prescribed by Company or other special orders not for Products with the specifications listed in Catalog ("Special Orders") by submitting appropriate drawings and specifications to the Company and the Company shall, if possible, issue a quotation (offer) for the Special Order. On the basis of such quotation, Article 3 shall then apply.

2. These Terms and Conditions shall apply to all Special Orders, provided that in the event of any conflict between the Terms and Conditions and any terms, set out in a Special Order, agreed between the parties in writing, the terms as set out in the Special Order shall prevail to the extent of such inconsistency.

Article 11 Price and Applicable Taxes

1. The price of Products shall be the price quoted by the Company to the Customer or, where no price has been quoted, the price listed in Catalog at the date of acceptance of the order ("Contract Price").

2. The Company shall charge and the Customer shall pay the applicable delivery rate notified, of which the Company will from time to time notify the Customer ("Delivery Charge") in addition to the Contract Price.

3. The Contract price shall be exclusive of any value added tax and any other taxes and duties, which shall (if and to the extent applicable) be payable by the Customer at the rate and in the manner from time to time prescribed by law.

Article 12 Payment

1. Unless otherwise agreed in writing, the Company shall be entitled to invoice the Customer for the Contract price (together with the Delivery Charge) and any applicable taxes and duties payable pursuant to the provisions of Article 11 on or at any time after delivery.

2. The Customer shall make payment of any amount invoiced by the Company in full within thirty (30) days of the date of the invoice, notwithstanding that title to the Products may not have passed to the Customer.

3. All amounts due under a Contract shall be paid in full without any deduction. The Customer shall enjoy rights of set-off only if its counterclaims have been legally upheld by a final verdict, are undisputed, or are recognized by the Company. Furthermore, the Customer shall only be entitled to exercise a right of retention if its counterclaim is based solely and directly on the contractual relationship between the Customer and the Company.

4. Payments hereunder shall be made by way of credit card, cheque or direct bank transfer to the Company's nominated bank account or by such other means as may be agreed between the parties in writing from time to time. The Customer shall be responsible for any bank charges levied for payments made by direct bank transfer.

5. All payments hereunder shall be made by the Customer in Euros.

Article 13 Maximum Amount

1. The Company will set a maximum amount the Customer can owe the Company for the purchase of Products at any given time (the "Maximum Amount").

2. The Company may respond, at its sole discretion, in any of the following ways if the total price for Products ordered by the Customer meets or exceeds the Maximum Amount:

    (a) requesting the Customer to pay in advance or to pay the outstanding amount;

    (b) refusing, revoking or cancelling the order(s); and/or

    (c) any other action as deemed reasonably necessary by Company.

3. The Customer may verify its Maximum Amount by contacting the Company.

Article 14 Refusal to Receive Products

If for any reason the Customer will not accept delivery of Products when they are ready for delivery, or the Company is unable to deliver Products on or before the agreed delivery date because the Customer has not provided adequate delivery instructions, documents, licenses or authorizations or due to any other act or omission on the part of the Customer then, without prejudice to any other right or remedy available to the Company, the Company shall reship the Products back to its warehouse or other premises and the Customer shall indemnify the Company against any and all claims, actions, liabilities, losses, damages and expenses incurred by the Company which arise out of or in connection with the Customer's failure to take delivery of the Products. All further statutory rights and claims of the Company shall be reserved.

Article 15 Force Majeure

The Company shall not be liable for the inability to deliver or delays in delivery caused by circumstances or events beyond the Company's control, which could not be foreseen at the time of signing the Contract and which include Acts of God and events such as all types of business disruption; difficulty or increased expense in obtaining labor, materials or transport; difficulties in obtaining regulatory authorization; the effects of regulatory measures; labor strikes and lock-outs; or failures on the part of the shipper to timely or completely deliver the products. To the extent that these events considerably hinder or render impossible the execution of the contract and these events are not temporary, the Company reserves the right to rescind the contract. Shall the events be of a temporary nature, the terms of delivery or execution of the service will be prolonged or the terms of delivery or execution of the service will be postponed for the duration of the hindrance plus an additional appropriate time period. If the Customer does not agree to the delay in the terms of delivery or the execution of the service, it can withdraw from the Contract having given prompt written notice to the Company.

Article 16 Changing or Cancelling Orders

The customer may change the details of an order and cancel a contract according to the hereafter detailed "Cancellation rules". The Customer is then obligated to pay fees according to these following rules:

Cancellation Rules:

(a) These rules do not affect the Customer's legal rights. They are applicable only when MISUMI allows for the cancellation of a contract and is not legally bound to cancel the contract. MISUMI reserves the right for exceptions to these rules, when due to the manner, type, quantity or shipment date of the product or the utilized distribution system, MISUMI cannot accept the cancellation.

(b) As a basic principle, cancellation of an order is free of charge, when it is made on the day that an order was placed. Express orders have to be cancelled until 12:00 a.m. on the day the order was placed. For cancellations, which are given to MISUMI on the next day (i.e., the day after placement of the order), the customer is responsible to pay a cancellation fee of 40% of the value of the order, including taxes, shipping charges etc according to these following rules. The work day at the facility at MISUMI, Schwalbach / Ts, Germany will be used to determine on which day cancellations were received.

(c) For all parts, which have an estimated delivery time of 2,4,5 or 6 days, it is possible to cancel free of charge on order date, later cancellation is not possible. Stock items can be cancelled free of charge until the day before shipment.

(d) For all parts, which have an estimated delivery time of 8 days, the customer is responsible to pay a cancellation fee of 40% of the value of the order, if the cancellation is made on the next work day following placement of the order. Cancellations at a later date are not possible.

(e) For all parts, which have an estimated delivery time of 10, 12 or 13 days, cancellation 1 day after placement of the order is free of charge. Cancellation 2 or 3 days after receipt of the order will result in a cancellation fee of 40% of the value of the order. Cancellations at a later date are not possible.

(f) For all parts, which have an estimated delivery time of 14, 15, 16 or more days, cancellations on the day of placing the order and 1 or 2 days after are free of charge. Cancellations 3 or 4 days after order placement will result in a cancellation charge of 40% of the value of the order. Cancellations at a later date are not possible.

(g) As exceptions to the rules listed above, special orders (see Article10), as well as express orders cannot be cancelled.

Article 17 Returning and Replacing Products

1. The Customer may only return Products ("Return") to the Company, if mistakes in delivery or damage to the Products are attributable to the Company, and provided that the Customer has notified the Company of such mistake in delivery or damage pursuant to Article 8. The Customer is requested to contact the Company by telephone prior to making a Return. The Customer shall not return any Products actually delivered to the Company without the written consent of, and upon terms agreed to, by the Company.

2. The Company will pay for all reasonable delivery costs incurred in replacing the Products according to the provisions in Article 17.1. The goods should be shipped DDU from outside EU and DDP (Incoterms 2000) from inside EU. The company will refund the actual shipping costs.

3. If the Customer returns Products without having a legal or contractual right to do so, the company reserves the right to refuse the acceptance of the returned Products.

4. Returning stock items may be accepted by the Company, under the condition that the Products are returned to the Company without any costs to the Company, and arrive there completely and undamaged within a period of 4 weeks from the order date. In this case, the Company has the right to take back the Products and to charge the Customer a re-stocking charge of 20% of the order value and the complete Delivery Charge.

5. The purchase price of the Products that have been returned to the Company will not be calculated in the aggregate amount that is used to determine any volume discounts to be offered by the Company and all prices will be re-calculated accordingly.

6. The regulations contained in Article 16.A and Article 17.A shall not be affected by the above regulations.

Article 18 Claims for Defects and Liabilities

1. Any claims for defects by the Customer assume that it has fulfilled its duties of inspection and complaint (examination and notice) as set out in Article 8 in a due and proper way.

2. Insofar as any item of purchase should be defective), the Customer shall be entitled to require subsequent fulfillment . Such subsequent fulfillment shall be made either by removal of said defect, or by the supply of a new, defect-free item, as the Company shall determine.

3. Should such subsequent fulfillment fail, the Customer shall be entitled, under the conditions prescribed by law, to require either rescission or price reduction , as it shall determine.

4. The Company shall be liable in accordance with statutory regulations should the Customer claim damages grounded on malice or gross negligence, including malice or gross negligence by the Company's representatives or vicarious agents. Provided the Company is not accused of malicious infringement of contract, liability for damages shall be restricted to foreseeable, typical damage.

5. The Company shall be liable in accordance with statutory regulations should it culpably infringe on a major contractual duty; in this case, however, when such infringement is not malicious or grossly negligent, liability for damages shall be limited to foreseeable, typical damage.

6. Liability for culpable damage to life, body or health shall not be affected hereby; this shall also apply to compulsory liability under the terms of the German Product Liability Act (Produkthaftungsgesetz).

7. Unless a different regulation is contained above, all liability for defects is hereby excluded.

8. The period of limitation governing claims for defects shall be 12 months, calculated from transfer of risk.

9. The regulations contained in Sections 478 and 479 of the German Civil Code (§§ 478,479 BGB) shall not be affected by this agreement.

10. Any further liability for damages beyond those set out in the above regulations is hereby excluded, irrespective of its legal justification (in particular, by way of other infringements of duty arising from contractual obligations or claims in tort). This shall also apply should the Customer require restitution of fruitless expenditure in place of damages. However, liability for default shall be regulated by Article 5.A and Article 15.A.

Article 19 Revocation of Customer's Registration and Termination of Sales Agreements

1. If any of the following cases apply to the Customer, the Company may revoke the Customer's registration and immediately terminate any Contract without notice for important reasons:

   (a) If it becomes evident that the case set forth in Article 1.2 (e) applies to Customer;

   (b) if a receiver, administrative receiver, administrator or equivalent is appointed over the whole or any part of the Company's business or assets;

   (c) if the Customer is subject to a petition for attachment or provisional attachment;

(d) if a petition for bankruptcy, reorganization or other insolvency proceeding is filed against or by Customer;

(e) if the Customer passes a resolution to dissolve or merge with another company; or

(f) if the Customer breaches a material provision of these Terms and Conditions.

2. If any of the above circumstances apply to Customer, all obligations owed by Customer through use of the Service will become immediately due and payable, and the Customer must promptly pay all such obligations. Further, the Customer must indemnify and hold the Company harmless for any damages incurred by the Company due to the Customer's breach of any provisions of these Terms and Conditions.

Article 20 Notification of and Changes to Registered Information

1. If there are any changes to the company name, address, representative, telephone number, fax number, contact person or other information registered by the Customer at the time of registration, the Customer must immediately notify the Company of such changes in writing.

2. In addition to Article 20.1, if (i) the Customer transfers its business to a third party, receives an assignment of a business from a third party or undergoes a merger, or (ii) any of the circumstances set out in Article 19.1 occur, the Customer must immediately notify the Company. In such cases, the Company may, if it deems it necessary, at its sole discretion, request consultation with the Customer about the status of Customer's registration. The Customer may not assign any of its rights or obligations under a Contract without the prior written consent of the Company.

3. If the Customer fails or delays in giving the appropriate notice provided in Article 20.1 or 20.2, and the Products and Catalog and any administrative communications are not delivered to the Customer or such delivery is delayed, the Company will deem such items to have been received by the Customer. Further, the Customer must pay for all delivery costs in re-sending such items to its new address, costs incurred in replacing Products and any additional fees incurred by the Company.

Article 21 Cancellation of Registration by Customer

The Customer may cancel its registration by notifying the Company in a writing signed by an authorized officer of the Customer. Upon receipt of such notification, Company will revoke the registration of Customer, and Customer will lose its status as a registered Customer.

Article 22 Revisions to Price and Specifications

1. The Company may change, revise or suspend sales of Products listed in its Catalog ("Revisions"), and may choose the timing, media and other methods concerning notification at its discretion in giving notification of Revisions to the Customer.

2. If a Customer orders Products after such Revisions, the Customer will be deemed to have approved such Revisions.

3. Please note, however, that the Company will not notify its Customer of minor changes that do not affect the specifications listed in the Catalog.

Article 23 Approval to Amend these Terms and Conditions

1. The Company may revise, modify or amend these Terms and Conditions ("Alterations"). The valid version of these Terms and Conditions is published by the Company on its homepage under www.misumi-europa.com.

2. If the Customer orders Products after such Alterations, the Customer will be deemed to have approved such Amendments.

Article 24 Effective Term of Catalog

1. The Catalog is effective only until the end of the effective period set forth in Catalog (the "Catalog Effective Term"). Unless the Company indicates otherwise, the Customer will be unable to make any orders from the Catalog after expiration of the Catalog Effective Term. This also applies to orders from any prior Catalog issued that are made before the expiration of the current Catalog Effective Term.

2. The Company will not be liable in any way to the Customer for any expenses or damages incurred by the Customer as a result of making an order from a Catalog whose Catalog Effective Term has expired.

Article 25 Intellectual Property

1. To the extent permitted by law, the Company gives no warranty that the Products shall not infringe the intellectual property rights of any third party.

2. The Customer acknowledges and agrees that it uses the Products at its own risk as regards infringement of third party intellectual property rights.

3. The Customer may not without the approval of the Company or intellectual property rights holder use any of the information provided in the Catalog beyond the scope of intellectual property rights (included, but not limited to copyright) and other applicable law.

Article 26 Confidentiality

Each party agrees and undertakes that it will keep confidential, and will not use for its own purposes nor without the prior written consent of the other party disclose to any third party, any information of a confidential nature (including trade secrets and information of commercial value), which may become known to such party from the other unless such information is public knowledge (other than by breach of this Article) or is required to be disclosed by a court of competent jurisdiction or government or competent authority.

Article 27 Miscellaneous clauses

1. Should individual provisions of the purchase contract or of these Terms and Conditions be void, the other provisions shall nevertheless remain in force.

2. The Customer may not assign or transfer any Contract to a third party except with the written consent of the Company.

3. Except as expressly stated in the Terms and Conditions to the contrary, all notices and other communications required or permitted to be given under the Terms and Conditions shall be in German and in writing and shall be delivered or transmitted to the intended recipient‘s registered office or principal place of business or such other address as either party may notify the other from time to time.

Article 28 Governing Law, Jurisdiction

All Contracts and these Terms and Conditions shall be governed by and construed in accordance with German law and each party agrees to submit to the exclusive jurisdiction of the courts having jurisdiction for MISUMI Europa GmbH. The Company shall have the right to bring a claim before a court at the Customer’s principal place of business or at its discretion before any other court being competent according to any national or international law. The UN Convention on the International Sale of Goods is hereby excluded.

MISUMI Europa GmbH
Katahrina-Paulus-Straße 6
65842 Schwalbach, Germany
HRB 6600, Amtsgericht Königstein/Ts

MISUMI Europe delivery time information

Country	Ship Days	Freight Charge
Albania	+5	75€
Algeria	+5	100€
Andorra	+4	75€
Armenia	+4	75€
Austria	+1	10€
Azerbaijan	+5	100€
Belarus	+3	75€
Belgium	+1	10€
Bosnia and Herzegovina	+3	75€
Bulgaria	+3	30€
Cameroon	+5	100€
Croatia	+3	50€
Cyprus	+3	75€
Czech Republic	+1	7.5€
Denmark	+2	15€
Egypt	+3	100€
Estonia	+2	30€
Finland	+3	15€
France	+2	10€
Georgia	+3	75€
Germany	+0	0€
Ghana	+5	100€
Greece	+3	30€
Hungary	+1	30€
Iceland	+5	75€
Ireland	+3	12.5€
Italy	+2	10€
Kazakhstan	+5	100€
Latvia	+2	30€
Lichtenstein	+1	10€

Country	Ship Days	Freight Charge
Lithuania	+1	30€
Luxembourg	+1	10€
Lybia	+5	100€
Macedonia	+3	75€
Malta	+1	50€
Moldova	+3	75€
Monaco	+3	25€
Montenegro	+3	75€
Marocco	+4	75€
Netherlands	+1	10€
Nigeria	+5	100€
Norway	+3	15€
Poland	+2	15€
Portugal	+2	20€
Romania	+2	30€
Russia	+3	75€
San Marino	+3	30€
Serbia	+3	75€
Slovak Republic	+1	7.5€
Slovenia	+1	20€
South Africa	+3	100€
Spain	+2	20€
Sudan	+4	150€
Sweden	+2	15€
Switzerland	+1	10€
Tunesia	+3	75€
Turkey	+3	75€
Ukraine	+3	75€
United Kingdom	+2	7.5€
Uzbekistan	+5	100€

Delivery times outside Germany:
The times mentioned here are for reference purposes and refer to the delivery times stated in working days in the catalogue (valid inside Germany only).

INFO: Delivery to destinations outside Germany may be longer due to customs procedures.
Notwithstanding our general terms of delivery (see AGB — general terms and conditions), other modes of dispatch may be used, depending on the size, weight and dimensions of the product in question.
For deliveries made by a forwarding company, the customer should have a forklift or elevating truck to receive the goods because the goods are delivered free loading ramp.

Please add the time mentioned in the table (according to your location) to the corresponding time in the catalogue.
The times are valid for economic centres in Europe approximately 98% of the cases.
In case you need an accurate delivery time for your delivery address, please contact your local service office.

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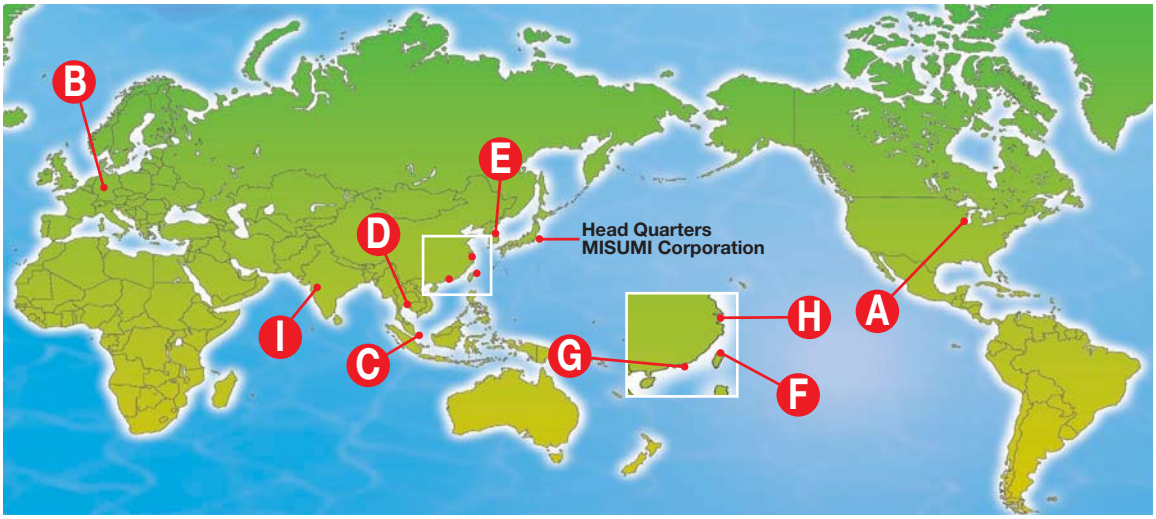

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B MISUMI Europa GmbH	DE: TEL: +49 (0) 6196-7746-0 FAX: +49 (0) 6196-7746-360 UK: TEL: +44 (0) 20 305 148 09 IT: TEL: +39 (0) 2 6203 3100	Katharina-Paulus-Strasse 6, 65824 Schwalbach, Germany	Europe Russia Turkey Africa
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